Biological Assessment for the Potential Effects of Managing the Payette National Forest in the South Fork Salmon River Section 7 Watershed on Snake River Spring/Summer Chinook Salmon, Snake River Steelhead, and Columbia River Bull Trout and Biological Evaluation for Westslope Cutthroat Trout

Volume 28

Ongoing and New Actions

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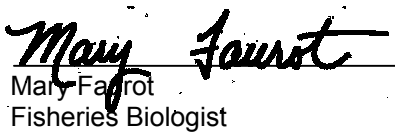

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I. INTRODUCTION

This Biological Assessment (BA) determines the effects of various Federal actions in the South Fork Salmon River Section 7 Watershed (SFSR), on Snake River spring/summer Chinook salmon *(Oncorhynchus tshawytscha)* and their designated critical habitat, Snake River steelhead *(Oncorhynchus mykiss)* and their designated critical habitat, and Columbia River bull trout *(Salvelinus confluentus)*. These species were identified in cooperation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). This BA is tiered to previous BAs and supplements for the Section 7 watershed defined as the South Fork Salmon River Section 7 Watershed (Figure 1). These BAs are listed at the end of this document under a section of the references cited called *Previous BAs*. Actions in this BA are similar actions as described in 50 CFR 402.12 (g). All acronyms, phrases, references, and associated documents from these BAs are included. Actions supersede all those in previous consultations within the boundaries of the Payette National Forest, including, but not limited to, those lands in the Frank Church River of No Return Wilderness.

This document also includes a Biological Evaluation (BE) of the effects of Federal actions on westslope cutthroat trout *(Oncorhynchus clarki lewisi)*. Biological Evaluations for sensitive species are prepared by direction of the Forest Service manual (FSM 2670).

Descriptive information in this BA covers the SFSR Section 7 watershed. The assessed federal actions occur in portions of the watershed that have been divided into four analysis areas, which are composite collections of hydrologic units (HUs) and often not true watersheds.

II. General Description of the Section 7 Watershed

The South Fork Salmon River (SFSR) watershed covers 721,926 acres on the Payette (594,432 acres) and Boise (104,427 acres) National Forests (this CD1: \Support Documents\Maps\sec7watersheds.pdf). State and private lands make up less than four percent of the watershed's land base. Designated wilderness areas total 69,100 acres. A variety of land uses occur on public and private land, including, but not limited to, livestock grazing, mining, recreation, road maintenance and reconstruction, road use and timber harvest.

The SFSR flows generally north and enters the Salmon River near Mackay Bar, Idaho. Elevations range from 2,166 feet at the mouth to about 9,280 feet at North Loon Mountain. Wildfire is a common occurrence on PNF lands in the watershed.

The composition and structure of rocks in the SFSR watershed includes four major types: glacial and stream sediments, granitic rocks of the Idaho Batholith, metavolcanic and metasedimentary rocks, and rocks associated with the Challis volcanics. Metamorphic rock roof pendants occupy a northwest-southeast trend in the eastern part of the watershed. The rest of the watershed is underlain by various types of granitic rocks, and some volcanics along the extreme eastern portion of the watershed. Weathering of granitic rocks breaks them down into a sandy material, and stream channels that flow through areas of granitic material have a higher percentage of sand-sized particles than streams associated with other geologic types.

Mean annual air temperatures vary throughout the watershed. At the Big Creek Summit monitoring site (elevation 6,580 feet) average daily maximum temperature is 63^{O} F, minimum is 14^{O} F, and mean average is 37^{O} F. At Yellow Pine (elevation 5,070 feet), average daily maximum is 54.6^{O} F, minimum is 23.6^{O} F and mean average is 39.1^{O} F. Frost can occur any day of the year at elevations above 7,000 feet (USFS 1997).

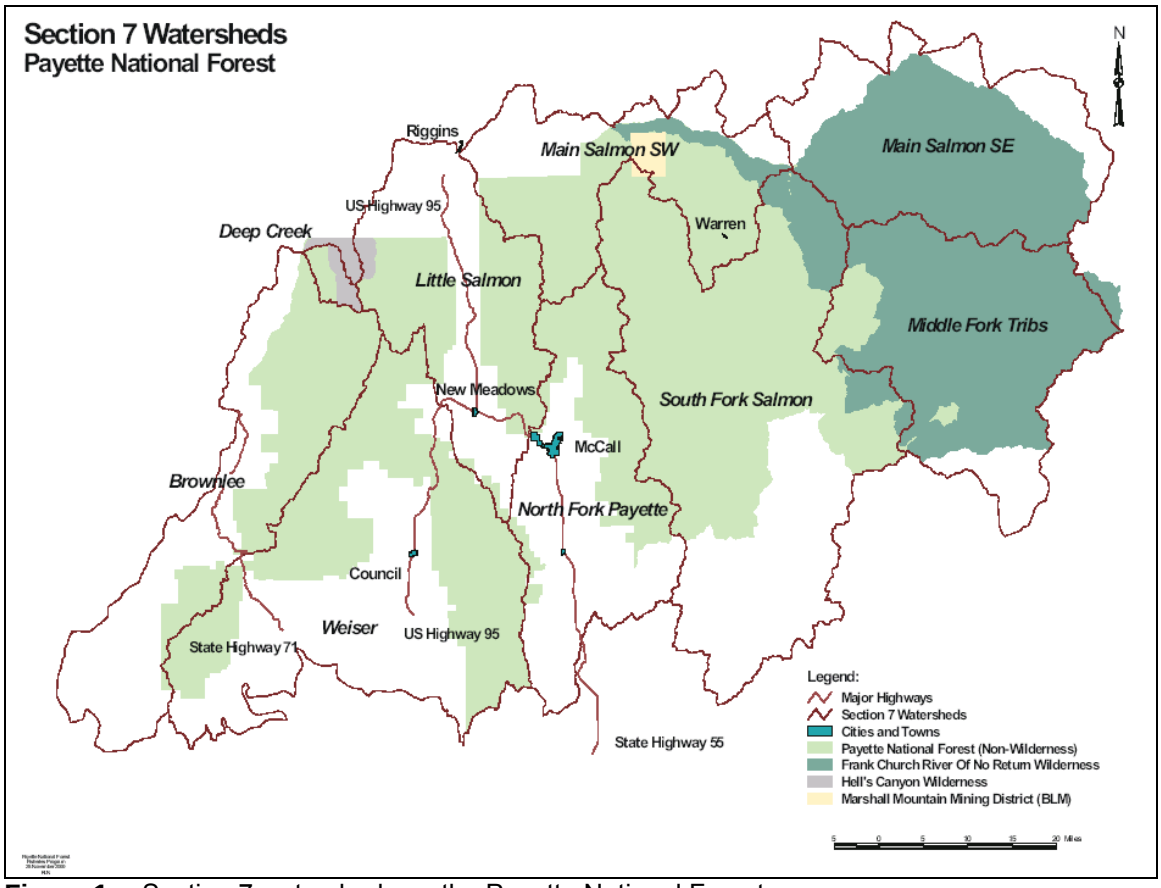

Figure 1.—Section 7 watersheds on the Payette National Forest

Precipitation in the watershed averages about 31 inches per year. The heaviest precipitation usually falls as snow in November and December. Occasionally, subtropical Pacific storms move over the area producing warm rainstorms in late fall or early winter. These storms have caused significant rain-on-snow events such as those that occurred in December 1964 and January 1997. Mean annual precipitation increases with elevation and ranges from about 18 inches at lower elevations to 27.6 inches at Yellow Pine, 49 inches at Big Creek Summit, and 58.3 inches at Deadwood Summit (USFS 1997).

Peak stream discharge occurs during a six-week period in May and June following snowmelt. Base flows occur from September through January. From 1928 to 1995, mean annual discharge ranged from 123 cfs to 622 cfs, at the mouth of Johnson Creek near Yellow Pine with a peak of 6,330 cfs in 1974.

The SFSR and its tributaries generally have low nutrient and mineral concentrations. Data collected from 1979 to 1981 on the upper SFSR measured average total dissolved solids (TDS) at 48 mg/l, average alkalinity at 24 mg/l, and specific conductance at 56 umHOS (Thurow, 1987).

Vegetation consists of several cover types. Lower elevations support mixed conifer, ponderosa pine, and Douglas fir. Mid- and higher elevation areas support lodgepole pine, grand fir, Englemann spruce, and subalpine fir. Slopes are characteristically steep, and high elevation areas are marked by craggy peaks, cirque basins, and other evidence of glacial activity. Much of the lower elevation area is open grassland with scattered trees on steep slopes, especially on the southern aspects.

Riparian stream bank vegetation typically consists of grasses, forbs, willow, and alder. Midstory vegetation includes shrubs, typically spirea, huckleberry, and alder. Riparian overstory includes

lodgepole pine and Douglas fir. Open meadows have overstory vegetation of grasses and sedges mixed with willow and alder.

Above the confluence with the East Fork SFSR, the SFSR alternates between V-shaped canyon sections and open U-shaped valley reaches. Low gradient reaches occur at Stolle Meadows, Dollar Creek, Poverty Flats, Secesh Meadows, Lake Creek, and Glory Areas. Tributary streams generally have steeper gradients.

In 1964 and 1965, a series of intense storms and rain-on-snow events created numerous landslides and slumps triggered by logging and associated road construction, inundating the SFSR and some of its tributaries with heavy sediment loads (Platts, 1972). Changes in channel profiles and cross sections have indicated a decrease in channel bed elevation and percentage of fines (Nelson et al. 1996b, 1997, and 1999). High runoff in the winter and spring of 1995-96, extensive flooding, and hillslope failures in the winter and spring of 1996-97 appear to have had less effect on substrate quality than the events of 1964-65 (Nelson et al. 1999).

Table 1.—Hydrologic unit composition of the South Fork Salmon River Section 7 watershed. (CD1: \Support Documents\Maps\sfsr_aa_map.pdf)

4th Level HU[a]	5th Level HU	Analysis Area	Area (acres)
17060208	17060208-02	East Fork (Upper) SFSR	115,030
	17060208-04	East Fork (Lower) SFSR	
	17060208-06	Lower SFSR	177,980
	17060208-05	Secesh River	157,247
	17060208-01	Upper SFSR (Payette NF portion)	128,238

[a] HU — hydrologic unit.

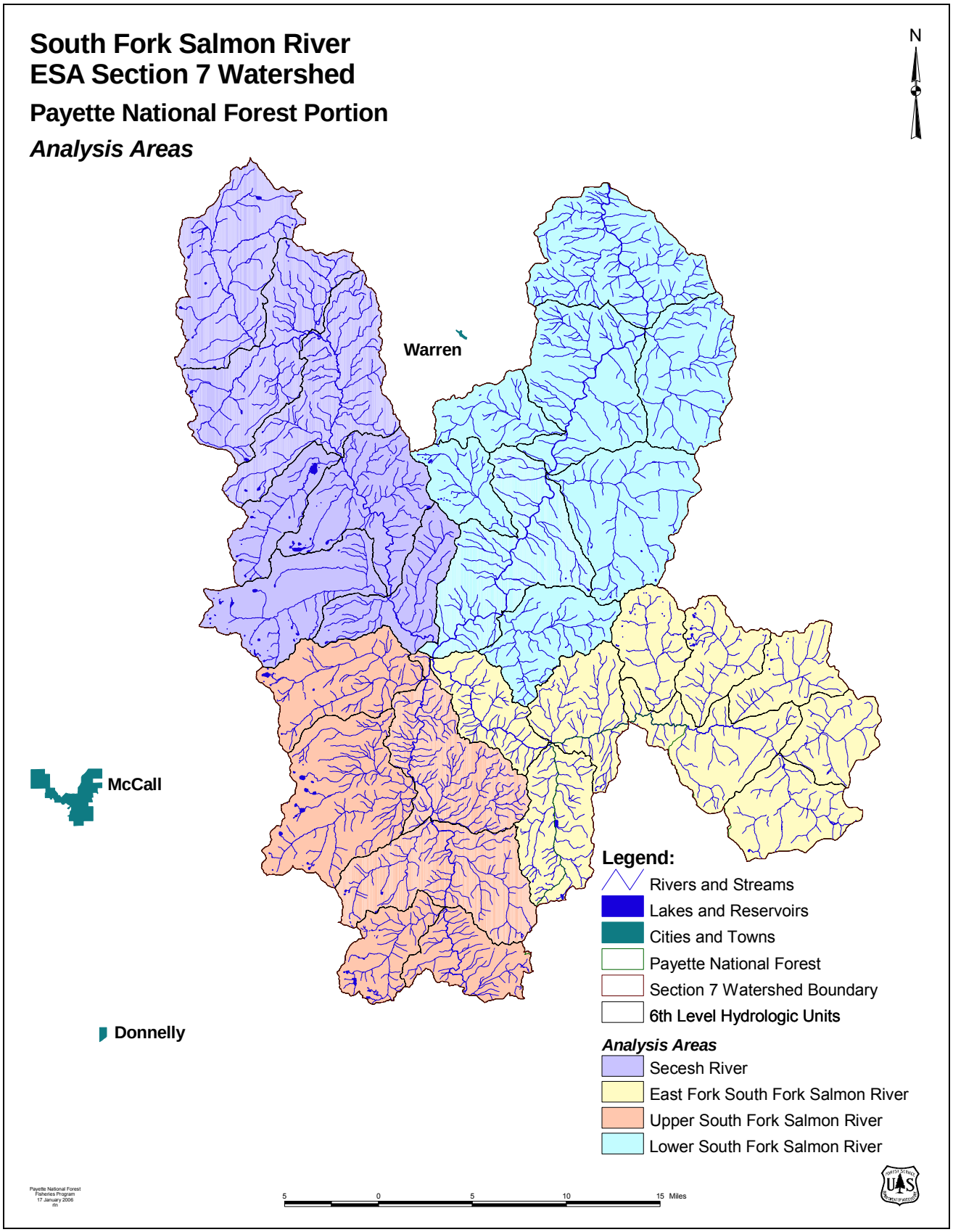

Figure 2.—Analysis areas for the South Fork Salmon River Section 7 watershed, 2006 Ongoing Biological Assessment (CD1: \Support Documents\Maps\sfsr_aa_map.pdf).

A. Listed Species and Critical Habitat and Sensitive Species

1. Overview

Forest-wide maps indicating the state of our knowledge of actual fish distribution by Forest stream are included in CD1: \Support Documents\Maps\bull_trout_map.pdf, chinook_map.pdf, cutthroat_map.pdf, steelhead_map.pdf.

These maps, which may be incomplete, were produced from primary sources that included: raw data, formal reports analyzing data, formal publications of analyzed data, and file letters documenting observations by trained personnel. Reports and publications containing second hand descriptions of fish distribution were not used. Documentation of anadromous species presence from sources created prior to 1965 when Hells Canyon Dam was completed was not accepted; and various other sources suspected to contain inaccurate descriptions of species distributions were rejected. Inferences with respect to species presence in areas where they were not observed were based on connectivity and population in adjacent reaches. Survey data used to create these maps are on file at PNF SO.

All of the listed species are found in the South Fork Salmon River Section 7 Watershed, but fall Chinook are found only in the mainstem Salmon River downstream from the mouths of the SFSR; fall Chinook are not mentioned or discussed further in this BA.

2. Chinook Salmon

a. Species Distribution

Snake River spring/summer and fall Chinook salmon, listed as threatened by the National Marine Fisheries Service (NMFS, 57FR14653), occur in the SFSR section 7 watershed and all of the subwatersheds previously defined. Hereinafter, all references to Chinook salmon are for the listed species.

b. Critical Habitat

Critical habitat for Chinook salmon was designated in 1993 (58FR68543) and specifically defines geographic areas, and essential habitat elements. Critical habitat for Chinook salmon includes all river reaches presently or historically accessible and adjacent riparian zones, except reaches above impassable natural falls. The SFSR section 7 watershed and all of the subwatersheds previously defined contain habitat elements necessary to support Chinook salmon, and are at least partially accessible to the fish. Designation of critical habitat specifically defines geographic areas, and essential habitat elements.

c. Essential Fish Habitat

This biological assessment also evaluates the potential effects within the MFSR Section 7 watershed on Essential Fish Habitat (EFH), in accordance with applicable requirements of section 305(b) of the Magnuson-Stevens Act (MSA), implementing regulations in 50 CFR Part 600.920. EFH is coincident with designated critical habitat for Chinook salmon in these section 7 watersheds.

3. Steelhead

a. Species Distribution

Snake River steelhead, listed as ***threatened*** by NMFS in 1997 (62FR43937) occur in the SFSR Section 7 watershed. Hereinafter, all references to steelhead are to the listed species.

b. Critical Habitat

The final rule designating critical habitat for steelhead was published by NMFS on September 2, 2005, and took effect on January 2, 2006 (70FR52629). The SFSR provides spawning and juvenile rearing, adult holding and migration habitat.

4. BULL TROUT

a. Species Distribution

Columbia River bull trout were listed as threatened by the U.S. Fish and Wildlife Service (USFWS) in 1998 (63FR31647). Columbia River bull trout occur in the SFSR Section 7 watershed. Hereinafter, all references to bull trout are to the listed species.

b. Critical habitat

Critical habitat for bull trout was proposed by the USFWS on November 9, 2002 (U.S. Fish and Wildlife Service, 67FR71236). In the October 6, 2004, final rule there is no designated critical habitat for bull trout within or immediately downstream of the analysis area (U.S. Fish and Wildlife Service, 69FR59996).

5. WESTSLOPE CUTTHROAT TROUT

a. Species Distribution

Westslope cutthroat trout are designated by the Regional Forester as a sensitive species. Westslope cutthroat trout were petitioned for listing (63FR31691) but were determined by the USFWS to not be warranted in 2000 (65FR20120). Westslope cutthroat trout occur in the SFSR Section 7 watershed. Hereinafter, all references to cutthroat trout are for the petitioned species.

b. Critical habitat

Critical habitat is not applicable to westslope cutthroat trout.

B. SCOPE

This BA covers both programmatic actions that can occur throughout the watershed and individual, site-specific actions. The actions covered in this BA include those where previous consultation would have expired in 2006, as well as new proposed actions.

C. LOCATION

The Salmon River watershed is within the Snake River and Columbia River basins. The South Fork Salmon River, located in west-central Idaho, is a major tributary to the Salmon River. It is bounded on the north by the Main Salmon River, on the east by the Main Salmon SE and Middle Fork NW watersheds, on the south by the Payette River watershed, and on the west by several tributaries of the Main Salmon River (CD1: \Support Documents\Maps\sec7watersheds.pdf). The SFSR watershed is designated as fourth level USGS hydrologic unit 17060208.

III. Specific Descriptions of Analysis Areas (Environmental Baselines)

Analysis areas in this BA are synonymous with action areas. The SFSR Section 7 Watershed is described below by analysis area. These four analysis areas correspond to PNF 5th HUs and are named similarly: Upper SFSR, Lower SFSR, Secesh, and East Fork SFSR (EFSF) (CD1: \Support Documents\Maps\sfsr_aa_map.pdf).

A. Upper SFSR Analysis Area

1. Natural Physical Characteristics

The Upper SFSR above the confluence of the EFSF alternates between V-shaped canyon sections and open U-shaped valley reaches. Low gradient reaches occur at Poverty Flats, Darling Cabin, Oxbow, and Glory areas. Tributary streams have steeper gradients. The major tributaries in this analysis area are Goat, Blackmare, Fourmile, Buckhorn, and Fitsum Creeks; small lakes are found in the headwaters. (See Wagoner and Burns 2001 for further description). There are very few natural barriers that fragment occupied or suitable habitat, however, human-caused barriers are present at Indian Creek and Goat Creek due to culverts.

Physical characteristics are tabulated in Wagoner and Burns (2001). Wildfire is a common disturbance in the watershed: 475 acres of "large fire" burned from 2001-2005 in the analysis area (PNF GIS 9/05, CD1: \Support Documents\Maps\fire_history.pdf). Maps of prescribed, wildland, and wildland fire use fires are in CD1: \Support Documents\Maps\large_fire_map.pdf and rx_fire.pdf.

2. Human-Caused Physical Characteristics

See Appendix 1 for a summary of past actions and their effects for which consultation has been completed. Unauthorized activities and potential effects for this analysis area are tabulated in Wagoner and Burns (2001). Road densities, road/stream crossings, and ECA are discussed by Watershed Condition Indicator (WCI) in Appendix 2. Restoration actions completed since 2001 that were prescribed in Wagoner and Burns (2001) (in addition to those specifically recorded in Appendix 1) include:

- Road-to-trail conversion in Buckhorn Creek drainage
- Ongoing slope stabilization and erosion control on the South Fork Salmon River Road
- SFSR streambank cleanup

The following human-caused physical actions update the baseline reported in Wagoner and Burns (2001) and are in addition to those specifically recorded in Appendix 1:

Annual Chinook salmon fisheries have been operated by the IDFG (sport) and Shoshone-Bannock and Nez Perce Tribes (subsistence) on hatchery salmon since 2000. The IDFG seasons run approximately from June 30 to July 5, when they typically close because the quota of incidental wild fish has been caught. The area for the IDFG sport fishery extends from 100 yards downstream of the SFSR fish weir to the mouth of Goat Creek, primarily on the Boise National Forest. The area open for tribal fishing use extends further downstream on the PNF to Fourmile Creek or lower. Aside from the direct effects of catching and releasing wild Chinook salmon, this activity results in ongoing streambank impacts related to concentrated use of areas for fishing access and camping. Stairways which provide and focus angler access were constructed by the Boise National Forest in some areas in 2001-2003 to reduce this erosion.

The Goat Creek culvert remains as described in Wagoner and Burns (2001). Planning is being conducted to replace the culvert with a open-bottom structure (see Federal Actions in this document).

Floating restrictions have been implemented since 2001 to restrict mainstem SFSR recreational floating. Restrictions should have reduced potential effects from interactions between recreational floaters and spawning steelhead and Chinook in the upper SFSR. Spawning areas in the SFSR that span the width of the river channel exist at large pool tailouts, for example at Krassel Guard Station (D.

Burns, Payette National Forest fishery biologist, personal communication). Before the restrictions were in place, harassment of spawning fish could have occurred because floaters would have been unable to avoid spawning areas, and floating occurs at the same time of year as spawning.

An accidental aerial fire retardant drop occurred in Nick Creek, tributary to Buckhorn Creek, in 2004. The BA (Faurot and Burns 2005a) concluded that lethal or sublethal adverse effects to downstream fish could have occurred.

3. Cumulative Analysis Area Effects

Cumulative effects in the analysis area are addressed in Appendix 2.

4. Analysis Area Restoration Opportunities

The following restoration opportunities have been identified in the Upper SFSR analysis area by PNF watershed specialists, fisheries biologists, and the Blackmare-Fourmile Watershed Analysis (Foster-Wheeler 2002). The legal descriptions are meant to indicate the vicinity, but not necessarily the exact location of the project.

- Complete a focused inventory of roads and trails
- Improve or obliterate road segments identified in the focused inventory that contribute sediment to the SFSR and its tributaries, especially in NF Fitsum, Camp, and Cougar Creeks
- Continue with SFSR Road ongoing stabilization projects (various locations)
- Oxbow Breach project (T18N R6E Sec16)
- Replace Goat Creek culvert with open-bottom culvert or bridge
- Asphalt maintenance of SFSR Road – seal coat and chip seal
- SFSR Road reconstruction component actions (see Federal Actions in this document)

5. Description and Distribution of Chinook, Steelhead, Bull Trout, and Cutthroat Trout

For general life history and distribution, see Section I.A. – General Species Overview. For specific distribution, see Fish Distribution Maps (CD1: \Support Documents\Maps\bull_trout_map.pdf, chinook_map.pdf, cutthroat_map.pdf, steelhead_map.pdf)

6. Habitat Condition, Trend, Limiting Factors

Appendix 2 tables address the status of Watershed Condition Indicators (WCIs). WCIs which are Functioning at Unacceptable Risk (FUR) or which have changed in status since 2001 (Wagoner and Burns (2001)) for the Upper SFSR analysis area are described below.

a. Local Population Size (bull trout) – FA.

This WCI was FR in 2001.

b. Intragravel Quality in areas of spawning and incubation for anadromous fishes (Sediment) – FR.

Nelson et al. 2006a: **"**Inspection of the WCI table from Nelson and Burns (2005) shows intragravel functional condition based on mean large fines (< 6.3mm in particle diameter) for the SFSR spawning areas as "functioning at risk" (FR) for Stolle, Dollar, Poverty and Oxbow, and "functioning appropriately" (FA) for Glory and Ice Hole*."*

c. Interstitial Sediment Deposition (Substrate Embeddedness) – FUR.

Nelson et al. 2006b describe the Upper SFSR sampling sites as follows: "All of the sites would be classified as FR for the revised embeddedness WCIs because the five-year means exceed 32% but are less than 42%". For free matrix, "The primary Buckhorn Creek site (E016) had the fewest streambed free particles on average and the 5-year mean places it in the "Functioning at Unacceptable Risk" (FUR) category according to the revised SFSR WCIs (< 11%). Only the Blackmare Creek site could be classified as "Functioning Appropriately" (FA), with the undeveloped Fourmile Creek site and the somewhat developed Fitsum Creek site being similar but "Functioning at Risk" (FR) for sediment according to the revised sediment WCIs."

Nelson et al. (2006b) describe the SFSR Road sampling sites as follows: "Both of these (control) sites were clearly in the FA range (free matrix), and were the only sites that were; the Fourmile Creek sites were near the lower limit of the FR range while the Camp Creek sites had the lowest proportions of free particles and were solidly in the FUR range." "Both of these (Fourmile) sites would be classified FR based on cobble embeddedness, just as they were using free matrix measurements."

d. Large Woody Debris (LWD) – FA.

This WCI was FR in 2001. Recent data shows LWD ranging from 31 – 224 pieces per mile.

e. Refugia – FR.

This WCI was FA in 2001. Mainstem SFSR RCAs are disturbed by a road, culverts, and localized recreational disturbance. RCAs in some side drainages are intact (Fourmile, Goat, Fitsum, Blackmare Creeks) except at road locations, where others have experienced effects of riparian roads, failed and existing fish passage barrier culverts, and timber harvest (Buckhorn, Camp, Phoebe, North Fork Fitsum).

f. Floodplain Connectivity – FR.

This WCI was FA in 2001. Mainstem SFSR RCAs are disturbed by a road, culverts, and localized recreational disturbance. RCAs in some side drainages are intact (Fourmile, Goat, Fitsum, Blackmare Creeks), where others have experienced effects of riparian roads, failed and existing passage barriers to fish at culverts, and timber harvest (Buckhorn, Camp, Phoebe, North Fork Fitsum Creeks).

g. Change in Peak/Base Flows – FR.

This WCI was FA in 2001. Mainstem SFSR RCAs are disturbed by a road, culverts, and localized recreational disturbance. RCAs in some side drainages are more intact (Fourmile, Goat, Fitsum, Blackmare Creeks), where others have experienced effects of riparian roads, failed and existing passage barriers to fish at culverts, and timber harvest (Buckhorn, Camp, Phoebe, North Fork Fitsum).

B. EAST FORK SOUTH FORK ANALYSIS AREA

1. NATURAL PHYSICAL CHARACTERISTICS

Deadman Creek has a natural fish barrier (boulder with 8-foot drop) 30m above EFSF Road. See Wagoner and Burns (2001) for further description and tabulation of natural physical characteristics.

Wildfire is a common disturbance in the watershed: 6,882 acres burned from 2001-2005 in the analysis area (PNF GIS 9/05, CD1: \Support Documents\Maps\fire_history.pdf). Maps of prescribed, wildland, and wildland fire use fires are in CD1: \Support Documents\Maps\large_fire_map.pdf and rx_fire.pdf. The Parks Eiguren spring prescribed burn was completed in 2003. No effects to fish were documented.

2. HUMAN-CAUSED PHYSICAL CHARACTERISTICS

See Appendix 1 for a summary of past actions and their effects for which consultation has been completed. Unauthorized activities and potential effects for this analysis area are tabulated in Wagoner and Burns (2001). Road densities, road/stream crossings, and ECA are discussed by Watershed Condition Indicator (WCI) in Appendix 2.

Restoration actions completed since 2001 that were prescribed in Wagoner and Burns (2001) (in addition to those specifically recorded in Appendix 1) include:

- Removal of concrete dam from EFSF channel above Stibnite mine (BAER action)
- CERCLA projects at Stibnite Mine
- Water management on Yellow-Pine to Stibnite Road

The following human-caused physical actions update the baseline reported in Wagoner and Burns (2001) and are in addition to those specifically recorded in Appendix 1:

Sediment delivery, chemical contamination, and changes to natural stream flow patterns have characterized the Stibnite mining area for the last 100 years. Since 1992, with the listing of Chinook salmon, actions on Federal lands have been reviewed and some effects mitigated (Appendix 1). Recent management activities have focused on continued clean up of Federal lands in the Stibnite mining area.

Baseline conditions still include the legacy of the century-old Stibnite and Cinnabar mining areas, however recent reclamation and CERCLA efforts have addressed sources of effects to fish and fish habitat. Mine reclamation activities have reduced potential erosion and sediment delivery by reducing sediment sources, restoring hydrologic function, and vegetating disturbed sites. Actions have also removed hazardous materials toxic to aquatic organisms. CERCLA actions have relocated part of Meadow Creek, reduced the risk of catastrophic failure of the Meadow Creek diversion channel, reduced mobilization of toxic tailings into Meadow Creek, reduced erosion of spent ore into Meadow Creek, eliminated the potential for diesel to enter Cinnabar Creek, and reduced the migration of tailings into Cinnabar Creek.

In 2005, the Red Mountain minesite in upper Quartz Creek was completely reclaimed. The Skipper Load lower adit, lower in the drainage, was backfilled. On the Quartz Creek Road, driveable dips were constructed, road drainage was improved, and the road was gated and locked against vehicle traffic. However, the road was not returned to a single track trail as called for in the reclamation plan.

Unauthorized road maintenance activities by Valley County resulted in the removal of log jams and the subsequent destruction of at least one Chinook salmon redd in the EFSF in 2004; as well as increased erosion from several culvert replacements.

3. Cumulative Analysis Area Effects

Cumulative effects in the analysis area are addressed in Appendix 2.

4. Analysis Area Restoration Opportunities

- Minimize sidecast of sediment on roads
- Install erosion control structures on FH 48 from the SFSR confluence to Yellow Pine (starts at T19N R6E Sec3)
- Armor ditchline on FH 48 from the SFSR confluence to Yellow Pine
- Vegetate RCAs with riparian species on FH 48.
- Ongoing Stibnite Mine site clean up (see Federal Actions) (T18N R9E Sec2, and others)
- Obliterate Sugar Creek Rd. and other exploration roads in the Sugar Creek drainage (T18N R9E Sec2, and others)
- Improve water management in RCA areas of Profile Creek Road 340 at specific locations determined through on-site review (starts at T19N R8E Sec25)
- Improve water management on Quartz Creek Road (Trail 067) at specific locations determined through on-site review (T20N R8E Sec33) and convert segments to a trail as specified on the reclamation plan for the Red Mountain mine in order to reduce encroachment on RCAs
- Eliminate fish passage barrier at Bradley Pit in the Stibnite Mining District on private land in cooperation with the Nez Perce Tribe

5. Description and Distribution of Chinook, Steelhead, Bull Trout, and Cutthroat Trout

For general life history and distribution, see Section I.A. – General Species Overview. For specific distribution, see Fish Distribution Maps (CD1: \Support Documents\Maps\bull_trout_map.pdf, chinook_map.pdf, cutthroat_map.pdf, steelhead_map.pdf).

6. HABITAT CONDITION, TREND, LIMITING FACTORS

Appendix 2 tables address the status of Watershed Condition Indicators (WCIs). WCIs which are Functioning at Unacceptable Risk (FUR) or which have changed in status since 2001 (Wagoner and Burns (2001) for the East Fork South Fork analysis area are described below.

a. Subpopulation Size – FR.

This WCI was FA in Wagoner and Burns (2001). There are not sufficient trend data in the EFSF to characterize subpopulation size (Burns et al. 2005). If "...a trend cannot be confirmed, a local population will be considered at risk until enough data is available to accurately determine its trend" (from definition of Functioning at Risk in LRMP App. B, Table B-1, USFS 2003).

b. Temperature – FR.

This WCI was FA in Wagoner and Burns (2001). Though temperature values are within the FR/FUR ranges for default WCIs, data are considered to reflect a natural temperature regime in most of the ESFSR drainage because there is little evidence of management effects in these watersheds that would contribute to elevated temperatures (except within the Stibnite mining area). Given the stream elevation, topography, aspect, and riparian vegetation characteristics, the data likely reflects the natural range of variability except within the Stibnite mining area.

c. Interstitial Sediment Deposition (Substrate Embeddedness) – FR.

Nelson et al. 2006b describe the EFSR sampling sites as follows: "we would classify only the Tamarack Creek site as FA, with FR classifications applied to E050 and the two Sugar Creek sites and FUR classifications for the two mainstem EFSFSR sites (free matrix)." "Cobble embeddedness measurements were consistent with free matrix counts, with the Tamarack and Profile Creek sites being least embedded and the sites downstream of the Stibnite area being most embedded."

d. Large Woody Debris – FUR.

Available data for the subwatershed show 1-4 pieces/mile (Kuzis 1997, Unpublished data on file at PNF SO). There is limited recruitment due to Stibnite mining disturbance and mainstem EFSFSR, Profile, Sugar and Quartz Creek Roads.

e. Streambank Condition – FR.

This WCI was FUR in Wagoner and Burns (2001). Kuzis (1997) reported a mean streambank stability of 88% for the Upper EFSF.

f. Change in Peak Flows – FR.

This WCI was FA in Wagoner and Burns (2001). Roads, the Glory Hole, and other historical diversions in the Stibnite Mining Area have affected flow timing in the upper EFSF, Profile Creek, and along the mainstem EFSF (personal observation). Water diversions removed more than a negligible flow.

g. Drainage Network Increase – FUR.

This WCI was FR in Wagoner and Burns (2001). Extensive channel rerouting and diversion began in the early 1900s, and a high percentage of roads within RCAs, have changed channel lengths in the Upper EF due to mining and RCA roads (personal observation).

h. Disturbance History – FUR.

This WCI was FR in Wagoner and Burns (2001). Extensive channel rerouting and diversion began in the early 1900s, and a high percentage of roads within RCAs, have changed channel lengths in the Upper EF due to mining and roads in RCAs (personal observation).

j. Riparian Conservation Areas – FUR.

This WCI was FR in Wagoner and Burns (2001). Roads along EFSFSR, Sugar, Profile and Quartz Creeks, and mining in the upper watershed, have affected RCA function (personal observation). RCAs were observed to be 62% intact for upper EFSF (Kuzis 1997), passage barriers exist at Reegan

Creek at a culvert in the EFSFSR road and Bradley Pit at Stibnite; sediment is delivered to tributaries crossing EFSF road, and water diversions exist on Parks Creek, Boulder Creek, and un-named EFSF tributary east of Reegan Creek. LEFSF tributaries are relatively intact drainages and likely to have >80% intact RCAs (personal observation).

C. SECESH ANALYSIS AREA

1. NATURAL PHYSICAL CHARACTERISTICS

The Secesh River analysis area covers about 158,000 acres. The main river enters the mainstem SFSR about one mile downstream of the EFSF. Channel gradients range from less than one percent along Lake Creek and the upper Secesh Meadows to over ten percent in canyon sections of the lower river. See Wagoner and Burns (2001) for further description and tabulation of natural physical characteristics.

Wildfire is a common disturbance in the watershed, with 2,546 acres burned from 2001-2005 in the analysis area (PNF GIS 9/05, CD1: \Support Documents\Maps\fire_history.pdf). Maps of prescribed, wildland, and wildland fire use fires are in CD1: \Support Documents\Maps\large_fire_map.pdf and rx_fire.pdf.

2. HUMAN-CAUSED PHYSICAL CHARACTERISTICS

See Appendix 1 for a summary of past actions and effects for which consultation has been completed. Unauthorized activities include illegal fuelwood harvest and potential effects for this analysis area, and are tabulated in Wagoner and Burns (2001). Road densities, road/stream crossings, and ECA are discussed by Watershed Condition Indicator (WCI) in Appendix 2.

Restoration actions completed since 2001 that were prescribed in Wagoner and Burns (2001) (in addition to those specifically recorded in Appendix 1) include:

- Lake Creek dispersed campsites restoration
- Burgdorf Roads Analysis Process (RAP) (CD2: \Support Documents\Roads\RAPs [in Roads.zip]).
- Grouse Creek bridge replacement and road relocation with BAER
- Willowbasket, Loon Lake, and Bear Pete trail reroutes
- Josephine Lake Road drainage problems addressed and resurfacing is in progress
- Chinook Campground road has been graveled and bladed
- Ruby Meadows ATV access has been treated to reduce erosion problems; some problems remain

The following human-caused physical actions update the baseline reported in Wagoner and Burns (2001) and are in addition to those specifically recorded in Appendix 1:

The Burgdorf Roads Analysis Process (RAP) was an area-wide road analysis which identified pertinent issues and needs necessary to make future decisions regarding road management. These issues and needs were used to identify road management opportunities that would improve the Forest classified roads and reduce road-related environmental effects. The analysis area roughly corresponds to the Burgdorf Junction Fire perimeter, although the area was expanded to include logical road segments that lie outside the fire perimeter (CD2: \Support Documents\Roads\RAPs [in Roads.zip]).

The Payette National Forest administers the Victor Loon and Marshall Mtn., Bear Pete and Josephine sheep grazing allotments in this analysis area. The Forest began monitoring effects of sheep grazing in watersheds supporting anadromous fish in 1993 to determine effects of changes in grazing management that were expected to reduce potential adverse effects to Chinook salmon. The monitoring includes annual measurements of substrate conditions (cobble embeddedness, free matrix, and surface fines), stream temperature, streambank disturbance, and forage utilization. Annual reports summarize approximately 13 years of sediment and temperature monitoring at fixed sites in grazed

watersheds (the actual length of monitoring records varies among sites) (Nelson 2006, Zurstadt and Bonaminio 2005, Zurstadt 2004, 2003). Current trends and current conditions in these indices do not indict grazing, as currently managed, for degrading salmonid habitat conditions in these streams, In most cases, sediment conditions were favorable for salmonid species. Temperatures were typically satisfactory or higher than preferred for anadromous species but often unfavorable for bull trout as defined by LRMP WCIs; discussion of this issue and rationale for refining this indicator is described in Nelson 2006. Recommendations and actions from past BAs (including surveys of allotment streams for bull trout spawning areas) are addressed in the annual reports.

The Burgdorf and Secesh fuelbreak projects (Wildland Urban Interface, WUI) were completed in 2004 and 2005. No adverse effects to fisheries have been observed.

Approximately 4 miles of road have been graveled and ½ mile of road has been decommissioned since 2001, all within RCAs. Two culverts in the Grouse Cr/Sand Cr drainage (FDR 50325) have been replaced with BAER projects.

Idaho Fish and Game (IDFG) has been issued a special use permit by the Payette National Forest for the installation, operation and maintenance of a fish screw trap on Lick Creek to trap and PIT tag juvenile steelhead. The trap shall be installed in late July or early August and removed in October/November. Specific mitigations for this use are included in the Operation and Maintenance Plan. IDFG has also been issued a special use permit for the installation, operation and maintenance of an additional fish screw trap that will be located in the Secesh River downstream of Ponderosa campground. The trap will be installed in the spring and removed in the fall annually. IDFG will contact the case manager at the McCall Ranger District prior to installation and removal of the trap each year. Access to the site will be by foot. Specific mitigations for this use are included in the updated Operations and Maintenance Plan (CD2: \Support Documents\SUPs\Lick_Secesh_screw_trap_SUP.pdf [in SUPs.zip]). An MOU with the Nez Perce Tribe permits the operation of video weirs and fish screw traps in Lake Creek and the Secesh River at Chinook Campground.

3. Cumulative Analysis Area Effects

Cumulative effects in the analysis area are addressed by WCI in Appendix C.

4. Analysis Area Restoration Opportunities

The following restoration opportunities were identified by PNF watershed specialists and fisheries biologists. The legal descriptions are meant to indicate the vicinity, but not necessarily the exact location of the project.

- Surface FH.48 from Ponderosa Campground to Oompaul Creek with crushed gravel (T20N R6E Sec20)
- Minimize sidecast of sediment on FH 48 (T20N R6E Sec18)
- Improve water management and stabilize roads in Cow/Maverick Creeks (SE ¼ of T20N R5E)
- Finish reconstruction/improve water management on Josephine Lake Road 316 (T22N R4E Sec22)
- Improve water management on Crystal Mt. Mine access road (T23R R4E Sec36)
- Improve water management on abandoned/closed roads east of Corduroy Burgdorf Road near old gravel pit access (T23N R4E Sec26)
- Erosion control and reestablishment of vegetation on disturbed areas at Chinook Campground (T22N R5E Sec26)

The ID Team associated with the Burgdorf RAP recommended the following management opportunities (Faurot and Burns 2005b).

- No change in management on 41.7 miles of the current road system
- Improving 78 erosion problem sites and 78 stream crossings identified during the road inventory

- Converting 13.7 miles of roads to ATV trails, changing 3 miles of special use easement roads to classified roads
- Decommissioning 30 miles of unclassified roads
- Realigning the portion of the Grouse Creek Road within the RCA (2.9 miles of new construction).

The majority of the roads within the analysis area were originally developed to facilitate mineral exploration and development. Almost 40% (33 miles) of surveyed roads in this analysis area are mining roads. Design specifications were limited to the shortest distance, easiest route, and least cost. Environmental considerations were minimal or non-existent. Most of these roads currently serve little or no purpose in relation to mineral exploration and development. The problems and hazards associated with abandoned mine lands within the analysis area include stream-connected surface erosion from exploration roads and access roads; safety hazards from open shafts and adits; unstable mine highwalls; drums of unknown chemicals; and abandoned equipment and machinery. The ID Team recommended decommissioning 23.7 miles of these mining roads (CD2: \Support Documents\Roads\RAPs [in Roads.zip]).

5. Description and Distribution of Chinook, Steelhead, Bull Trout, and Cutthroat Trout

For general life history and distribution, see Section I.A. – General Species Overview. For specific distribution, see Fish Distribution Maps (CD1: \Support Documents\Maps\bull_trout_map.pdf, chinook_map.pdf, cutthroat_map.pdf, steelhead_map.pdf).

6. Habitat Condition, Trend, Limiting Factors

Appendix tables address the status of Watershed Condition Indicators (WCIs). WCIs which are Functioning at Unacceptable Risk (FUR) or which have changed in status since 2001 (Wagoner and Burns (2001)) are described below.

a. Intragravel Quality - FA.

This WCI was FR in Wagoner and Burns (2001). Nelson et al. (2006a) states: "All of these sites [Secesh drainage] except the Threemile Creek site, would currently receive a rating of "functioning appropriately" (FA) under the revised WCI guidelines. These sites were used as reference sites for generating the revised ratings because they usually exhibit sediment conditions similar to those of the wilderness Chamberlain Basin sites (Nelson and Burns 2005). The Threemile Creek site, however, is clearly "functioning at risk" (FR) and is not far from the "functioning at unacceptable risk" (FUR) category for intragravel fine sediments."

b. Interstitial Sediment – FA.

This WCI was FR in Wagoner and Burns (2001). Nelson et al. 2006b state: "Both of the Secesh River area primary sites could be categorized as FA based on
recent mean free matrix counts." "…cobble embeddedness results are consistent with the free matrix analysis…".

c. Pool Frequency, Pool Quality – FA.

This WCI was FR in Wagoner and Burns (2001). Data collected from 2001 to 2004 shows pool frequency/quality within the FA range (Unpublished data on file at the PNF SO).

d. Width/Maximum Depth Ratio – FA.

This WCI was FR in Wagoner and Burns (2001). Data collected from 2001 to 2004 shows width/max depth ratios within the FA range (Unpublished data on file at the PNF SO).

e. Streambank condition – FA.

This WCI was FR in Wagoner and Burns (2001). Data collected in 2005 indicates streambank condition within FA range (Dugaw et al, 2005).

f. Floodplain Connectivity – FR.

This was FA in Wagoner and Burns (2001). Adverse effects to stream channels and riparian areas are evident from historic mining, roads-stream crossings, private land development, and ATV use (CD1: \Support Documents\Roads\Master Burgdorf RAP Final.doc [in Roads.zip]).

g. Change in Peak/Base Flows – FR.

This was FA in Wagoner and Burns (2001). There are no current flow data for the analysis area. Burgdorf Junction Fire has probably altered the hydrograph in the upper portion of the analysis area (Grouse Creek). There is no evidence that peak/base flows have been altered in the rest of the analysis area.

D. LOWER SFSR ANALYSIS AREA

1. NATURAL PHYSICAL CHARACTERISTICS

The lower SFSR analysis area encompasses the SFSR watershed downstream of the Secesh River. Elevations range from 3,650 feet at the Secesh confluence to 2,166 feet at the Main Salmon River. The river here flows primarily through V-shaped canyon sections that are broken by short, open, U-shaped valleys. The wider areas occur near the Sheep Creek, Elk Creek, Smith Creek, and Knob Creek confluences. Stream gradients range from less than 1% in some short sections near Knob Creek to about 5% in the Rooster Creek area. Tributaries tend to be high gradient (5-10%). In a 2003 survey of Pony Creek, it was noted that a large waterfall above the Pony Creek bridge could be a potential barrier to fish passage (Unpublished data on file PNF SO).

See Wagoner and Burns (2001) for further description of natural physical characteristics. Physical characteristics are tabulated in Wagoner and Burns (2001). Wildfire is a common disturbance in the watershed, with 6042 acres burned from 2001-2005 in the analysis area (PNF GIS 9/05, CD1: \Support Documents\Maps\fire_history.pdf). Maps of prescribed, wildland, and wildland fire use fires are in CD1: \Support Documents\Maps\large_fire_map.pdf and rx_fire.pdf.

2. HUMAN-CAUSED PHYSICAL CHARACTERISTICS

See Appendix 1 for a summary of past actions and effects for which consultation has been completed. Management-related land disturbances that have occurred in this analysis area include timber harvest, road construction, mining, and, to a lesser extent, livestock grazing. Effects from these actions have been primarily associated with a loss of vegetation and increased exposure of bare, disturbed ground. Sediment inputs have occurred where roads failed and in other areas where vegetation was lost and bare ground exposed (Wagoner and Burns 2001).

A possible barrier to fish passage was noted in the 2002 Grouse Creek survey. It was documented that the cause of the barrier was related to an old road along the creek that had recently washed out, depositing sediment and debris in the creek (unpublished data on file at PNF SO).

Unauthorized activities and potential effects for this analysis area are tabulated in Wagoner and Burns (2001). Road densities, road/stream crossings, and ECA are discussed by Watershed Condition Indicator (WCI) in Appendix 2.

Restoration actions completed since 2001 that were prescribed in Wagoner and Burns (2001) include riparian planting and erosion control along Elk Creek Road. The Davis Ranch Road has not been re-opened to motorized vehicles but unauthorized use continues.

3. CUMULATIVE ANALYSIS AREA EFFECTS

Cumulative effects in the analysis area are addressed by WCI in Appendix C.

4. ANALYSIS AREA RESTORATION OPPORTUNITIES

The following restoration opportunities have been identified by PNF watershed specialists and fisheries biologists. The legal descriptions are meant to indicate the vicinity, but not necessarily the exact location of the project.

- Improve water management on NE side of Hettinger Ranch Road (FR337) below Hayes Station (T22N R7E Sec26)
- Improve water management on Smith Knob Road (355) (T23N R7E Sec35)
- Obliterate Hamilton Bar/Threemile Road 673 (T20N R6E Sec26)
- Obliterate Davis Ranch Trail 076 (T21N R7E Sec 27)
- Improve water management on Bear Creek Road 359 (T12N R6E Sec12)

5. Description and Distribution of Chinook, Steelhead, Bull Trout, and Cutthroat Trout

For general life history and distribution, see Section I.A. – General Species Overview. For specific distribution, see Fish Distribution Maps (CD1: \Support Documents\Maps\bull_trout_map.pdf, chinook_map.pdf, cutthroat_map.pdf, steelhead_map.pdf).

6. Habitat Condition, Trend, Limiting Factors

Appendix 2 tables address the status of Watershed Condition Indicators (WCIs). WCIs which are Functioning at Unacceptable Risk (FUR) or which have changed in status since 2001 (Wagoner and Burns (2001)) for the Lower SFSR analysis area are described below.

a. Physical Barriers – FR.

This WCI was FA in Wagoner and Burns (2001). Data collected from 2001 to 2004 show physical barriers (in Grouse Creek), which puts this WCI within the FR range (unpublished data on file at the PNF SO). Water diversions remove more than a negligible flow from Smith Creek.

b. Interstitial Sediment Deposition (Substrate Embeddedness) – FUR.

This WCI was FUR in Wagoner and Burns (2001). Nelson et al. 2004 state that the Elk Creek site would be classified as FUR, and Nelson et al. 2006b state: "Using the revised WCI values (free matrix) of Nelson and Burns (2005), only site E054 would be classified FA, the two more developed watersheds (Elk and Pony) would be FR." There are few recent cobble embeddedness data on these sites, however, but free matrix conditions (which can be used to predict embeddedness) suggest that embeddedness is increasing (Nelson et al. 2006b); Professional judgement leads to a rating of FUR for this analysis area.

c. Large Woody Debris – FA.

This WCI was FR in Wagoner and Burns (2001). Data collected in 2005 indicates Large Woody Debris within FA range (Dugaw et al. 2005). Roads in Pony and Elk Creeks are likely to affect sources and existence of LWD in Pony and Elk Creeks because of human access, therefore those drainages are FR for this WCI (PJ).

d. Pool Frequency – FA.

This WCI was FR in Wagoner and Burns (2001). Data collected from 2001 to 2005 shows pool frequency in FA range for most of the analysis area, with the exception of Elk Creek, which is FR (PJ) (unpublished data on file at the PNF SO).

e. Width/Maximum Depth Ratio – FA.

This WCI was FR in Wagoner and Burns (2001). FBase output data collected from 2001 to 2004 shows width/max depth ratios within the FA range (unpublished data on file at the PNF SO).

f. Drainage Network Increase – FA.

This WCI was FR in Wagoner and Burns (2001). The presence of roads in the Elk and Pony Creek drainages are likely to cause this WCI to be FR there, based on

g. Riparian Conservation Areas – FA.

This WCI was FR in Wagoner and Burns (2001). Most RCAs have historic and occupied refugia for listed, sensitive or native/desired nonnative fish species which are present and provide LWD, shade, sediment buffering.

h. Disturbance Regime– FA.

This was FR in Wagoner and Burns (2001). There are very few human caused or natural barriers that fragment occupied or suitable bull trout habitat.

IV. DESCRIPTIONS OF ONGOING AND PROPOSED ACTIONS

Programmatic actions that can occur across the watershed, as well as individual, site-specific actions occurring in individual analysis areas are the subject of this consultation (Table 2).

Table 2.—Ongoing and proposed actions in the South Fork Salmon River Watershed.

Subwatershed	Federal Action
Entire watershed	Miscellaneous forest products
	Mistletoe control and pre-commercial thinning
	Fire management activities
	Fish habitat/riparian sampling
	Watershed and fish habitat improvements and maintenance
	Road management
	Trails, recreation and administrative site O&M
	Travel plan
Lower SFSR	Special Use Permits (SUPs) Mackay Bar Sandy Cove
	Outfitter/Guides Mackay Bar Corp. Elk Creek Pony Creek Wapiti Meadows Wiley Ranch Elk Springs Pineland Outfitters
East Fork SFSR	Special Use Permits (SUPs) Peterson water diversion Eiguren Diversion
	Outfitter/Guides Wapiti Meadows Idaho Angler
	Stibnite Mine closure
	Daddy Dels III Mine
Secesh River	Special Use Permits (SUPs) Wyatt spring development Phillips-Larrea spring development LaPaglia spring development Spradling spring development Hardy spring development Titus spring development
	Outfitter/Guides Pacific Crest Outward Bound Idaho Angler
	Allotments Victor Loon sheep allotment Josephine sheep allotment Marshal Mtn. sheep allotment Bear Pete sheep allotment N.FK. Lick Creek sheep allotment
Upper SFSR	Outfitter/Guides Pacific Crest Outward Bound Willey Ranch
	SFSR Road reconstruction

A. FEDERAL ACTION: MISCELLANEOUS FOREST PRODUCTS

PURPOSE AND NEED: Public harvest of miscellaneous forest products such as firewood, posts and poles, Christmas trees, small volumes of timber (less than 70 acres of green harvest, or 250 acres of salvage in any analysis area annually), mushrooms and other plants and seeds for use by permitted Forest users until December 31, 2017.

LOCATION: SFSR Section 7 Watershed

DATES OF PREVIOUS CONCURRENCE:

- USFWS: October 15, 2001
- NMFS: August 8, 2001

DESCRIPTION: Public harvest of miscellaneous forest products such as firewood, posts and poles, Christmas trees, small volumes of timber (less than 70 acres of green harvest, or 250 acres of salvage in any analysis area annually), mushrooms and other plants and seeds for use by permitted Forest users.

REQUIRED MITIGATION:

Adopt LRMP buffer widths for tree harvest with the exception that the District Ranger may designate areas for miscellaneous forest products harvest or collection within RCAs that have been agreed to by both a journey level hydrologist and fisheries biologist and meet the following criteria:

Trees may be harvested or collected if all the following conditions are met:

- where trees do not provide shade to a perennial stream during any part of the day or year,
- where trees do not contribute to potential large woody debris recruitment to adjacent perennial or intermittent stream channels or floodplains,
- where tree removal or tree felling would not impact stream banks, springs, seeps or other wetlands,
- where vehicles would remain on existing open roads,
- where trees would not be felled or brought across any road cutslope,
- where root or tree firmness is high and blow down potential is low,
- where a riparian area exists for effective sediment filtering.

Adopt LRMP buffers for storage and refueling operations with regard to post and pole and small sales.

Restrict campsites for commercial forest product harvesters to areas outside of RCAs unless approved by a fisheries biologist or hydrologist. This restriction would cover all forest product harvest activities listed in the federal action. Large campsites will have site plans completed with necessary mitigation measures. Grey water will be removed from camp and disposed of properly. At locations where camps will encroach on RCAs, a fisheries biologist or hydrologist will assist in laying out the camp to avoid effects to WCIs. Measures used to avoid effects to streams and WCIs may include flagging no-entry zones to maintain a desired distance between camp and streams, maintaining a close dialog with campers as to resource concerns, and regular visits to camp(s) by a fisheries biologist, hydrologist, or contract administrator.

In order to avoid and mitigate effects identified in the environmental baseline, the Forest will conduct additional activities. In addition to previous requirements developed for consultation, the Forest will do the following:

- Forest employees with training and knowledge of riparian function will talk to firewood cutters in the field concerning LWD in riparian areas. Contacts will occur if employee believes that he/she is safe doing so, or is accompanied by another employee and they believe that they are safe. Safety training will be provided. Any observed violations should be called in on the radio with necessary information, at a minimum.
- “Forest officers" who can approve cable yarding of any products identified as part of this action will be limited to line officers or persons authorized to sign permits and contracts.
- A positive emphasis will be used on signing. Signs will emphasize areas open to use of miscellaneous forest products and the reasons certain areas, like RCAs, are generally closed.
- Increased monitoring of firewood harvest will occur.
- If monitoring shows no decrease in incidents of unauthorized firewood harvest over the next two years, the results will be brought to the attention of the level one streamlining team, who will

decide whether initiation of consultation is warranted, or whether to make other recommendations to the Forest to avoid adverse effects.
- Equivalent Clearcut Area (ECA) will not be increased to greater than 15% in any 6th level HU.

B. FEDERAL ACTION: MISTLETOE CONTROL AND PRE-COMMERCIAL THINNING

PURPOSE AND NEED: To control mistletoe infestation in timber and to reduce competition among trees in merchantable timber stands until December 31, 2017.

LOCATION: SFSR Section 7 Watershed

DATES OF PREVIOUS CONCURRENCE:

- USFWS: October 15, 2001
- NMFS: August 9, 2001

DESCRIPTION: Mistletoe control and pre-commercial thinning occur as follow up activities to previous timber harvest, or in other tree stands where stand density is too great to meet management objectives. Mistletoe control can involve the removal of any size tree infested with mistletoe, but treatment generally focuses on large over story trees. Previously harvested stands are precommercially thinned 15 to 25 years after a timber sale to reduce the stand density. Most stands to be thinned are plantations. Pre-commercial thinning will not occur in RCAs except to improve WCIs, which will be agreed to by a journey-level fisheries biologist and hydrologist. An annual list of pre-commercial thinning projects within RCAs will be provided to the Level 1 Team for informal review by May 1 each year.

MITIGATION MEASURES:

No fuel will be stored or transferred within RCAs. These activities will be conducted to insure that ECA is not increased over 15 percent in any 6th field HU.

These activities will not occur within RCAs except in RCAs that have been agreed to by both a hydrologist and journey-level fisheries biologist and must meet all the following criteria:

- where trees do not provide essential shade to a perennial stream during any part of the day or year.
- where trees to be thinned are not required to meet WCIs (i.e., to contribute to potential large woody debris recruitment).
- where tree removal or tree felling would not impact stream banks, springs, seeps or other wetlands.
- where vehicles would remain on existing open roads.
- where trees would not be felled or brought across any road cutslope.
- where a riparian area exists for effective sediment filtering.

Or:

- where trees are located away from streams upslope, uphill, from an existing open road.

C. FEDERAL ACTION: FIRE MANAGEMENT ACTIVITIES

PURPOSE AND NEED: This action involves all activities that could occur during management of wildland fires on the Payette National Forest until December 31, 2017. This includes wildfires, wildland fire use fires, and prescribed fires.

- Wilderness management objectives may be met by permitting lightning-caused fires to play, as nearly as possible, their natural ecological role within wilderness, and

- Lightning-caused fires in non-wilderness lands that allow wildland fire use for resource benefit can be permitted; this action has previously been called prescribed natural fire.

The action also includes prescribed fires to restore, and maintain ecosystem health and resilience.

***LOCATION*:** Within the South Fork Salmon River Section 7 Watershed this action will amount to an estimated annual average of 32 ignitions, most of which will receive initial attack. This action will also amount to an average of one large fire per year (i.e., larger than 100 acres), which may be designated a Wildland Use Fire (WFU), amounting to approximately 3,388 acres. These estimates are based on historic fire occurrence (see CD1: \Support Documents\Maps\large_fire_map.pdf and rx_fire.pdf, and Sanders 1998). The Payette National Forest has suppression responsibility for initial attack on some areas outside of the Forest.

DATES OF PREVIOUS CONCURRENCE: SIMILAR ACTION

- USFWS: October 15, 2001, July 16, 2003, October 27, 2004
- NMFS: August 8, 2001, July 30, 2003, June 18, 2004

DESCRIPTION: The fire management activities within this area include application of appropriate measures to control unwanted "wildfires" as well as activities that strive to meet land management objectives through a combination of management ignited prescribed fire and management of natural ignitions for resource benefit. The later action is referred to as "Wildland Fire Use". All activities are implemented in accordance with the Forest Service Manual (FSM 5140) and the Wildland and Prescribed Fire Management Policy Implementation Procedures Reference Guide (1998), and the Wildland Fire Use Implementation and Procedures Reference Guide (see CD2: \Support Documents\Fire\wildland_fire_use_guide052505.pdf [in Fire.zip]). These activities include aerial application of water and chemical fire retardants, (including FIRE-TROL [CD2: \Support Documents\Fire\janik_2000.doc, in Fire.zip]), construction of fuel breaks by hand and machinery around fire perimeters, the opening and use of closed roads in areas where tractors are allowed, complete removal of under story and over story vegetation as a part of fire line construction, the establishment and operation of base and spike camps which could involve hundreds or thousands of people, burnout operations between fire lines and the wildfire, application of water drafted from stream courses, construction of temporary dams for drafting water into hoses, establishment of helispots and helibases where Jet-A fuel is transported and stored, bucket dipping (or snorkeling) of water from rivers, large streams, and lakes by helicopter, and transport and use of gasoline and diesel fuel for pumps, saws, and engines, and management ignition of prescribed fires using aerial or hand ignition methods. More detailed descriptions of these activities are included below.

Camps, Helicopter Landing Sites, and other Operational Facilities

Camps, helibases, staging areas, and helispots are areas used to camp or stage personnel and equipment and places to land and park helicopters:

- Camps vary in size and impacts from coyote camps for two people with minimal equipment and comforts to large camps for several hundred personnel camped in one area. Large camps have areas for sleeping, eating, showering, staging supplies and equipment, fueling equipment and for Incident Management Teams to work. Large campsites will have site plans completed with necessary mitigation measures. Grey water will be removed from camp and disposed of properly. Where possible, camps will be located outside RCAs. At locations where camps will encroach on RCAs, resource advisors will be contacted prior to camp setup and assist in laying out the camp to avoid effects to WCIs. Measures resource advisors may use to avoid effects to streams and WCIs include flagging no-entry zones to maintain a desired distance between camp and streams, maintaining a close dialog with camp managers as to resource concerns, educating personnel at morning and evening briefings about why measures to protect streams & fish are in place, and regular visits to camp(s) by both resource advisors and law enforcement personnel assigned to the fire to quickly fixing problems observed.

- Helicopter bases are areas where helicopters can be fueled, loaded, parked, and maintained. One to several helicopters can be stationed at a helibase. Helispots are areas where personnel and equipment can be loaded or unloaded from a helicopter. Helicopters are usually only at helispots long enough to drop or pickup a load. Helicopter bases will have plans completed identifying necessary mitigation measures.
- Staging areas are places where personnel and equipment are placed for rapid deployment on large fires. These areas have sanitation facilities and places to safely park personnel carriers and equipment. Some fueling and light maintenance may be performed on equipment. Food and sleeping facilities are normally not provided at staging areas. Staging areas are short-term and for temporary use only. Where possible, staging areas will be located outside RCAs. At locations where staging areas will be in RCAs, resource advisors will be contacted prior to use and assist in laying out the area to avoid effects to WCIs. Examples of measures resource advisors may use to avoid effects to streams and WCIs can be seen in "camps" above.

Fire Line Construction

Fire lines are constructed to control the spread of the fire:

- Fire line construction involves clearing a path; removing all flammable material and scraping a line clear to mineral soil wide enough to check the spread of fire. The line may be constructed wider if the conditions warrant. A cup trench may be used across the bottom of the fire to catch rolling debris.
- Most often hand tools and chainsaws are used for line construction though tractors or explosives may be used. Use of explosives would only occur outside RCAs of fishbearing streams. Fuel characteristics, fire behavior, topography, access, and suppression strategy dictate the type and size of fire line constructed.
- In some instances, a wet line using a hose lay with pump and water source or cold trailing the fire's edge may be sufficient. Natural barriers are used whenever possible, including rock outcrops, areas of little or no fuel, and streams, rivers, or lakes.
- Cooling the fire and knocking down the hotspots can include separating burning heavy fuel and using dirt, water, or humidity to cool them down. Some felling and burning of hazard snags or trees, and bucking of down logs may be required using hand tools or a chainsaw.
- Fireline construction may be completed by use of helicopters or fixed-wing aircraft dropping water, foam, or retardant to create a "wet-line" in front of the advancing fire. As directed under "chemical use" below in this action, no retardant or foam is to be dropped in streams or adjacent riparian areas.

Water Drafting

Where available, water is used to suppress fires:

- Water may be transported to the fire in a truck or a portable pump and hose. A draft source is used to refill the truck and draw water for the pump and hose. Helicopters are also used to dip water from lakes and streams and drop it on the fire.
- The pump used varies with the size of the water source, and stream flows are not significantly affected by pump operations. If the water source has inadequate flow for effective pumping, a "porta-tank" may be used or occasionally a sump is created. When available, a culvert crossing is generally used to create this sump by temporarily restricting stream flow. A sump may be constructed by hand using native materials, plywood, and/or plastic. These sites are usually (but not always) located in steep, low-order headwater streams. Intakes will be screened with 3/32" mesh screen to prevent fish entrainment. In all cases:

    - □ Drafting equipment will be inspected for proper screening when it arrives on Forest prior to deployment on a fire.
    - □ Any sump created by blocking flow will be performed in coordination with a fisheries biologist to prevent dewatering.
    - □ Crews will be trained to avoid dewatering of streams.

- Portable pumps are fueled either by an attached tank or by a portable fuel container.
- In the case of a portable pump, a water source is located near the fire and a sump may be developed.
- Helicopter bucket drops of water or retardant may be used. Buckets range in size from 75 gallons to more than 1,000 gallons, depending on the allowable helicopter payload.
- Water is dipped (or snorkeled, which is considered synonymous with dipping) by helicopters from lakes, rivers, streams, or portable tanks that are located as close to the incident as possible unless they are identified as closed; areas shown as closed to dipping will only be used to provide protection for life or property. Snorkeling occurs when the snorkel is appropriately screened and the location avoids spawning fish. A suitable dip (or snorkel) site is located according to specific criteria that include safety considerations for the helicopter, water depth, and water surface area. Dipping (or snorkeling) generally occurs from lakes and large rivers. Sometimes dipping occurs in smaller streams; the size of the stream used is limited by the pool size available.
- The Forest will complete an Invasive Species Action Plan that addresses treatment and protocol for limiting invasive species spread through fire management activities. Helicopter buckets, snorkels and tanks as well as engine and portable pump drafting equipment and tanks will be treated in accordance with this plan.

Invasive Species

The following steps will be taken to limit spread of invasive species:

- Keep all water handling equipment, including helicopter buckets, clear of mud or plant material. Following each use, rinse foot valves, draft hoses, buckets, etc with fresh clean water (well or city would be best) and allow the equipment to completely dry before putting back in service. This may require having several sets of this equipment at stations or vehicles to switch out with.
- While on assignments, try to limit drafting or dipping to one drainage or water source, or if you have to change water sources, change out the equipment (implement step 1 to the equipment before placing back in service). This way the potential of inadvertently transferring an invasive species from one pond or creek to another is limited.
- Wash underside of vehicles often, especially after fording a stream.

Application of Retardant, Foams, and Surfactants

Chemical fire retardants, foams, and other surfactants may be used to increase the effectiveness of water in checking the spread of fire or to support burnout and/or prescribed fire operations:

- The volume of retardant drops ranges from 400 to 3,000 gallons depending on the size of the aircraft involved. Retardant is usually laid out in a linear fashion near the hottest part of the fire and most often loads are split into multiple drops.
- Retardant generally reaches the fuel in the form of a mist or rain and not as a concentrated mass.
- Retardant is generally applied on areas above the drainage bottoms because of the limited maneuverability of aircraft in drainage bottoms; most retardant drops occur on ridges or side slopes, where the fire is burning hottest.
- Heavy Airtankers, Single Engine Air Tankers (SEAT) and Helicopters may be able to deliver either retardant, foam, or water only depending on the need, environmental restrictions, and their loading capabilities.

Mop-Up

Once the fire is contained and the spread is stopped, mop-up is started. Mop-up involves insuring that the fire is out. This includes cold trailing, a process by which a bare hand is used to feel for heat along the edge of “the black” on larger fires or throughout the entire area of smaller fires, in search of hotspots. When hotspots are found, they are extinguished with hand tools, dirt, and water.

Rehabilitation Activities

After the fire is controlled, rehabilitation of the fire line, roads, camps, and other areas used, will be planned and completed as necessary. Actions associated with rehabilitation will be identified in the Incident Action Plan or Rehabilitation Plan and may include measures such as:

- Construction of water bars and covering the fireline with debris is usually sufficient for hand lines.
- Tractor fire lines, in particular, usually require extensive rehabilitation, and these areas are usually seeded in addition to water bars and debris placement.
- Any required seeding will be done with certified weed-free seed mixes.
- Trees felled in RCAs during suppression actions will be left in place, unless they are a safety hazard around facilities.

Wildland Fire Use and Fire Management Plans

This action has previously been called prescribed natural fire. There are two basic premises of the Wildland Fire Use program:

- Wildland fire will be used to protect, maintain, and enhance resources and, as nearly as possible, be allowed to function in its natural ecological role.
- Use of fire will be based on approved fire management plans and will follow specific prescriptions contained in operational plans.
- Wildland fire use can be applied to any lands identified and permitted by the Forest Plan to meet resource management objectives so long as a Fire Management Plan has been approved for the area in question. This means that lightning-caused fires occurring within areas covered by the above plans would be evaluated and allowed to burn if evaluation criteria are met. For a fire to be designated under the wildland fire use (WFU) program, a fire must meet the following criteria:
- Fire must be lightning-caused. Anthropogenic ignitions will not be considered for WFU designation and will receive an appropriate management response.
- Effects to cultural and natural resources may be mitigated by various management techniques, fuels, weather, or topography, under appropriate circumstances.
- Weather Forecasts and fire behavior (current and expected) must be considered acceptable for a fire to be declared a WFU.
- Risk indicators are acceptable. Risk indicators are defined in the Wildland Fire Use Implementation and Procedures Reference Guide (2005) and include fire danger indexes, time of season, fire size, and potential complexity, safety concerns, threats to boundaries, fuels & fire behavior, objectives, management organization, improvements, natural/cultural/social values, air quality values, logistics, political concerns, tactical operations, and inter-agency coordination.
- Current wildfire activity on the Forest, in the Region, or nationally must be at a level where resources are available to manage the fire or hold it if necessary.
- There are no other compelling reasons to preclude WFU designation (line officer discretion).
- If the WFU event exceeds the planned parameters for risk or is no longer meeting resource objectives, then it may be declared a wildfire, in which case the appropriate management response would be implemented.

The decision to classify a fire under "Wildland Fire Use" or as a "Wildland Fire needing an appropriate suppression response" is complex, requiring consideration of many factors, and involvement of fire, wilderness, and other resource specialists:

- Within a maximum of eight (8) hours of the discovery of a fire, the appropriate line officer will decide whether or not to allow a candidate fire to be managed as a WFU event. The decision is documented in a Stage I Initial Assessment. This assessment is a report on the fire situation that includes information as to where the fire is located, start date/time, current size, fuel conditions in the fire area, weather (current/predicted), fire behavior (current/predicted), and

availability of resources to manage the fire under WFU. If the decision is to declare the fire a wildfire, then the appropriate management response will be applied to suppress the fire. If the decision is to manage as a WFU, further planning will be completed in accordance with the Wildland Fire Use Implementation Procedures Reference Guide. The Stage II and Stage III plans as they are referred to, are described in the guide (CD2: \Support Documents\Fire\wildland_fire_use_guide052505.pdf [in Fire.zip]) and would be completed as needed if incident complexity changes.

- Whether an ignition is declared a WFU or not, it is still considered on an equal basis with other fires for allocation of resources, meaning fires that pose greatest threat to life and property will receive highest priority for receiving requested resources regardless of their designation as WFU or Wildfire.

Prescribed Fires

The Payette National Forest is proposing to burn up to 1000 (varies by watershed) acres per year. A five-year plan (CD2: \Support Documents\Fire\plan05.pdf [in Fire.zip]) is updated annually to identify burn locations.

The intent is re-introduce fire, using aerial and ground based ignition during the predetermined weather conditions that will allow a mixed severity fire to take place. Ignition will depend on site conditions. The creation of openings, similar to what natural fire might produce is anticipated. Aerial ignition may take place on the upper slopes and ridge tops to create a backing fire. A prescribed burn of low to moderate intensity will reduce surface and ladder fuels in order to mitigate future stand replacement fires of intensities which exceed the historic norm, and will increase opportunities to manage naturally occurring wildland fires. This treatment will be used to mimic historic vegetative characteristics by reintroducing early stages of succession, altering species composition, and reducing unusually high stand densities.

Individual burn units would range from about 100 to 1000 acres, totaling up to 1000 acres for this project depending on site-specific objectives and the available prescription window for meeting objectives. Burning may also occur of material piled from either harvest of Miscellaneous Forest Products, or Mistletoe Control and Pre-Commercial Thinning actions as described above. Hand-piling in RCAs may occur when agreed to by both a hydrologist and fisheries biologist. Hydrologist and fisheries biologist will designate distance hand piles must be from streams or other waters.

Ignitions are planned to occur during appropriate weather conditions whenever a specific set of fuel moisture, soil moisture, humidity, and weather criteria (prescription elements and management requirements) can be met. No mechanical fire-line construction is planned. Contingencies will be identified should an escaped fire warrant line construction. Natural barriers to fire movement such as moist riparian areas, changing fuel conditions, and topographic breaks will be used to confine the prescribed fires.

Burn units would be ignited aerially either by dispensing plastic spheres from a helicopter, with a heli-torch, and/or with some areas hand-ignited with torches. The spheres contain potassium permanganate (3 grams each) and are injected with glycol (0.75-1.5 cc's, i.e., antifreeze) just prior to release to cause ignition. Ignition typically occurs after about 20 seconds, on the ground. Additional details of this procedure are in the current CD2: \Support Documents\Fire\Rx_fire_aerial_ign_process.doc (in Fire.zip).

There would be no purposeful ignition, except for burning of hand-piles, and no active prevention within RCAs, and fire would be allowed to burn into RCAs. For burning piles the objective would be to consume the pile and limit spread from it.

For prescribed fires, a burn plan will be written that meets FSM 5140 direction. Important considerations include duff moisture, mineral soil exposure, terrain breaks, and fuel reduction objectives.

Mitigation applied to prescribed fires.—(The proposed action includes the following mitigation measures):

- No ignition activity, except for ignition of hand-piles, will occur within 300 feet (slope distance) of fish bearing perennial streams. Fire that "backs" into riparian zones will be allowed to burn, since higher fuel moistures in riparian areas typically limit fire impacts/spread in these zones.
- Ignition will be avoided on Landslide Prone and moderate-high risk /hazard landtypes, and will only occur uphill from these areas.
- Helicopter landing sites and refueling areas will be located outside of the RCAs.
- Burn plans will address required elements as discussed in FSM 5140 and the *Prescribed Fire Planning and Implementation Procedures Reference Guide*.
- A fish biologist will review the burn plan prior to line officer approval.
- No new roads will be built to access prescribed burns, no roads will be re-opened that are presently closed and vegetated.
- Approved spill prevention containment and countermeasure plans (SPCC) will be used for prescribed fire. Plans will include direction for transporting, storing, and use of toxic materials, such as spheres and torch fuels, to minimize risk of accidental spills and/or introduction into live water.
- During actions to prevent the spread of fire use guidelines below for fire suppression.
- The prescribed burn will not increase ECA above 15% in the corresponding 6th level hydrologic units.
- A post-burn visual assessment will be conducted by fire personnel and a fisheries biologist via a walk through of selected stream corridors. This will assess implementation of the burn and associated mitigation listed above (e.g., avoidance tactics) in riparian areas.

Design Criteria (Mitigation Measures part of all fire management actions)

These project design criteria address potential adverse effects such that they can be avoided or minimized to the point of being negligible or discountable. They are guidelines that apply unless protection of life and property require deviation. They are often discussed in the program description and are listed here as a summary.

Guidelines for Fire Management within Drainages Supporting Listed Fish and Critical Habitat.— Rangers ensure all personnel involved in fire suppression have been briefed and are familiar with these guidelines:

- Utilize minimum impact suppression tactics in areas where there is potential to damage listed fishes or critical habitat. Every effort should be made to minimize stream course disturbance, sedimentation, and actions that will result in increased water temperatures.

- Use of tractors:

  - □ Do not use tractors in the South Fork Salmon River basin (section 7 watershed), Rapid River, or Big Creek, except for the direct protection of human life and property.
  - □ Minimize tractor use in other areas.
  - □ Do not use tractors in RCA and landslide prone areas.

- Chemical Use:

  - □ Do not use chemicals when there is a potential for direct stream contamination.
  - □ Minimize the application of retardant near live streams. Do not drop retardant or foam directly in streams or adjacent riparian areas.
  - □ Do not pump directly from streams if chemical products are going to be injected into the system without mitigation in place. If chemicals are needed, pump from a fold-a-tank, pumpkin, blivet or other water containment device, or use a backflow check valve.

- Do not authorize storage of fuels and other toxicants or refueling within RCAs unless there are no other alternatives. Storage of fuels and other toxicants or refueling sites within RCAs shall be approved by the responsible official and have an approved spill containment plan commensurate with the amount of fuel (Forest Plan standard SWST11).
- Spill containment equipment will be readily available and utilized when neccessary.
- Petroleum products will be contained in impermeable devices of sufficient size to contain amount of fuel/oil stored. Examples of fuel containers requiring containment are fuel trucks, portable pumps and their fuel, portable generators and their fuel, fuel stored in cans at camps and staging areas.
- Helicopter bucket dipping (or snorkeling) from lakes and streams with juvenile bull trout, salmon, and steelhead is not permitted except as otherwise described in the no dipping map (see CD1: \Support Documents\Maps\no_dipping_map.pdf).
- The Forest will develop a contingency plan identifying procedures to be initiated should a chemical spill or contamination occur.

- Suppression tactics (backburns or burnouts) should minimize fire severity in riparian areas.
- Resource Advisor:

  - A fish biologist will be involved in planning and training for the development of a Wildland Fire Situation Analysis (WFSA) and/or, working with or as the Resource Advisor.
  - Resource advisors assist to locate camps, staging areas, and base heliport locations which will be identified early during the action. Identification will be approved either during presuppression planning, or on a case-by-case basis. Resource advisors will work to locate camps, staging areas, etc. outside RCAs where no or negligible effects to listed fish species are likely to occur. Should camp, staging areas, etc. be located in RCAs, measures to mitigate effects such as those described under "camps" above will be taken.
  - A Resource Advisor, usually a resource specialist, is assigned to large fires requiring either a Type I or II Incident Management Team. This advisor is a representative of the responsible PNF line officer and will:

    - Provide constant linkage between the suppression objectives of the Incident Management Team and the resource interests of the PNF.
    - Be readily available to the Incident Commander and the Operations Chief.
    - Review Operational Period Plans to assess the potential effects of the planned actions to develop suppression strategies and tactics to minimize the impacts of the fire's effects and those of the suppression actions on natural and social resources.
    - Provide information about the local areas resource values.

  - Provide updates to the Level 1 team.
  - Contact Level 1 team members if emergency consultation is triggered.

- Suppression Rehabilitation

  - An Emergency Suppression Rehabilitation Team will be assigned to all fires over 100 acres and report to the Resource Advisor.
  - A fisheries biologist, or hydrologist, will always be assigned to the Rehabilitation Team.
  - After suppression, rehabilitation is completed, a Rehabilitation Team will review the suppression and rehabilitation efforts to see if the tactics identified successfully avoided adverse effects to listed fishes and critical habitat.
  - A separate Burn Area Emergency Rehabilitation Team (BAER) may be formed as appropriate, but burn area rehabilitation is not part of the fire suppression action. That team would have to initiate an independent consultation should any BAER actions be recommended that might affect listed species or critical habitat. BAER actions are infrequent on any fires on the Payette National Forest over the past 20 years with fewer than four total actions.

- Briefings

    - Present a brief to the fire overhead team on threatened species present and the legal requirements, before they deploy to the fire.

Program Evaluation, Monitoring, and Reporting

The following monitoring and reporting will be accomplished for fires, including ignitions, project fires, wildland fire use fires, and prescribed fires insofar as they are applicable:

- The Forest Supervisor be responsible for determining consistency of fire suppression activities with this BA. They are encouraged to seek counsel from fisheries biologists regarding the expectations of this BA.
- When the IC determines that the fire suppression activities being implemented are inconsistent with this BA, the Forest Supervisor will be notified. In general, this may lead to the initiation of emergency consultation on the fire (see CD2: \Support Documents\Fire\Emergency Consultation Guidelines.doc [in Fire.zip]), and should occur before resources available to mitigate effects are released from the incident.
- When the burn boss determines that the prescribed fire activities being implemented are inconsistent with this BA, the District Ranger or Forest Supervisor will be notified. In general, this may lead to the initiation of emergency consultation on the fire (see CD2: \Support Documents\Fire\Emergency Consultation Guidelines.doc [in Fire.zip]), and should occur before resources available to mitigate effects are released from the incident.
- Critical information about the incident and expected suppression actions will be shared with the USFWS and the NMFS when listed species are involved; documents submitted to these agencies for emergency consultation will be tracked where emergency consultation is triggered. The Forest will follow guidelines for emergency consulation provided by the Level 1 team (CD2: \Support Documents\Fire\Emergency Consultation Guidelines.doc [in Fire.zip]).
- A monitoring report on this program will be completed, as part of the next Biological Assessment for programmatic fire management and presented to the Level 1 team during consultation. The monitoring report will include:

    - fire location and size for all types of fires.
    - summary of fire intensity, or fire intensity map, if available, and results of prescribed burn monitoring.
    - results of post-fire reviews and monitoring.

D. FEDERAL ACTION: FISH HABITAT AND RIPARIAN SAMPLING

PURPOSE AND NEED: To conduct fish habitat and riparian surveys to gain fuller knowledge of existing conditions and trends until December 31, 2017. This work may be contracted to private firms.

LOCATION: Streams within the SFSR Section 7 watershed.

DATES OF PREVIOUS CONCURRENCE:

- USFWS: October 15, 2001
- NMFS: August 8, 2001.

DESCRIPTION: The Payette National Forest's Land and Resource Management Plan (LRMP, USFS 2003), specifies that monitoring of aquatic species and habitats will occur to evaluate implementation of standards and the effectiveness of these standards in achieving WCIs. Section 4 (c) 2 A of the Endangered Species Act directs the U.S. Fish and Wildlife Service to review the status of species listed under the Act. Other federal agencies are directed under 50 CFR 402.01 (a) to "utilize their authorities to further the purposes of the Act by carrying out conservation programs for listed species". Among the purposes of the Act specified in Section 2 (b) is "to provide a program for the conservation of each endangered and threatened species". Conservation programs, to be successful, must monitor

the effectiveness of measures taken to protect listed species and their habitats. To monitor the habitat and population trends of aquatic species on the Payette National Forest, the actions described below will be carried out annually in many streams on the Forest.

Habitat surveys

Some streams will be surveyed to produce quantitative assessments of fish habitat. Survey methods are similar to those described in Overton et al. (1997) and Burton et al (1992). Habitat surveys involve walking and snorkeling within stream channels, measuring channel and habitat dimensions and qualities, using stadia rods, measuring tapes, or surface fines grids. Methods to measure substrate composition and quality that may be used include determination of cobble embeddedness, percent surface fines, free matrix measures, and core sampling. Measurement of cobble embeddedness involves removing cobble-sized rocks from the stream bottom. The cobbles are returned to the site after measurements are taken. Percent surface fine determination is a visual estimate that involves no disturbance other than that caused by the presence of the crews in the stream channel. Determination of free matrix measures involves randomly placing a sampling hoop and counting the number of non-embedded rocks within the hoop; this action requires disturbing all loose rocks within the hoop. Core sampling requires removing from the stream all substrate within the substrate samples, which may be taken from any part of the habitat. Most core samples will be done with a hollow cores sampler; some freeze sampling may occur.

Aquatic invertebrate sampling

Aquatic invertebrate sampling will occur on some streams. Invertebrates will be sampled with a Hess sampler, Surber sampler, or kick nets.

ASSUMPTIONS:

- Bull trout rearing and spawning occur in some of the streams to be sampled.
- Crews are able to recognize and avoid bull trout redds.

REQUIRED MITIGATION:

- Crews will be trained in redd identification, likely redd locations, and methods to avoid stepping on redds or delivering fine sediment to redds.
- Crews will avoid redds and spawning Chinook, steelhead, and bull trout while walking within or near stream channels to the extent possible and will typically work more than one stream width or greater than one habitat unit upstream of redds. Avoidance will be accomplished by examining pool tail-outs and low gradient riffles for clean gravel and characteristic shapes and flows prior to walking or snorkeling through these areas.
- If redds or spawning Chinook, steelhead, or bull trout are observed at any time, the habitat surveyors will step out of the channel and walk around the habitat unit on the bank at a distance from the active channel and take all precautions to avoid any harassment of individuals.
- If continuing to survey while avoiding Chinook, steelhead, or bull trout is not possible the crew will step out of the active stream channel and walk around the habitat unit at a distance from the stream.
- While conducting free matrix substrate measurements or core samples, and while sampling aquatic invertebrates, redds and areas immediately above redds will not be sampled in order to avoid killing eggs or delivering sediment to redds. The distances involved will be approximately the same as for other measures.

E. FEDERAL ACTION: WATERSHED AND FISH HABITAT IMPROVEMENT AND MAINTENANCE

PURPOSE AND NEED: To maintain existing watershed improvement projects and to complete new small projects (up to 10 acres each) using the Watershed Improvement Tracking inventory list and other sources from which to draw projects. To maintain existing fish habitat projects and to complete new small projects (less than one acre each or 20 structures) as funds become available. The Forest will provide a list of project descriptions and maps annually for informal review by US Fish and Wildlife

Service Level 1 team members before the projects are implemented. The current planning period runs until December 31, 2017.

LOCATION: Within the SFSR Section 7 watershed

DATES OF PREVIOUS CONCURRENCE:

- USFWS: October 15, 2001
- NMFS: August 8, 2001.

DESCRIPTION:

Watershed Improvements

These projects include such things as gully stabilization, road obliteration, vegetation and structure placement, using gabions, trees, wooden grids, and soil cementing techniques to stabilize slopes. Structures have been, and will be, placed on slopes that are actively eroding to help stabilize and vegetate these slopes. Structures are generally used in combination with other techniques such as the planting of trees and shrubs, and the use of matting materials. This action includes mining reclamation (less than 10 acres) including re-contouring to restore hydrologic function, clean up of existing facilities and other previously mentioned activities. This action includes the clean up of small toxic spills and dumps. This actions does not include when the volume of substance requires the implementation of the Clean Water Act, Resource Conservation Act, Comprehensive Environmental Response Compensation and Liability Act or Oil Pollution Act. Emergency consultation will occur if any of the aforementioned Acts are implemented.

Fish Habitat Improvements

These projects include stream/riparian area improvements, woody debris management, stream bank stabilization and vegetation, fine sediment removal, boulder cluster placement, anchored whole-tree revetments, log weirs, and fish barrier removal. Maintenance of these projects would consist of an inspection, followed by the repair of any deficiencies found. This includes, vegetation of eroded areas, debris removal (from weirs), reshaping or reinforcement of existing structures and the addition of rock or other woody material to stabilize existing structures, especially on stream bank stabilization structures.

Actions Not Covered

Actions not described in this action include channel realignment, handling and relocting fish, and actions that cause adverse displacement or disruption of listed fish.

REQUIRED MITIGATION:

- Instream work will be timed to avoid spawning activity, and eggs or alevins in the substrate.
- Watershed Improvements:
    - The watershed improvement and maintenance program is mitigation for past watershed impacts (i.e, not from ongoing actions). Projects address erosion and sedimentation problems associated with old roads, timber sale areas, old grazing, and old mining projects.
    - These mitigation projects will use the highest level of additional mitigation (water control devices, mulch or erosion control matting, vegetation and grass seed and fertilizer) when the construction site is within the RCA buffers or on slopes greater than 45 percent, or where necessary to minimize effects. A moderate level of erosion control (mulch, grass seed and fertilizer) will be used on other areas. Generic BMPs (Best Management Practices) that can be used include:
        - Silt fence and filter barriers
        - Straw-bale sediment barriers

- Erosion control blankets and mats
- Hydromulching
- Mulching
- Waterbars and rolling dips
- Temporary sediment basins
- Straw rolls
- Straw bale dikes
- Slash filter windrows
- Scattered slash
- Brush layering
- Shrub planting

Specific details including intructions and diagrams for some of the BMPs listed above are provided on this CD1: \Support Documents\Misc\bmp.pdf

- **Fish Habitat Improvements**:

  - The fish habitat improvement and maintenance program is mitigation for recognized habitat deficiencies.
  - Ground disturbing construction activities within the RCA buffers will be fully mitigated at the "high" level of mitigation as explained above. Mechanized equipment, such as a trackhoe, must be free of any petroleum or hydraulic leaks and must be serviced outside the RCA buffers.
  - Use of mechanized equipment within the RCA buffers, including within the stream channel, would only occur after a journey level fisheries biologist has determined that effects to substrate embeddedness, other WCI's, and individual listed fishes (including their eggs and alevins) would be negligible.

- **Any culvert replacement will conform to the following guidelines**:

  - Before work begins a journey level fisheries biologist will confirm that any effects to listed fishes, due to their proximity to the activity, would be negligible.
  - Culverts will meet LRMP standards.
  - FishXing or similar software may be used to determine culvert specifications required for fish passage.
  - Use erosion control at the work site to minimize sediment delivery to the stream prior to any construction.
  - Remove fill from around existing culvert and store at a stable location.
  - Construct a temporary channel and line it with plastic and/or geotextile, or use some other water conduction facility (e.g., pipe) that must meet fish passage requirements.
  - Divert the stream into the temporary water conduction facility.
  - Remove existing culvert.
  - Install replacement culvert.
  - Reconstruct approaches over new culvert.
  - Seed and mulch disturbed areas, remove sediment collected by erosion control material as specified by a hydrologist, soil scientist, or fisheries biologist.
  - Additional site-specific measures, including modifications to BMPs because of site-specific conditions, may be identified and approved by a fisheries biologist or hydrologist.

F. FEDERAL ACTION: NOXIOUS WEED MANAGEMENT

PURPOSE AND NEED: To control, contain or eliminate noxious weed invasion and infestations on National Forest Systems lands, and maintain vegetative communities and the species dependent on them, in the SFSR watershed until December 31, 2017. This action does not include weed treatment within the Frank Church River of No Return Wilderness. Noxious weed management and control has been recognized through national policy, forest plan development, broad scale assessments, and site-specific NEPA decisions. Laws that require management of noxious weeds include:

- Federal Noxious Weed Act of 1974, as amended.
- The Forest and Rangeland Renewable Resource Planning Act of 1974.
- The Public Rangelands Improvement Act of 1978.
- The Carlson-Foley Act of 1968.

In Addition, Executive Order 13112, signed by the President of the United States in February 1999, directs federal agencies to conduct activities that will reduce noxious weed populations.
The Idaho Noxious Weed Law (Title 22, Chapter 24, Idaho Code) requires landowners to eradicate noxious weeds on their lands, except in special management zones. This requires prevention of their above- ground parts for at least two years. The Forest cooperates with the state but is not bound by most state laws.

LOCATION: This activity would occur throughout the SFSR watershed. Noxious weed management is covered for the FCRONR Wilderness portion of this analysis area in the SFSR watershed under a separate consultation. Known noxious weed locations that are mapped into GIS, where management and/or control could occur, are shown in CD1: \Support Documents\Maps\weeds.pdf. This map is continually being updated as known locations are verified.

The Forest would provide a list of site-specific project descriptions and maps annually (separate from this document) for informal review and approval by National Marine Fisheries Service and US Fish and Wildlife Service Level 1 team members before the projects are implemented. Unknown sites found during project implementation may be treated following the guidelines within this BA, and would be mapped and reported annually.

DATES OF PREVIOUS CONCURRENCE:

- USFWS: none
- NMFS: none

DESCRIPTION: This action covers all activities involved with the noxious weed management program. Noxious weed management activities include herbicide application, mechanical controls (hand pulling or digging), biological treatments, and rehabilitation (i.e. seeding, plantings). Herbicide treatment occurs annually from April through September. The noxious weed management activities on the PNF include: awareness/education, prevention/early detection, inventory, an array of weed treatment practices, monitoring, and rehabilitation.

Noxious weed management measures depend on the area being considered and the particular weed situation, management objectives may range from containment to control and eventually to eradication.

Introduced noxious weeds and non-native species are found in many plant community types and at many locations. Weed management efforts may be necessary on rangelands, in timber harvest areas, along roads and road rights-of-way, along trail routes, at dispersed recreation sites, on developed recreation sites, and at other disturbed sites (i.e. fires, flood events).

Noxious weeds are plant species that have been designated “noxious” by law. In addition to noxious weeds, additional plant species may be identified and treated over the course of the consultation. The word “noxious” simply means deleterious by definition. Examples of noxious weeds and other weedy species that may require control measures within the analysis area are (**bold** indicates priority target species for the PNF):

- **Hoary Cress** (whitetop**)** ***Cardaria draba***
- Musk Thistle *Cardus nutans*
- Canada Thistle *Cirsium arvense*

- **Diffuse Knapweed** ***Centaurea diffusa***
- **Spotted Knapweed** ***Centaurea maculosa beibersteinii***
- **Yellow Starthistle** ***Centaurea solsititialis***
- **Rush Skeletonweed** ***Chondrilla juncea***
- Field Bindweed Convolvulus arvensis
- **Leafy Spurge** ***Euphorbia esula***
- Dyers Woad *Isatis tinctoria*
- Perennial Pepperweed *Lepidium latifolium*
- **Dalmation Toadflax** ***Linaria genistifolia***
- Yellow Toadflax *Linaria vulgaris*
- Purple Loosestrife *Lythrum salicaria*
- **Scotch Thistle** ***Onopordum acanthium***
- Tansy Ragwort *Senecia jacobaea*
- Johnsongrass *Sorghum halepense*
- Chicory *Cichorium intybus*
- Hound's Tongue *Cynoglossum officianale*
- St. John's Wort *Hypericum perforatum*
- Sulfur Cinquefoil *Potentilla recta*
- Mediterranean Sage *Salvia aethiopis*
- Medusahead Rye *Taeiathrum caput-medusae*
- Common Tansy *Tanacetum vulgare*

The noxious weed program on Forest Service lands is based on weed management objectives and priorities that are influenced by weed infestations and site susceptibility. These criteria provide focus and direction for the noxious weed program and allow for site specific and adaptive decision-making. Table 3 identifies the objective and priority system used on FS lands. The intent of containment is to prevent the spread of the weed to beyond the existing infestation perimeter.

The control objective is to reduce the infestation through time; some level of infestation may be tolerated. The eradication objective is total elimination of all weeds.

Table 3.—Weed treatment prioritization and objectives used for noxious weed control on FS lands.

Operational Objectives	Operational Priorities
Eradicate: The weed is treated to the extent that no viable seed is produced over the entire infestation and all plants (above ground portions) have been eliminated during the current field season. **Control:** Portions of the infestation or outbreak are treated to the extent that overall infestation area diminishes because no viable seed is produced and/or plants have been eliminated. Contain: Portions of the infestations are treated to the extent that the weed is not expanding beyond the established treatment zones. The main body of the infestations may be left untreated. **Reduce:** The infestation is treated to the extent that densities and/or rate of spread are reduced to an acceptable level.	**Critical:** Urgent actions due to a combination of outside funds and/or invasive weeds found in susceptible and relatively intact habitats. **High:** Important actions associated with outbreaks of invasive weeds along key spread-vectors and/or linked to a combination of treatment strategies. Moderate: moderately important actions associated with invasive weeds in somewhat susceptible but disturbed habitats. **Low:** Actions associated with non-invasive weeds or in areas of low susceptibility where rapid spread is unlikely. May not need immediate (current year) attention.

Table 4.—Annual Noxious Weed Control Program for the Payette National Forest (includes Wilderness)

Type of Noxious Weed Control Activity	Acres
Mechanical/Manual Control	5 – 25 (about 5 acres per Section 7 watershed)
Biological Control No. Site Releases	0 -5
Chemical Ground Based Application	100 – 1000 (100-500 per Section 7 watershed)
Restoration, Seedings, and Plantings	0 – 200 (about 10 acres per Section 7 watershed)
Cooperative Weed Management Areas (CWMAs)[a]	4

[a]These include the Upper Payette River, Lower Weiser River, Adams, and Frank Church Wilderness CWMAs.

Control Methods

All vegetation treatments conducted for control of noxious weeds are done in accordance with established FS policy, regulations, and product labels. FS policy requires the use of specific design features when in close proximity to sensitive areas to insure vegetation treatments do not have an adverse impact on non-target plants or animals. For example, design features for herbicide application include: use of aquatic-approved herbicide where there is a probability that the herbicide may enter the water; buffers adjacent to live waters; and spot-spraying or manual control only of target species in sensitive areas (see Effects section and "Required Mitigation", below).

Chemical Control.—Generally, less than 200 acres will be annually treated with herbicide in the Little Salmon, Middle Fork/Main Salmon Southeast, and Main Salmon Southwest Section 7 watersheds, and less than 500 acres in the SFSR Section 7 watershed. Herbicide treatments would be conducted in accordance with FS procedures found in Pesticide-Use Management FSH 2109 (CD1: \Support Documents\Law\2109.14, individual chapters) and Noxious Weed Management (FSM 2080; CD1: \Support Documents\law\2080.rtf). The chemicals can be applied by many different methods (see below), and the selected technique depends on a number of variables. Some of these are (1) the treatment objective (removal or reduction); (2) the accessibility, topography, and size of the treatment area; (3) the characteristics of the target species and the desired vegetation; (4) the location of sensitive areas in the immediate vicinity (potential environmental impacts); (5) the anticipated costs and equipment limitations; and (6) the meteorological and vegetative conditions of the treatment area at the time of treatment (see Effects section and "Required Mitigation", below).

Herbicide applications are scheduled and designed to minimize potential impacts to non-target plants and animals, while remaining consistent with the objectives of the vegetation treatment program. The rates of application (i.e., pounds of active ingredient per acre) depend on the target species, the presence, and condition of non-target vegetation, soil type, depth to the water table, presence of other water sources, riparian areas, special status plants, and the requirements of the herbicide label. The majority of treatments will be in travel corridors.

Herbicides

Herbicides that could potentially be used that are approved by the USFS, have completed risk assessments, and are EPA-registered and approved, include the following: 2,4-D amine (Weedar® 64, Amine 4); glyphosate (Rodeo®); picloram (Tordon™); clopyralid (Transline®); metsulfuron methyl (Escort®); dicamba (Banvel®); and imazapic (Plateau®). These herbicides, further described in the following text, would be the primary chemicals used in the Federal Action that include the chemical treatment of weeds. The Forest will continue to evaluate new chemicals and amend this consultation to include them where they meet the following conditions: 1) any chemicals appearing on the Forest Service's list of herbicides approved for use on National Forests; and 2) any new or updated chemicals as they are registered and approved by the EPA and added to the Forest Service's list of herbicides approved for use and accompanied by complete risk assessments.

Selection of a herbicide for site-specific application would depend on its chemical effectiveness on a particular weed species, success in previous similar applications, habitat types, soil types, proximity of the weed infestation to water, and the presence or absence of listed fish species. All herbicide applications would follow label instructions, specifications, and precautions as well as applicable Forest Service policy. Characteristics and properties of herbicides are discussed further below.

Table 5.—Common herbicides used by the Payette National Forest, trade name, and typical application rates.

Common Name	Trade Name	Typical Rates
Clopyralid	Transline®	0.1-0.5 lb/ac
Picloram	Tordon™	0.25-1.0 lb/ac
Glyphosate	Rodeo®, Roundup®, Accord®	0.5-2.0 lb/ac
Metsulfuron Methyl	Escort®	0.5-2.0 oz/ac
2,4-D	Amine 4, Weedar® 64	0.5-2.0 lb/ac
Dicamba	Banvel®	0.25-4.0 lb/ac
Imazapic	Plateau®	0.06-0.75 lb/ac

Carriers, Dyes, and Adjuvants

Carriers are gases, solids, or liquids used to dilute or suspend herbicides during application and allow for proper placement of the herbicide, whether it is to the soil or on foliage. Water is the only carrier that is proposed for use and addressed in this document.

Non-hazardous indicator dye is required to be used with herbicides based on direction from the NMFS BO (NMFS 2007). The presence of dye makes it easier to see where the herbicide has been applied and where or whether it has dripped, spilled, or leaked. Dye makes it easier to detect missed spots and to avoid spraying a plant or area more than once.

Adjuvants are not being proposed for use within this watershed.

Application Methods

Ground based application for treatment of noxious weed infested areas would utilize vehicle-mounted or ATV sprayers (spot-gun) (most common method); spot-spraying with hand-held spray nozzles either mounted on a vehicle (slip tank) or attached to a backpack system (very common method); hand-spreading granular formulations (least common method); and wicking, wiping, dripping, painting, or injecting target weeds (uncommon method). All application methods may be used for each herbicide and herbicide combinations. Specific treatment of individual plants can be accomplished with wicking, wiping, dripping, painting, or injecting target weeds. Most of the herbicides that may be used are liquid formulations that are applied onto the foliage of the target vegetation, although soils also may be a major receptor for these chemicals.

Within 50 feet of streams and wetlands, and where riparian or hydrophilic plants are present, and where surface material is obvious recent deposition of sediment of any diameter(s), only herbicides approved for use adjacent to water bodies (glyphosate - Rodeo®) will be used.

***Manual Control*.—**Hand-operated power tools and hand tools are used in manual vegetation treatment to cut, clear, mow, or prune herbaceous and woody species. In manual treatments, workers would cut plants above ground level; pull, grub, or dig out plant root systems to prevent subsequent sprouting and growth; scalp at ground level or remove competing plants around desired vegetation; or place mulch around desired vegetation to limit the growth of competing vegetation.

Hand tools such as the handsaw, axe, shovel, rake, machete, grubbing hoe, mattock (combination of axe and grubbing hoe), brush hook, and hand clippers are used in manual treatments. Axes, shovels, grubbing hoes, and mattocks can dig up and cut below the surface to remove the main root of plants that have roots that can quickly sprout in response to surface cutting or clearing. Workers also may use power tools such as chain saws, power brush saws, and line trimmers (i.e. weed eaters). A less common method that may be used is mowing of weeds, and typically involves hand/motor-powered mowers or tractor mowers.

The manual method of vegetation treatment is labor intensive and costly when compared to herbicide application. However, it can be extremely species selective and can be used in areas of sensitive habitats. Manual control may occur in a variety of areas and is often used in sensitive areas to avoid adverse effects to non-target species or water quality. All noxious weed disposals would be in accord

with proper disposal methods. Noxious weeds that have developed seeds would be bagged and burned.

***Biological Control*.—**Biological control would include the use of insects, pathogens, or some combination of the two. Biological methods of vegetation treatment use living organisms to selectively suppress, inhibit, or control herbaceous and woody vegetation. This method is viewed as one of the more natural processes because it requires the proper management of plant-eating organisms and may be used in combination with other control methods within a general area, such as chemical treatments and mechanical. Biological weed control activities include the release of insect agents which are parasitic and "host specific" to target noxious weeds. This activity includes the collection of beetles/insects, development of colonies for collection, transplanting parasitic beetles/insects, and supplemental stocking of populations.

Insects and pathogens would be used as biological control methods generally in conjunction with other control methods (i.e. herbicides), although at the present these methods can control few plant species. Insects are the main natural plant enemies being used at the present time. Other natural enemies include mites, nematodes, and pathogens. This treatment method would not eradicate the target plant species but merely reduces the target plant densities to more tolerable levels. This method also reduces competition with the desired plant species for space, water, and nutrients. This treatment method would be used on larger sites where the target plant has become established and is strongly competitive (e.g., yellow star thistle) or remote locations.

Particular insects, pathogens, or combinations of these biological control agents may also be introduced into an area of competing or undesired vegetation to selectively feed upon or infect those target plants and eventually reduce the target plant density to the desired level of control. There fore in most situations, a complex of biological control agents is needed to reduce the target plant density to a desirable level. But even with a complex of biological control agents, often 15 to 20 years are needed to bring about an economic control level. In most circumstances, biological control agents would not control weeds. They are only creating stresses on the weeds, which is not the same as control.

***Cultural Control*.—**Cultural control would include preventing weed introduction and/or minimizing rate of spread by requiring the following actions on public lands:

- Clean all ground disturbing equipment prior to moving into and out of weed-infested areas before and after use (applies to both USFS and contract equipment. Forest Plan Standard NPST03: "To prevent invasion/expansion of noxious weeds, the following provisions will be included in all special use authorizations, timber sale contracts, service contracts, or operating plans where land-disturbing activities are associated with the authorized land use: b) Earth-disturbing equipment used on NFS lands - such as cats, graders, and front-loaders – shall be cleaned to remove all visible plant parts, dirt, and material that may carry noxious wed seeds. Cleaning shall occur prior to entry onto the project area and again upon leaving the project area, if the project area has noxious weed infestations).
- Use only certified, noxious weed-free grains, hay, or pellets for feeding domestic animals and wildlife; and inspect all feeding sites during and following use.
- Use only certified noxious weed-free seed, along with hay, straw, mulch, or other vegetation material for site stability and vegetation projects.
- Use only noxious weed-free gravel and fill material from inspected sites.
- Vegetate disturbed areas as soon as practical; use temporary fencing if required assuring new seedling establishment.
- Evaluate current and proposed vegetation management practices (i.e. livestock grazing, prescribed burning, and seeding), and implement practices to restore desired plant communities.

***Rehabilitation, Seeding, and Plantings*.—**Noxious weeds commonly invade areas that have vegetation that can't compete with aggressive invader species. Consequently, after weeds are

controlled on a site it is beneficial to establish desirable native vegetation that would compete with noxious weeds, restrict or prevent additional infestations, and help prevent soil erosion and further soil nutrient loss. These treatments may involve ground or aerial application of seeds.

Adaptive Management

The noxious weed control program is a long-term endeavor to control weeds where/when practical. However, because there are areas of scientific and management uncertainty, management actions would need to be refined over time to meet the basic objective of noxious weed control activities systematically reducing weed abundance, extent and spread throughout the PNF. Annual site-specific monitoring would assess the effectiveness of specific control measures on weed species relative to application rate/method and area. Management actions may require refinement or change over time as data from specific effectiveness monitoring is analyzed.

Landscape level management would be reevaluated if consultation were reinitiated. Information from weed inventories and results from treatments will be mapped spatially and the PNF will use this information to assess the noxious weed program objectives and can use this information to build a current baseline for future consultations.

Monitoring

The PNF would be monitoring the effectiveness of the noxious weed program on both a site-specific treatment level and on a landscape level.

Site-specific treatment level monitoring would involve assessing the effectiveness of the treatment agent or control method on a specific patch of noxious weeds. Follow-up treatments would occur as staffing and funding allow. Monitoring may involve multiple years to determine effectiveness. Monitoring of physical, cultural, and chemical control methods would be conducted on randomly selected sites (approximately one site per Section 7 watershed) within one to two months of treatment through visual observation of target species' relative abundance/site dominance compared to pre-treatment conditions. Sequential monitoring of these sites would occur in subsequent years.

Landscape level effectiveness monitoring would be accomplished over the consultation period of the BA by tracking noxious weed occurrence through Geographic Information System (GIS) mapping across the PNF. Noxious weed infestations would be inventoried, mapped, and tracked through GIS to monitor the amount of the PNF land base with noxious weeds and how the control program has worked over the consultation period.

Landscape level inventory and monitoring is expected to reveal new populations of noxious weeds, which would be mapped and evaluated for control or eradication. Management of these newly discovered sites would occur under the guidelines as described in the preceding proposed action.

Program Reporting and Evaluation

Project proposals (with methods, objectives of treatment, location, map of treatment area, acreage, proposed dates to be started and completed, sensitive areas, and special mitigation) for noxious weed control activities involving herbicides will be prepared annually by Weed Coordinators and submitted by April 1, for review by PNF biologists. Project proposals would be reviewed for compliance with this BA. The PNF biologists (Level 1) would provide a list of project descriptions and maps annually (or as identified) for informal review and approval by National Marine Fisheries Service and US Fish and Wildlife Service Level 1 team members before the projects are implemented. All projects would be reviewed and approved by the NMFS and USFWS before herbicide application occurs.

Annually, a project summary of treatments would be prepared for land treatments that took place during the past year. The report would document treatments that took place, methods used, location, map, acreage, evaluation of achievement of objectives, brief summary of environmental effects, and evaluation of compliance with the BA. This summary report would be completed by April 1, annually, and will likely be provided in a NMFS consultation document.

Based on annual treatment evaluations and with the likely development of new control methods and technology, changes in existing or use of new noxious weed treatments may be authorized and warranted. Any changes to the proposed action, as described in the BA, would be analyzed for impacts to listed/proposed species and critical habitat, and consultation would be reinitiated as appropriate.

Partnership and Cooperative Weed Management Areas

The Payette National Forest is a cooperative partner in four Cooperative Weed Management Areas (CWMAs). The cooperative partnerships undertaken through these WMAs make individual and cooperative efforts more effective. Partners include Federal, State, County, private organizations, and private landowners. The cooperative WMAs are listed below:

- Adams.
- Frank Church Wilderness.
- Lower Weiser.
- Upper Payette River.

The cooperative WMAs provide an opportunity for coordinating weed control efforts within a specific project area and provide a more efficient method of control, restoration, and monitoring. When a federal agency is a cooperator in CWMAs, it does not necessarily mean the Forest is the action agency for non-federal lands. However, it does provide the Forest the opportunity of identifying potential private land ESA concerns and issues and recommending noxious weed control BMPs that would reduce risk to listed species and their habitats. It is recognized that the federal listing of species requires the Forest to ensure that all actions authorized or funded by the Forest are not likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of critical habitat of listed species. Where FRTA easements are granted, the Payette NF conditions the easements with these PDCs. Where CWMAs are treating on forest, any cooperators are bound by the same PNF PDCs.

Required Mitigation

- The PNF would follow established USDA Forest Service guidelines (FSM 2080; CD1: \Support Documents\law\2080.rtf)
- The PNF would have a certified herbicide applicator overseeing all spray projects.
- A spill cleanup kit would be available whenever herbicides are transported or stored.
- A spill contingency plan would be developed prior to all herbicide applications. Individuals involved in herbicide handling or application would be instructed on the spill contingency plan and spill control, containment, and cleanup procedures.
- Herbicide applications would only treat the minimum area necessary for the control of noxious weeds.
- Trained personnel would monitor weather conditions at spray sites during application.
- All herbicide labels would be strictly enforced
- No spraying would occur when wind velocity exceeds 8 miles per hour.
- No spraying would occur if precipitation is occurring or is imminent (within 3 hours) (this measure is considered to be effective at reducing herbicide delivery from ditches into streams).
- No carrier other than water would be used.
- No use of 2,4-D ester formulations would be authorized.
- The Weed Coordinator will map and identify buffers, methods of application, and herbicide restrictions that may be required for the project, and will make a pre-project review of all spray projects to provide to the level one team by April 1, annually.
- Equipment would be designed to deliver a median droplet diameter of 200 to 800 microns. This droplet size is large enough to avoid excessive drift while providing adequate coverage of target vegetation.
- Equipment used for transportation, storage, or application of chemicals shall be maintained in a leak proof condition.
- All vehicles carrying herbicides shall have a standard spill kit.

- No herbicide storage, mixing or post-application cleaning would be authorized within RCA (100 feet of any live waters). Mixing and loading operations must take place in an area where an accidental spill would not contaminate a stream or body of water before it could be contained.
- Only very low risk, or "aquatic-approved" chemicals (glyphosate-Rodeo®) could be used within 50 feet of open water, where riparian or hydrophilic plants are present, and/or where surface material is obvious recent deposition of sediment of any diameter(s), and these would be applied with hand spraying or wiping only.
- No more than one application of picloram would be made on a given site in any given year to reduce the potential for picloram accumulation in the soil.
- Manual control (e.g. hand pulling, grubbing, cutting, etc.) is authorized in all areas, and may be used in sensitive areas to avoid adverse effects to non-target species or water quality. All noxious weed disposals would be in accord with proper disposal methods. Noxious weeds that have developed seeds would be bagged and burned.
- Only the amount of herbicides that are planned to be used daily would be transported in vehicles.
- Equip drafting equipment for filling spray tanks with back siphoning prevention devices.
- Non-hazardous indicator dye is required to be used with herbicides based on direction from the NMFS BO (NMFS 2007). The presence of dye makes it easier to see where the herbicide has been applied and where or whether it has dripped, spilled, or leaked. Dye makes it easier to detect missed spots and to avoid spraying a plant or area more than once.

Spill plan.—The following procedures for mixing, loading, and disposal of herbicides and spill prevention plan will accompany all herbicide spraying operations:
Procedures for Mixing, Loading, and Disposal of Herbicides
Procedures for mixing, loading, and disposing of herbicides will comply with Forest Service Manual (FSM) 2109.14 Chapter 40.

The following summary is taken from the Frank Church River of No Return Noxious Weed Treatments Final Environmental Impact Statement, Intermountain and Northern Regions: Bitterroot, Nez Perce, Payette, and Salmon-Challis National Forests (NMFS 2007).

- All mixing of herbicides will occur at least 100 feet from surface waters or well heads
- All hoses used to add dilution water to spray containers will be equipped with a device to prevent back-siphoning
- Applicators will mix only those quantities of herbicides that can be reasonably used in a day
- During mixing, mixers will wear a hard hat, goggles or face shield, rubber gloves, rubber boots, and protective overalls
- All empty containers will be triple rinsed and disposed of by spraying near the treatment site at rates that do not exceed those on the treatment site
- All unused herbicides will be stored in a locked building in accordance with herbicide storage regulations contained in FSM 2109.14
- All empty and rinsed herbicide containers will be punctured and either burned or disposed of in a sanitary landfill
- Any additional herbicide label requirements will be strictly followed during the mixing, loading, and disposal of herbicides

Herbicide Spill Plan for Weed Control
All actions involving incidents, spills, and accidents will comply with FSM 2109.14 Chapter 60.
The following has been modified from the Flathead National Forest Noxious and Invasive Weed Control Environmental Assessment (USFS 2000).

A reportable herbicide spill is one pint of concentrate of herbicide and/or five gallons of mixed herbicide, even if these amounts can be contained and recovered by the weed field crew. Spills that can be contained and recovered will thereafter be applied in the field according to the label requirements for the herbicide. If an herbicide spill occurs, the field crew will radio the Ranger District

they are working in, and report the spill. The receptionist on duty will use the form on the attached sheet to gather information. The information will then be forwarded to the appropriate District Safety Officer and to the FS/BLM Interagency Hazardous Materials coordinator for appropriate action. The National Poison Control Center (1-800-222-1222) will be contacted as necessary. If there is a spill, report it on approved forms.

At a minimum, the following equipment and materials will be available with vehicles or pack stock used to transport herbicides.

- A shovel
- Absorbent material or the equivalent
- Plastic garbage bags or buckets
- Rubber gloves
- Safety goggles
- Protective clothing
- Rubber boots
- Applicable Material Safety Data Sheets (MSDS)

G. FEDERAL ACTION: ROAD MANAGEMENT

PURPOSE AND NEED: To conduct management activities on National Forest System roads within the SFSR Reservoir Section 7 watershed on the Payette National Forest until December 31, 2017. These activities are performed by Forest engineering staff, other authorized Forest personnel, contractors, or cooperators who have written agreement with the Forest to perform maintenance.

LOCATION: SFSR Section 7 Watershed

DATES OF PREVIOUS CONCURRENCE:

- USFWS: October 15, 2001
- NMFS: August 8, 2001

DESCRIPTION: Road management has several major components, road maintenance, administration of easements, rights of way and permits, and physical closures of various types related to reducing resource impacts. Road maintenance that is part of mining operating plans is the sole road maintenance activity that is not part of this federal action; operating plans require separate consultation where they may affect listed species and/or critical habitat. Road management and the travel plan Federal action are interdependent actions; therefore, they will be discussed collectively in the effects matrix (Appendix 3).

Maintenance can be summarized as routine road surface blading, culvert repair and cleaning, brushing on roadways (top of the cut to the bottom of the fill) and road ditch cleaning. Road maintenance includes replacing existing facilities (e.g. road, culvert, bridge, retaining wall, etc.) and resurfacing roads with pre-existing materials, except as identified under “acts of God.” Road surfaces may be upgraded to reduce erosion and sedimentation so long as cut and fill-slopes are not enlarged or disturbed; for example, a native surface road may be upgraded to pit-run gravel, crushed aggregate or asphalt. The federal action includes replacement of facilities normally maintained by the Forest where they are obliterated (severely damaged, or eroded) for up to 500 feet of full prism by flood, fire or other “acts of God” if a journey level fisheries biologist agrees that the effects are not likely to be adverse. Repairs due to “acts of God” may involve alignment shifting to reduce encroachments of RCAs and flood plains. Within funding constraints, the maintenance level assigned to a road dictates the frequency and extent of maintenance work performed on a particular road, or section of road. Roads assigned a higher maintenance level are traveled more often and therefore receive more maintenance more frequently (for further detail refer to Fall Back Emergency Steps below). . Maintenance Levels also provide a way to classify forest roads according to their assigned use, so that the road will perform as planned. A description of the various road maintenance levels is located in

CD2: \Support Documents\Roads\7709.58,12.3,ex.01[1].rtf (in File Roads.zip). Routine road maintenance activities, snow plowing, and road dust abatement will be conducted to prevent resource damage. Road plowing will follow standards described in the Land and Resource Management Plan. These standards are designed to reduce the potential for damage to the road from snow plowing activities and thereby reduce sediment delivery to streams.

Maps indicating maintenance levels and responsible agencies are included on the accompanying CD:

- CD1: \Support Documents\Maps\rds_oper_ML.pdf

These maps represent the most current information available, and may change as additional information becomes available.

A more detailed description of road maintenance is that road maintenance is any activity that takes place on an existing classified for unclassified road for the expressed purpose of maintaining the road or road system in a safe and properly functioning condition for the user and level of use identified by the road use objective and maintenance level. This activity would be further defined by the following sub-categories:

- ***Rote or Routine Road Maintenance.—***Maintenance is anticipated/planned on a repeated/yearly basis, e.g. surface blading, brushing, culvert & bridge clearing, cleaning & repair, surface clearing, deadfall removal. Slide and slough removal occurs. Ditch clearing and cleaning occurs. Rock raking, and dust abatement applications occur. Hazard trees are felled.
- ***Normal or Frequent Road Maintenance.—***Road resurfacing, gravel placement (new or resurface), pavement patching and sealing (including new bituminous surface treatments (seal coats, and similar measures) occur but not annually. Culvert installations, including replacements, upgrades, extensions and new installations, can occur providing LRMP standards, at a minimum, are met and the listed BMPs are used. Such actions in fishbearing streams will be reviewed by the Level 1 Team prior to implementation. Aggregate crushing and hauling can occur from existing rock pit sources. Minor concrete work, i.e. small headwalls can occur. Riprap slope protection, prism reconstruction, retaining walls for slope stabilization, seeding and mulching can occur. Riprap placement for culvert inlet and outlet protection and bridge repairs can occur if limited to a cumulative linear distance of 100 feet or less at an individual site and after approval by a fisheries biologist, except where there may be potential adverse effects to listed species or designated critical habitat. Snow removal occurs on roadways to facilitate access following inclement weather.
- ***Extreme or Very Infrequent Road Maintenance.—***Road re-alignments can occur. Re-alignment is defined as road maintenance because: the road exists and is part of an existing road system, and the local road network accesses a portion of the National Forest maintaining the systems function. In addition, meeting present Forest Plan Standards or Legal requirements, (i.e. Endangered Species Act & Clean Water Act, etc.) is a maintenance function. Road re-alignment could occur if the Ranger through the input of fisheries biologists, hydrologists, and others has determined that listed species or designated critical habitat would benefit by road re-alignment, and a fisheries biologist has determined there would be no adverse affects due to sediment delivery, harassment of adults, or other mechanisms of effect. Temporary bridge placement or permanent bridge replacement in locations where a fisheries biologist has determined listed fishes are not present; when utilizing existing abutments or supports or with minor movement or improvement of abutments, and when effects to listed fishes or designated critical habitat from sediment delivery are negligible (see erosion control mitigations below). Actions may require stream fording after fisheries biologist approval. All design criteria applicable to Forest Service roads would be implemented with extreme or very infrequent road maintenance.

Administration of permits and easements results in conducting similar activities to road maintenance except that the Forest Service jurisdiction is limited to prescribing terms and conditions. Permits contain the most flexibility and can contain all mitigation measures that the Forest Service believes are

appropriate. The terms and conditions applied to easements, or rights of way can only contain those measures consistent with the property rights identified in the easement or right of way; the latter may apply to state or county roads, access to private property and similar circumstances.

Administration of permits and easements also includes grooming of snowmobile routes and connections among them; the routes are mostly on existing roads; these agreements are with the counties and the state of Idaho.

Physical road closures are those identified according to the mitigation measures described below. The Forest has a process for making decisions about what roads to close for resource protection and otherwise how to manage roads; that process is identified below.

SITUATIONS REQUIRING SEPARATE CONSULTATION: Separate consultation will be required for Forest road maintenance activities if:

- A specific road maintenance action on roads for which the Payette National Forest has maintenance responsibility (including maintenance by County personnel or road use permittees) does not adhere to Payette National Forest road maintenance standards, does not adhere to all applicable mitigations listed below, and/or may adversely affect a listed species (which could include stranding or harassing fish) or designated critical habitat;

and/or

- A maintenance activity or assigned maintenance level results in adverse effects to a listed species (which could include stranding or harassing fish) or designated critical habitat regardless of whether maintenance standards are followed.

Road maintenance crews, contractors and cooperators will be provided training by the Payette National Forest, prior to operation, regarding the potential for effects to listed fishes and designated critical habitat, and what maintenance practices are mandatory and appropriate.

REQUIRED MITIGATION: Mitigation, in this case, consists of practices aimed at minimizing sediment production and delivery to streams, maintaining or improving the designed drainage of the road, and avoiding the introduction of dust abatement chemicals that could be delivered to streams.

Regular maintenance keeps roads in good functioning condition and allows for identifying and correcting problems promptly. Recommended maintenance (mitigation) for activities in the SFSR Watershed is found in Furniss et al. 1991. These practices will help reduce the adverse effects of road deterioration on habitat.

General Practices

- Do not leave berms along the outside edge of roads, unless an outside berm was specifically designed to be a part of the road and low-energy drainage is provided for. The creation of outside berms during road grading is a common mistake, and frequently turns low-impact roads into high-impact, chronic sediment producers.
- Grade and shape roads to conserve existing surface material. Road grading and shaping should maintain, not destroy, the designed drainage of the road, unless modification is necessary to improve drainage problems that were not anticipated during the design phase.
- Inspect ditches and culverts frequently, as appropriate to the maintenance level, and clean them out when necessary. Do not over-clean them, however, because excessive cleaning of ditches causes unnecessary sedimentation. Use care to not undercut the ditch back slope, or the cut-slope.
- When blading and shaping roads, do not side cast excess material onto the fill. End haul all excess fine material that cannot be bladed into the surface as periodic side casting can prevent fill stabilization and promote erosion. End haul and prohibition of side casting is not required for

organic material like trees, needles, branches, and clean sod; however, fine organics like sod and grass should be cast somewhere other than into water. Slides and rock failures including fine material of more than approximately ½ yard at one site should be hauled to disposal sites. Fine materials from slides, ditch maintenance, or blading can be worked into the road. Scattered clean rocks could be raked or bladed off the road except within 300' of perennial or 100' of intermittent streams. Fine material is 1" minus; rocks are 1" plus.

- When treating weeds or brush follow all measures identified in the federal action titled "Noxious Weed Control."
- Apply dust-abatement additives and stabilization chemicals (typically $MgCl_2$ or $CaCl_2$ salts) so as to avoid run-off of applied dust abatement solutions to streams. Spill containment equipment will be available during chemical dust abatement application.
- Promptly remove debris that obstructs drainage systems.
- Identify and close those unsurfaced roads that during the wet season can directly contribute sediment to streams.
- Identify, close, and reclaim unneeded classified and unclassified roads. These roads should be put into shape to be stable and drain properly without maintenance. This usually requires earthwork for removing culverts or "dishing out" crossings that have high potential for diversion, shaping the road for long-term stability (Eubanks 1980; Weaver et al. 1987). Where high-value fisheries are at risk from abandoned roads, more extensive obliteration and reclamation of roads should be considered. Road obliteration and reclamation actions are covered under the *Watershed and Fish Habitat Improvements and Maintenance* action.
- Locate fuel storage areas outside of RCAs and provide facilities to contain the largest possible spill. Leaks of motor oil and hydraulic fluids from heavy equipment should be monitored and controlled to prevent water contamination.

In addition, the following practices will be followed during road maintenance activities:

- Avoid road maintenance activities during times in which listed fish eggs or alevins are in gravels near enough downstream to the disturbance to possibly be affected by the action. A fisheries biologist will determine this time period and whether the action is near enough to the fish to warrant this protection.
- Preventive maintenance should be practiced on all roads, not just actively used ones, as prioritized based on resource impacts and funding.
- Do not side cast road grading material (<1 inch diameter fine inorganic material) along all roads within one-quarter mile of perennial streams and from roads onto fill slopes having a slope greater than 45 percent.
- Do not "undercut" cutslopes when cleaning inside ditches so as to avoid destabilizing the slope and thereby accelerating erosion.
- End-haul all large rocks, slides, and other material that ends up on the road to a designated disposal area as agreed by a journey hydrologist/soils scientist or a journey fisheries biologist.
- Earth disturbing projects, such as emergency culvert replacement, where listed fishes are present, shall have the agreement of the Level 1 team that the effects are not likely to be adverse and agreement of a journey hydrologist/soils scientist, one of whom should be on hand to monitor the project. In addition, any culvert replacement will conform to the following guidelines:

    - Culverts will meet LRMP standards.
    - FishXing or similar software will be used to determine culvert specifications required for fish passage.
    - Place erosion control at the work site prior to any construction so as to reduce sediment delivery to the stream to negligible levels.
    - Remove fill from around existing culvert and store at a stable location.
    - Construct a temporary channel and line it with plastic and/or geotextile, or use some other water conduction facility (e.g., pipe) that must meet fish passage requirements.
    - Divert the stream into the temporary water conduction facility.

- Remove existing culvert.
- Install replacement culvert.
- Reconstruct approaches over new culvert.
- Seed and mulch disturbed areas, remove sediment collected by erosion control material as specified by a hydrologist, soil scientist, or fisheries biologist.
- Additional site-specific measures, including modifications to BMPs because of site-specific conditions, may be identified and approved by a fisheries biologist, soil scientist or hydrologist.

- Road maintenance will not be attempted when surface material is saturated with water and erosion problems could result.
- Do not excessively "brush" (cutting vegetation) along roads where the vegetation is stabilizing slopes, or providing shade to a stream or river channel.
- Road maintenance may interrupt the delivery of large woody debris to streams thereby inhibiting the maintenance or attainment of good habitat conditions. Therefore, large woody debris (LWD > 9 m in length and >50 cm in diameter) present on roads within this watershed's RCAs shall be moved intact to down slope of the road, subject to site-specific considerations. Movement down-slope will be subject to the guidance of a journey level fisheries biologist; that guidance will be provided at annual training sessions for road crews and on a site-by-site basis as necessary.

In order to avoid and mitigate effects identified in the environmental baseline, the Forest will conduct additional activities. In addition to previous requirements developed for consultation, the Forest will:

- In February 2000, the Forest began to examine priorities for road management's actions to incorporate the Chief's agenda and incorporate listed fishes and designated critical habitat into the priority setting process.
- In order to fully evaluate appropriate road management options the Forest will use a new Trails/Roads Analysis Process (TRAP, Current CD2: \Support Documents\Roads\TRAP process [in Roads.zip]). TRAP was developed to be compatible with sub-basin review and watershed analysis. This process is being incorporated into a national Roads Analysis Process (RAP), which will be required in all NEPA projects involving road management after 12 July 2001.
- A journey soils scientist has been incorporated into the road maintenance crew.

Documentation Requirements

The following documentation is required and will be provided to the USFWS or the NMFS if requested:

- All culvert replacement will be documented with respect to location, problem, action, date, fisheries biologist approval, etc.
- Road resurfacing will be documented with respect to resurfacing material, method of application, dates, fisheries biologist approval, etc.

Fall Back or Emergency Steps

Situations such as culvert failures, slides, and road failures are evaluated and prioritized according to the maintenance level of the road and the potential for damage to other resources. Road maintenance problems that may pose a threat to listed fishes or their designated critical habitat will receive the highest priority. Problems on roads of either maintenance levels 1 (closed) or 2 are usually given a lower priority than more heavily used roads of levels 3, 4, or 5. Problems are usually reported to the road operations engineer and a work order is given to the road crew to repair the problem. "Road Situation" forms are available to apprise Engineering staff of road-related problems or potential problems by other Forest personnel.

Road maintenance problems are usually corrected within 1 to 10 days, depending upon the priorities of the road maintenance crew. Problems threatening listed fishes or their designated critical habitat will be addressed immediately. If Forest road crews are unable to respond immediately (e.g., because

of equipment problems or location), the work will be contracted and supervised by Forest personnel, including a fisheries biologist, soil scientist, or hydrologist.

A fisheries biologist will review road-related maintenance problems that require more than routine maintenance (see definition above). The Forest will complete a BA and consultation with the NMFS and the USFWS, as appropriate, for major road repairs or maintenance that may pose a threat to listed fishes or their designated critical habitat.

H. Federal Action: Trails, Recreation, and Administrative Site Operation and Maintenance

Purpose and Need: To conduct routine operation and maintenance (O & M) of trails, recreation and administrative facilities on the Payette National Forest until December 31, 2017.

Location: SFSR Section 7 Watershed

Dates of Previous Concurrence:

- USFWS: October 15, 2001
- NMFS: August 8, 2001

Description: Operation and maintenance of recreation and administrative facilities on the Payette National Forest would include the following activities:

- ***Recreation and Administrative facilities (Forest Service work station and recreation sites).—***Operation, maintenance and repair of the administrative facilities will occur that includes hazard tree removal, water system repair, structural repair of fences, structural repair of buildings and barns, painting, and maintaining current septic systems. This action would also include the replacement, maintenance, improvement, and installation of structures at recreation and administrative sites such as outhouses, fences, water tanks, signs, septic systems, parking areas, etc. for the purposes of maintaining site function, to serve site users, and to provide for user's health & safety and for resource protection, etc.
- ***Airstrips.***—Leveling, smoothing, removing surface hazards, protecting surface from erosion, watering, mowing, raking rocks, applying fill dirt, re-seeding, and felling of encroaching trees.
- ***Trails.***—Conducting Trail maintenance on National Forest Systems trails to keep them in a condition suitable for use and to minimize resource impacts from the trail location and use will be conducted.. Trail characteristics and use levels vary, with the location and destination of the trail. The Forest Service Trail Maintenance Management System is "a method to plan, schedule, perform, and evaluate the maintenance activities necessary to ensure the safety, protection, proper administration, and appropriate use of the forest trail system" (Forest Service Handbook [FSH] 2309.18). Maintenance on these trails is performed after maintenance needs have been identified from condition and prescription surveys and an Annual Maintenance Plan is developed (within funding constraints). Maintenance is conducted on routine (usually annual or bi-annual schedule) and intensive (for one-time resolution of site-specific problems) levels using the methods outlined in Lund and Burns (1995) (Table 6).

Table 6.—Trail maintenance activities (Forest Service Handbook 2309.18)

Activity	Level of Maintenance	Concern
loose rock removal	routine	tread maintenance
rock & root removal	routine	tread maintenance
slough & berm removal	routine, intense	tread erosion water management
slide maintenance	routine, intense	tread erosion slope stabilization
borrow (fill)	routine, intense	Tread maintenance
drainage maintenance	routine, intense	erosion
maintain waterbars	routine, intense	erosion
maintain culverts	routine, intense	erosion
maintain stream fords	routine, intense	erosion
maintain gully crossings	routine, intense	erosion

Activity	Level of Maintenance	Concern
maintain drainage dips	routine, intense	erosion
fallen tree removal	routine	trailway
brush cutting	Routine	trailway
slope re-vegetation	intense	trailway, erosion
maintain rock/log retaining wall/barriers	intense	erosion, trailway,structure maintenance
construct rock/lock retaining wall or barrier	intense	erosion, trailway, structure maintenance
bridge maintenance	intense	erosion, structure maintenance

Trail operation and maintenance may include:

- Replacement or moving of trail segments (to improve trail function, for resource protection or other management needs), (less than 500 feet of trail), if potential effects to stream channels are reduced (i.e. by moving trails away from stream channels, wetlands etc.) is being proposed. Repair, removal, and installation of culverts, or bridges, and the replacement of trails, bridges and related facilities that have deteriorated to the point of being unsafe and/or representing a hazard to users, or are obliterated by floods, fires, landslides etc. may occur. Most trail bridges are removed by hand. Generally, this consists of removing unusable materials and replacing them with new materials. Bridge repair and replacement can include stream fording by forest personnel. Equipment such as a crane or helicopter may be used to remove/install both prefabricated metal bridges and wooden structures. Installation of a bridge or culvert to reduce or eliminate effects to listed fish species may also occur. Bridges may be native stringer, laminate, or prefabricated metal. Armoring may occur outside edge of trail with logs or rock to inhibit erosion. Stream fords may also be armored.
- Construction of puncheon or corduroy structures over bogs, or small streams, or placement of culverts to direct water under trail tread may occur. Culverts will be used in intermittent, perennial, and non fish-bearing streams. Culverts would be plastic, metal, or constructed from available rock. Culverts would be placed by hand. Plastic or metal culverts would be short (a little over trail width), entail minor excavation for placement, and be covered first with rock, then native material. Culvert replacement would also be done by hand and entail removal of cover and fill material, placement of fill material where it would not enter the stream, may include minor excavation for placement of new culvert, and covering culvert first with rock, then native material.
- Trail operation and maintenance may also include use of motorized equipment (i.e. chainsaws, ATV's, trailcat, bobcat) to transport equipment and materials, or to assist in trail construction. (Only on motorized trails, for non-motorized trails personnel must carry or use pack animals to bring in supplies)

- ***Bridge Construction.—***Types of bridges that may be constructed include native stringer, laminate, and prefabricated metal. Laminate and prefabricated metal bridges would be placed on keystone block or pressure-treated wooden abutments. Native stringer bridges may be placed on either treated or pressure-treated wooden abutments. All treated wood used shall be produced and used in compliance with "Best Management Practices for the use of wood in aquatic and other sensitive environments" (Western Wood Preservers Institute, 2006). Although treated wood does contain chemicals that are potentially toxic, studies indicate that there are no measurable impacts on aquatic organisms if the wood is properly treated and installed (Lebow and Tippie, 2001).

  Native stringer bridge construction: These bridges are constructed by hand, with hand tools such as chainsaw, shovel, axe, and hammer. Log stringers for these bridges are generally attained near the bridge site, but will not be from RCAs. Other materials such as abutments and decking may be packed or flown in. Generally, construction steps may include hand placement of abutments on each side of stream, placing log ends side by side on abutments with logs spanning the stream, attaching logs to abutments and attaching decking to top of logs, and construction of ramp or step up to bridge from trail.

Laminate bridge construction: These bridges are also constructed by hand, with hand tools such as chainsaw, shovel, axe, and hammer. Materials such as abutments and decking may be packed or flown in. Generally, construction steps include placement of abutments on each side of stream (usually keystone block or pressure-treated wood), placement of planks on edge between abutments (usually 2 x 10s or 2 x 12s) , additional planks of varying lengths are nailed to initial planks (i.e., side to side) with joints offset until desired width is reached. Decking and edge rail are then attached to the top of the laminated planks.

Prefabricated metal construction: These engineered bridges are generally done under contract. These bridges often require both hand and machinery work using tools such as shovel, chainsaw, and helicopter or crane. Generally, construction steps include placement of abutments on each side of the stream (usually keystone block), and placement of bridge using a crane or helicopter.

Some stream fording may occur with each of these types of construction depending on site conditions. Often with laminate construction there is little or no stream fording, as people and materials will cross on boards laid spanning the stream. One or two native stringers can sometimes be placed without entering the stream, and once in place can be used for crossing during the remaining construction.

REQUIRED MITIGATION:

General

- Ground disturbing activities within LRMP riparian buffer strips will be fully mitigated by applying a "high" level of soil erosion mitigation measures which can include water control devices such as silt fence or straw bales, erosion control matting, seed, mulch, fertilizer and placement of woody debris.
- Both a journey level hydrologist and fisheries biologist must agree to the decision to replacing or relocating more than 500 feet of trail that has the potential to affect stream channels and the new location.
- During bridge construction, mechanized equipment will be restricted to operation on streambanks, and may not enter streams, lakes etc. without approval from a journey level fisheries biologist.
- Seeding will be done with certified weed free native seed mixes.
- Bridge construction or other ground disturbing activities potentially affecting habitat for listed fishes will be completed when effects to listed fishes can be minimized. A journey level fisheries biologist will be consulted to determine appropriate timing.
- Planned trail, recreation and administrative site work will be presented to the level one team annually.
- All treated wood used shall be produced and used in compliance with "Best Management Practices for the use of wood in aquatic and other sensitive environments" (Western Wood Preservers Institute, 2006).

Administrative facilities *(airstrips, Forest Service work stations, and recreation sites)*

- Maintenance and repair or replacement of structures that requires replacement, improvement, or installation of water and/or septic systems would meet applicable State Department of Environmental Quality and District of Health requirements. Only existing facilities and water developments are covered by this action.

Trail

- Conduct fish habitat (riparian and stream channel condition) surveys of streamside trails. Develop and implement recommendations for Annual Trail Maintenance Management Plans.
- Side casting of soil/sediment from trails directly into stream channels or within a deliverable distance will not occur.
- Rolling dips and/or waterbars will be placed as needed in newly constructed and existing trails, and near bridge crossings as needed to minimize water travel lengths and erosion.

- To dissipate surface runoff, place woody debris (>3in. diam.) perpendicular to the downhill end of rolling dips and/or waterbars.
- Route trails away from crossings to minimize length of trail sections perpendicular to streams that may direct sediment toward streams.
- Place rolling dips/waterbars such that water and material potentially moving down trails is directed off the trail and filtered by intervening vegetation.
- Reinstall culverts in fish-bearing streams in a manner that allows fish passage. As necessary, FishXing or similar software may be used to determine culvert specifications required for fish passage. Stream gravels and cobbles will not be 'borrowed' from any RCA. where it would affect WCIs. Culvert installation or replacement will follow guidelines for culvert replacement found in the federal actions road management and watershed and fish habitat improvements and maintenance.
- Stream fords will be designed to allow passage of all aquatic organisms and lifestages, and not be located in potential fish spawning areas. The Forest identifies stream fords where damage is occurring and evaluates options for mitigating any resource damage that is occurring. Stream fords are prioritized according to type and volume of use, with horse trails and motorized trails receiving the highest priority for mitigation. Potential mitigations include installation of a bridge or culvert, armoring of potential erosion sites, placement of stepping stones and logs, or re-routing of the trail to a less sensitive location. Mitigation method is determined by the natural materials available on-site and the amount and type of use. If a section of trail has numerous resource problems then the section is re-routed and the old tread is rehabilitated

Bridge Construction

- Bridge design and construction will meet LRMP standards and guidelines.
- Minimize sediment entering streams by: using silt-fence, or straw bales between abutments and stream, by avoiding abutment construction, or by using keystone blocks or native rock type material that avoid generating erosion/sedimentation. Minimize stream fording as much as is practical.
- Install bridge abutments well outside of active stream channel. Fisheries biologist or hydrologist will determine the extent of active stream channel.
- If native stringers must be taken from RCAs, they will be removed by hand from separate locations. Generally 3 to 5 trees are needed for native stringer bridges.
- Where practical, construct short approach inclines on ends of bridges to prevent water movement from trail onto bridge.

Motorized Equipment

- Mechanized equipment (i.e., bobcat, trailcat, etc.) may ford streams with the approval of a fisheries biologist. Mechanized equipment, must be free of any petroleum or hydraulic leaks and must be serviced outside the LRMP (or LRMP) buffers.
- Fuel for motorized equipment will be transported in US DOT approved containers.
- Refueling of motorized equipment will occur as far from streams as is practicable, and on ground where a fuel spill would be easily contained. Spill containment equipment will be available.

I. FEDERAL ACTION: TRAVEL PLAN

PURPOSE AND NEED: To permit travel on the Forest until December 31, 2017 by issuing a travel plan and to achieve regulation of human access on the Forest to protect resources and provide for appropriate public travel..

LOCATION: The Payette National Forest portion of the South Fork Salmon River Section 7 watershed

DATES OF PREVIOUS CONCURRENCE:

- USFWS: October 15, 2001
- NMFS: August 8, 2001

DESCRIPTION: Summer motorized travel would be limited to designated roads, trails, and parking areas. This is a change from activities that were permitted during the 2001 consultation because of road and trail motorized use was permitted on some areas of the Forest. Refer to Table 7. Travel on foot and riding livestock is permitted Forest-wide. Motorized use on trails is limited to those so designated by the Forest (Figure 3) and for 100 feet off the travel-way in order to facilitate camping. Motorized use on roads is also limited to roads so designated (Figure 4) and for 300 feet off the roadway to facilitate camping. The action described in 2001 would be modified by a decision based on an analysis being conducted (CD2: \Support Documents\Travel Plan [in Travel Plan.zip]). The change from the baseline in this action is approximated in this BA by Alternative E (CD2: \Support Documents\Travel Plan [in Travel Plan.zip]). Under this federal action degradation of some watersheds would occur in the long term because of anticipated increases in motorized use on roads and trails over time. Alternatives that lessen the rate of long term degradation are beneficial compared to no change, and are therefore considered to be consistent with Forest Plan standards and guidelines. The federal action is consistent with the Forest Plan because proposed activities (such as closure of areas to cross-country motor vehicle use) would reduce the anticipated rate of degradation compared to doing nothing. The federal action makes no changes to travel by horse or foot, but off-road or off-trail use of motorized vehicles is changed (Table 7).

Table 7.—Changes in motorized use by watershed under Alternative E of the proposed new Travel Plan compared to baseline conditions.

Pathways & Indicators	Approximate change from baseline conditions in acres open to motorized use (for substrate embeddedness) or miles of roads and trails (for stream bank condition)
South Fork Salmon River-Goat Creek, Blackmare Creek, South Fork Salmon River-Fourmile Creek, South Fork Salmon River-Camp Creek, & Buckhorn Creek	
Substrate Embeddedness	Open acres decrease by 727
Stream bank Condition	Decrease by 15 mi.
East Fork South Fork Salmon River-Loosum Creek, Lower East Fork South Fork Salmon River	
Substrate Embeddedness	Open acres decrease by 340
Stream bank Condition	Decrease by 15 mi.
Upper Secesh River, Secesh River-Summit Creek, Secesh River-Victor Creek, Secesh River-Zena Cr.	
Substrate Embeddedness	Open acres decrease by 20022
Stream bank Condition	Increase by 3.7 mi. in areas open to cross-country motor vehicle use. Opportunities increase and PDF are applied.
South Fork Salmon River-Rock Creek, Sheep Creek, Bear Creek, Pony Creek, South Fork Salmon-Grouse Creek, Lower South Fork Salmon River	
Substrate Embeddedness	Open acres decrease by 21949. Affected by upstream improvements.
Stream bank Condition	No change

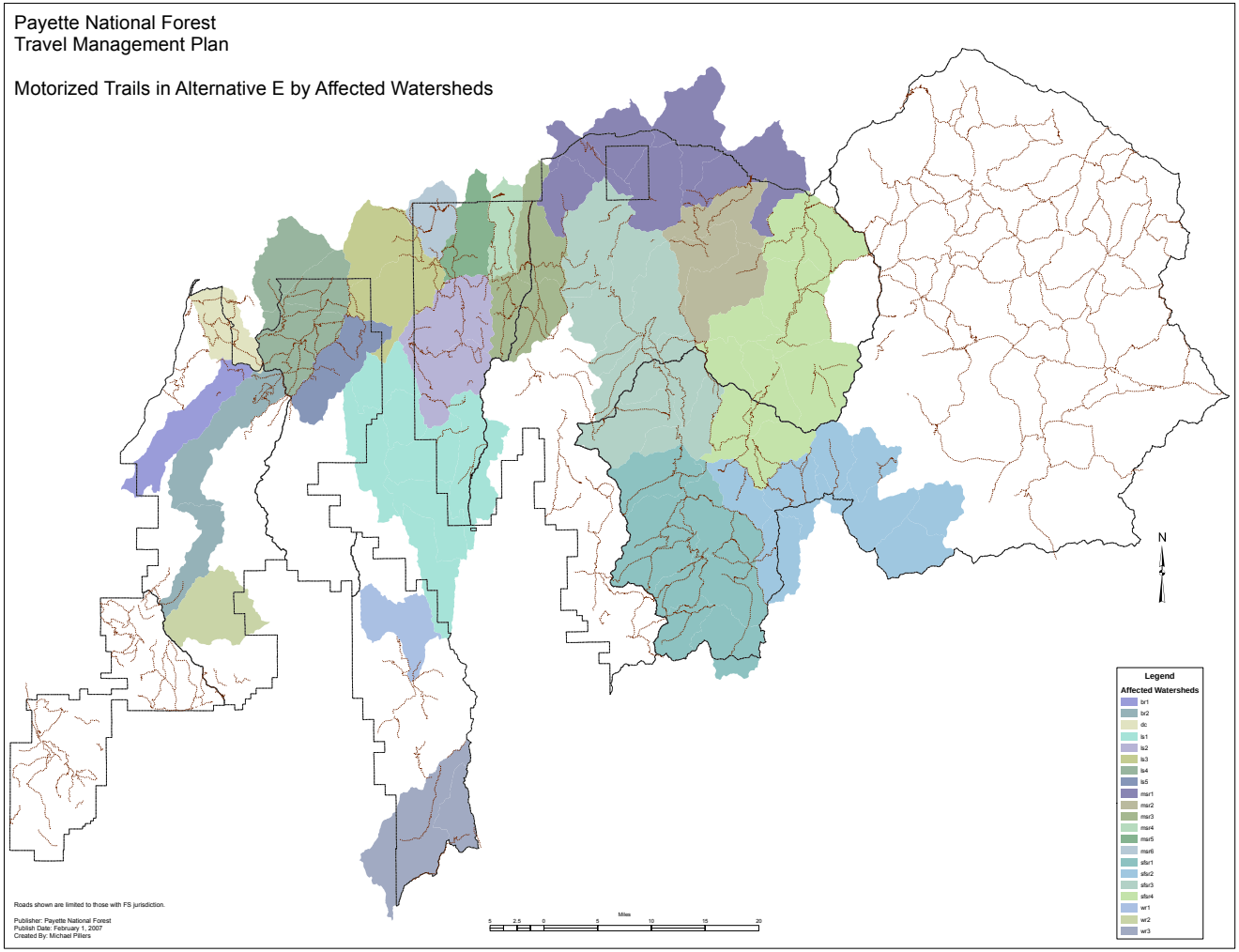

Figure 3.—Trails under Payette National Forest jurisdiction with motorized use.

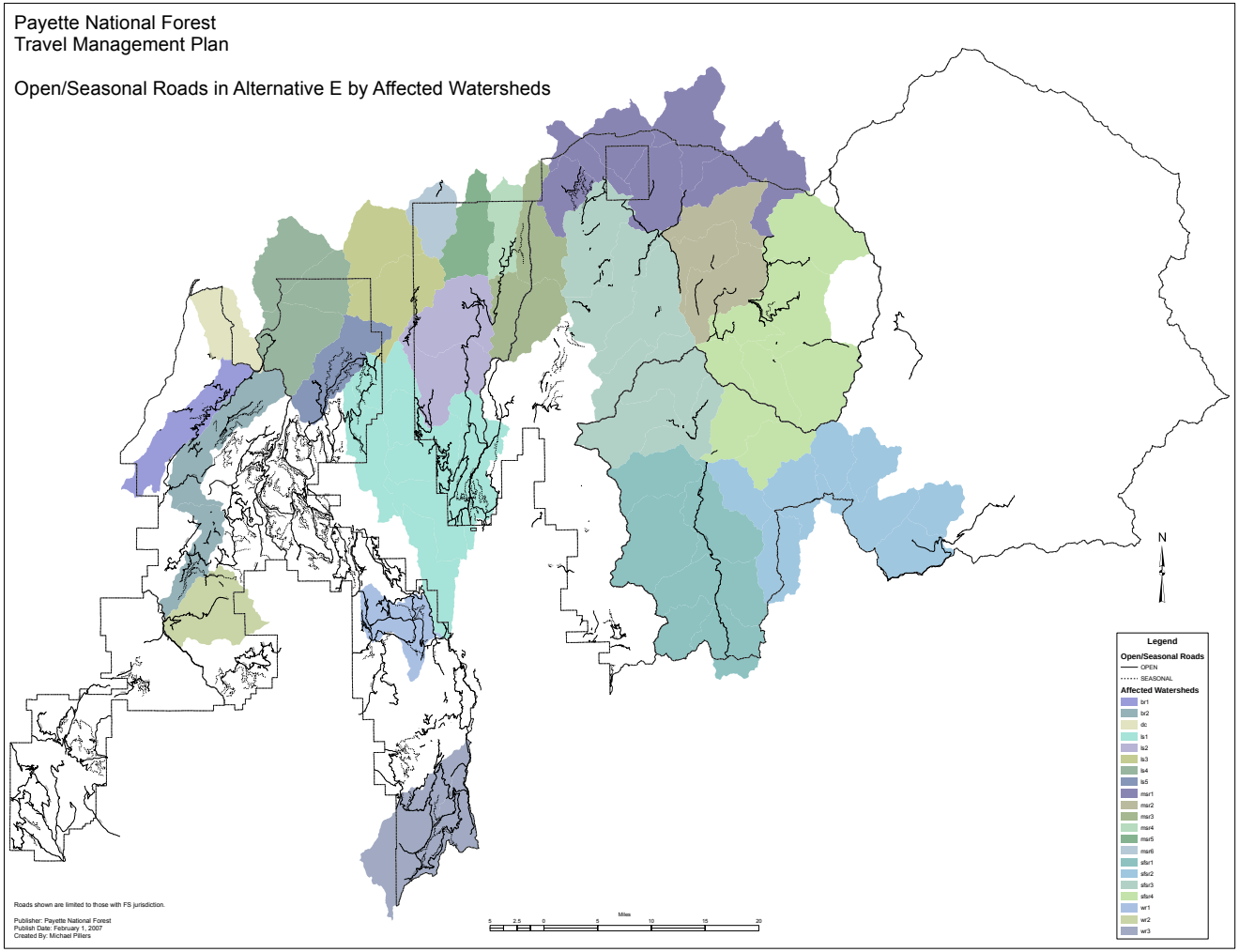

Figure 4.—Roads under Payette National Forest jurisdiction with motorized use.

REQUIRED MITIGATION:

The interdependent actions of "Road Management" and "Trails, Recreation, and Administrative Site Operation and Maintenance" reduce adverse effects of authorizing travel on roads and trails on the Forest; also, see the description of those actions and their effects. The Travel Plan action has specific mitigation measures, and Project Design Features (PDFs) include Best Management Practices (BMPs, Appendix C of Travel Plan on CD2: \Support Documents\Travel Plan [in Travel Plan.zip]), standard operating procedures (SOPs), identified design features, and Forest Plan Management Requirements (Table 2-27 of Travel Plan on CD2: \Support Documents\Travel Plan [in Travel Plan.zip]) that must be included to protect listed species. This action has the following features in the SFSR watershed incorporated in the action as project design features.

Project Design Features

Project design features (PDFs) include Best Management Practices (BMPs) (see Appendix C) standards operating procedures (SOPs), identified design features (below), and Forest Plan Management Requirements (Table 2-27) that must be included to protect Forest resources. PDFs are part of all action alternatives.

- The Payette National Forest would continue to support programs and publications that provide information, education, and training on travel access.
- The Payette National Forest would follow National direction for signing and maps. The Forest Service plans to develop a standard national format for motor vehicle use maps. These maps will be available at local Forest Service offices and, as soon as practicable, on Forest Service web sites. The Forest Service plans to issue additional travel management guidance in its sign standards handbook to ensure consistent messages and use of standard interagency symbols.
- Any roads being converted to trails and new motorized trails would be subject to the following features. (Note: new routes are those on which no designated use has occurred in the past. Reconstructed roads and trails are defined as roads or trails that would be designated on previously unauthorized or closed system roads that would now be open to public travel.)

    - □ Before a new or previously unauthorized road or trail is constructed, reconstructed, or open for use, a cultural resources survey and evaluation would be completed and concurrence received from the Idaho State Historic Preservation Office so that no impacts would occur to cultural resource sites. Although most routes have been inventoried and cleared for use, a Programmatic Agreement or Memorandum of Agreement may be used to ensure all cultural resource requirements are met.
    - □ Before a new or previously unauthorized road or trail is constructed, reconstructed, or open for use, a rare plants survey and evaluation would be completed and necessary protection measures enacted so that no unacceptable impacts would occur to rare plants, or impacts would be mitigated.
    - □ Before a new or reconstructed route is made available for use a Hydrologist or Soil Scientist would complete an ATV Trail Condition Assessment to identify problems and to establish a baseline for future monitoring. The assessment would include a standardized classification system, a GPS location, and documentation in a GIS database.
    - □ New trails or roads would be designed to meet the minimal trail or road standard as defined by the USDA Forest Service Standard Specifications for Construction of Trails, EM-7720-102; or the FSH 7700 Roads USDA Forest Service Handbook for roads.
    - □ Reroute trails where water management structures cannot function or be properly maintained, or where trails cross soils and sites poorly suited for motorized use. Reclaim abandoned trail alignment by physical closure, installation of water management structures, de-compacting the abandoned travelway, and pulling of available slash onto the abandoned trail.
    - □ Construct and maintain water management features (such as waterbars, grade dips, rolling dips, culverts, sheet drains, check dams, ditches or bridges) as determined by a Forest Service hydrologist and /or fisheries biologist. Aquatic organism passage requirements

would be developed based on a new interdisciplinary approach to create stream simulation (CD2: \Support Documents\Roads\stream_crossing_design [in Roads.zip]).

- When rerouting of poorly located trail is not feasible, improve the trail surfaces so they will support use without unacceptable resource impacts. Improvement techniques include replacing or capping unsuitable soils including fills with geotextiles, gravel, corduroy, wood matrix, puncheon, porous pavement panels, or matting.
- Include measures to prevent the spread of noxious weeds such as: uses of weed-free gravel or soil, use of weed-free hay or straw, and prompt re-vegetation of areas of disturbed soil.
- Avoid removing snags and potential snags when constructing or reconstructing roads and trails whenever practical. Hazard trees that are a threat to public safety may be removed.

In addition to the project design features, BMPs are included in the action. Those BMPs (Table 8) are included in order to minimize adverse effects to listed fish species where they occur.

Table 8.—Watershed related BMPS are included in the action in order to minimize adverse effects to listed fish species where they occur. This table is a summary from the measures defined in the Environmental Impact Statement.

BMP Description	Purpose or Objective	Effectiveness and IFPA Compliance
SWCP 11.05 - Wetlands analysis and evaluation.	Maintain wetland functions and avoid adverse soil and water resource impacts associated with the destruction or alteration of wetlands, bogs, and wet meadows.	HIGH. IFPA Rule 030: 08c
SWCP 11.07, 11.11 - Oil spill contingency plan. Petroleum storage, delivery facilities, and management.	Prevent contamination of soil and water resources resulting from leaking delivery systems and storage facilities.	HIGH. IFPA Rules 060: 02a, b, c
SWCP 11.09 - Management by closure to use.	Exclude activities that could result in damages to facilities or degradation of soil and water resources.	HIGH. IFPA Rule 040: cii, di, dii, eiii, eiv
SWCP 11.14 - Management of snow survey sites.	Protect snow courses and related data sites from effects by land management activities.	HIGH. No related IFPA rules.
SWCP 13.04 - Revegetation of surface-disturbed areas.	Protect soil productivity and water quality by minimizing soil erosion.	MODERATE. IFPA Rule 030: 04c, 05a, 05b
SWCP 14.05, 15.05 - Protection of unstable areas. Slope stabilization and prevention of mass failures.	Identify and protect unstable areas so as to avoid triggering mass movements and resultant erosion and sedimentation.	HIGH. IFPA Rule 3.d.ii
SWCP 14.17, 15.3, 15.19 - Stream channel protection. Controlling in-channel excavation. Stream bank protection.	Protect natural stream flows and streamside vegetation by maintaining unobstructed passage of stream flows and by reducing sediments and other stream pollutants from entering.	HIGH. IFPA Rule 030: 05a, 040: 04a thru d
SWCP 15.02 - General guidelines for the location and design of roads and trails.	Locate and design roads and trails with minimal soil and water resource impacts while considering all design criteria.	MODERATE. IFPA Rule 030: 03b, c; 04a 040: 02a thru h
SWCP 15.03 - Road and trail erosion control plan.	Prevent, limit, and mitigate erosion and sedimentation through timely implementation of erosion control practices prior to and during ground-disturbing activities.	MODERATE. IFPA Rule 040: 03c, f, hi.
SWCP 15.06 - Mitigation of surface erosion and stabilization of slopes.	Minimize soil erosion and sedimentation from road cut slopes, fill slopes, and travelways during and after construction.	MODERATE. IFPA Rule 040: 03a thru j.
SWCP 15.07 - Control of permanent road drainage.	Minimize the erosive effects of concentrated water and the degradation of water quality through proper design and construction of road drainage systems and control structures.	MODERATE. IFPA Rule 040: 03 and 04.
SWCP 15.08 - Pioneer road construction.	Minimize sediment production and mass wasting associated with pioneer road construction.	MODERATE. IFPA Rule 040: 02
SWCP 15.09 - Timely erosion control measures for incomplete roads and stream crossings.	To minimize accelerated erosion and sedimentation from disturbed ground created by ongoing incomplete projects.	MODERATE. IFPA Rule 040: 03a, b, f, l
SWCP 15.10, 15.18 - Control of road construction excavation and sidecast. Disposal of right-of-way and roadside debris.	Reduce sedimentation from unconsolidated excavated and sidecast material and construction slash caused by road construction, reconstruction, or maintenance.	HIGH. IFPA Rule 040: 04a
SWCP 15.11 - Servicing and refueling of equipment.	Prevent contamination of water from accidental spills of fuels, lubricants, bitumens, raw sewage, wash water, and other harmful materials.	HIGH. IFPA Rule 060: 02a, b, c
SWCP 15.14 - Diversion of flows around	Minimize downstream sedimentation by ensuring that all	HIGH. IFPA Rule 040:

BMP Description	Purpose or Objective	Effectiveness and IFPA Compliance
construction sites.	stream diversions are carefully planned.	03e
SWCP 15.16 - Bridge and culvert installation (disposition of surplus material).	Minimize sedimentation and turbidity resulting from excavation for in-channel structures.	HIGH. IFPA Rule 040: 03b, d, e
SWCP 15.17 - Regulation of borrow pits, gravel sources, and quarries.	Minimize sediment production from borrow pits, gravel sources, and quarries, and limit channel disturbances in those gravel sources suitable for development in floodplains.	HIGH. IFPA Rule 040: 03g
SWCP 15.21 - Maintenance of roads.	Conduct regular preventive maintenance operations to avoid deterioration of the road surface and minimize disturbance to water quality and fish habitat.	MODERATE. IFPA Rules 040: 04a, b.
SWCP 15.23 - Traffic control during wet periods.	Reduce the potential for road surface disturbance during wet weather and reduce sedimentation probability.	MODERATE. IFPA Rule 040: 03.i
SWCP 15.24 - Snow removal controls.	Minimize impacts of snowmelt on road surfaces and embankments and reduce the probability of sediment production resulting from snow removal operations.	MODERATE. IFPA Rule 040: 05a, b
SWCP 15.27 - Trail maintenance and rehabilitation.	Minimize soil erosion and water quality problems resulting from trail erosion.	HIGH. No related rules

Division of Environmental Quality (DEQ)

Idaho Department of Health and Welfare DEQ is responsible for the overall coordination and implementation of the state's nonpoint source programs. Implementation of the Nonpoint Source Management Program is accomplished through interagency coordination with local, state, and federal natural resource agencies. The nonpoint source programs are implemented with assistance from public advisory committees, which provide continuous feedback on the direction and acceptability of the nonpoint source control strategy.

The nonpoint source control strategy is based on the feedback loop concept. BMPs are the backbone of this control program. A process for site-specific application of BMPs is developed under each nonpoint source program, and monitoring is used to evaluate the effectiveness of the BMPs. Changes to BMPs are recommended when they do not support the beneficial uses; monitoring continues to ensure that the revised practices are adequate (The 1992 Idaho Water Quality Status Report, Idaho Department of Health and Welfare, DEQ, December 1992). The nonpoint source program places emphasis on the following actions:

- Building on the strength of existing nonpoint programs, such as agriculture and forestry;
- Focusing evaluation and monitoring techniques on beneficial use assessments and BMP effectiveness;
- Creating public awareness and support through information, education, and citizen participation;
- Institutionalizing the feedback loop components in state and federal agency programs using the Clean Water Act requirements; and
- Integrating the nonpoint source control program with implementation of the Antidegradation Policy.

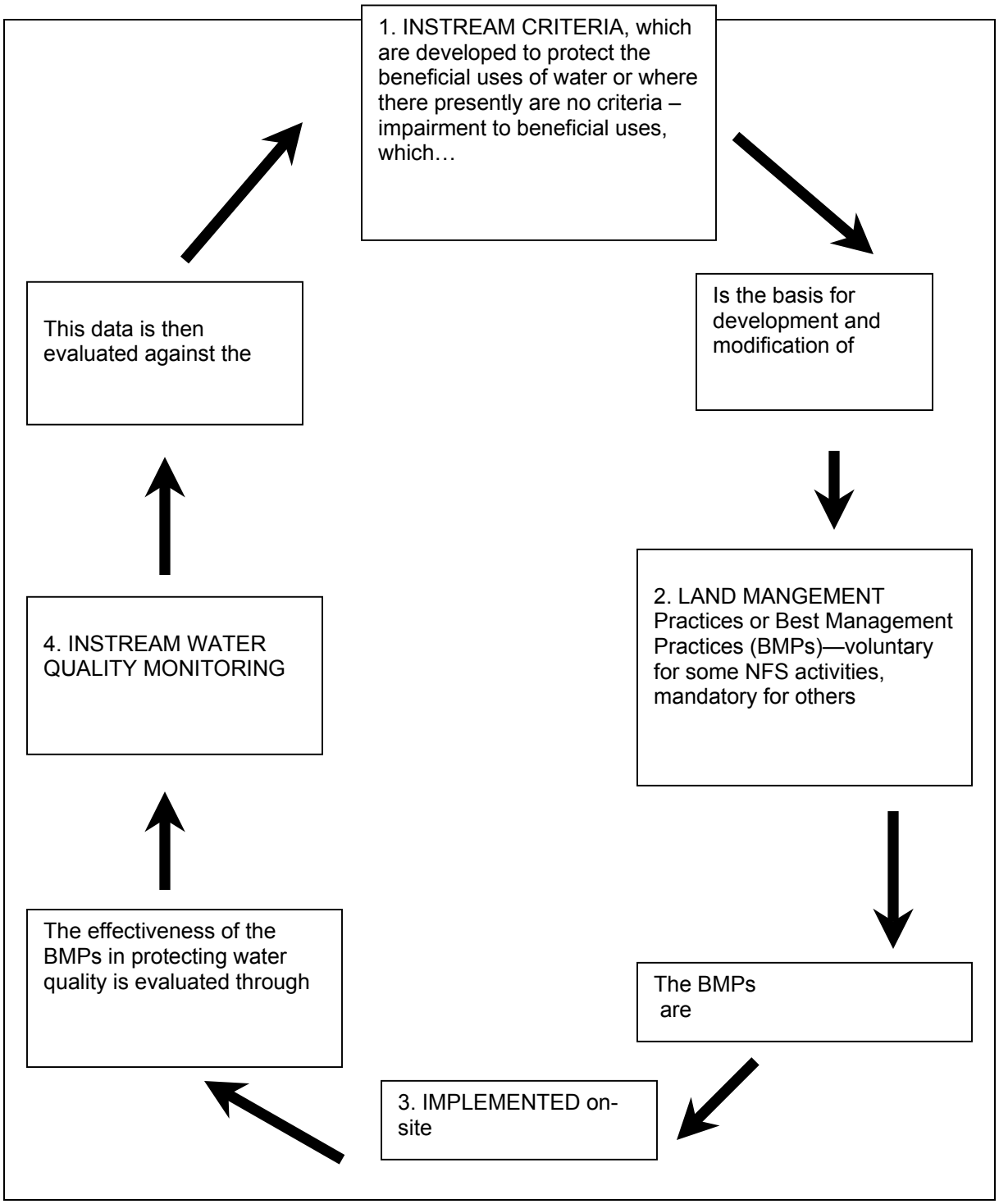

Figure 5.—Feedback loop for BMPs associated with the Travel Plan.

In addition to project design features and BMPs the following measures from the 2001 consultation are not altered with the action proposed, because they were beyond the scope of the analysis. Therefore, they continue to be a part of the travel plan action.

Recreational Floating in the South Fork Salmon River

Close spawning areas to floating during Chinook salmon and steelhead spawning times. The LRMP BA for steelhead (Burns et al. 1997) identifies mitigation related to Recreation Management that applies to the travel plan. Specifically*: where steelhead spawning has been documented and where disturbance of spawning fish is likely to occur, close streams or affected reaches to commercial and noncommercial recreational boating and floating in any craft from April to June each year* (Page 18 of Burns et al. 1997). This mitigation item has Regional Forester approval (ltr. to NMFS from R-1, R-4, R-6, and BLM dated September 16, 1997). All mitigative measures specified in the LRMP BA regarding recreational boating and floating shall apply to the SFSR (Burns et al 1997, Recommendations 3 and 6). This mitigation item is necessary in order to reduce effects.

One alternative in the Supplemental DEIS for management of the FC-RONRW (USFS 1999f) addresses floating in the SFSR: "No use restrictions would apply on the South Fork of the Salmon River within the Wilderness boundary."…. "However, the South Fork, up river from it's confluence with the East Fork and outside the Wilderness boundary, would be closed to boating prior to June 1. Other closures may be applied to other tributaries based on consultation with NMFS."

A closure order was signed April 17th, 2001 and signs have been made that notify recreational floaters of closed areas. The closed areas include designated portions of Lake Creek, the Secesh River, and the main SFSR, where potential conflicts were identified. The closure is effective for the periods of April 1 through May 31, and August 1 through September 30 of each year. Signs have been placed in appropriate locations and enforcement of the closure order will begin in August, 2001.

J. FEDERAL ACTION: WATER DIVERSION SPECIAL USE PERMITS (SUPS)

PURPOSE AND NEED: Ongoing administration of existing permits allows permittees to operate, maintain, and repair existing water diversions for domestic, irrigation, and hydroelectric purposes. This consultation covers the actions listed in Table 9 until December 31, 2017. If a permit has expired or if permits expire before December 31, 2017, this consultation covers reissuance of the permits until December 31, 2017.

LOCATIONS: SFSR Section 7 watershed

DATES OF PREVIOUS CONCURRENCE:

- USFWS: October 15, 2001
- NMFS: August 8, 2001

Exceptions to these concurrence dates are for Mackey Bar, which was withdrawn from consultation in 2001, and for Badley, Holly, and Smith permits, which have no consultation record.

DESCRIPTIONS

Table 9.—Water diversion special use action information for the SFSR.

Permit Holder/status	Analysis Area	Stream	Location	Purpose	Amount
Mackay Bar (temporary permit pending FERC exemption and Ditch Bill determination)	Lower SFSR	Smith Creek	T22N R7E Sec 13	Hydro and irrigation	2.0 cfs
Sandy Cove	Lower SFSR	Pony Creek	T21N, R7E, Section 2	Domestic, irrigation	0.10 cfs
Peterson	East Fork SFSR	Unnamed spring	T19N R7E Sec 26	domestic, irrigation	0.94 cfs
Eiguren (temporary permit pending Ditch Bill determination)	East Fork SFSR	Parks Creek	T19N, R7E, Sec 25	Domestic, irrigation	1.6 cfs
Wyatt	Secesh	Unnamed spring	T22N R5E Sec 14	domestic	0.12 cfs
Phillips-Larrea	Secesh	Unnamed spring	T22N R5E Sec 14	domestic	0.02 cfs
LaPaglia	Secesh	Unnamed spring	T22N R5E Sec 14	domestic	0.04 cfs
Spradling	Secesh	Unnamed spring	T22N R5E Sec 14	domestic	0.04 cfs
Hardy	Secesh	Unnamed spring	T22N R5E Sec 15	domestic	0.04 cfs
Smith	Secesh	Unnamed spring	T22N R5E Sec 10	domestic	0.04 cfs
Holly	Secesh	Unnamed spring	T22N R4E Sec 1	domestic	0.02 cfs
Titus	Secesh	Unnamed spring	T22N R5E Sec 15	domestic	0.04 cfs
Badley (Ditch Bill easement)	Lower SFSR	Carlson Creek	T23N R8E Sec 7	irrigation and culinary	0.42 cfs

Maps showing locations and SUP information are included with previous BAs (Faurot and Burns 1998 a and b, Faurot and Burns 1999, Wagoner and Burns (2001), and on CD2: \Support Documents\SUPs\eiguren_ditch_SUP.pdf, Mackey Bar Hydro.pdf, sandy_cove_diversion.pdf, LaPaglia_SUP.pdf, Peterson water.pdf, Phillips-Larrea_SUP.PDF, Titus water.pdf, Spradling Water.pdf, Hardy Water.pdf, Smith_water.pdf, Badley.pdf, and Holly.pdf [in SUPs.zip]). Recent inspections, conducted by Special Uses Personnel from the Payette NF, are on file at the PNF Supervisors Office, McCall, ID (CD2: \Support D[illegible]nents\SUPs\SFSR_Inspections.pdf [in SUPs.zip]).

The federal action for the Mackay Bar facility

This is an extension of the temporary permit for which formal consultation began, and was withdrawn in 2001(see Wagoner and Burns 2001). The permittee is pursuing a new License of Exemption from the Federal Energy Regulatory Commission and a Ditch Bill Easement. The POD is the same POD as the irrigation POD. There is also a spring domestic water diversion adjacent to Smith Creek. At the hydropower diversion, a wooden plank dams Smith Creek and a screened intake diverts water into a 10" pipe, which drops it downslope to the hydroplant. November through March, this water is returned to Smith Creek approximately 600 feet downstream of the POD. During the irrigation season April-October, the 2 cfs is withdrawn and used for irrigation. Below the hydroplant, the pipe bifurcates, and carries part of the flow across Smith Creek into "South Ditch", which irrigates south pastures. The rest of the flow is carried by the "North Ditch" to irrigate northern pastures.

The Peterson spring development

This is an existing facility with a water right for 0.94 cfs. Water is diverted from an unnamed tributary of the East Fork. This tributary is not expected to support fish because of its small size. The listed species are all found in the East Fork, in this vicinity. Recent inspection reports (2001 and 2005) are on file for this diversion, noting no erosion.

The eight developments in the Secesh subwatershed (Wyatt, Phillips-Larrea, LaPaglia, Spradling, Hardy, Titus, Smith, Holly)

These consist of collection boxes and transmission lines on springs near the upper Secesh River. The scope of actions would not extend beyond those previously covered. The water collected is for domestic purposes, and totals 0.36 cfs. The outflows from the springs are not expected to support fish because of their small size. The developments are all about ¼ mile from the Secesh River. Inspections from 2001 report no erosion.

The Eiguren irrigation structure and transmission facility (ditch)

This diverts Parks Creek, a perennial tributary of the EFSFSR. Consultation covers temporary permit issuance through LRMP revision (permittee has applied for a Ditch Bill permit). The expired SUP has a consultation record (Faurot and Burns 1999). The SUP covers an irrigation ditch to convey water from Parks Creek to private land for agricultural irrigation and livestock watering and for access easement over an existing road to maintain and operate the ditch and diversion from Parks Creek. The action would include work on the access road should it be recommended by resource personnel after periodic inspection. This road work would be consistent with the Programmatic Action on road management. Projected use (for which the proponent has a water right) is for 1.61 cfs from April to November 1. The estimated low summer flow of Parks Creek is 2.1 cfs (measured in 1977- R. Zuniga, retired Payette NF hydrologist, McCall, ID, personal communication). The diversion headgate is 4' x 6'. The length of the ditch is approximately 6000 feet, the width of the ditch at the top is approximately 4 feet, the depth is 1 foot, the width of the ditch including cutbank and embankment is approximately 7 feet, the length of the road is approximately 6500+ feet, the width of the road surface is 10+ feet, and the width of cut and fill banks and road surface is approximately 16 feet. The use has been continuous by the permittee and predecessors since 1919. No future expansion from the original permit is included with the Federal Action. A 2001 inspection reports a screened diversion, and: "…there is high risk of failure, pipe is anchored to boulders in unstable, low cutbank and headgate is vulnerable to debris and rock flow …". Based on observations of Dale Olson and David Burns during 2005 effective screens were in place to prevent fish entrainment in the diversion.

The Sandy Cove Water, Inc. domestic and irrigation water system

This is located near the bottom of the Pony Creek watershed. The system consists of a screened cylinder 6" by 6' long submerged into Pony Creek, and anchored in place with native rock at the POD, and 640 feet of 3" plastic PVC, 125 psi pipe within the high water mark of Pony Creek. The 640 feet of pipe is placed above ground, and removed every fall for winter storage on private property.

The Badley Ranch.— withdraws 0.42 cfs from Carlson Creek, a small tributary to the lower SFSR. The POD is below a waterfall where two 12' PVC pipes are buried in a pool created by damming Carlson Creek with large rocks. The diverted water runs in an open ditch and a series of buried pipes. The use of this system qualified for a Ditch Bill easement in 2006. The easement will be issued by the USFS Regional Office in 2007.

REQUIRED MITIGATION:

- Diversions will be screened with a mesh size of 3/32" to avoid entrainment of fish and eggs. A flat plate fish screen (3/32") and bypass channel were installed on the East Fork Weiser River Ditch to prevent entrainment of fish into the East Fork Ditch, and allow for upstream passage around the head gate sill (Hogen and Burns 2003). Based on observations and data collected in 2005, the screen and bypass channel appear to be operating as designed (Caleb Zurstadt, Council District Fisheries Biologist, personal observation, and Greenway 2005a, b).
- Any ground disturbance due to maintenance of diversion equipment will be mitigated with a high level of erosion control to prevent erosion and subsequent sediment deposition into streams. All maintenance is assumed to be hand maintenance.
- Any leakage due to malfunctioning diversion equipment will be repaired a soon as possible to prevent streambank washout or erosion and avoid sediment deposition in streams.

- Stream channel conditions at diversions will be monitored every 3 years by special use administrators and fisheries biologist and/or hydrologists to determine if changes to the diversion activities are necessary based on conditions found at the site.

K. FEDERAL ACTION: COPENHAVER CABLE CAR SUP

PURPOSE AND NEED: Ogoing administration of existing permit allows permittee to operate, maintain, and repair existing cable car over the SFSR for transportation of people and materials across the river. If the permit has expired or if permits expire before December 31, 2017, this consultation covers reissuance of the permits until Decemer 31, 2017.

LOCATIONS: The cable car, is in the Lower SFSR analysis area in T22N R7E Sec 13. .

DATES OF PREVIOUS CONCURRENCE:

- USFWS: none
- NMFS: none

DESCRIPTION:

The permit is for year-round use. Maps showing locations and SUP information are on CD2: \Support Documents\SUPs\copenhaver.pdf (in file SUPs.zip). Recent inspections, conducted by Special Uses Personnel from the Payette NF, are on file at the PNF Supervisors Office, McCall, ID.

The **Copenhaver** cable car SUP covers using and maintaining an existing cable car across the SFSR. There is no previous concurrence for this SUP. A small parking area is also authorized adjacent to the cable car support on the east side of the river. Supports are located in the immediate RCA of the SFSR. Maintenance would include repair of structural elements of the support system. Ground disturbance of the RCA is not anticipated. Fording of the SFSR is not authorized with this action.

L. FEDERAL ACTION: OUTFITTERS AND GUIDES

PURPOSE AND NEED: The permitting of commercial outfitter/guides to operate on National Forest System Land.

This consultation covers the permits through December 31, 2017, even though the life of the permit may extend beyond that. If a permit has expired or if permits expire before December 31, 2017, this consultation covers reissuance of the permits until December 31, 2017, as long as the effects are within the scope of this BA.

LOCATIONS: Outfitter/guide operations encompass some territory in all the SFSR analysis areas, but those with assigned camps are primarily in the Lower SFSR analysis area. Maps of assigned camps are on file at the PNF SO, and at CD2: \Support Documents\SUPs\outfitter_permit_boundaries2006.pdf (in file SUPs.zip).

DATES OF PREVIOUS CONCURRENCE:

- USFWS: October 15, 2001
- NMFS: August 8, 2001

DESCRIPTIONS:

These actions were previously described in Wagoner and Burns (2001). The actions have not changed in scope, except for name changes as permits are sold, renamed, and re-arranged. Outfitter and Guide permittees working in the SFSR are authorized approximately 1320 service days, 90 AUMs, and 7 assigned camps in this analysis area. Some camps may lie within RCAs.

An assigned camp typically consists of a combination of the following: stock corrals, hitchrails, stock watering and human access to stream (usually separate accesses), water collection facilities, small impoundment of springs, tents and tent platforms, fire rings, cooking areas, latrines, gray water disposal areas, access trails that may ford streams, and firewood storage areas. Outfitters and clients can occupy in these camps for several days or weeks in a season (no set limit). The size of the camps and number of people each camp can support is variable. Transfer camps may consist of similar components as assigned camps, but outfitters and clients only occupy these overnight on their way to assigned camps.

Recent inspections of assigned O&G camps are on file at the PNF SO. Problems that are documented on inspection reports are typically identified to the permit holder in performance evaluations. These evaluations can occur immediately if the permit is in operation, or during the off-season if the problem is identified after the camp has been vacated for the season. Problems are required to be remedied before operation can resume or before operation can be initiated the next season (Clem Pope, Recreation Manager, Payette NF, personal communication). Every effort is made by FS permit administrators to assure compliance with permit conditions. Examples of noncompliance notifications for unauthorized bridge construction, grazing, and hot tub construction are on file with the outfitter inspection reports at the PNF SO. Noncompliance items were rectified by the outfitters before the next operating season (Quinn Carver, Krassel District Ranger, Payette NF, personal communication).

Elk Springs Outfitters (formerly Idaho Outdoor Wilderness Adventures and a portion of Heaven's Gate Outfitter)

- CD2: \Support Documents\SUPs\ Idaho_outdoor_wilderness.pdf, Heavens Gate Outfitter.pdf (in file SUPs.zip)

Has a camp at Mosquito Springs in the lower SFSR analysis area. Fall hunting trips make up the majority of their business, but they are also permitted for summer pack trips. Recent 2005 assigned camp inspections on file at PNF SO report for Mosquito Springs disclosed the following: some erosion due to stock loose in camp, no cutting of trees within 300 feet of the stream (upper headwaters of Porphyry Creek, 6” wide in early October), a distance of 150-200 feet between hitchrails and corrals and flowing water, an outhouse 150’ from water that should be moved further from the stream, and no observation of fish presence.

Elk Creek Outfitters (formerly a portion of Heavens Gate Outfitter

- CD2: \Support Documents\SUPs\ Heavens Gate Outfitter.pdf (in file SUPs.zip)

Permitted for fall hunting trips and summer pack trips in the Rattlesnake Peak area of the SFSR drainage, and has camps at Rattlesnake Peak and Pilot Peak in the lower SFSR analysis area. Recent 2005 assigned camp inspection for the Rattlesnake Peak camp reports: no erosion in camp, no recent cutting of live trees, 500 feet between corrals/hitchrails and water, an overused corral, 400 feet between the outhouse and water, a 10”-wide spring water source, no ford, good streambank conditions, and no evidence of fish observed. No recent inspections are available for the Pilot Peak camp, as it has not been used in recent years.

Wapiti Meadows Ranch

- CD2: \Support Documents\SUPs\ wapiti_SUP.pdf (in file SUPs.zip)

Operator guides pack and fishing trips, and uses the Tamarack Creek, and Sugar Mt. areas. The group is authorized 870 service days (Boise and Payette and Salmon-Challis NFs combined), and a maximum of 14 head of pack and saddle stock. There are no assigned camps.

Pineland Outfitters

- CD2: \Support Documents\SUPs\pineland_outfitters.pdf (in file SUPs.zip)

Operate fall hunting trips in Quartz, Tamarack, and Marble Creeks, and has assigned camps at Sugar Mountain and Quartz Creek in the East Fork SFSR analysis area. This use was previously described as part of Wapiti Meadows Ranch Outfitters. Recent 2004 assigned camp inspections for the Quartz Creek camp report: no erosion in camp, no cutting of trees within 300 feet of Quartz Creek (approximately 3' wide in September 1994), 120' feet between hitchrail/corrals and Quartz Creek, 170' between the outhouse and Quartz Creek, no fish observed in creek, but possible meadow spawning area noted, no ford associated with the camp, and no erosion of streambanks. No recent inspection is available for the Sugar Mountain camp, as it has not been used recently.

Wiley Ranch Outfitters

- CD2: \Support Documents\SUPs\ Wiley Ranch Outfitters.pdf (in file SUPs.zip)

They provide outfitter and guide services for fall big game hunting, with no assigned camps. The group is authorized 70 service days, and a maximum of 15 head of pack and saddle stock.

Idaho Angler (formerly High Llama Wilderness Tours)

- CD2: \Support Documents\SUPs\ HighLlama_SUP.pdf (in file SUPs.zip)

Operator uses the western edge of the Krassel Ranger District north of Cougar Lake and south of Loon Creek, and the area around Profile Summit and Monumental Summit in the Frank Church - River of No Return Wilderness. They conduct fishing trips to high mountain lakes, with no assigned camps.

Pacific Crest Outward Bound

- CD2: \Support Documents\SUPs\Pacific Crest Outward Bound.pdf (in file SUPs.zip)

Uses the Secesh and SFSR corridors and conducts 18-21 day backpacking and mountaineering trips, with no assigned camps.

Pony Creek Outfitters (Kummet) (formerly a portion of Heavens Gate Outfitter and Warren Outfitters)

- CD2: \Support Documents\SUPs\warren outfitters.pdf, Heavens Gate Outfitter.pdf (in file SUPs.zip)

Operates in the Pony Creek drainage for fall hunting and summer pack trips. Assigned camps are located in Pony Meadows in the Lower SFSR analysis area, and Whangdoodle Creek in the Secesh analysis area. Inspection surveys show no resource concerns at the Pony Creek camp.

REQUIRED MITIGATION: Required mitigation from Wagoner and Burns (2001) included adopting LRMP standards for Riparian Conservation Areas (RCAs) in the SFSR Section 7 Watershed. The default RCAs are minimum no-activity riparian buffers of 300 feet on both sides of all fish bearing streams and lakes, 150 feet on permanently flowing non-fish bearing streams and lakes and most wetland, and 100 feet buffer zones along intermittent streams. Recent inspections have found minor problems (see above).

Mitigation:

- Annually inspect permitted campsite(s)
- Check camps to see (1) that they are meeting LRMP standards, (2) if they are causing detrimental sediment delivery, or adversely impacting riparian vegetation and (3) if there are potential adverse effects to fish or fish habitat at the site(s),
- Camps may be in RCAs; but should monitoring find a camp may be causing adverse effects to fish or fish habitat, changes will be made in coordination with a fisheries biologist to eliminate the problem or reduce effects to a negligible level
- Determine whether permit conditions are being met
- If there are potential adverse effects, consultation will be reinitiated

- The Forest will annually educate outfitters and guides about ways to avoid adverse effects to listed fishes
- The Forest will report noncompliance with outfitter and guide operating plans to the level one team.

M. FEDERAL ACTION: STIBNITE MINE CLOSURE

PURPOSE AND NEED: Stibnite Mine closure actions are needed to reduce resource impacts and meet rehabilitation needs at the site, and to meet requirements in Biological Opinions for Stibnite Mine operations. There are two Biological Opinions that cover the Plan of Operation for mining actions at Stibnite Mine (NMFS 1995a, 1996b). That Plan of Operation is no longer in effect. The BOs identify components of the ongoing closure action that are the subject of this consultation.

LOCATION: Stibnite Mine is located in the upper portion of the East Fork SFSR analysis area, about 14 miles east of Yellow Pine, Idaho.

DATES OF PREVIOUS CONCURRENCE:

- USFWS: October 15, 2001
- NMFS: August 8, 2001. BO June 29, 1995

DESCRIPTION: The federal action encompasses the continuation of mine closure activities at Stibnite Mine until December 31, 2017. The federal action includes both CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) activities and other activities to be performed by the PNF. Additional construction details (such as contract specifications) will be provided to the Level 1 Team as they become available. Specific activities are described in several documents and mentioned in the following paragraphs. Some of these actions are outstanding items that originated in Biological Opinions issued by NMFS as reasonable and prudent alternatives (RPAs) (NMFS 1995a, 1996b) (CD2: \Support Documents\Minerals\stibnite_RPA_table.doc).

The federal action also includes rehabilitation of the keyway wetland, smelter flats, and Northeast Bradley waste rock dump, which are outstanding CERCLA action items that are described in more detail in CD1: \Support Documents\Minerals\MSE Stibnite Mine EECA Final Report\R1338 Stibnite EECA.doc, and all supporting files within that pathway). This Engineering Evaluation/Cost Analysis (EE/CA) was conducted for a non–time critical Removal Action under CERCLA at the Stibnite mine area. The removal action objectives are to eliminate or reduce human and ecological risks generated by mine waste. For each outstanding CERCLA item (or operational unit) listed above, the EECA performed a Site Characterization and a Streamlined Risk Assessment. The moderate and high human health and ecological risks were listed, then various remedial technology alternatives were identified and screened. From this initial screening, the EECA carried forward alternatives considered to be potentially applicable at each operational unit. These remaining alternatives were analyzed in greater detail based on their effectiveness, ease of implementation, and relative cost. For each operable unit, the EECA then recommended alternatives for further consideration. It evaluated the recommended alternatives for each operational unit by performing a detailed analysis based on the following criteria: Overall Protection of Human Health and the Environment; Long-Term Effectiveness and Permanence; Reduction of Toxicity, Mobility, or Volume Through Treatment; Short-Term Effectiveness; Ease of Implementation; and Cost.

All the items on the following table have either been covered in previous consultation documents, and/or are identified in a BO for Stibnite Mine, or as RPAs (see CD2: \Support Documents\Minerals\Stibnite_RPA_table.doc, CD2: \Support Documents\Minerals\Stibnite_DOW.pdf, CD2: \Support Documents\Minerals\Stibnite_Cleanup_matrix.xls, CD2: \Support Documents\Minerals\Stibnite_cleanup.doc, CD2: \Support Documents\Minerals\Stibnite_BMPs.pdf, CD2: \Support Documents\Minerals\Stibnite_2001_SOW.doc.

Table 10.—Components of the Stibnite Mine closure federal action,

Item	Reference	Status	Scheduled for 2006-2017
Revegetate/ stabilize Blowout Creek failure [2]	RPA[1]	Incomplete. Some revegetation done by the State. Preliminary surveys done.	Completion of NEPA and decision document; project implementation and completion.
Surface water monitoring	RPA[1]	Ongoing	Continuation of monitoring
Sediment Reduction to Glory Hole	RPA[1]	Some sediment reduction has occurred with completed mine reclamation and CERCLA projects	Sediment reduction will continue with each CERCLA project and as part of other activities at a later unplanned date, as funds become available.
Redevelopment of fish passage above Glory Hole and at Box Culvert above Glory Hole (non-federal land)	RPA[1]	Incomplete, however this is occurring naturally.	To be performed at a later unplanned date as funds become available.
Stabilize and revegetate 2600 feet along EFSFSR between Glory Hole and Sugar Creek	RPA[1]	Incomplete – private property	To be performed at a later unplanned date as funds become available.
Stabilize banks by reshaping, revegetate newly shaped banks by three levels of riparian planting from Glory Hole to Box Culvert	RPA[1]	Incomplete	More work through CERCLA action to be performed at a later unplanned date as funds become available..
Road reclamation and adjacent borrow site monitoring	Jim Egnew, PNF geologist, personal communication	Ongoing	Reclaimed roads and borrow sites along existing roads w ill be monitored to determine any reclamation needs and/or erosion problems, problems will be addressed as they arise
Garnet Creek	Jim Egnew, PNF geologist, personal communication	Ongoing	Failing slopes will be assessed to develop a rehabilitation action
Keyway wetland -eliminate seeps and springs that are high in metals, enhance wetlands below Keyway to act as a bioreactor	EECA	Incomplete	Work began in 2006 CD2: \Support Documents\Minerals\MSE Stibnite Mine EECA Final Reports)
Smelter Flats remediation	EECA	Incomplete	Work began in 2006 CD2: \Support Documents\Minerals\MSE Stibnite Mine EECA Final Reports)
Decrease bank slopes on the Bradley Dumps and revegetate	EECA	Incomplete	Work began in 2006 CD2: \Support Documents\Minerals\MSE Stibnite Mine EECA Final Reports)

[1] This table can be found at CD2: \Support Documents\Minerals\Stibnite_RPA
[2] When a draft EA has been completed and additional details are available on the Blowout Creek stabilization project, this BA will be amended to request consultation on the selected alternative.

REQUIRED MITIGATION

LRMP RCAs would be protected from removal of trees and ground disturbance except as necessary to rehabilitate impacted areas. Identified spawning areas and redds will be avoided.

A journey level hydrologist or fisheries biologist will approve all site-specific measures for erosion control (silt fence, straw bales, geotextile, seeding/mulching) (see BMP list at CD2: \Support Documents\Minerals\Stibnite_BMPs.pdf).

If monitoring of this project should identify unanticipated effects to fish or fish habitat, the activity will be suspended by the District Ranger until corrections can be made, and the Level 1 Team will be consulted or consultation will be reinitiated. All other mitigation is incorporated as part of the federal action. Site-specific BMPs to be implemented with all projects are listed at CD2: \Support Documents\Minerals\Stibnite_BMPs.pdf).

N. FEDERAL ACTION: GRAZING ALLOTMENTS

PURPOSE AND NEED: The purpose of this activity is to continue permitted livestock grazing on National Forest System lands until December 31, 2017.

LOCATION**:** This action is dispersed throughout the Secesh analysis area of the SFSR Section 7 watershed.

DATES OF PREVIOUS CONCURRENCE:

- USFWS: October 15, 2001
- NMFS: August 8, 2001

DESCRIPTION: The action consists of permitting grazing by authorized permittees in several allotments (Victor Loon, Josephine, Marshall Mountain, and Bear Pete) in the Secesh analysis area of the SFSR Section 7 watershed. All of these permits have received previous concurrence (Wagoner and Burns 2001). The Annual Operating Instructions (AOIs – see specific CD citations below), and Annual Operating Plans (AOPs) describe season of use, permitted numbers and head months, and trailing patterns. Maps are available in the AOIs/AOPs. The allotments are grazed in accordance with LRMP. Specific descriptions are provided below.

The Payette National Forest (PNF) annually monitors the effects of grazing, by both sheep and cattle, on allotments within anadromous watersheds. Fisheries and range personnel annually monitor water temperature, streambank disturbance, streambed substrate, and riparian/upland utilization. Another study, green line ecological status and stability rating, is performed every 3 to 5 years and is used to determine long-term condition of the riparian area. Annual monitoring reports from both of these efforts are submitted to the Level 1 Team. Water temperature and streambed substrate monitoring takes into account all of the activities of the watershed upstream of the monitoring site, whether it is grazing, timber harvest, recreation, mining or other management-related disturbance. The resulting data reflect the cumulative effects due to management and natural causes. In contrast, streambank disturbance, upland/riparian utilization and green line monitoring are intended to monitor the direct effects of livestock and wildlife grazing. Monitoring occurs each grazing season by PNF range and fisheries personnel. Monitoring standards, timing of monitoring, modification recommendations, data, and trends are provided in annual range monitoring reports (Nelson 2006, Zurstadt and Bonaminio 2005, Zurstadt 2004, 2003). A summary of monitoring data is provided in Section V.D.1. (Effects of Grazing Allotments).

Chinook salmon were first listed under the ESA in 1992 and initial consultations determined that grazing management in watersheds tributary to the Salmon River was “Likely to Adversely Affect” (LAA) the species and issued a Biological Opinion (BO) (NMFS 1993). Subsequently, modifications have been made to the Forest’s grazing management in watersheds supporting Chinook salmon and this monitoring program was instituted. Based on these efforts, NMFS has concurred with “May Affect Not Likely To Adversely Affect” (NLAA) determinations for grazing activities on the PNF in watersheds containing threatened Snake River spring/summer and endangered fall Chinook salmon and Snake River steelhead (O. mykiss), which were listed under ESA in 1997. These concurrence letters (NMFS 2001a,b) were based on the requirement
that we continue the monitoring, which is designed to evaluate the effects of the imposed mitigations mentioned above, and revision of the PNF LRMP reaffirmed this requirement in standard TEST02 (USFS 2003,pg. III-11). Although listing of Chinook salmon was the initial trigger for this program, consultations on Columbia River bull trout (Salvelinus confluentus) with the USFWS in these watersheds have also resulted in concurrence with NLAA determinations pending, in part, continued monitoring (USFWS 2001a,b).

The range monitoring program, including fisheries data collection, began in 1993. The Forest’s fisheries biologists and range conservationists determined site locations that potentially best reflected areas influenced by livestock. Additionally, sites were added in 1996 as part of monitoring

requirements outlined in updated biological assessments. All sites have had grazing in the past or are currently grazed and grazing could occur in the future at any of the sites; thus, continued monitoring of these sites is assured.

Victor Loon Sheep Allotment

- CD1: \Support Documents\AOIs\Stringer_AOI_02.doc (in file SUPs.zip)

This sheep allotment in the Upper Secesh analysis area consists of grazing sheep following the approved AOI and long-term allotment management plan (AMP). The Victor Loon allotment is approximately 43,835 acres in size. It is located primarily in the South Fork of the Salmon River watershed, but approximately 25% is located in the North Fork of the Payette watershed. Although the allotment is large, fifty percent of the SFSR portion is not suitable for grazing due to topography and vegetation limitations. The allotment is grazed by 1500 dry ewes from 9/1 through 10/10 each year. Use of the allotment rotates yearly. Sheep utilize allotments south of the Victor Loon allotment prior the use of the Victor Loon allotment. They trail onto the allotment down Loon Creek, through Willow Basket Creek and out Ruby Meadows or Victor Creek. They trail back to McCall, grazing some of the area along Summit Creek, Trail Creek, and Victor Creek. Use the following year rotates in the opposite direction. The scope of activities for this action has not changed from that described in previous BAs.

The streams in the Victor Loon allotment boundary support all three listed fish species. Summit and Ruby creeks are relatively larger than the other three streams and are known to support Chinook and steelhead. Lick Creek, Loon Creek, and Victor Creek are all Secesh River tributaries and contain bull trout and probably provide rearing habitat for Chinook and steelhead in their lower reaches.

Josephine Sheep Allotment

- CD1: \Support Documents\AOIs\Soulen MYOP 95-00.pdf (in file SUPs.zip)

This allotment includes a small area bordering Summit Creek and encompassing the Josephine Creek area within the Secesh analysis area. The allotment is approximately 14,116 acres in size. The northwest portion flows into the Main Salmon River, the northeast portion into the South Fork of the Salmon River and the south portion into the North Fork Payette River. From July 10 through September 15, 1333 ewes and their lambs are permitted to graze the allotment. Grazing routes alternate each year (deferred system). The route starts one year from the south in Wilson Creek and grazes north, ending in the Josephine Lake drainage. The next year the route starts in the Josephine Lake drainage and moves to the south. Lambs are shipped at either the Brundage or Sater Corrals, both of which are located north of Brundage Reservoir. Brundage Corral is located in the Little Salmon River drainage and Sater Corral is within the North Fork Payette drainage.

Within the Josephine allotment, Summit Creek is known to support all three listed species. Josephine Creek is a tributary of Summit Creek, contains bull trout and steelhead (data on file in Forest Supervisor's office, McCall, ID), and may provide rearing habitat for Chinook salmon in its lower reaches.

Marshall Mountain Sheep Allotment

- CD1: \Support Documents\AOIs\Carlson MYOP 98-02.pdf (in file SUPs.zip)

Within the Secesh River analysis area, this allotment encompasses upper Lake Creek, Willow Creek, Threemile Creek, Sand Creek, and the upper portion of Grouse Creek. This allotment is approximately 29,946 acres. Additionally, there are BLM lands and the Studebaker Saddle area (USFS, Main Salmon River drainage) grazed with this allotment. The northeast portion drains into the Main Salmon River, and the rest of the allotment drains into the Secesh drainage. Use varies annually. Access is from the north, up from the Main Salmon River along the Fingers Road or the Carey Creek Road. From July 7 through September 5, 833 ewes and their lambs are permitted to graze the allotment. Depending on the access location, the band grazes approximately ¾ of the allotment prior to shipping lambs. Lambs are shipped from either the Three Mile or Nethker Corrals with the other two bands. The allotment may also be used for dry ewes in the fall. This use occurs within the portion of

the allotment not grazed by the ewe/lamb band. Use with the dry ewe band is authorized from September 5 through October 7.

In the Marshall Mountain allotment, Lake Creek is known to support all three listed species. Willow and Threemile creeks are tributaries that probably provide rearing habitat, especially in their lower reaches. Grouse Creek contains all three listed species and bull trout have been found in Sand Creek, a Grouse Creek tributary (data on file in Forest Supervisor's office, McCall, ID).

Bear Pete Sheep Allotment

- CD1: \Support Documents\AOIs\Carlson MYOP 98-02.pdf (in file SUPs.zip)

Within the Secesh River analysis area, this allotment encompasses portions of Lake Creek, its tributaries of Pete Creek and Nethker Creek, Summit Creek, Flat Creek, and the lower portion of Grouse Creek. This allotment is approximately 34,285 acres. It is located between French Creek on the west side and Lake Creek (Secesh subwatershed) on the east side; however, the southeast portion of the allotment extends east of Lake Creek to the lower portion of Grouse Creek. The west half of the allotment drains into the Main Salmon River and the east half drains into the South Fork of the Salmon River. From July 7 through September 5, 833 ewes and their lambs are permitted to graze on the allotment, or dry ewes from September 5 through October 7. Planned rotations are specified in the Annual Operating Instructions. The west side of the Lake Creek meadows are closed to all livestock use. The meadow area on the east side of Lake Creek is open to grazing, limited to the time livestock are using Three Mile corrals. No watering or bedding is authorized on the east side of Lake Creek. Crossing of Lake Creek is authorized on bridges. The Nethker and Three Mile Corrals are located on this allotment. Both are in the Secesh subwatershed. The use of the shipping corrals is alternated bi-annually.

In the Bear Pete allotment, Lake Creek is known to support all three listed species. Bull trout have been found in Nethker Creek. Pete Creek provides rearing habitat, especially in its lower reaches. Summit Creek is known to support all three listed species. Grouse Creek and Flat Creek contain all three listed species (data on file in Forest Supervisor's office, McCall, ID).

North Fork Lick Sheep Allotment (used for trailing only)

- CD1: \Support Documents\AOIs\Stringer MYOP 98-02.pdf (in file SUPs.zip)

Within the Secesh River analysis area, this allotment encompasses upper Lick Creek, North Fork Lick Creek, Hum, and Cly Creeks. Lick Creek is a Secesh River tributary that contains rearing habitat for the listed fish species. Livestock grazing is no longer permitted on this allotment. However, a band of 1,500 dry ewes trail across it annually. "Trailing" forces the animals through a route at a fast pace and does not allow any other than overnight stops where grazing may occur. It is used during either the last two weeks of August or the first two weeks of October to move animals between grazing areas. Timing of use alternates yearly. Livestock are limited to trailing only from the Duck Lake trailhead to the summit into Loon Creek. No grazing or bedding is authorized at Hum Lake or Duck Lake.

REQUIRED MITIGATION:

General Measures

Several mitigation measures are specified as LRMP Standards in all allotments to protect aquatic resources. These include:

- TEST25 - Mitigate, through avoidance, the adverse effects of livestock access or activities that may result in trampling of redds or disturbance of spawning or reproductive staging of ESA listed fish species
- RAST02 -Limit livestock trailing, bedding, watering, and other handling to those areas and times that maintain or allow for restoration of beneficial uses and native and desired non-native fish habitat.

- RAST03 - New water developments, corrals, and other handling or loading facilities shall not be located within RCAs, unless it can be demonstrated that these facilities maintain or allow for restoration of beneficial uses and native and desired non-native fish habitat.
- RAST04 - Livestock salting will be prohibited in RCAs
- RAST07 - Only annual once-over sheep grazing will be allowed, with the exception of designated sheep driveways, travel routes, or where specifically authorized.

These measures are specified for all sheep grazing allotments to maintain or improve aquatic resources:

- Adjust grazing practices to maintain or improve inland and anadromous fish resources and fish habitat.
- Salt is not to be placed in meadows or bottoms, where livestock congregate and should be placed no less than 0.25 miles from water.
- Once over grazing equivalent to 30% allowable use in riparian and upland areas.
- One time watering per location.
- One time bedding per location.
- Permitted grazing can be modified based on range utilization and monitoring studies.
- Grazing around all high mountain lakes is prohibited.
- Newly-identified bull trout spawning areas will be compared to known sheep stream crossing areas and conflicts identified and resolved (this has been completed for known bull trout spawning areas. See annual range monitoring reports Nelson 2006, Zurstadt and Bonaminio 2005, Zurstadt 2004, 2003).

During bull trout surveys conducted since 2000, spawning was not occurring at the time and in the areas where sheep were crossing streams. Spawning occurs after the sheep have moved through the stream crossing areas (Nelson 2006, Zurstadt and Bonaminio 2005, Zurstadt 2004, 2003). Sheep crossing sites are described in annual range monitoring reports (Nelson 2006, Zurstadt and Bonaminio 2005, Zurstadt 2004, 2003). Sheep crossing sites are located in streams that are smaller and higher-gradient than those where Chinook salmon spawning typically occurs; no known sheep crossing sites are located in known Chinook salmon spawning areas (Nelson 2006, Zurstadt and Bonaminio 2005, Zurstadt 2004, 2003).

Additional Mitigation for Victor Loon Allotment

- Livestock are authorized to cross Loon Creek only at existing trail crossings (which do not conflict with bull trout spawning) because trail crossings are all upstream of passage barriers.

Additional Mitigation for Bear Pete Allotment

- Trailing would occur along Grouse Creek, but livestock remain on the road for this one-day period (P. Grinde, PNF range specialist, personal communication).

O. FEDERAL ACTION: SFSR ROAD RECONSTRUCTION

PURPOSE AND NEED: The current federal action is the completion of some outstanding components of the original federal action of the Final Environmental Impact Statement (FEIS) for the SFSR Road Project (USFS 1990) with some other portions of the action having uncertain implementation dates. This consultation extends until December 31, 2017.

DATES OF PREVIOUS CONCURRENCE:

- USFWS: October 15, 2001 (portion of this action),
- NMFS: August 8, 2001 (portion of this action), April 8, 1993 (BO on entire action),

LOCATION: The federal action is in the upper SFSR analysis area, encompassing the SFSR Road from the Warm Lake Highway to the East Fork SFSR bridge, about 32.5 miles.

DESCRIPTION: Except as described in the ROD for the SFSR Road (USFS 1990), road maintenance for the SFSR Road will be conducted consistently with the general Road Maintenance described in Wagoner and Burns (2001). Table 11 summarizes the specific actions and timeframes of outstanding components of the original federal action.

Table 11.—Components of the 2001-2006 federal action for the SFSR Road Reconstruction

Federal Action Components	1990 ROD Reference	Scheduled for 2006-LRMP Revision
Snow removal	Pg. 2, 6, 16	Ongoing
Traffic management, including transport of toxic substances	Pg. 2, 5, 6, 15, 16, 18	Ongoing
Treatment of unstable cuts and fills with vegetation and log structures	Pg. 6, 9, 19	Ongoing
Area closure (PNF only)	Pg. 6, 18	Signs have been acquired, closure orders are being planned
Replace Goat Creek culvert	Pg. 5, 18	Incomplete. Funding sources are being pursued
Gravel 1 mile of the McCall-Yellow Pine Rd from the Secesh R. bridge to Hamilton Bar[a]	Pg. 16	Incomplete, road easement has been given to Valley County
Close Three Mile Road from Hamilton Bar to Threemile Creek, establish trailhead at Hamilton Bar, convert closed road to motorcycle trail[a]	Pg. 16	Incomplete
Enforce designated parking areas (PNF only)	Pg. 7	Complete – see Travel Plan action
Survey fish populations one year after construction	Pg. 21	Completed in 1989, NOAA has proposal to monitor fish population status and trends beginning in 2006
Stream substrate monitoring	Pg. 21	Ongoing
Inspection of BMPs	Pg. 22	Ongoing

[a] Valley County has asserted an R.S. 2477 right of way on these road sections.

Incomplete Components of the 2006 federal action

- ***Area closure.—***Closure orders have been intermittently planned since the BO, but have never been implemented. . The Level 1 Team will be consulted as these plans are developed.
- ***Road gravelling (One mile of McCall-Yellow Pine road from Secesh River bridge to Hamilton Bar) (Lower SFSR subwatershed).—***This component has not yet been completed. The Level 1 Team will be consulted as these plans are developed.
- ***Road closure (SFSR Road from Hamilton Bar to Threemile Creek).—***Closure orders and road-to-trail conversion have been intermittently planned since the BO (1993), but have never been implemented. Plans will be developed to implement this measure. The Level 1 Team will be consulted as these plans are developed.
- ***Goat Creek culvert replacement.—***The Goat Creek culvert is scheduled to be replaced with an open-bottomed structure, which will reconnect 1.20 miles of habitat for listed Chinook salmon, steelhead, and bull trout; and USFS Region 4-sensitive westslope cutthroat trout, with the rest of the SFSR subbasin and Salmon River Basin. The action is scheduled to begin in July 2007, and to be completed by November 2007. See details below.

Goat Creek culvert replacement

The Goat Creek crossing currently consists of a large culvert that is perched above the SFSR and acts as a migration barrier to the listed species. The culvert acts as a small dam and causes sediment to accumulate on its upstream end. All listed species are present in some life stage in the SFSR near Goat Creek (data on file in Forest Supervisor's office, McCall, ID). Goat Creek supports resident rainbow (but is a migration barrier to steelhead). Chinook salmon spawn in the SFSR just downstream of the Goat Creek culvert. Bull trout and cutthroat migrate and rear in the SFSR adjacent to the Goat Creek culvert.

Replacement of the culvert started in the fall of 2000 under a prematurely terminated contract. The project was not completed because of problems related to excavating into unconsolidated fill (i.e., caving in of the tunnel) resulting in the contractor not being able to meet timeframes. The decision was made to shut the project down for the winter and implement a winterization plan for the site. Soil

material was backhauled and used to fill the excavation and reshape the work area. Slash windrows were placed on the fillslope above the tunnel entrance and this area covered with wood chips. The culverts used to contain Goat Creek during construction were removed and kept on site. Riprap was placed along the stream channel on geotextile cloth. Disturbed areas were mulched with straw. A drain was installed to convey water from the road ditchline into a settling basin and the outflow of the basin lined. The access road was reshaped and covered with wood chips.

In 2006, funding was secured to re-implement a culvert replacement contract. Detailed descriptions, plans, and maps for this current Goat Creek culvert replacement contract are on CD2: \Support Documents\Roads\Goat CreekCulvert\ Goat_Creek_contract.doc [in Roads.zip]).

Sediment that has accumulated at the culvert will be removed during culvert replacement. Replacement of the culvert with an open-bottomed culvert will restore access to Goat Creek spawning and rearing habitat by eliminating the present barrier (NMFS 1993). In addition to eliminating the present barrier, the crossing area will be increased, and the hydraulic capacity increased.

Many of the project design features, BMPs, and erosion control measures listed below and further described in contractor-provided documents (which are not currently available) will be similar to those that were used during the Fourmile culvert replacement (Appendix 4 of Faurot & Burns 1999). These items will be captured through the project plans, project design, and contract package. The contractor will provide a Hazardous Spill Plan, a Dewatering and Sediment Erosion Control Plan, and an Excavation Plan to the Forest Service prior to project implementation. These will be shared with the Level 1 Team as they become available. If monitoring of activities associated with this project should identify unanticipated effects to fish or fish habitat, the activity will be suspended by the District Ranger and the Level 1 Team will be consulted.

Relevant contract specifications that minimize effects to listed fish species and habitat are summarized from the contract as follows (CD2: \Support Documents\Roads\Goat_Creek_contract.doc [in Roads.zip]):

107.10 Environmental Protection.
Design and locate equipment repair shops, stationary refueling sites, or other facilities to minimize the potential and impacts of hazardous material spills on Government land.
Before beginning any work, submit a Hazardous Spill Plan. List actions to be taken in the event of a spill. Incorporate preventive measures to be taken, such as the location of mobile refueling facilities, storage and handling of hazardous materials, and similar information. Immediately notify the CO of all hazardous material spills. Provide a written narrative report form no later than 24 hours after the initial report. The Contractor is solely responsible for all spills or leaks that occur during the performance of this contract. Clean up spills or leaks to the satisfaction of the CO and in a manner that complies with Federal, state, and local laws and regulations.

156.05 Temporary Closures.
The South Fork Salmon Road will be closed between July 11, 2007 and October 1, 2007.

The South Fork Salmon road will be open to public except behind the barricades at the closure points. To avoid conflicts with public traffic on the open part of the South Fork Salmon River road the following requirements will be followed:

- Maximum shipments of fuel per truck will be 500 gallons. Pilot vehicles and spill containment equipment are required during shipments on the South Fork Salmon Road.
- Maximum speed for over width vehicles will be 20 miles/ hour.
- Pilot vehicles will precede: a) all over width vehicles; b) all semi-tractor type vehicles pulling any trailer or combination of trailers (with the exception being logging trucks), and; c) all vehicles with more than two axles transporting hazardous materials.

157.03 General

Submit a Dewatering and Sediment Erosion Control Plan detailing permanent and temporary control measures to minimize erosion and sedimentation during and after construction according to the contract specifications, contract permits, Section 107, and this Section. Contract permits amend the requirements of this Section. Do not modify the type, size, or location of any control or practice without approval. Submit the erosion control plan proposal at least 14 days before operations begin to the Contracting Officer for approval.

Reflect in the erosion control plan special concerns and measures necessary to protect resources and government improvements. Include:

- The construction activities and sequence of implementation relating to specific erosion control measures.
- The location and type of permanent controls to be implemented during construction.
- The location and type of temporary controls to be implemented during construction.
- A detailed dewatering plan for Goat Creek, and for the footing excavation that may be below the water table of the South Fork of the Salmon at the downstream end of the footing. Water will be conveyed around the construction area via rigid pipe or some other means capable of containing both the flow anticipated during the operating season and higher flows in the event of a storm.
- For work in stream channels without flowing water describe level of ground and vegetative disturbance and measures to reduce potential sediment delivery.
- Describe what monitoring will take place.

Upon completion of construction at the site, all temporary dewatering materials and equipment are to be removed from Government property.

The Contractor shall adhere to the following practices:

- The Contractor shall operate in a manner that will protect aquatic organisms.
- Construct the Dewatering and Sediment Control according to the Contractor's approved plan.
- Maintain the roads and stockpiles of material in a manner that prevents direct entry of surface drainage into the stream.
- Construct permanent and temporary control features to intercept sediments. A settling basin will be constructed, or a portable one used, that is able to handle the volume of water anticipated, and that provides filtering capability. Dewatering of the excavation site, (of ground water from the excavation) will be done by pumping water to the settling basin and the basin shall be cleaned out when full of sediments. Transport sediment to the waste site on the 474E road, or incorporate into the embankment material if it is suitable.
- Any sanitation facilities established by the Contractor shall be located as designated by the CO.

157.13 Maintenance and cleanup.
Erosion control materials will be removed by a Forest Service hydrologist or soil scientist when the sites have revegetated. The Forest Service will perform the re-vegetation work.

Restore the ground to its natural condition. Restore the staging area on the 474E road to a smooth surface that can be used as a dispersed campsite in the future. The material that remains on the disposal site on the 474E road shall be graded and smoothed so that vehicles can drive on it in the future.

171.04 Weed and disease prevention - Equipment.
Use a high pressure washing system that traps all wash water and either stores it for removal from National Forest System lands or recycles the water for continued use. If the equipment recycles the water, provide adequate filters for seed removal. Dispose of the filter material and removed seeds in an approved manner. Wash the sides, tops, and undercarriages of all construction equipment. Remove all seeds, plants, plant fragments, dirt, and debris from the construction equipment. Inspect

the washed construction equipment, including the undercarriage, to ensure that the washing removed the dirt, debris, and seeds from the construction equipment. Rewash the construction equipment as necessary or as directed.

203.01 Removal of Structures and Obstructions - Description
Windrowing Construction Slash. Place construction slash outside the roadway in neat, compacted windrows approximately parallel to and along the toeline of embankment slopes. Obtain approval (from COR) for pioneer roads. A pioneer road may be constructed to provide an area for placement of windrows, provided the excavated material is kept within the clearing limits and does not adversely affect the road construction.

- **Scattering.** Scatter construction slash outside the clearing limits without damaging trees. Limb and scatter other construction slash to reduce slash concentrations.
- **Chipping or Grinding.** Use an approved chipping machine to grind slash and stumps greater than 3 inches in diameter and longer than 3 feet. Deposit chips or ground woody material on embankment slopes or outside the roadway to a loose depth less than 6 inches. Minor amounts of chips or ground woody material may be permitted within the roadway if they are thoroughly mixed with soil and do not form a layer.
- **Debris Mat.** Use tree limbs, tops, cull logs, split stumps, wood chunks, and other debris to form a mat upon which construction equipment is operated. …
- **Piling.** Pile construction slash in designated areas. Place and construct piles so that if the piles are burned, the burning will not damage remaining trees.
- **Placing Slash on Embankment Slopes.** Place construction slash on completed embankment slopes to reduce soil erosion.
- **Hydrological Sensitive Placement.** Where required use this method in combination with other designated methods to dispose of material to reduce erosion and to aid in re-vegetation:
- Scatter slash on bare or disturbed areas within or outside the clearing limits as directed.
- Scatter chips or ground woody material on bare or disturbed areas within or outside the clearing limits as directed

208.04 Structural Excavation and Backfill for Selected Major Structures - General
A plan of work shall be submitted in writing and shall describe the procedures, methods, materials, and equipment the contractor proposes to use to conduct his excavating operations, including details of shoring, cribbing, and cofferdam construction and/or plans for construction of earthen, or rockfill dikes, dams, or embankments in lieu of a cofferdam.

Conserve suitable material for backfill of the new embankment from excavated material from the road way and from the Goat Creek stream channel. There is little space available at the site for material storage, and the contractor shall haul the material to the temporary disposal site at the end of the 474E road. Clean rocks may be temporarily stockpiled along the edges of Goat Creek in the flat areas upstream of the culvert.

648.01 Stream Simulation – Description
This work consists of placing rock and fill to simulate natural stream profile and streambed though culverts and other structures.

Obtain rocks that meet the contract specifications for stream simulation rock and the channel rock used to construct the weirs and the rock bands from the following sources.

- From the excavation of the road embankment for the arch, and from the excavation for the new stream channel.
- From the existing riprap pile that is located at the Roaring Creek riprap site approximately 1 mile south of the project.

As the contractor is excavating the stream channel to the grade shown on the drawings, the CO will inspect the material to determine if the material will act as suitable streambed material as it sets. The CO will inform the contractor which section of the stream channel needs the stream simulation material that is shown on the plans.

648.03 General.
Place stream simulation rock on a prepared surface to form a well-graded, low permeability mass, similar in appearance and texture to the natural streambed. Do not drive metal track or rubber tired equipment directly on metal or concrete structure surfaces.
The placement of stream simulation rock and channel rock shall be done when the channel is dewatered. Before the stream is diverted back into the new channel, wash the new channel, and collect the sediments (if any) and remove the sediments from the channel via the use of SEDIMAT or approved equal. All stream simulation materials and channel rock shall be in place and the channel approved by the COR prior to the introduction of the stream.

648.04 Placed Stream Bed Simulation Rock and Fish Rest Stops.

- **Method A, Machine Placed.** Place stream simulation rock in one or more layers with a layer depth less than 1 ½ times the maximum dimension of the stream simulation rock
- **Method B, End Dumped.** Dump stream simulation rock in one or more layers with a layer depth less than 1 ½ times the maximum dimension of the stream simulation rock. Obtain a uniformly dense, compact, low permeability bed with a surface matching stream simulation bed details.
- **Method C, Hand Placed.** Place stream simulation rock using hand labor. Material may be hand carried, or carried in wheelbarrows and end dumped to obtain its full thickness

Place fish rest stop rock as designated.

648.04 Foundation fill.
Fill all voids left during placement of stream bed simulation rock with fines. The purpose of filling the voids with fines is to create a streambed that will be non-porous enough to keep water flowing on the top surface, even at low flows.

Ongoing components of the 2006 federal action

Snow removal.—In an effort to relieve fillslopes adjacent to the SFSR from additional snow loading that could cause slope failure and sediment delivery, a strategy was developed to employ plowing methods such as: no-sidecast, using a blower, or winging the snow to the inside of the road. An interdisciplinary group identified and posted signs on approximately three miles of road where sidecasting is not to occur. Monitoring of snowplowing has been conducted by Krassel District Soil and Water personnel. It has not been determined what effect the alternative methods have had on reducing sediment into the SFSR, but the alternative methods have been implemented (correspondence between Krassel District, Payette NF, and NMFS, regarding snowplow monitoring of the SFSR Road, 1992-1999, on file at PNF SO, McCall, Idaho, and personal communication between author and Tom Crawford, Payette NF Watershed Specialist, January 2006).

- **Traffic management:** A traffic management plan was implemented in 1995, which is intended to reduce the risk of fuel spills into the SFSR by limiting loads to less than 500 gallons.
- **Enforce designated parking areas:** This action is being implemented on an ongoing basis (see Travel Plan federal action).
- **Treatment of unstable cuts and fills:** Stabilization of cutslopes and fillslopes has been occurring since 1992. Maintenance of structural treatments (slash filters, grid structures, slab wood structures) and mulching are ongoing and implemented as needed on eroding cuts and fills.

- **Stream substrate monitoring and inspection of BMPs:** These actions are ongoing; BMPs are inspected annually by watershed specialists) (data on file at PNF SO, and Tom Crawford, PNF Watershed Specialist, personal communication, and Nelson et al. 2006a, 2006b).

REQUIRED MITIGATION

All mitigation is incorporated as part of the federal actions.

V. Analysis of Potential Effects

A. General Effects of Management Disturbances

1. Direct and Indirect Effects of Logging from Small Sales, Green and Salvage

Potential effects to fish and their habitats are principally related to increased sedimentation from land disturbance and alteration of riparian communities. When sediment production exceeds a stream's ability to transport it, the amount of fine sediments increase on and within stream substrates. Salmonid populations are typically negatively correlated with the amount of fine sediment in stream substrate (Chapman and McLeod, 1987). Spawning area quality is affected because egg deposition and survival are reduced when sediment fills the interstitial spaces between gravels, preventing the flow of oxygen and the flushing of metabolic wastes. Emerging fry and aquatic insects can also be trapped and smothered by sediment deposition in the gravels. Rearing areas are diminished as sediment fills pools and other areas. Sedimentation of deep pools and coarse substrate used for rearing and over wintering limits the space available for fish. Bell (1986) cited a study in which salmonids did not move in streams where the suspended sediment concentration exceeded 4,000 mg/L because of a landslide. Newly emerged fry appear to be more susceptible to even moderate turbidity than older fish. Turbidity in the 25-50 NTU range (equivalent to 125-275 mg/L of bentonite clay) reduced growth and caused more young salmon and steelhead to emigrate from laboratory streams than did clear water (Sigler, et al. 1984).

Stream channel habitat components are highly dependent upon the configuration of the bed and banks of the stream channel. Perpetuating the physical, vegetative, and biological processes that maintain stream channel configuration is a necessity. Human-induced disturbance and geoclimatic factors often produce different stream/riparian characteristics than would geoclimatic factors alone. The result can be a stream that no longer performs its physical functions of floodplain access, water table maintenance, and sediment transport. The aquatic habitat variables associated with the physical functioning of a stream (pool/riffle ratio, pool size, undercut, woody debris) may not be adequate to support viable fish populations (Bull 1979; Heede 1980).

Use of roads is an integral part of all logging operations. Roads can affect streams directly by accelerating erosion and sediment loading, altering channel morphology, and by changing the runoff characteristics of watersheds. These processes interact to cause secondary changes in channel morphology (Furniss et al. 1991). All of these changes can affect fish habitat. The bare, compacted soils on roads exposed to rainfall and runoff are a potential source of surface erosion. Roads and ditches form pathways for sediment transport to stream channels (Chamberlin et al 1991). Roads are constructed, reconstructed, and maintained in the watershed for general traffic use and in conjunction with timber harvest and other activities.

Riparian areas are a component of functioning aquatic ecosystems. Protection of these areas is often accomplished by delineating riparian areas and restricting or prohibiting management activities within these zones (Forest Ecosystem Management Assessment Team, 1993). This approach allows for the maintenance of current and future sources of large, woody material, intact riparian vegetation communities, and functional ecological processes of temperature (water, air, and soil) regulation and buffer strip functioning.

Logging and salvage within buffer strips reduce their ability to contribute large wood to streams (Bryant 1980; Bisson et al. 1987) and can have other effects. Logging might occur due to noncompliance as described for the environmental baseline, or under special provisions for miscellaneous products. Increased water temperature can often be traced to removal of shade-producing vegetation along streams and smaller tributaries that supply cold water to fish-bearing streams (Beschta et al. 1987). A distinct microclimate is maintained along stream channels, created by cold air drainage and the presence of turbulent surface waters (Chen 1991). In the Oregon Coast Range and western Cascade Mountains, riparian buffers of 100 feet or more have been reported to provide as much shade as undisturbed late succession/old growth forests (Steinblums 1977). Many effects of riparian vegetation on streams decrease with increasing distance from the stream bank (McDade et al. 1990) and are

influenced by the degree of channel constraint and floodplain development (Sedell et al. 1987). The effectiveness of buffer strips along constrained channels to deliver large wood is low at distances greater than approximately one tree height away from the channel. Wind throw, an important contributor of large woody material to streams, is driven by riparian topography. Streams with steep V-shaped topography have the ability to deliver leaf and other particulate organic matter to streams, the amount of which declines at distances greater than approximately one-half tree height away from the channel (Forest Ecosystem Assessment Team, 1993).

Within riparian and/or landslide prone areas, buffers, called RCAs, are identified to protect streams from non-channelized sediment inputs, act as source of wood, and provide other necessary ecosystem functions (LRMP). These RCAs have been shown to be wide enough to prevent non-channelized sediment from reaching fish-bearing streams. These RCAs minimize the likelihood of non-channelized flow reaching any stream and becoming channelized flow. Broderson (1973), Belt et al. (1992), Ketcheson and Megahan (1990), Burroughs and King (1989), and Swift (1986) generally concluded that 200-300 foot riparian filter strips are effective at protecting streams from sediment from non-channelized flow. All RCAs areas are required to be mapped on the ground and specific standards and guidelines applied.

Standard RCA widths are:

- ***Perennial streams.—***300-foot slope distance from ordinary high water mark, or flood-prone width, or two site-potential tree heights, whichever is greatest.
- ***Intermittent streams.—***150-foot slope distance from the ordinary high water mark, or flood-prone width or one site-potential tree height, whichever is greatest.
- ***Ponds, lakes, reservoir, and wetlands.—***150-foot slope distance from the ordinary high water mark, or outer edge of seasonally saturated soils, outer edge of riparian vegetation, or one site-potential tree height, whichever is greatest.

Landslide prone areas are excluded from harvest during the final unit layout.

2. DIRECT AND INDIRECT EFFECTS OF FIRE

There are three major components of the federal action that may have very different effects; those are:

1. Fire suppression, where the effects of the wildfire itself are not effects of the federal action.
2. Wildland fire use fires, where the decision is to take no federal action and the effects of the fire are a natural event.
3. Prescribed fire, where the effects of the fire are effects of the decision to burn under prescribed conditions.

Fire suppression effects are quite different from wildfire and prescribed burning because we consider only the management effects of suppression and not the fire itself. Effects of fire suppression and prescribed fire would be similar to observed effects of other prescribed burns and effects from wildfires that have been observed and studied. Those studies are described in the following section. These effects have been essentially natural, with no persistent adverse changes to fish habitat. Most observed prescribed burns have been spring burns, done during cool, moist conditions. Wildfires generally occur under warmer, drier conditions and burn with greater intensity than prescribed fires. The influence of fire on hydrology and water quality can be viewed as a continuum, with effects of prescribed burning at one extreme and wildfire at the other (Baker 1989). Even the effects of wildfire on fish habitat have been found to be essentially natural with no persistent effects. Intense wildfires, like those occurring after years of suppression, can alter fish habitat and the ecology of streams (Rieman et al. 1995; Minshall et al. 1989).

Fire Suppression

Studies of the effects to fish habitat from wildfire suppression show that they are not necessarily adverse when Payette National Forest fire suppression guidelines are applied. These studies confound the effects of the fire with the effects of the suppression action, so the effects of the

suppression itself are expected to be far less than the total effects documented. The following discussion of monitoring results is for the confounded studies, after which we will describe other effects of fire suppression.

Monitoring by Idaho State University in the Rapid River and Big Creek watersheds on the Payette National Forest has shown that wildfires have essentially natural effects (Minshall et al. 1994). Overall, the physical and chemical habitat of study streams in the Big Creek and South Fork Salmon River watersheds has not been altered by either the Golden Fire of 1988 or the Chicken Fire of 1994 (Bowman and Minshall 1999).

Distinct changes in the benthic habitat characteristics did not occur in Big Creek tributaries influenced by wildfires that occurred in 1988 or 1991 (Royer et al. 1995). Major changes were not observed in the channel or substrate characteristics in Big Creek tributaries burned by the 1988 Golden Fire. Only minor year-to-year variation was observed in physical and chemical parameters. (Royer and Minshall 1996).

The heavy spring runoff in 1996 did not appear to scour burned streams in Big Creek to any great extent compared to control streams. (Royer et al. 1997). No substantial changes in water chemistry or measurements of physical habitat characteristics have been observed over nine years of study on Big Creek tributaries influenced by wildfire (Bowman et al 1998, Bowman and Minshall 1999). The streams continue to show no discernable change related to burning by wildfire, and the studies support the hypothesis that fire would have no measurable long-term effects.

Minimal influence from the 1994 Chicken Fire was observed in South Fork Salmon River tributaries (Royer and Minshall 1996). Monitoring in South Fork Salmon River tributaries after wildfires that occurred in 1994 indicated that there were no immediate effects on the catchments studied and only small areas of intense wildfire impact in the catchments. Riparian areas were relatively undamaged and stream channels appeared stable (Royer and Minshall 1996). The Chicken Fire has not created unstable habitat conditions in Fritzer Creek. The physical and chemical habitat of streams studied in the South Fork Salmon River watershed has not been altered by the Chicken Fire (Bowman and Minshall 1999).

Sediment monitoring in the South Fork Salmon River and Chamberlain Creek showed that fine sediment in spawning areas did not show unnatural increases after the 1994 wildfires, or the floods that occurred in 1997 (data on file, Payette National Forest, Supervisor's Office, McCall, Idaho). The 1994 fires, coupled with other potentially destabilizing natural events including floods, hill slope failures, and extreme spring flows have not resulted in obvious deposition of fine sediments (Nelson et al. 1999).

The upper reaches of Chamberlain Creek were within the 1994 Chicken Fire Complex. Fine sediments were slightly elevated in 1996, but have generally declined since 1989. In the upper South Fork watershed, in spite of two large wildfires, high snow packs, and spring runoffs for three consecutive years, and widespread hill slope failures, streambed conditions have fluctuated but did not change significantly (Nelson et al. 1999). Similar results were found in the Secesh River watershed, where the entire Lake Creek area was within the Chicken Fire perimeter, but the trend in spawning conditions for anadromous fish appear to be improving, with decreasing amounts of fine sediment.

Post-fire BAER (Burned Area Emergency Rehabilitation) surveys conducted on the Payette National Forest after the 1994 wildfires found natural vegetation recovering by the following summer. Sprouting of vegetation was noted later in the fall of 1994, after the fire had passed through some areas. Burned trees, even in riparian areas are important sources of large woody debris. Large woody debris recruitment to streams was evident where moderate burn severities occurred after the 1994 wildfires (BAER reports, 1994).

It was estimated that only 5% of small streams within the Chicken Fire perimeter were affected by near total loss of riparian vegetation (Chicken BAER 1994). Burn intensities in riparian zones of the

Chicken Fire varied from low to moderate-hot. Vegetation in these areas was already beginning to resprout by September 1994, and was expected to fully recover within two years (Chicken BAER 1994). By the following summer, there was an excellent natural vegetation recovery response (Dave Kennell, Forest Hydrologist, personal communication). Abundant forbs and shrubs were evident.

The BAER report for the Corral Fire concluded that there would be no persistent effects to anadromous fish. A lack of burning was observed in riparian areas. Natural recovery patterns are expected to be sufficient to preclude long-term degradation of fish resources. Riparian vegetation was generally not much affected or only dried by the fire.

Lightning caused fires that were allowed to burn in the Selway-Bitterroot Wilderness were observed from 1979 to 1987. Despite the steep topography, very little soil movement was observed (Saveland and Bunting, no date).

Observations by fishery biologists and monitoring by Idaho State University and the Payette National Forest indicate that fish habitat is generally not adversely affected by wildfire, and any habitat changes are short-term. Even in other areas, the consequences of large fires are not as catastrophic as often anticipated (Rieman et al. 1995). The magnitude of effect varies widely because, on average, there are about 150 incidents/year on the Forest (most of which are initial attack) compared to a larger acreage burned on a more sporadic basis. Again, it is pointed out that monitoring of fire effects confound the effects of suppression and the effects of fire, such that the independent effects of the suppression action are expected to be far less than the documented combined effects.

Use of tractors, heavy equipment, and chainsaws can alter fish habitat to an extent similar to logging or other similar land disturbing activities. Chamberlain et al. (1991) summarized these types of effects to include changes in sedimentation and stream channel morphology. Potential effects from these sources should be reduced by adoption of guidelines requiring the use of minimum impact fire suppression techniques. The risk and reduction cannot be quantified. Although research in Yellowstone National Park (Schullery and Varley 1994; Gresswell 1993; Mahoney et al. 1993; Young and Bozek 1996) and central Idaho wilderness do not discriminate among sources of change to fish and habitat from fire versus suppression, the combined effects were well within the range of natural variation. Minimum impact suppression techniques were applied to many of the fires studied. This research shows that fish habitat and populations remain unchanged or only changed marginally under such circumstances and effects are negligible.

Norris et al. (1991) summarized the toxicity of various fire retardants. These chemicals are toxic to salmonids in some concentrations. A detailed description of the potential effects of retardants can be found in previous emergency consultation for the South Fork Salmon River (Faurot and Burns, 2005a). Adoption of the guidelines will decrease the risk of effects from fire retardant. The risk and reduction cannot be quantified for various reasons documented in detail by Faurot and Burns (2005a), including such factors as the magnitude of material reaching fish, ameliorating water chemistry and quantity, and avoidance by fish. So long as the guideline to avoid applying retardant to streams is implemented effects are anticipated to be negligible.

Fuel can be toxic to salmonids (McKee and Wolf 1963), with the hydraulic fate of the fuel playing a large role in the resultant effects (Saha and Konar 1986). Risks associated with fuel are reduced by the guidelines requiring certain handling procedures. The risk and reduction cannot be quantified. In the past, there have been no instances where the guidelines resulted in observed effects to listed salmonids; therefore we conclude that the effects are negligible.

Location of fire camps and crews close to occupied fish habitat can directly affect salmon habitat or their behavior. David Burns (Forest Fish Biologist, personal communication) has observed that salmon move away from people. People can trample redds and fish mortality can result (Roberts and White 1992). Risk of these impacts is directly proportional to the number of people and their proximity to the salmon and habitat. The risk of these types of effects is reduced by the adoption of these guidelines. The risk and reduction cannot be quantified, but are expected to be negligible because of avoidance.

Prescribed Burns

Disturbance must be recognized as an integral component of any long-term freshwater habitat restoration strategy (Reeves et al. 1995). Historically, fires were a natural and an important part of the disturbance regime for aquatic systems. Changes are often observed from wildfires after a large-scale hydrologic event (e.g., heavy rains and flooding), and are the result of the two natural events together. In the Oregon Coast Range, the frequency, size, and distribution of wildfires and landslides has been responsible for developing a range of channel conditions within and among watersheds (Reeves et al. 1995). Reeves et al. (1995) found that immediate impacts from intense wildfires followed by intense winter rainstorms include direct fish mortality, elimination of access to spawning and rearing sites, and temporary reduction or elimination of food sources. However, long term effects may be positive, related to landslides and debris flows that introduce large wood and sediment into channels and affect storage of these materials. The configurations of channel networks, the delivery, transport and storage of sediment and wood and the decomposition of woody debris interact to create, maintain, and distribute fish habitat. It is important to maintain and restore complex habitats across a network of streams and watersheds (Rieman and Clayton 1997).

Fish species present are not expected to be adversely affected by any disturbances to habitat resulting from the prescribed burning. Anadromous salmonid populations in the Pacific Northwest are well adapted to dynamic environments because of their high fecundity, mobility of juveniles, and straying adaptations (Reeves et al. 1995). Species such as bull trout and redband trout (steelhead) appear to be well adapted to pulsed disturbances such as those created by fire (Rieman and Clayton 1997). Rieman and Clayton (1997) recommend priority management activities that emphasize prescribed fire where depressed and small or isolated populations of sensitive species persist in landscapes at high risk of uncharacteristic wildfire. Successfully reestablishing more natural patterns and processes could lead to long-term restoration of more complex, productive aquatic habitats.

Prescribed fires are expected to have much lesser degree of effects than wildfires that burned in the Boise River basin in 1992 and 1994. Those fires were large, intense events that would probably have been rare historically (Rieman et al. 1995). Although these wildfires profoundly altered fish populations and habitat, the short-term recovery of bull trout and redband trout populations has been dramatic (Rieman et al. 1995). Broadly distributed habitats suitable for these fish during and after the fire provided for colonization. In an evolutionary sense, bull trout likely experienced disturbance patterns that included mixed or high intensity fires.

Outcome of future prescribed burning projects would be expected to be similar to that of past prescribed burns. Effects have been essentially natural, with no adverse changes to fish habitat. Most prescribed burns observed have been spring burns, done during cool, moist conditions. Observations of spring prescribed burning on the Payette National Forest has shown natural effects in riparian areas, or no observable evidence that fire had burned into riparian areas more than *de minimus* amounts (John Lund [retired], Mary Faurot and Dave Burns, Payette National Forest fisheries biologists, personal communications). Similar observations were made for spring prescribed burns on the Nez Perce National Forest (Gary Seloske, Nez Perce National Forest fishery biologist, personal communication).

Data were collected on pre- and post-burn under-story conifer mortality and fuel loading on two prescribed burns in the South Fork Salmon River watershed. On most study plots, the mortality of trees 7" dbh and smaller was 0-33%. Two plots (out of twelve) experienced 100% mortality of this under-story (the desired result). Five of the twelve plots did not burn at all, because, even though a prescribed fire "unit" is delineated, the fire does not burn every acre in the unit. Fuel loading (total downed woody fuel) was reduced by 12% and 15% on two plots, and was not reduced at all on a third plot (CD2: \Support Documents\Fire\Rx_Fire_Monitoring.pdf [in Fire.zip]).

Observations in the most concentrated area of tree mortality in the riparian corridor of the 1999 Rapid River fall prescribed burn revealed mortality in far less than 10% of mature riparian trees, with mortality as low as 1% for the entire riparian burn area. Observations of the 1999 under-burn in riparian areas

dominated by grand fir in the Rapid River area documented mortality of mature trees as very low to low. Observations of riparian areas within the 1994 Rapid River burn show that the effects are invisible in the grand fir riparian areas. Observations of the 1990 burn show that effects of prescribed fire uphill of riparian areas are now invisible (this CD2: \Support Documents\Fire\RapidRiverMay2004 [in Fire.zip]). Study plots established in the late 1980s on the Camp Creek burn area to monitor post-fire soil movement found essentially no movement of soil (J. Lund, Krassel District Fish Biologist, personal communication).

Some effects of prescribed burning have also been described elsewhere. A fall prescribed fire, which covered 43% of a previously undisturbed ponderosa pine watershed in east-central Arizona, did not increase annual or seasonal stream flow significantly over a 6-year study period (Gottfried and DeBano 1989). Fire consumed little of the forest floor, although surface fuels were generally consumed. Baker (1989) found that prescribed burns in the Southwest usually have minimal hydrologic impact on watersheds because the surface vegetation, litter, and forest floor are only partially burned. If properly executed, prescribed burns will not significantly affect the integrated overland flow and stream flow regime of a watershed.

Impacts to riparian areas from prescribed burning are not expected to be so severe that stream temperatures would be affected. The majority of the acreage (about 80-90%) to be burned would be a low intensity under-burn. Over-story mortality of 2% and up to 15% is expected in burned areas. Observations of other prescribed burns indicate the percentages of over-story mortality would be even less in riparian areas. These low levels of canopy removal are not expected to cause increases in stream temperatures. Controlled burning that occurred in riparian areas would stimulate regeneration of some riparian species that may have become decadent due to fire exclusion, contributing to stream shading.

One intended effect of prescribed burning is to reduce the likelihood of large stand replacing wildfire. Previous prescribed burns reduced the amount and continuity of fuel available for large stand-replacing fires (Suzanne Acton, Former New Meadows District fuels specialist, personal communication, 2003). Large, stand-replacing fires might theoretically adversely affect the quality of habitat for the listed fish species, but this has not been shown by monitoring on the PNF (Minshall et al 1994; Bowman and Minshall 1999). Data collected on the PNF show no fine sediment deposition increase from either prescribed burns or wildfire (Nelson et al. 1999, 1996a, 1996b, 1997, 1998; Nelson and Burns 1999). Fish habitat is generally not adversely affected by wildfire, and changes to habitat that result from wildfire are considered natural. Field review of past Rapid River prescribed burns in 2000, 2001, and 2003 found that fire had burned in a mosaic pattern at varying intensities and severities in upland areas. Where burning had occurred in riparian areas it had also been in a mosaic pattern, had been of low intensity and severity as new under-story growth could be seen, had killed very few trees, and had virtually no impact on vegetation directly adjacent to streams (Dale Olson, PNF fisheries biologist, personal communication, 2003).

The National Marine Fisheries Service recognizes that the introduction of prescribed fire could have potential long-term benefits in restoring habitat functions in RHCAs (Biological Opinion for LRMPs, Chinook salmon, 1995). The Biological Opinion for LRMPs, steelhead (NMFS 1995c) added items under "Fire Management" to be implemented to reduce or avoid adverse effects to steelhead and listed salmon. These include maximizing the use of planned ignitions and natural prescribed fire to meet vegetation management objectives."

Effects of any holding action, action to reduce the spread, of prescribed fire are expected to be the same as described for fire suppression above. The same mitigation measures would apply for fire suppression, or holding actions on prescribed fire.

Effects of Mitigation Measures

Effects to stream temperature are mitigated in all actions to negligible levels where guidelines are followed. Stream temperature is largely controlled by shading. The density of the riparian canopy is a critical factor in determining heat input to a reach (Amaranthus et al. 1989). Stream temperatures

increased by as much as 10 °C in headwater streams after high intensity wildfires in basins burned during the Silver Complex fire in southern Oregon (Amaranthus et al 1989). Stream shade went from 90% pre-fire to 30% post fire. Wildfire that burned moderately altered the thermal stability of South Fork Salmon River streams compared to reference streams studied by Royer and Minshall (1997), but not to a degree that is likely to be ecologically significant. Return to pre-fire thermal regimes is expected as surrounding riparian vegetation recovers. Even in intensely burned areas, resprouting and increased canopy cover of riparian vegetation may occur over a few years following a fire (Rieman et al. 1995; BAER reports 1994). Severe wildfires that consume all the vegetation in small catchments are expected to have a greater impact on stream temperatures than those found in the study of South Fork streams (Royer and Minshall 1997); therefore, limitations on ignitions for back burns, burnouts, and planned ignitions should be effective mitigation.

Fish being sucked up into pumps or impinged on improperly screened pump foot-valves, retardant or fuel spills entering streams and causing fish mortality, LWD removed from streams during fireline construction, sedimentation from un-rehabilitated fireline, redd trampling during stream fording, and disturbance of spawning Chinook salmon or bull trout are examples of how this action can potentially affect fishes and/or habitat. The federal action discussion provides direction such as properly screening pumps, not dropping retardant in RCAs or streams, containing fuel, proper handling or use of chemicals, not removing RCA trees unless they present a hazard, rehabilitating disturbed areas (e.g., fireline, helispots, camps), to address potential effects.

Properly screening pumps (i.e, with 3/32" mesh screen) will prevent fish from being impinged or entrained. Not dropping retardant in streams, following direction for containment of fuels, and use of other chemicals (foams) will keep contaminants from entering streams and causing fish mortality. Not removing trees felled within RCAs will reduce soil disturbance and potential sediment moving to streams as well as provide stream cover and diversity, shade, sediment filtering, allochthonous material, and other benefits depending on where the trees lie. Rehabilitation of disturbed areas such as fireline, camps, staging areas, and helibases will serve to stabilize those areas and limit sediment entering streams. In addition, direction to see that fire personnel are briefed and familiar with fire management guidelines in this BA, and oversight and continued education/briefing of fire personnel on fires by resource advisors will be implemented. This action is expected to have negligible effects due to implementation of mitigation measures and guidelines, continued education of fire personnel, and use of resource advisors.

3. Direct and Indirect Effects of Noxious Weed Treatment

Chemical Control

As part of the aquatic analysis for herbicide application, a risk quotient was developed for each herbicide product that may be used to treat noxious weeds on the PNF (Tables 12, 13). The risk quotient was calculated from a no adverse effect level, or safety factor, divided by an "Expected Environmental Concentration" (EEC). The EEC, expressed in parts per million (ppm), was derived from a direct application of the active ingredient to an acre pond (one-foot deep) using the maximum rate specified on the label (Urban and Cook 1986). The EEC is an extreme level that is unlikely to occur during implementation and should be viewed as a worst-case situation. The risk quotient provides a reference from which a possible worst-case situation can be viewed. If the risk quotient is greater than 10, the level of concern is categorized as "Low". If the risk quotient is between one and 10, the level of concern is Moderate. If the risk quotient is less than one, the level of concern is High. Levels of Concern were used to develop mitigative prescriptions for stream buffers (see "Required Mitigation" in Federal Action). Spray card monitoring on the stream banks have shown that buffers have been effective in preventing sprayed herbicides from reaching streams (Pete Grinde, Payette NF Weed Coordinator, McCall, ID, personal communication).

- No spraying would occur when wind velocity exceeds 8 miles per hour; no spraying would occur if precipitation is occurring or is imminent (within 3 hours);

- Only very low risk, “aquatic-approved” chemicals (e.g. glyphosate-Rodeo®) could be used within 50 feet of open water, where hydrophilic or riparian plants are present, and/or where surface material is obvious recent deposition of sediment of any diameter(s).

Table 12.—Worksheet for assessing risk quotient values and levels of concern associated with herbicide applications for aquatic species. EPA risk definitions and safety factors are assumed to be current, and were used in the NOAA draft BO for the Effects of Treatment of Noxious Weeds under the Frank Church River of No Return Wilderness Management Plan (NMFS 2007 CD1: \Support Documents\BAs\LOCs\noaa_weeds_bo_07.pdf)

Methodology for Determining Level of Concern	Example using 2,4-D
Maximum application rate (known constant based on label rates)	3 lb ai/ac (pounds active ingredient per acre)
EEC - Estimated Environmental Concentration (from Urban and Cook table cited based on direct application to a pond 1 acre-foot in volume) measured in ppb (parts per billion), and converted to ppm (parts per million)	at 3 lb ai/ac, in 1 acre-foot water, the EEC = 1103 ppb or 1.103 ppm
Toxicity - the 96-hour LC_{50} (a standard test) for a specific aquatic species. The LC_{50} is the concentration of a toxicant that causes mortality in 50% of the test organisms under a specific set of conditions.	LC_{50} = 250 mg/L (milligrams per liter), or = 250 ppm (testing conducted with rainbow trout)
Safety Factor - A divisor applied to the toxicity value to establish a concentration below which risk is acceptable (as determined by EPA). For endangered aquatic species, EPA uses 1/20 of the LC_{50} value.	1/20 of the LC_{50} = 12.5 ppm (250 ppm x 1/20 = 12.5 ppm)
The EPA has determined that there is a presumption of unacceptable risk to endangered aquatic species if the EEC > 1/20 LC_{50}. Conversely, if the EEC < 1/20 LC_{50}, the application rate used to calculate the EEC should not result in an unacceptable risk to endangered aquatic species.	For the 2,4-D amine, where: EEC = 1.103 ppm at 3 lb ai/ac maximum application rate 1/20 the LC_{50} = 12.5 ppm EEC is < 1/20 of the LC_{50}
Because of some of the concerns associated with this level of concern (risk) analysis (see Table in the text) and because the EPA does not define a magnitude of risk of endangered species, especially when the EEC < 1/20 LC_{50}, a gradual “level of concern” scale was developed based on how close the EEC value is to the 1/20 LC_{50}. The 1/20 LC_{50} value is divided by the EEC value and the quotient represents the level of concern for a given herbicide. The level of concern scale is as follows: If the 1/20 LC_{50} ÷ EEC is a quotient of >10, the level of concern is low. If the 1/20 LC_{50} ÷ EEC is a quotient of >1 but <10, the level of concern is moderate. If the 1/20 LC_{50} ÷ EEC is a quotient of <1, the level of concern is high.	For 2,4-D amine: 1/20 the LC_{50} = 12.5 ppm EEC = 1.103 ppm 12.5 ppm ÷1.103 ppm = 11 Since the quotient is >10, the level of concern is low.

Table 13.—Risk quotient values and aquatic level of concern assessment for chemical products used by the PNF (information from NMFS [2007, CD1: \Support Documents\BAs\LOCs\noaa_weeds_bo_07.pdf] except as indicated).

Active ingredient and soil half life (range) in days	Product name and EPA Registration Number	Typical Application Rate (lb/ai/acre[a])	Label-Maximum Application Rate (lb/ai/acre)	EEC (ppm)	Toxicity 96-hr. LC_{50} (mg/L)	Safety Factor 1/20 LC_{50} (ppm)	Species Tested	Highly Volatile[b]	Quotient Value (1/20 LC_{50}/EEC) and Level of Concern
Clopyralid	Transline® 62719-259	0.5	0.5	0.184	103	5.2	Rainbow trout	No	28 Low
Glyphosate 47 (21-60)	Rodeo® 524-323	1.0	3.75	1.379	>1000	50	Rainbow trout	No	36 Low
Metsulfuron methyl 120 (14-180)	Escort®	1.5 oz (0.094 lb/ac)	2.0 oz	0.046	>150	7.5	Rainbow trout	No	163 Low
Picloram 90 (20-277)	Tordon™ 22K 62719-6	0.5	1[c]	0.368	5.5-19.3	0.965	Rainbow trout	No	2 Moderate
2,4-D 10(2-16) amine	Weedar® 64 264-2AA	1.0	3	1.103	250	12.5	Rainbow trout	No	11 Low
Dicamba	Banvel®	0.25-4.0	4.0	1.47	>1000	50	Rainbow trout	No	34 Low
Imazapic	Plateau®	0.06-0.2	0.75	0.276	>100	5.0	Rainbow trout	No	18 Low

[a] The application rates are those commonly used on the PNF.
[b] Mostly inferred from NMFS (2007) which states that "[n]o highly volatile herbicides are approved for use within the FC-RONRW"; these herbicides were all approved.
[c] Maximum rate per acre of picloram is 1 lb; rates may be higher for smaller portions of the acre, but the total use on the acre cannot exceed 1 lb ai/ac/year.

The basic toxicology of the herbicides to be used is presented in Table 14. This information is summarized primarily from NMFS (2007, CD1: \Support Documents\BAs\LOCs\noaa_weeds_bo_07.pdf), except that the bioaccumulation information was summarized from the FC-RONRW noxious weed treatment final BA (USFS 2003, CD1: \Support Documents\BAs\Other\FCRONRW_Final_Weeds_BA.pdf).

Table 14.—Toxicology profile of commonly used herbicides on the PNF.

Toxicology	Transline™	Rodeo®	Escort®	Tordon™	Weedar®	Banvel®	Plateau®
	Clopyralid	Glyphosate	Metsulfuron–methyl	Picloram	2,4-D Amine 4	Dicamba	Imazapic
Rainbow Trout (LC_{50}, mg/L)	103	140	>150	19.3	250	28	>100[a]
Level of Concern for Aquatic Species	Low	Low	Low	Moderate	Low	Low	Low
Daphnia (LC_{50}, mg/L)	232 - 350	780 - 930	>12.5[b]	68.3	184[c]	<11	>100
Bioaccumulates[d]	No	No	No	No	No	No	No
Persistent in Soil[e]	Moderately	No	Moderately	Moderately	Moderately	No	Yes
Mobile in Soil[f]	Yes	No	No	Yes	Moderately	Yes	Yes

[a] Not reported for rainbow trout, but NMFS (2007) suggests this value may be appropriate for most fish species.
[b] Ahrens (1994, CD1: \Support Documents\Toxicity\escort.pdf).
[c] USFS (2006, CD1: \Support Documents\Toxicity\093006_24d.pdf)
[d] Taken verbatim from USFS (2003).
[e] Derived from "Soil Half Life" in Table 4 of NMFS (2007).
[f] Derived from "Pesticide Movement Rating" in Table 4 of NMFS (2007).

Effects of chemical control were evaluated using indicators from the effects matrices (Appendix 3) as follows:

Local population indicators.—Sub-lethal effects to listed fish and their food sources are probable, therefore adverse effects are expected from this action. Herbicide runoff, volatilization, and drift are the primary mechanisms of off-target movement of chemicals. Off-target movement can result in unintended injury to nontarget species, and contamination of surface waters. Volatilization would be minimized with the use of nonvolatile herbicide formulations (2,4-D amines are much less volatile than 2,4-D esters for example) and avoiding application of herbicides during hot days. Herbicide drift would be minimized with the use of nozzles with large orifices that produce large spray droplets, using drift control agents, and spraying during calm conditions. Ground application minimizes drift because spray nozzles can be in close proximity to target species and to the ground. Restrictions on the use of non-persistent herbicides in close proximity to water, where riparian or hydrophilic plants are present, and where surface material is obvious recent deposition (Table 15, below), would reduce risks associated with herbicides moving into surface waters or leaching into ground water.

Table 15.—Buffers, maximum wind speed, application methods, and herbicide restriction associated with aquatic habitats, riparian areas, and wetland resources on the PNF.

Buffer	Maximum Wind Speed	Herbicide Application Method	Herbicides Authorized
>50 feet from open water	8 mph	All propsed methods (Ground spraying, hand spraying, wicking, wiping)	Picloram, Clopyralid, Metsulfuron methyl, 2,4,D amine, Dicamba, Imazapic, Glyphosate
<50 feet from open water, where riparian or hydrophilic plants are present, and/or where surface material is obvious recent deposition of sediment of any diameter(s)	8 mph	All proposed methods (Ground spraying, hand spraying, wicking, wiping)	Glyphosate (Rodeo®) ("aquatic approved" herbicides) only

Given the exposure, toxicity, and indirect effect information described following this section for proposed chemicals, sub-lethal effects to listed fish and their food sources are probable, therefore adverse effects are expected from this action. The risk of toxic effects from the proposed action depends primarily on the likelihood that herbicides enter water, the toxicity of the herbicide formulation, and the duration and concentration of herbicides once they reach the water. The risks vary considerably among treatment areas, ranging from virtually no risk in upland areas that lack stream channels and have well-developed soils, to low -moderate risks in areas adjacent to streams, on alluvial deposits composed largely of gravels and sand, and where large amounts of herbicides are applied.

Some potential risks of the action are unknown where information concerning sublethal effects and effects of inert ingredients in the herbicide formulations is lacking or incomplete. Sublethal effects associated with the herbicides used in the proposed action include reductions in reproductive success, weight loss, physiological effects (endocrine system, blood chemistry, liver function, etc.), and reductions in growth, prey capture ability, and swimming ability, all of which are associated with reduced survival. Information available on sublethal effects of all herbicides proposed for use is incomplete for some chemicals and completely lacking for others. Few herbicide formulations have been thoroughly tested for sublethal effects on salmon or steelhead. There are no field studies available that evaluated potential effects of the herbicides used in the proposed action on aquatic productivity or invertebrate prey species found in Idaho streams. Consequently, the extent and likelihood of harmful sublethal effects from the proposed action from sublethal exposures and changes to the invertebrate prey base are unknown, but cannot be discounted.

If herbicides enter water in an appreciable amount, they could adversely affect listed salmon and steelhead through lethal or sublethal effects of exposure to the herbicide or other additives in the product formulation, alteration of the food web, or loss of riparian vegetation from contact with herbicides. The action includes numerous features and safeguards that minimize the likelihood of appreciable water contamination, such as relatively small and scattered treatment areas, ground-

based application, low amounts of chemical application, and application methods that reduce the likelihood of water contamination through wind drift or runoff, and restriction of herbicides used near water to those that have relatively low toxicity to aquatic organisms. Available water quality monitoring by the USFS for past weed treatments are limited, but suggest that safeguards similar to those in the proposed action are likely limiting the occurrence of water contamination and the concentrations of chemicals when water contamination occurs (NMFS 2007). Buffers are a key safeguard and are evaluated for each herbicide as follows:

- **Tordon™ (picloram):** all proposed application methods may be used; but only more than 50 feet from open water, where hydrophilic or riparian plants are not present, and where no surface material is obvious recent deposition of sediment of any diameter(s)
- **Transline™ (clopyralid):** all proposed application methods may be used; but only more than 50 feet from open water, where hydrophilic or riparian plants are not present, and where no surface material is obvious recent deposition of sediment of any diameter(s)
- **Escort® (metsulfuron–methyl:** all proposed application methods may be used; but only more than 50 feet from open water, where hydrophilic or riparian plants are not present, and where no surface material is obvious recent deposition of sediment of any diameter, where hydrophilic or riparian plants are not present, and where no surface material is obvious recent deposition of sediment of any diameter(s)
- Weedar® **(2,4-D amine):** all proposed application methods may be used; but only more than 50 feet from open water, where hydrophilic or riparian plants are not present, and where no surface material is obvious recent deposition of sediment of any diameter(s)
- **Banvel® (dicamba):** all proposed application methods may be used; but only more than 50 feet from open water, where hydrophilic or riparian plants are not present, and where no surface material is obvious recent deposition of sediment of any diameter(s)
- **Plateau® (imazapic):** all proposed application methods may be used; but only more than 50 feet from open water, where hydrophilic or riparian plants are not present, and where no surface material is obvious recent deposition of sediment of any diameter(s)
- **Rodeo® (glyphosate):** all proposed application methods may be used; this chemical is approved by the EPA for aquatic use and may be used up to the waters edge, where hydrophilic or riparian plants are present, and where surface material is obvious recent deposition of sediment of any diameter(s).

Buffers should reduce the risk of adverse effects to listed aquatic species, their prey, and non-target riparian vegetation from spray drift or herbicide runoff. Buffer zones have been used previously to minimize (not eliminate) potential effects of herbicides to aquatic resources. In the North Fork Payette River watershed, buffer zones of 50 to 100 feet were used to protect from spraying designed to control weeds and undesirable conifers (CD1: \Support Documents\NEPA\BEs\North Fork Payette River\NFPR be1.pdf). Spray card monitoring on the stream banks has shown that buffers have been effective in preventing sprayed herbicides from reaching streams (Pete Grinde, Payette NF Weed Coordinator, McCall, ID, personal communication).

Risks were evaluated for an accidental direct spraying of a pond (Tables above). Streams are the most likely habitat types to be treated under the proposed action and due to the moving water and resultant dispersal of any contaminate combined with project design criteria that minimize potential exposure, the pond evaluation is considered an overestimate of any likely conditions on the ground. According to risk calculations for realistic (typical) exposures, risks to aquatic species are low to moderate for all herbicides proposed for use (Tables above). Use of appropriate buffers along bodies of water and avoidance of spraying on windy days minimizes risk. Risks from accidental direct spraying of a water body of an herbicide mixture into a water body exist, but the probability of either event occurring is low.

Fuel and herbicide transportation, storage, and emergency spill plans would be developed and implemented to reduce the risk of an accidental spill which may occur from the use of large amounts of fuel and/or herbicides. A catastrophic spill of fuels or herbicides reaching waters with listed species

would have potential for significant adverse effects; however, the probability for such an event to occur is negligible.

Characteristics of Proposed Herbicides.—This section, which discusses in detail the chemical, biological, and ecological properties of the herbicides to be used was taken directly from NMFS (2007, CD1: \Support Documents\BAs\LOCs\noaa_weeds_bo_07.pdf), though the format has been changed slightly. We have not provided, and likely not have, the individual citations in this section, except for the SERA risk assessment documents (produced by Syracuse Environmental Research Associates, Inc. for USFS) on CD1 in folder ..\Support Documents\Toxicity:

Picloram

Exposure.—Picloram is highly soluble in water, readily leaches through soil, and is resistant to biotic and abiotic degradation processes with a field half-life of 20 to 300 days. Ismail and Kalithasan (1997) found that picloram moves rapidly out of the top 2 inches of soil with a half-life of about 4 to 10 days. Somewhat longer half-lives of 13 to 23 days have been reported by Krzyszowska et al. (1994) who also noted that picloram is degraded more rapidly under anaerobic than aerobic conditions and also degrades more rapidly at lower application rates. Generalized estimates of peak levels of picloram in water ranged from 0.012 mg/L in sandy soil to 0.025 mg/L in clay soil, when applied at an application rate of 0.45 kg acid equivalents (a.e.) per acre, and modeled as transport directly into a pond (SERA 2003a). Water concentrations expected from the proposed action would likely be far less than the concentrations modeled in SERA (2003a).

SERA (2003a) identified a peak estimated rate of contamination of ambient water associated with the normal application of picloram at 0.05 (0.01 to 0.2) mg a.e./L at an application rate of 1 lb a.e./ac. Typical application rates for picloram in the proposed action range from 0.125-0.5 lb a.e./ac, with a maximum label rate of 1 lb a.e./ac. At the maximum application rate of 1 lb. a.e./L, the expected levels of picloram in ambient water, using the worst-case scenario in the BA and generalized modeling in SERA (2003a), picloram concentrations would likely be well below levels causing death in rainbow trout. Considering the fact that chemicals from the proposed action that reach a stream would be more dilute in running water in comparison to a pond, and that application of picloram would not occur within 50 feet of any stream, it is unlikely that picloram will reach water in an amount causing outright mortality in the majority of locations where the herbicide will be used. The most likely scenario where picloram will enter the stream is where weeds are treated on floodplains with a high water table and highly permeable soils.

Toxicity.—The proposed action includes the use of Tordon 22K, which contains picloram as the active ingredient, and also contains the inert ingredients potassium hydroxide, ethoxylated cetyl ether, alkyl phenol glycol ether, and emulsified silicone oil. Toxic assays of the product formulation are not available. Rainbow trout exposed to picloram in 96-hour exposures have an LC_{50} from about 0.8 mg/L to about 20 mg/L, while chronic studies using reproductive or developmental parameters for trout report no-effect levels of 0.55 mg/L and adverse effects levels of 0.88 mg/L (SERA 2003a). Presmolt stages of coho salmon exposed to sublethal concentrations of picloram in freshwater were found to have a 70% higher mortality rate in the smolt stage when the fish were later exposed to seawater (Lorz et al. 1979).

Most of the potential sublethal effects for picloram have not been investigated in regard to toxicological endpoints that are important to the overall health and fitness of salmonids (e.g., growth, life history, mortality, reproduction, adaptability to environment, migration, disease, predation, population viability). Sublethal effects concentrations reported in the literature vary. Woodward (1979) found that picloram concentrations greater than 0.61 mg/L decreased growth of cutthroat trout and a similar finding was reported by Mayes (1984). Maximum exposure concentrations not affecting survival and growth of cutthroat trout ranged from 290 to 48 µg/L in Woodward's (1979) study. Picloram concentrations modeled as the worst-case scenario in the BA would approach or exceed the thresholds identified by Woodward (1979)

where salmonid growth and survival may be affected. Tests with the early life-stages of rainbow trout showed that picloram concentrations of 0.9 mg/L reduced the length and weight of rainbow trout larvae, and concentrations of 2 mg/L reduced survival of the larval fish (Mayes et al. 1987). Woodward (1976), in a study of lake trout, found that picloram reduced fry survival, weight, and length at concentrations of 0.04 mg/L, and that the rate of yolk sac absorption and growth of lake trout fry was reduced in flow-through tests at concentrations as low as 0.35 mg/L. These effects were observed at herbicide concentrations that may be encountered from the proposed action. Yearling coho salmon exposed to 5 mg/L of picloram for 6 days suffered "extensive degenerative changes" in the liver and wrinkling of cells in the gills (EPA 1979).

Indirect Effects on Aquatic Organisms.—Although picloram is toxic to salmonids, it is not as toxic to *Daphnia* or algae at the same concentrations. In *Daphnia* the reported acute (48-hour) LC_{50} value is 68.3 (63 to 75) mg/L. Chronic studies using reproductive or developmental parameters in *Daphnia* report a no-effect level of 11.8 mg/L and an adverse effect level of 18.1 mg/L (SERA 2003a).

The toxicity of picloram to aquatic plants varies substantially among different species. Based on the available toxicity bioassays, the most sensitive species is *Navicula pelliculosa*, a freshwater diatom, with an EC_{50} (i.e., the concentration causing 50% inhibition of a process for growth) of 0.94 mg a.e./L and a No-Observable-Effect Concentration (NOEC) of 0.23 mg a.e./L. The least sensitive aquatic plants appear to be from the genus *Chlorella* (another group of freshwater algae), with EC_{50} values greater than 160 mg a.e./L. Macrophytes appear to have a sensitivity that is in the upper range of that seen in algae, with a reported EC_{50} of 164 mg a.e./L in duckweed (SERA 2003a).

Given the information reported above, the proposed action is unlikely to cause adverse effects to zooplankton and algae; however, the potential for adverse effects to aquatic invertebrates other than *Daphnia* is unknown.

Effects on Non-Target Plants.—While most grasses are resistant to picloram, it is highly toxic to many broad-leafed plants. Picloram is persistent in the environment, and may exist at levels toxic to plants for more than a year after application at normal rates. In normal applications, non-target plants may be exposed to chemical concentrations many times the levels that have been associated with toxic effects. Spray drift has been shown to kill crops a short distance away from the area being treated. Under the proposed action, picloram will not be used within 50 feet of water, or within 100 feet of water if winds exceed 5 mph. These precautionary measures greatly reduce the likelihood that the action will result in any significant loss of non-target riparian vegetation. Picloram's mobility allows it to pass from the soil to nearby, non-target plants. It can also move from target plants, through roots, down into the soil, and into nearby non-target plants. Since picloram will not be used within 50 feet of live water, riparian shrubs, forbs, and saplings will not be exposed to picloram. Large riparian trees with roots that extend beyond the 50-foot streamside zone may be injured by picloram; however, beyond occasional injury to mature trees, no appreciable changes in riparian trees are likely to occur.

2,4-D (amine salt only)

Exposure.—The herbicide 2,4-D is available in a variety of chemical forms with different toxicities to fish. The products identified in the proposed action contain the amine salt form, which has the lowest toxicity among the various 2,4-D formulations. The worst-case exposure scenario modeled for 2,4-D in the BA estimated maximum concentrations to be from 2.2 to 2.7 mg/L. The herbicide 2,4-D is highly soluble in water, but it rapidly degenerates in most soils, and is rapidly taken up in plants. 2,4-D ranges from being mobile to highly mobile in sand, silt, loam, clay loam, and sandy loam (USFS 1995a). Consequently, 2,4-D may readily contaminate surface waters when rains occur shortly after application, but is unlikely to be a ground-water contaminant due to the rapid degradation of 2,4-D in most soils and rapid uptake by plants. Most reported 2,4-D ground-water contamination has been associated with spills or

other large sources of 2,4-D release. 2,4-D may remain active for 1 to 6 weeks in the soil and will degrade to half of its original concentration in several days (USFS 1995a). Soils high in organic matter will bind 2,4-D the most readily. 2,4-D is degraded in soil by microorganisms and degradation is more rapid under warm, moist conditions.

Transport of 2,4-D into rivers by storm runoff is likely to occur from rain events within or shortly following the spray season, based on documented studies. Out of 32 stream samples collected downstream from helicopter application of 2,4-D, 2,4-D was found in all samples collected and in highest concentrations following a rainstorm the day after the spraying (Rashin and Graber 1993). In a national study of surface water quality, 2,4-D was found in 19 of 20 basins sampled throughout the United States (USGS 1998).

Toxicity.—Weedar 64 and Amine 4 are the 2,4-D formulations proposed for use. Both products contain roughly 53% inert ingredients that are not identified on the label. Toxicity assays are reported for the active ingredients only; consequently, the actual toxicity to fish is unknown for exposure to Weedar 64 or Amine 4. In rainbow trout, tests of the 2,4-D dodecyl/tetradodecyl amine salt on several life stages yielded LC_{50}s of 3.2 mg/L for fingerlings, 1.4 mg/L for swim-up fry, 7.7 mg/L for yolk-sac fry, and 47 mg/L for eggs (USFWS 1980). For Chinook salmon in the fingerling stage, tests of the dodecyl/tetradodecyl amine salt yielded a 96-hour LC_{50} of 4.8 mg/L and at the yolk-sac stage, a 96-hour LC_{50} yielded 2.9 mg/L (USGS 2001). Based on the exposure modeling in the BA and reported lethal assays, 2,4-D contamination from the proposed action could reach or exceed the lowest LC_{50} under the worst case scenario, while remaining at slightly one-half or less of the lowest concentration reported for sublethal effects.

Most of the potential sublethal effects from exposure to 2,4-D have not been investigated for endpoints important to the overall health and fitness of salmonids. Exposure to 2,4-D has been reported to cause changes in schooling behavior, red blood cells, reduced growth, impaired ability to capture prey, and physiological stress (NIH 2002; Gomez 1998; Cox 1999). Exposure to the 2,4-D amine salt at a concentration of 5 mg/L reduces the ability of rainbow trout to capture food (Cox 1999). 2,4-D can combine with other pesticides and have a synergistic effect, resulting in increased toxicity. For example, combining 2,4-D with picloram damages the cells of catfish (*Ictalurus spp.*) gills, although neither individual pesticide has been found to cause this damage (Cox 1999). Little et al. (1990) examined behavior of rainbow trout exposed for 96 hours to sublethal concentration of 2,4-D amine and observed inhibited spontaneous swimming activity and swimming stamina.

Indirect Effects on Aquatic Organisms.—The SERA (1998) report suggests that amine and acid formulations have relatively low toxicity to aquatic invertebrates and aquatic plants, although the effects are highly variable. Insect larvae are most susceptible to adverse effects, while zooplankton are the least susceptible (Sarkar 1991). Acute toxicity tests exposing the cladoceran, *Simocephalus vetulus*, to the sodium salt of 2,4-D show complete mortality following 96 hours of exposure to concentrations ranging from 0.5 to 5.0 mM (Kaniewska-Prus 1975). Using a molecular weight of 221 for 2,4-D acid, these levels correspond to 0.1105 to 1.105 grams a.e./L. The EPA (1989) reported for the dimethylamine salt, a LC_{50} for grass shrimp of 0.2 mg/L. SERA (1998) concluded that some species of aquatic algae are sensitive to concentrations of approximately 1 mg/L 2,4-D; however, low levels of the compound may stimulate algal growth in some species. Ester formulations have much greater toxicity, but are not proposed for use in this action.

Glyphosate (Rodeo formulation only)

Exposure.—Glyphosate strongly binds to most soils, but dissolves easily in water. Glyphosate remains unchanged in the soil for varying lengths of time, depending on soil texture and organic matter content. The half-life of glyphosate can range from 3 to 130 days (USFS 1995b). Soil microorganisms break down glyphosate and the potential for leaching is low due to the soil adsorption. However, glyphosate can move into surface water when the soil particles to which it is bound are washed into streams or rivers (EPA 1993). Studies examined glyphosate residues in surface water after forest application in British Columbia with and without no-spray streamside zones. With a no-spray streamside zone, very low concentrations were sometimes found in water and sediment after the first heavy rain (USFS 1995b). Although glyphosate is chemically stable in pure aqueous solutions, it is degraded relatively fast by microbial activity, and water levels are further reduced by the binding of glyphosate to suspended soil particulates in water and dispersal (SERA 2003b).

After an aerial application of Roundup at a rate of 1.8 lb a.i./ac in British Columbia streams that were intentionally oversprayed, maximum concentrations of glyphosate reached 0.16 mg/L and rapidly dissipated to less than 0.04 mg/L after 10 minutes. After a storm event, peak concentrations in stream water were less than 0.15 mg/L, rapidly dissipating to less than 0.02 mg/L before the end of the storm event (Feng et al. 1990, Kreutzweiger et al. 1989). At the same application rate, another Canadian study noted maximum stream concentrations of 0.109 to 0.144 mg/L, occurring 7 to 28 hours after aerial application. Similar results were noted in a study conducted in Oregon (Newton et al. 1984). Maximum water levels in streams reached 0.27 mg/L following repeated helicopter applications directly across a small stream at an application rate of 2.9 lbs/ac. Peak concentrations of glyphosate under the proposed action are likely to be lower than these examples of helicopter spraying, since the herbicides will be applied by hand. As reviewed by Neary and Michael (1996), some applications have resulted in much lower concentrations in streams, in the range of 0.003 to 0.007 mg/L per lb applied (Neary and Michael 1996, Table 11, p. 253). The highest residues were associated with sediments, indicating that they were the major sink for glyphosate. Residues were noted throughout a 171-day monitoring period. Suspended sediment is not a major mechanism for glyphosate transport in rivers, but glyphosate sprayed in road ditches or other drainage structures could readily be transported as suspended sediment and cause acute exposures following rain events.

Toxicity.—Glyphosate is available in a variety of formulations with different toxicities to fish. The primary hazards to fish appear to be from acute exposures to the more toxic formulations, where the toxicity is likely caused by surfactants rather than the active ingredient. Only the Rodeo formulation, which lacks surfactants, is proposed for use. At the typical application rate of 2 lbs a.e./ac, the hazard quotients for the more toxic formulations at the upper ranges of plausible exposure indicate that the LC_{50} values for these species will be not reached or exceeded under worst-case conditions (SERA 2003b). Reported tests of glyphosate (technical grade or formulations without surfactants) toxicity to fish for 24 to 96 hour LC_{50} values range from approximately 10 mg/L at a pH of 6, to >200 mg/L at a pH of 10 (Smith and Oehme 1992; EPA 1993). Technical glyphosate acid (parent compound) is “practically nontoxic” to fish. The 96-hour LC_{50} for technical grade glyphosate in rainbow trout ranges from 1.3 mg/L (USGS 2002), to a range of 86 to 140 mg/L reported in SERA (2003b). The results of a rainbow trout yolk-sac 96-hour LC_{50} static bioassay ranged from 3.4 to 5.3 mg/L (USGS 2002).

The use of less toxic formulations result in acute hazard quotients that do not approach a level of concern (LOC) for any species. Nonetheless, the hazard quotient of 0.08 for sensitive species at an application rate of 2 lbs/acre is based on an LC_{50} value rather than a sublethal assay or NOEC. Thus, the use of glyphosate near bodies of water where sensitive species of fish may be found (i.e., salmonids) should be conducted with substantial care to avoid contamination of surface water. Concern for potential effects on salmonids is augmented by the potential effects of low concentrations of glyphosate on algal populations (SERA 2003b).

Information on sublethal effects of glyphosate is available for many of the endpoints important to the overall health and fitness of salmonids and, of those reported, glyphosate appears to carry a low risk for sublethal effects (SERA 2003b).

Indirect Effects on Aquatic Organisms.—Glyphosate is highly toxic to all types of terrestrial plants and is used to kill floating and emergent aquatic vegetation. Glyphosate does not appear to have similar toxicity to algae. Glyphosate is considered by EPA to be "slightly toxic" to aquatic invertebrates (SERA 2003b). LC_{50} values of 780 and 930 mg/L have been reported for *Daphnia*. Hildebrand et al. (1980) found that Roundup treatments at concentrations up to 220 kg/ha did not significantly affect the survival of *Daphnia* or its food base of diatoms under laboratory conditions. In addition, Simenstad et al. (1996) found no significant differences between benthic communities of algae and invertebrates on untreated mudflats and mudflats treated with Rodeo. It appears that under most conditions, rapid dissipation from aquatic environments of even the most toxic glyphosate formulations prevents build-up of herbicide concentrations that would be lethal to most aquatic species (Tu et al. 2001).

Clopyralid

Exposure.—Clopyralid's half-life in the environment averages 1 to 2 months and ranges up to 1 year. It is degraded almost entirely by microbial metabolism in soils and aquatic sediments. Clopyralid is not degraded by sunlight or hydrolysis. Similar to picloram, clopyralid is highly soluble in water, does not bind to soil particles, is not readily decomposed in some soils, and may leach into ground water. Clopyralid is extremely stable in anaerobic sediments, with no significant decay noted over a one year period (Hawes and Erhardt-Zabik 1995; Tu et al. 2001). Because clopyralid does not bind readily with sediments, it is likely to disperse in flowing waters, and remain at progressively lower concentrations as it moves downstream. The clopyralid half-life ranges from 8 to 40 days (Tu et al. 2001). Clopyralid is stable in water over a pH range of 5 to 9 (Woodburn 1987) and the rate of hydrolysis in water is extremely slow, with a half-life of 261 days (Concha and Shepler 1994).

Because Clopyralid does not bind tightly to soil it has a high potential for leaching. While clopyralid will leach under conditions that favor leaching, such as sandy soil, a sparse microbial population, and high rainfall, the potential for leaching or runoff is functionally reduced by the relatively rapid microbial degradation of clopyralid in soil (e.g. Baloch-Haq et al. 1993; Bergstrom et al. 1991; Bovey and Richardson 1991). A number of field lysimeter studies and the long-term field study by Rice et al. (1997) indicate that leaching and subsequent contamination of ground water are likely to be minimal. This conclusion is also consistent with a short-term monitoring study of clopyralid in surface water after aerial application (Leitch and Fagg 1985).

SERA (2003c) estimated peak rates of contamination of ambient water associated with the normal application of clopyralid to be 0.02 (0.005 to 0.07) mg a.e./L at an application rate of 1 lb a.e./ac. For longer-term exposures, average estimated rate of contamination of ambient water associated with the normal application of clopyralid is 0.007 (0.001 to 0.013) mg a.e./L at an application rate of 1 lb a.e./ac.

Toxicity.—Little information is reported for toxic effects of Clopyralid. Clopyralid is available in two forms (acid and amine salt) which have different toxicities to fish. Transline, which is the product identified in the proposed action, uses the monoethanolamine salt of clopyralid, which appears to have very low toxicity, compared to the acid formulation present in some other products. Toxicity of the acid formulation of clopyralid for a 96-hour LC_{50} is reported in SERA (2003c) to be 103 mg a.e./L, using an unspecified life stage of rainbow trout. Similarly, Tu et al. (2001) reported LC_{50}s for steelhead of 104 mg/L. For the monoamine salt form used in the proposed action, SERA (2003c) reported a 96-hour LC_{50} of 700 mg a.e./L. No longer-term toxicity studies are available on the toxicity of clopyralid to fish eggs or fry (SERA 2003c). No information is available on sublethal effects.

The material safety data sheet for Transline indicates the product contains roughly 60% inert ingredients that include polyglycol 26-2, which is a surfactant that belongs to a class of chemicals sometimes referred to as alkylphenol ethoxylates. Alkylphenol ethoxylates are generally much more toxic to fish than clopyralid, with estrogenic and growth effects in trout observed at concentrations on the order of 1 to 10 ppb (µg/L) (Bakke 2003).

Indirect Effects on Aquatic Organisms.—Toxic effects on aquatic invertebrates are reported only for *Daphnia*, which has an LC_{50} of 350 mg a.e./L for the monoamine salt and 232 mg a.e./L for the acid LC_{50} (SERA 2003c). If other invertebrates respond similarly to *Daphnia*, then lethal effects on aquatic invertebrates are unlikely.

Aquatic plants are more sensitive to clopyralid than fish or aquatic invertebrates (SERA 2003c). From information reported in SERA (2003c) it appears that there could be potential losses in primary productivity from algae killed by clopyralid, based on an EC_{50} for algae of 6.9 mg/L. However, concentrations lethal to algae are unlikely to occur unless clopyralid is directly added to water, or if a rainfall washes the chemical into a stream shortly after it is applied.

Imazapic

Exposure.—A study by Ta (1994) identified a soil half-time of 113 days. Tu et al. (2001) reported a similar average soil half-life of 120 days, and is primarily degraded by soil microbial metabolism. Imazapic is moderately persistent in soils, and has not been found to move laterally with surface water (generally moving only 6 to 12 inches laterally but can leach to depths of 18 inches in sandy soils). Although the extent to which imazapic is degraded by sunlight is believed to be minimal when applied to terrestrial plants, it is rapidly degraded by sunlight in aqueous solutions (half-life of 1 to 2 days). Imazapic is water soluble and is not degraded hydrolytically in aqueous solutions (Tu et al. 2001).A study by Ta (1994) identified a soil half-time of 113 days. Tu et al. (2001) reported a similar average soil half-life of 120 days, and is primarily degraded by soil microbial metabolism. Imazapic is moderately persistent in soils, and has not been found to move laterally with surface water (generally moving only 6 to 12 inches laterally but can leach to depths of 18 inches in sandy soils). Although the extent to which imazapic is degraded by sunlight is believed to be minimal when applied to terrestrial plants, it is rapidly degraded by sunlight in aqueous solutions (half-life of 1 to 2 days). Imazapic is water soluble and is not degraded hydrolytically in aqueous solutions (Tu et al. 2001).

Simulations of imazapic were conducted for both clay, loam, and sand at annual rainfall rates from 5 to 250 inches and the typical application rate of 0.0624 lb a.e./ac (SERA 2004a). Based on the modeling, under arid conditions (i.e., annual rainfall of about 10 inches or less), no runoff is expected and degradation, not dispersion, accounts for the decrease of imazapic concentrations in soil. At higher rainfall rates, plausible offsite movement of imazapic may result in runoff losses that range from about 1% to 45% of the application rate, depending primarily on the amount of rainfall rather than differences in soil type. In very arid environments substantial contamination of water is unlikely. In areas with increasing levels of rainfall, exposures to aquatic organisms are more likely to occur. Thus, the anticipated concentrations in ambient water encompass a very broad range, 0.00003 to 0.0114 mg/L, depending primarily on differences in rainfall rates (SERA 2004a).

SERA (2004a) estimated peak concentrations of imazapic in contamination water to be 0.0005 mg/L (0.00005 to 0.01) mg a.e./L per 1 lb a.e./ac, for an annual rainfall of 50 inches. For longer-term exposures, average estimated rate of contamination of ambient water associated with the normal application of imazapic is 0.00002 mg a.e./L (0.00001 to 0.00003 mg a.e./L) at an application rate of 1 lb a.e./ac.

Toxicity.—Imazapic is available in acid and ammonium salt forms. Platueau, which is proposed for use, is formulated with the ammonium salt, which is less toxic than acid formulations. Fish appear to be relatively insensitive to imazapic exposures, with LC_{50} values

>100 mg/L for both acute toxicity and reproductive effects. In acute toxicity studies, all tested species (channel catfish, bluegill, sunfish, trout, and sheepshead minnow) evidenced 96-hour LC_{50} values of >100 mg/L. The low toxicity of imazapic to fish is probably related to a very low rate of uptake of this compound by fish. In a 28-day flow-through assay, the bioconcentration of imazapic was measured at 0.11 L/kg (Barker and Skorsynski 1998) indicating that the concentration of imazapic in the water was greater than the concentration of the compound in fish. Barker and Skorsynski (1998) observed no effects on reproductive parameters in a 32-day egg and fry study using fathead minnow.

No studies are reported in the SERA assessment (2004a) for sublethal effects of imazapic to listed fish. Barker and Skorsynski (1998) observed no effects on reproductive parameters in a 32-day egg and fry study using fathead minnow. Even though imazapic itself appears to be only moderately toxic to fish, based on the LC_{50}, Plateau contains roughly 76% inert ingredients that are not identified by the manufacturer. With many herbicides, the inert ingredients may be more toxic to fish and other aquatic organisms than the active ingredient. While toxicity tests are reported for imazapic, there is no apparent information regarding the toxicity to salmon and trout for the product formulation in Plateau, which includes imazapic and unspecified inert ingredients. Consequently, the toxic effects of salmon or trout exposure to Plateau are unknown.

Indirect Effects on Aquatic Organisms.—Relatively little information is available indicating the effects of imazapic on aquatic organisms in the natural environment. No adverse effects to *Daphnia* or mysid shrimp were observed at nominal concentrations of imazapic of up to 100 mg/L in 96-hour studies (SERA 2004a); however, the report did not specify if the analysis included any sublethal endpoints. Effects of imazapic on aquatic plants are highly variable. *Lemna gibba*, a freshwater macrophyte, is the most sensitive aquatic plant reported in the literature, with an EC25 value based on decreased frond counts of 0.00423 mg/L. Algaes were less sensitive than macrophytes (reported LC_{50} values > 0.045 mg/L), and responses included both growth inhibition and growth stimulation (SERA 2004a).

Dicamba

Exposure.—In soil, dicamba is very mobile because it binds poorly to most soils. Dicamba is also readily soluble in water, so its transport is influenced by precipitation. At low rainfall rates, dicamba dissipation had a half time of approximately 20 days. At high rainfall rates using modeled runs, virtually all the dicamba was washed from the soil. As detailed in SERA (1995), the environmental fate of dicamba has been extensively studied. In general, dicamba is very mobile in most soil types, with the only reported exception being peat, to which dicamba is strongly adsorbed (Grover and Smith 1974). For many soil types, the extent of soil adsorption is positively correlated with and can be predicted from the organic matter content and exchangeable acidity of the soil (Johnson and Sims 1993). In a monitoring study by Scifres and Allen (1973), dicamba levels in the top 6 inches of soil dissipated at a rate of approximately 22% per day over the first two weeks following application, with a soil half-life of 3.3 days. After 14 days no dicamba was detected, with the limit of detection of 0.01 µg/g, in the top 6 inches of soils. Residues at all depths were less than 0.1 µg/g. The rates of dissipation in clay and loam were essentially identical.

Available monitoring data indicate that ambient water may be contaminated with dicamba after standard applications of the product. The range of average to maximum dicamba levels in water, reported in a monitoring study by Waite et al. (1992), are from 0.1 to 0.4 µg/L. SERA (1995) characterized the water concentration of dicamba in a severe spill as approximately 10 mg/L, which could result in some fish mortality.

SERA (1995) concluded that ambient concentrations of dicamba in water will vary considerably, depending on various site-specific conditions. The maximum level reported in ambient surface water is 37 µg/L, 5 hours after direct aerial spraying of a stream with dicamba at a rate of 1 lb/acre (Norris and Montgomery 1975). Because the proposed action will not be

applying dicamba by this method maximum concentrations of dicamba are likely to be lower. Monitored levels of dicamba in water, caused by rights-of-way management were reported by (Muir and Grift 1987) to be 0.12 to 5.48 µg/L

Toxicity.—The product proposed for use (Banvel) is formulated with the dimethylamine salt, with roughly 60% inert ingredients that include an unspecified amount of ethylene glycol. Ethylene glycol has much lower toxicity to fish than dicamba. Available information on the toxicity of Banvel to fish is limited to assays using only the active ingredient; consequently, the toxicity of Banvel to listed fish is unknown. There is wide variation in the reported acute toxicity of dicamba to fish, with 24-hour LC_{50} values ranging from 28 mg/L to more than 500 mg/L. Most laboratory assays in SERA (1995) reported LC_{50} values >100 mg/L. In bluegill sunfish, the standard 96-hour LC_{50} is 600 mg/L, but when the herbicide was adsorbed onto vermiculite, the LC_{50} dropped to around 20 mg/L (USFS 1984). In a study by Lorz et al. (1979), yearling coho mortality was observed at 0.25 mg/L during a seawater challenge test which simulates their migration from rivers to the ocean. An LC_{50} of 28 mg/L in trout was reported by Johnson and Finley (1980). Little is known about effects on fish other than acute toxicity.

Indirect Effects on Aquatic Organisms.—The range of toxicity values of dicamba to aquatic invertebrates suggests wide variation among species. Consequently, available assays provide little insight about the toxicity of dicamba to invertebrate species consumed by listed salmon and steelhead. Seed shrimp, glass shrimp, and fiddler crabs are killed by concentrations over 100 mg/L, while *Daphnia* and amphipods are killed by concentrations in the range of 3.9 to 11 mg/L (Cox 1994). The low end of this range is several orders of magnitude higher than water concentrations observed by Waite et al. (1992), but within the range of concentrations SERA (1995) described for a moderate to severe spill.

Sublethal effects on aquatic invertebrates are unknown. The only endpoints that have been examined are acute lethal responses for aquatic animals (LC_{50} values) and growth inhibition in unicellular algae (EC_{50} values). Algae species are much more sensitive to dicamba than fish (SERA 1995).

Metsulfuron–methyl

Exposure.—Metsulfuron-methyl is generally active in the soil. It is usually absorbed from the soil by plants. The adsorption of metsulfuron-methyl to soil varies with the amount of organic matter present in the soil, and with soil texture and pH. Adsorption to clay is low. The half-life of metsulfuron-methyl can range from 120 to 180 days (in silt loam soil). There are major areas of uncertainty and variability in assessing potential levels of exposure in soil. In general, metsulfuron-methyl absorption to a variety of different soil types will increase as the pH decreases (i.e., the soil becomes more acidic). The persistence of metsulfuron-methyl in soil is highly variable, and reported soil half-lives range from a few days to several months, depending on factors like temperature, rainfall, pH, organic matter, and soil depth. Off-site movement of metsulfuron-methyl is governed by the binding of metsulfuron-methyl to soil, the persistence in soil, as well as site-specific topographical, climatic, and hydrological conditions.

Metsulfuron-methyl will degrade faster under acidic conditions, and in soils with higher moisture content and higher temperature (Extoxnet 1996). Soil microorganisms break down metsulfuron-methyl to lower molecular weight compounds under anaerobic conditions. Metsulfuron-methyl in the soil is broken down to nontoxic and non-herbicidal products by soil microorganisms and chemical hydrolysis. Metsulfuron-methyl dissolves easily in water. There is a potential for metsulfuron-methyl to contaminate ground waters at very low concentrations. Metsulfuron-methyl readily leaches through silt loam and sand soils.

Metsulfuron-methyl environmental fate and transport simulations reported in SERA (2004b) were conducted for clay and sand at annual rainfall rates ranging from 5 to 250 inches and the typical application rate of 0.02 lb ai/ac. In sand or clay under arid conditions (i.e., annual rainfall of about 10 inches or less), there is no percolation or runoff and the rate of decrease of

metsulfuron-methyl concentrations in soil is attributable solely to degradation rather than dispersion. At higher rainfall rates, plausible concentrations in soil range as high as 0.007 mg/L and, under a variety of conditions, concentrations of 0.0005 mg/L and greater may be anticipated in the root zone for appreciable periods of time. Metsulfuron-methyl exposure to aquatic species is affected by the same factors that influence terrestrial plants, except the directions of the impact are reversed. In very arid environments (i.e., where the greatest persistence in soil is expected) substantial contaminations of water is unlikely. In areas with increasing levels of rainfall, toxicologically significant exposure to aquatic plants is more likely to occur. As summarized in SERA (2004b), peak water levels of about 0.003 to 0.006 mg/L can be anticipated under worst case conditions at rainfall rates of 25 to 50 inches per year after a single application.

Toxicity.—Metsulfuron-methyl is non-lethal to fish at the peak concentrations likely to be encountered by listed salmon and steelhead and peak concentrations are many orders of magnitude lower than the concentrations where various sublethal effects were observed in rainbow trout. Metsulfuron-methyl does not bioaccumulate in fish. The lowest concentration at which mortality was observed in any species of fish is 100 mg/L for rainbow trout; however, in the same study, no mortality was observed in fish exposed to 1000 mg/L (Hall 1984). SERA (2004b) concluded that mortality is not likely to occur in fish exposed to metsulfuron-methyl concentrations less than or equal to 1000 mg/L.

Debilitating sublethal effects (erratic swimming, rapid breathing, and lying on the bottom of the test container) were observed by Muska and Hall (1982) after exposure to 150 mg/L for 24 hours. In tests with rainbow trout, no significant long-term effects (90-day exposure) were observed by Kreamer (1996) on hatch rate, last day of hatching, first day of swim-up, larval survival, and larval growth at concentrations up to 4.7 mg/L. Concentrations greater than 8 mg/L resulted in small but significant decreases in hatching and survival of fry.

The metsulfuron-methyl product used in the proposed action is Escort, which contains 40% inert ingredients that include Sodium naphthalene sulfonate-formaldehyde condensate; a mixture of a sulfate of alkyl carboxylate and sulfonated alkyl naphthalene, sodium salt; polyvinyl pyrrolidone, trisodium phosphate, and sucrose (NCAP 2006). There is insufficient information on the toxicity of napthelene-based surfactants and polyvinyl pyrrolidone to fish to determine the impact on fish. All of these ingredients are commonly used in household cleaning products or as food additives. Polyvinyl pyrrolidone is marketed as a disinfectant for fish aquaria and treatment of certain fish infections; consequently, the product is not likely to be toxic to listed trout at environmental concentrations encountered in the proposed action. Because the amount of each of the various inert chemicals in Escort and the toxicity of some of the inert ingredients are unknown, there is no assurance that the proposed action will avoid toxic effects to listed fish if fish are exposed to the product in any appreciable amount.

Indirect Effects on Aquatic Organisms.—Toxicity studies on aquatic invertebrates are reported only for *Daphnia*, which for acute exposure, a 48-hour NOEC for immobility of 420 mg/L is used. For chronic exposures, the NOEC of 17 mg/L for growth inhibition is used, although higher chronic NOECs, ranging from 100 to150 mg/L, have been reported for survival, reproduction and immobility (SERA 2004b). The only effect reported by Hutton (1989) in a 21-day *Daphnia* study was a decrease in growth at concentrations as low as 5.1 mg/L, but decreased growth at concentrations less than 30 mg/L was not statistically significant. In aquatic invertebrates, decreased growth appears to be the most sensitive endpoint. Wei et al. (1999) report that neither metsulfuron-methyl nor its degradation products are acutely toxic to *Daphnia* at concentrations that approach the solubility of the compounds in water at pH 7. Although the results of *Daphnia* studies suggest that metsulfuron-methyl is relatively non-toxic to invertebrates, toxic effects concentrations for different invertebrate species often vary widely, as seen in several herbicides reviewed in this Opinion. Consequently, given the limited data available on invertebrate effects, there is insufficient information to draw any conclusion

about the toxicity of metsulfuron-methyl on invertebrates consumed as prey by listed salmon and steelhead.

There are substantial differences in sensitivity to effects of metsulfuron-methyl among algal species, but all EC_{50} values reported in SERA (2004b) are above 0.01 mg/L, and some values are substantially higher. Toxicity in algae increases with lower pH, most probably because of decreased ionization leading to more rapid uptake. At a concentration of 0.003 mg/L, metsulfuron-methyl was associated with a 6 to16% inhibition (not statistically significant) in algal growth rates for three species but stimulation of growth was observed in *Selenastrum capricornutum* and the aquatic macrophyte, duckweed (SERA 2004b). Wei et al. (1998; 1999) assayed the toxicity of metsulfuron-methyl degradation products in *Chlorella pyrenoidosa* and found that the acute toxicity of the degradation products was about two to three times less than that of metsulfuron-methyl itself in a 96-hour assay. One field study cited in SERA (2004b) on the effects of metsulfuron-methyl in algal species found that concentrations of metsulfuron-methyl as high as 1 mg/L are associated with only slight and transient effects on plankton communities in a forest lake.

All watershed condition indicators.—Removal of solid stands of vegetation by chemical treatment may result in short-term, insignificant increases in surface erosion that would diminish as vegetation reoccupies the treated site. The speed of site vegetation and the plant composition of the new vegetation would depend on the persistence and selectivity of the herbicide used. Chemical control of noxious weeds is expected to result in negligible adverse effects to sediment yield. Risk for effects to non-target vegetation are lowest with wicking, backpack or hand operated sprayers.

Channel condition, water quality, and habitat condition Indicators.—Spraying of "long-lived" persistent herbicides (e.g. Tordon) would not be authorized within 50 feet of any live waters. This would reduce risks associated with residual herbicides that persist in the soil and continue to affect newly emerging plants or sprouting perennial shoots. Restrictions on the use of non-persistent herbicides in close proximity to water would reduce risks associated with herbicides moving into surface waters or leaching into ground water. Only aquatic-approved herbicides (glyphosate - Rodeo) would be authorized for use within 50 feet of live waters or where hydrophilic or riparian plants are present, or where surface material is obvious recent deposition of sediment of any diameter(s). Ground based herbicide application would result in reduction of noxious weeds within riparian areas and along stream banks. Negligible effects to stream bank stability are expected. A reduction of noxious weeds in riparian areas and along stream banks could benefit native plant species and result in improved stream bank stability and riparian condition. Negligible and unmeasurable effects that are attributed to chemical control are expected to occur to water temperature, large woody debris, streambank condition, sediment, and related features. Chemical control is expected to have adverse effects to water contamination, but risk will be reduced because of the buffers which would be used along riparian areas and due to the use of special guidelines for ground based herbicide application within riparian areas and along live waters. These include:

- The Weed Coordinator will map and identify buffers, methods of application, and herbicide restrictions that may be required for the project,
- No herbicide storage, mixing or post-application cleaning would be authorized within RCAs (100 feet of any live waters). Mixing and loading operations must take place in an area where an accidental spill would not contaminate a stream or body of water before it could be contained.
- No spraying of herbicides other than glyphosate (Rodeo) would be authorized within 50 feet of any live waters, where hydrophilic or riparian plants are present, and where surface material is obvious recent deposition of sediment of any diameter(s)
- Only very low risk, or "aquatic-approved" chemicals (glyphosate-Rodeo) could be used within 50 feet of open water, where hydrophilic or riparian plants are present, and where surface material is obvious recent deposition of sediment of any diameter(s).

Implementation of hazardous materials (fuel and herbicide) transportation, storage, and emergency spill plans would result in a low risk for hazardous material contamination (fuels and herbicides) of ground water and surface water.

Manual Control

In manual treatments workers primarily would cut plants off above ground level; pull, grub, or dig out plant root systems. The scope of this is very low for the amount of acreage treated annually. However, noxious weed control benefits are very high for treating sensitive areas (i.e. riparian areas, special status plant populations, developed recreation sites), dispersed recreation sites, remote areas, and spot control of individual plants and small patches.

Watershed condition indicators.—Minor soil and vegetation disturbance would occur from the small amount of manual noxious weed control conducted annually. This would result in negligible sediment effects. This method is very target specific and would have a negligible effect on riparian habitats. Beneficial effects would be expected from the reduction of noxious weeds encroaching on and invading riparian areas, wetlands, and streams.

Channel condition, water quality, and habitat condition indicators.—Minor soil and vegetation disturbance would occur within riparian areas and along stream banks from manual noxious weed control. Any adverse impact to sediment and stream bank stability is expected to be negligible because prescribed buffers will result in only a minor area of disturbance.. A reduction of noxious weeds in riparian areas and along stream banks would benefit native plant species and improve stream bank stability and riparian condition. No adverse effects attributed to manual control are expected to occur to these indicators because the area affected is small (less than 25 acres per Section 7 watershed), and because prescribed buffers will minimize the amount of riparian areas and plants that are affected..

Biological Control

Biological methods of vegetation treatment use living organisms to selectively suppress, inhibit, or control herbaceous and woody vegetation. This method is viewed as one of the more natural processes because it requires the proper management of plant-eating organisms and precludes the use of mechanical devices, chemical treatments, or burning of undesired vegetation. Biological weed control activities include the release of insect agents that are parasitic to target noxious weeds. This activity includes the collection of beetles/insects, development of colonies for collection, transplanting parasitic beetles/insects, and supplemental stocking of populations. Development of biological control insect colonies (nursery sites) for collection purposes would often not have active weed control, because these sites would be managed for propagation of insects. Controlling the host noxious weed species would reduce the insects food supply and cause a decline in the numbers of these beneficial insects that would be available for transplanting efforts.

Watershed condition indicators.—This method is very target specific and would have no adverse effect on riparian species. Beneficial effects would be expected from the reduction of noxious weeds encroaching on and invading riparian areas, wetlands, and streams.

Channel condition, water quality, and habitat condition indicators.—A reduction of noxious weeds in riparian areas and along stream banks would benefit native plant species and improve riparian condition. No adverse effects attributed to biological control are expected to occur to water temperature, suspended sediment, deposited sediment, or from water contamination.

Rehabilitation, Seeding, Plantings – Mechanical Control

After weeds are controlled on a site it is beneficial to establish desirable vegetation that would compete with noxious weeds and restrict or prevent additional infestations. These treatments may involve ground or aerial application of seeds. Mechanical treatment is normally limited to raking by hand, or ATV drawn drag rake.

Watershed condition indicators.—Broadcast seeding (aerial or ground) would result in no short-term adverse effects to watershed condition indicators. Long-term benefits would occur from establishment of desirable vegetation that would reduce adverse erosion and sediment.

Channel condition, water quality, and habitat condition indicators.—A reduction of noxious weeds and establishment of desirable vegetation would reduce potential for future noxious weed encroachment into riparian areas. No adverse effects attributed to rehabilitation and/or use of mechanical equipment would occur to water temperature, suspended sediment, deposited sediment, or from water contamination. Potential for increased erosion/sediment is considered negligible and would be undetectable in live waters. Long-term benefits from reduced erosion/sediment would occur from establishment of desirable vegetation.

Cumulative Effects

It is reasonably certain that on-going herbicide application programs implemented by other federal, state, county and private land managers/owners that have been conducted within the proposed action area are likely to continue. The full scope of their programs is not known to the PNF. The State of Idaho, Counties, Idaho Transportation Department has in the past and continues to conduct an active spray program for controlling noxious weeds. At this time it is difficult to determine the amount of total herbicide use by federal, state, and county agencies and private landowners within a particular watershed.

Other land management activities which are reasonably certain to continue into the future, and which may affect implementation of the proposed action at some level include livestock grazing, agriculture, timber harvest, road and other facilities maintenance, recreation, prescribed fire, emergency fire rehabilitation, and other surface-disturbing activities. These actions, which take place on other federal, state and private lands within the proposed action area, may actually contribute to the need to maintain or increase current levels of noxious weed treatment for many years into the future. The USFS (and presumably other federal and state agencies) manage lands with goals to maintain and enhance natural resources, which would include mitigating actions that should be conducive to preventing or reducing weed infestations. As such, implementation of this proposed action in addition to other land management activities is not expected to contribute significantly to a continuing need to treat noxious weeds at site-specific locations into the future. Proper implementation and monitoring of all land management activities is expected to have a beneficial effect to the long-term treatment of noxious weeds. The levels of types of activities that take place on private lands and their impact to the PNF's ability for long-term noxious weed control, is unknown. It is reasonable to expect that the cumulative effects of private land management activities, as with other federal and state activities, would be as various as the landowners and the lands being managed. However, in the absence of cooperative agreements between federal/state and private landowners, it is expected that activities on private lands, particularly on lands upstream, adjacent, and intermingled with public lands, would continue to present challenges to weed management for the PNF.

4. DIRECT AND INDIRECT EFFECTS OF PETROLEUM PRODUCTS

Should fuel or other petroleum products enter live water, they would affect water quality and invertebrates and would directly affect the listed fish, should petroleum products come in contact with them. Fuels and other petroleum products can directly poison salmonids and their aquatic invertebrate food source. Fuels and petroleum products are moderately to highly toxic to salmonids, depending on concentrations and exposure time (Gutsell 1921, and Allen and Dawson 1961). Free oil and emulsions can adhere to gills and interfere with respiration, and heavy concentrations of oil can suffocate fish (McKee and Wolf 1963). Evaporation, sedimentation, microbial degradation, and hydrology act to determine the fate of fuels entering fresh water (Saha and Konar 1986). Sources of mortality to the listed fish from the types of effects described above can be density independent.

Fuel-related mitigation keeps fuels as far as possible from live water, and includes measures to reduce the likelihood of uncontained spills. The risk of fuel-related effects are reduced to very low levels because of these factors.

5. DIRECT AND INDIRECT EFFECTS OF GRAZING

The effects of grazing on fish habitat can include altered stream banks and riparian areas, which can result in sediment loading, increased water temperatures, and altered water tables and flow regimes (Platts 1991). Increased sediment from grazing is usually the result of bank trampling, overused trail crossings and overgrazed riparian areas. The threshold level at which fines begin to adversely affect the emergence and survival of salmonid embryos is somewhere between 10-15% (particle diameter less than 6.3 mm) and 20% (particle diameter including 6.3 mm) (Irving and Bjornn 1984).

Increased water temperatures can result from the removal of stream bank vegetation that provides shade, and from shallow, slow-moving reduced water flows through open stream areas. Salmonid species do not usually persist in waters where maximum temperatures consistently exceed 22º C, although they can withstand brief periods of temperatures as high as 25º C if nighttime cooling occurs (Behnke and Zarn 1976).

Grazing prescriptions such as rest rotation and deferred rotation, especially if improvements occur across the watershed, have fair to good stream rehabilitation potential (Platts 1991, Kondolf 1993). A recent 7-year study compared cattle grazing prescriptions and effect to impacted riparian areas (Myers and Swanson 1995). The study showed that deferred rotation grazing allowed much improvement of aquatic and riparian habitats, but the improvement was limited by the presence of roads, which apparently added sediment to the streams. Deferred rotation grazing in the absence of roads produced the second most improvement, and complete rest showed the most improvement. Pool habitat recovery lagged substantially behind improvements in bank stability and cover (Myers and Swanson 1995). No similar study has been conducted for sheep, but the general relationship between livestock grazing, riparian effects, and impacts to fish habitat is assumed to be similar for this analysis. A 30% utilization strategy in riparian areas provides stream bank protection and reduced sediment delivery to streams (Clary and Webster 1989). Rest-rotation systems can degrade previously ungrazed streams, and one year's rest can allow vegetation growth that subsequently attracts heavy grazing (Platts and Nelson 1985).

6. EFFECTS OF SEDIMENT ON SALMONIDS

Removal of vegetation, mechanical disturbance, and topographic alteration increase the erodibility of forest soils and, consequently, both the amount of soil available for transport and the likelihood of transport downslope and into streams. Once in streams, fine sediments (most frequently regarded as those smaller than 6.3mm in particle diameter) may be transported further downstream or deposited in slow water areas and behind obstructions, locally altering fish habitat conditions. In particular, fine sediment has been shown to fill the interstitial spaces among larger streambed particles, which can eliminate the living space for various microorganisms, aquatic macroinvertebrates, and juvenile fish. Potential problems associated with excessive sediment have long been recognized for a variety of salmonid species and at all life stages, from possible suffocation and entrapment of incubating embryos (Coble 1961, Phillips et al. 1975, Hausle and Coble 1976, McCuddin 1977, Cederholm and Salo 1979, Peterson and Metcalfe 1981, Irving and Bjornn 1984, Tagart 1984, Reiser and White 1988) through loss of summer rearing and overwintering cover for juveniles (Bjornn et al. 1977; Kelley and Dettman 1980; Hillman et al. 1987; Griffith and Smith 1993), to reduced availability of invertebrate food for resident adults (Tebo 1955; Nuttall 1972; Cederholm and Lestelle 1974; Bjornn et al. 1977; Alexander and Hansen 1986).

B. LOWER SOUTH FORK SALMON RIVER ANALYSIS AREA - DIRECT AND INDIRECT EFFECTS

1. MISCELLANEOUS FOREST PRODUCTS

Reduced shade and availability of recruitable LWD, ground disturbance yielding sediment delivery, and a fuel spill contaminating waters, are potential effects of Miscellaneous Forest Product activities. In general, refueling equipment, fuel storage, and activities that could disturb soil and vegetation will not occur within LRMP RCA buffers; therefore, effects to WCI's will be negligible. Public contact and education through signing will help minimize illegal removal of firewood from RCA's. Activities within LRMP RCA buffers will only occur after a journey level fisheries biologist and hydrologist has insured

that all of the mitigations described in the Federal action are followed. If followed the mitigations will insure that effects from activities in RCA's will be negligible because trees that could provide shade or LWD will not be removed and activities that could create measurable sediment delivery would not be allowed. Due to similarities in the mechanism and timing of effects miscellaneous forest products harvest and mistletoe control and precommercial thinning are described in the same effects matrix (Appendix 3).

2. Mistletoe Control And Precommercial Thinning

The potential negligible effects of this action are increased sedimentation from land disturbance, alteration of riparian communities, and reductions in large woody debris levels. Following LRMP guidelines, and the specific guidelines for conducting this action listed in this BA will avoid adverse effects to listed fish or their habitat. Mitigations and LRMP standards that would apply for actions within RCAs will insure that any temperature changes, sediment delivery, chemical contaminants, or reduction in LWD related to the actions is negligible (see Appendix 3). General effects from this action are addressed above under "Direct and Indirect Effects of Logging from Small Sales, Green and Salvage".

3. FIRE MANAGEMENT ACTVITIES

See "Direct and Indirect Effects of Fire", Section V.A.2., above.

4. FISH HABITAT AND RIPARIAN SAMPLING

The potential negligible effects of this action are related to disturbance of fish or eggs from turbidity or direct disturbance. The potential area for these effects is localized around the areas where surveyors are working. The required mitigation measures are intended to prevent these effects from occurring to WCIs in areas occupied by listed fish or eggs (Appendix 3). The fish habitat surveys involve walking in streams, which presents the possibility of personnel trampling redds, resulting in mortality or suspension of fine sediments but these effects are mitigated by training and avoidance. Where listed or sensitive fish species are present, short-term displacement from normal activities, such as feeding or breeding, is expected when personnel are present. However, these displacements are judged biologically negligible because of the extremely short duration of disturbance. Aquatic invertebrate sampling and sediment sampling procedures (core sampling, % fines, and free matrix) can all disturb fish and or resuspend sediments that could affect downstream redds. Any sediment that is generated is expected to settle out within the prescribed buffer distance (one stream width or within one habitat unit of any redd). The buffers are also judged to be effective in eliminating any potential harassment of adjacent fish. Because sampling will not occur closer than one stream width or one habitat unit, the potential for adverse effects are avoided as sediment is expected to settle out within that distance.

5. WATERSHED IMPROVEMENTS AND MAINTENANCE

These actions are designed and expected to cause short and long term improvements in habitat conditions, such as fish barrier removal, increase in large woody debris, riparian planting, streambank stabilization, and reduction in sediment delivery. Mitigations described in the Federal actions will insure that any temporary degrading effects from these actions are negligible. For example, erosion control measures that have proven effective in capturing and storing sediment on the Payette National Forest, and restrictions on use of mechanized equipment within RCA buffers will insure that any soil, streambank, or streambed disturbance and associated sediment delivery to the stream channel is temporary and minimal so that effects to listed fishes are negligible. Furthermore, a journey level fisheries biologist will insure that activities do not proceed if there is potential for more than negligible effects to individual listed fish, or their eggs. In Appendix 3 the effects of watershed and habitat improvements and maintenance are combined with the fish habitat and riparian sampling because they have similar negligible to improving effects. Due to similarities in the mechanism and timing of effects (especially for sediment) watershed and habitat improvements and maintenance and fish habitat and riparian sampling are described in the same effects matrix (Appendix 3).

6. NOXIOUS WEED MANAGEMENT

Noxious weed management is covered for the FCRONR Wilderness portion of this analysis area under a separate consultation. The effects of this action for the non-wilderness portion of the

watershed are described above in the section describing general noxious weed treatment effects (Section V.A.3.).

7. ROAD MANAGEMENT

The primary mechanism of effect from the road management action is sediment delivery to stream channels. When mitigations are followed, many road management activities such as graveling, water barring, dust abatement, blading, and replacement of plugged or damaged culverts, will result in less erosion and a reduction in sediment delivery to stream channels compared to not taking these road management actions. This is especially true with expected future increases in public travel on Forest roads. Specific mitigation that will insure sediment delivery is negligible includes erosion control on disturbed or exposed soil, restrictions on sidecasting material while blading or plowing snow, designing proper road surface drainage, proper maintenance of ditches, and for some actions mandatory approval by a journey level fisheries biologist, hydrologist, and in some instances the Level 1 team. A specific instance where the Level 1 team must approve an activity is if earth disturbance occurs, such as culvert replacement, in streams with listed fishes. This will give the Level 1 team the opportunity to insure the effects of these actions are not adverse. In all cases where road management activities run the risk of disturbing listed fishes in the immediate area (i.e., harassment, redd destruction) a fisheries biologist must first approve the activity by documenting the presence or absence of listed fishes, which reduces the likelihood of disturbance of listed fishes to negligible levels. With restrictions on removal of downfall and felled hazard trees from RCAs and direction to minimize brushing, along with the relative rarity that these actions occur, the effects from these actions on listed fishes or designated critical habitat will be negligible. Other mechanisms of effect include chemical contamination from salts used for dust abatement, and fuel spills. Due to restrictions on storing fuel or refueling equipment within RCAs, and requirements for containment, the chance of fuel contaminants reaching listed fishes is minor. Dust-abatement additives such as $MgCl_2$ are not likely to reach water with listed fishes because of the strong tendency to bind to the road surface thereby minimizing displacement. Furthermore, effects would be negligible due to the low toxicity at the concentrations that may be expected (see e.g., Heffner 1996). In addition, spill containment is required; therefore, the likelihood of spilled dust abatement chemicals reaching streams with listed fishes is negligible.

Road management, trail maintenance and recreation and administrative site operation and maintenance and the travel plan are interdependent Federal actions; therefore, they will be discussed collectively in the effects matrix (Appendix 3).

8. TRAILS, RECREATION AND ADMINISTRATIVE SITE OPERATION AND MAINTENANCE

This action and the travel plan Federal action are interdependent and therefore they will be discussed collectively in the effects matrix (Appendix 3).

Sediment delivery as a result of trail work or facility maintenance and repair is the primary potential effect of this activity. Potential exposure to petroleum products or other water contamination is also a concern, as is providing for passage of aquatic organisms at stream crossings.

Applying erosion control measures such as straw bales, erosion control matting, silt fence, seeding, and mulching on disturbed areas will serve to minimize sediment movement from disturbed areas and speed re-vegetation and soil stability. Measures implemented during trail maintenance or construction such as not sidecasting soils where they can be delivered to streams, placement of waterbars and rolling dips to move water off trails and into vegetation where sediment can be filtered, minimizing trail length perpendicular to stream crossings which may direct sediment toward streams, placing woody debris below rolling dips and waterbars to dissipate water flow and minimize erosion and sediment movement, and constructing short inclines to bridges to inhibit sediment movement onto bridge and eventually into streams are measures expected to minimize sediment entry into streams. Minimal sediment delivery associated with culvert placement/replacement is expected due to measures such as placing erosion control prior to other activities to catch sediment that may move, removing and storing fill material where it won't be delivered to limit sediment sources, and seeding and mulching site to speed site re-vegetation and stabilization.

Petroleum products from mechanized equipment presents the potential for water contamination. To minimize potential for effects due to petroleum contamination, mechanized equipment must have no oil or fuel leaks, equipment must be serviced outside RCAs, fuel for equipment will be stored outside RCAs in US DOT approved containers, and refueling of motorized equipment will occur as far from streams as is practicable, and on ground where a fuel spill would be easily contained. Spill containment equipment will be available. These measures are expected to minimize the potential for petroleum contamination and effects on listed fishes by and ensuring equipment is clean when near streams, and by having spill containment equipment available and putting distance between fuel/oil sources and waters thus providing the means and area for spill containment. Also, a journey level fisheries biologist will approve equipment fording to ensure machines are clean, and that fording occurs at times and places to minimize effects on listed fishes.

Wood preservative chemicals that may leach from materials used for bridges, raised trail treads etc. may also contaminate waters. Because all treated wood used shall be produced and used in compliance with "Best Management Practices for the use of wood in aquatic and other sensitive environments" (Western Wood Preservers Institute, 2006), and research has found that there are no measurable impacts on aquatic organisms if the wood is properly treated and installed, negligible effects are expected.

Minimal risk of sewage contamination is expected because most toilets used are vault style which are impermeable and do not leak into surrounding soils, and any replacement of septic systems will meet applicable DEQ and District of Health requirements.

At new and rebuilt trail culverts and fords, passage for aquatic organisms and all life stages will be provided for by using available tools (such as software) to determine necessary culvert specifications, (i.e., size, grade etc.), and placement of substrate as needed. In addition, to avoid effects to spawning fishes, fords will not be located where there is spawning habitat.

Overall, this action is expected to yield negligible effects on listed fishes or their habitat due to implementation of the above mitigation measures to minimize sediment delivery, minimize potential for petroleum or other chemical contamination, and provide for aquatic organism passage (Appendix 3).

9. TRAVEL PLAN

Potential effects of this action are: increased sedimentation in streams due to motorized and non-motorized use at road and trail stream crossings, increased chances of petroleum spills, and physical harm to eggs that may be present in redds at fords and elsewhere. Soils on roads and trails at stream crossings can be delivered as sediment to streams via wind, water, and tires at fords. As described above (section V. A. 6.), this additional sediment can reduce habitat quality and adversely affect incubating eggs, and petroleum products can directly poison salmonids and their aquatic invertebrate food source (section V. A. 4.). Mortality of listed fish eggs (adverse effect) can occur should redds be trampled or driven over. Trampling can occur due to any foot or horse use in streams, including use from anglers, swimmers, people floating in watercraft, people hiking, and similar activities. There are approximately 40 road crossings and 94 stream trail crossings in the Lower SFSR subwatershed, of which an unknown number are fords. About 90 percent of these trail crossings are assumed to be fords (Clem Pope, Recreation Manager, Payette NF, McCall, ID). Fording frequently occurs in spawning habitat because these are often the easiest places to cross a stream. Roberts and White (1992), found that twice-daily wading throughout trout egg development killed up to 96% of trout eggs and pre-emergent fry, while a single wading just before hatching killed up to 43% of eggs.

Under the new travel plan action, no motorized cross-country travel will be allowed. The reduction in fording and soil disturbance in RCAs (compared to baseline) associated with restricting motorized cross-country travel will improve the sediment and substrate embeddedness WCIs by only negligible amounts because travel across streams will still occur on authorized motorized routes, and existing areas of erosion are not remedied with the action. For the Lower SFSR subwatershed, the number of acres open to cross-country travel will be reduced by 21,949 acres, compared to the previous travel plan. Project Design Features and Best Management Practices (BMPs) will reduce sediment delivery

during reroute or reconstruction of previously unauthorized routes. Specific examples of Project Design Features and BMPs to reduce sediment delivery are part of the Road and Trail Maintenance federal actions and include: construction and maintenance of water management structures such as waterbars, rolling dips, and bridges; reclamation of abandoned trails, and designing reroutes to meet current Forest Service standards. The decrease in road/trail mileage for the Upper SFSR and East Fork SFSR have beneficial effects downstream in the Lower SFSR by decreasing sediment and substrate embeddedness downstream. Over time, increasing public use of roads and trails and related increases in sediment yield will degrade the sediment and substrate embeddedness WCIs in the short and long term. Because of the proximity of listed fish and critical habitat to roads and/or trails in this analysis area, increases in sediment due to travel plan actions are expected to have adverse effects.

The streambank condition WCI has two definitions for this analysis. For the Travel Plan EIS (CD2: \Support Documents\Travel Plan [in Travel Plan.zip]) analysis, miles of road and trail authorized for motorized use were used as an index of streambank condition, with the assumption that the number of stream crossings would increase with mileage. In the Lower SFSR subwatershed, streambank condition related to the number of road and trail crossings will be maintained because total mileage of roads and trails will be unchanged. For the LRMP WCI definition of streambank condition, there will be a temporary improvement when cross country motorized travel is restricted due to a reduction in the amount of fording and soil disturbance in RCAs. In the short and long term, streambank condition at existing crossings will degrade with increased public use. Road and trail maintenance activities (with related mitigations) that reduce erosion and sediment delivery to stream channels will decrease the magnitude of degrading effects to sediment, substrate, and streambank condition WCIs from expected increases in public use, but will not alter the general increasing trend. Disturbance history and regime, and RCA WCIs will improve with the restriction on motorized cross-country travel.

Motorized recreation is the most likely source of petroleum contamination with this action. Because motorized trails ford streams directly adjacent to occupied habitat, and roads also occur adjacent to and cross streams, a fuel spill in these areas is likely to result in adverse effects to listed fishes.

Adverse effects to listed fishes such as harassment or redd trampling are also likely to occur from fording streams on foot, horseback, or other non-motorized travel, as mentioned above.

10. WATER DIVERSION SUPS

a. Effects Related To All Diversions

The three potential effects of water diversion special use permits are: direct disturbance due to entrainment, sediment deposition, and reduction of habitat area due to removal of water.

The potential area for effects of entrainment and sediment deposition is around the points of diversion and immediately downstream. The required mitigation measures are intended to prevent these effects from occurring to WCIs in areas occupied by listed fish or eggs.

The diversions include small impoundments, pipes and/or ditches which could entrain fish, resulting in mortality or displacement of fish into unsuitable habitats. However, these effects are mitigated by screening (3/32" mesh) requirements. Screening of diversions with a mesh size of 3/32" has been shown to mitigate entrainment of Chinook salmon juveniles (NOAA 1995). PNF inspections of water diversions have documented general compliance with this measure (CD2: \Support Documents\SUPs\SFSR_Inspections.pdf [in SUPs.zip]). Monitoring has shown that generally, when permittees have been informed about noncompliance on this issue, screening has been implemented (Kathy Nash, PNF SUP coordinator, McCall Ranger District, McCall, ID, personal communication). Where mitigation measures have been implemented, they have been effective. Because screening with 3/32" mesh has been scientifically reported to be effective in mitigating entrainment of fish, and because PNF monitoring has shown that this mitigation measure has been implemented successfully, the potential for adverse effects is avoided as diversions are not expected to entrain fish.

The existence, maintenance, and/or reconstruction of diversion equipment could cause erosion of streambanks due to ground disturbance. Erosion could also occur due to leakage or washout of diversion equipment. The streambank erosion could result in sediment deposition downstream of diversions. However, these effects are mitigated by requirements for erosion control during maintenance and construction of diversion equipment, and for diversions being maintained in proper working order. Inspections of water diversions have documented general compliance with these measures (CD2: \Support Documents\SUPs\MFSR_Inspections.pdf [in SUPs.zip]). Monitoring has shown that generally, when permittees have been informed about noncompliance on this issue, mitigation measures have been implemented and effects have been reduced (Kathy Nash, PNF SUP coordinator, McCall Ranger District, McCall, ID, personal communication). Sediment deposition from ground disturbance or from inadequately maintained diversions is judged to be biologically negligible because of the rarity of its occurrence in inspection reports, because of the small size of the diversions and their associated maintenance requirements, and because of the short duration of maintenance and/or construction actions. The mitigation measures of erosion control and equipment maintenance are judged to be effective in eliminating "more than negligible" quantities of sediment deposition on downstream fish habitat. Because mitigation measures have been shown to be effective, the potential for adverse effects is avoided as sediment is not expected to be delivered in "more than negligible" quantities.

Other potential effects include the reduction of habitat area for listed fish and eggs due to removal of water from affected streams. In this analysis, the reduction of habitat area was modeled for each water diversion or group of water diversions based on modeled flow and habitat data from the Snake River Adjudication Team (data on file at Payette NF SO). In some cases and for some species, modeled effects are expected to be negligible because the amount of flow withdrawn by diversions is negligible, compared to the amount of water and habitat in the affected stream. In other cases and for other species, modeled effects of the diversions are expected to be adverse due to a "more than negligible" amount of flow and subsequent modeled habitat reduction, compared to the flow and habitat in the affected stream.

b. Sandy Cove Diversion

The Sandy Cove diversion removes 0.10 cfs from Pony Creek, tributary to the lower SFSR (see Description of Federal Action). Pony Creek supports steelhead, bull trout, and cutthroat trout. Average monthly flow data from the Snake River Adjudication Team is available for Pony Creek (Site PA057, Figure 6). The location of site PA014 is at the mouth of Pony Creek.

Low flows of 6-10 cfs occur in Pony Creek (Figure 6). The removal of 0.10 cfs by this diversion would be negligible compared to the subsequent small change in weighted useable area required for all life stages of cutthroat trout, bull trout, and steelhead represented in the following "area versus flow" models for Pony Creek (Figures 7-9). The amount is considered to be negligible because the amount of habitat that would change (in square feet) from a withdrawal of 0.10 cfs is immeasurable, even at low flows, given the following models.

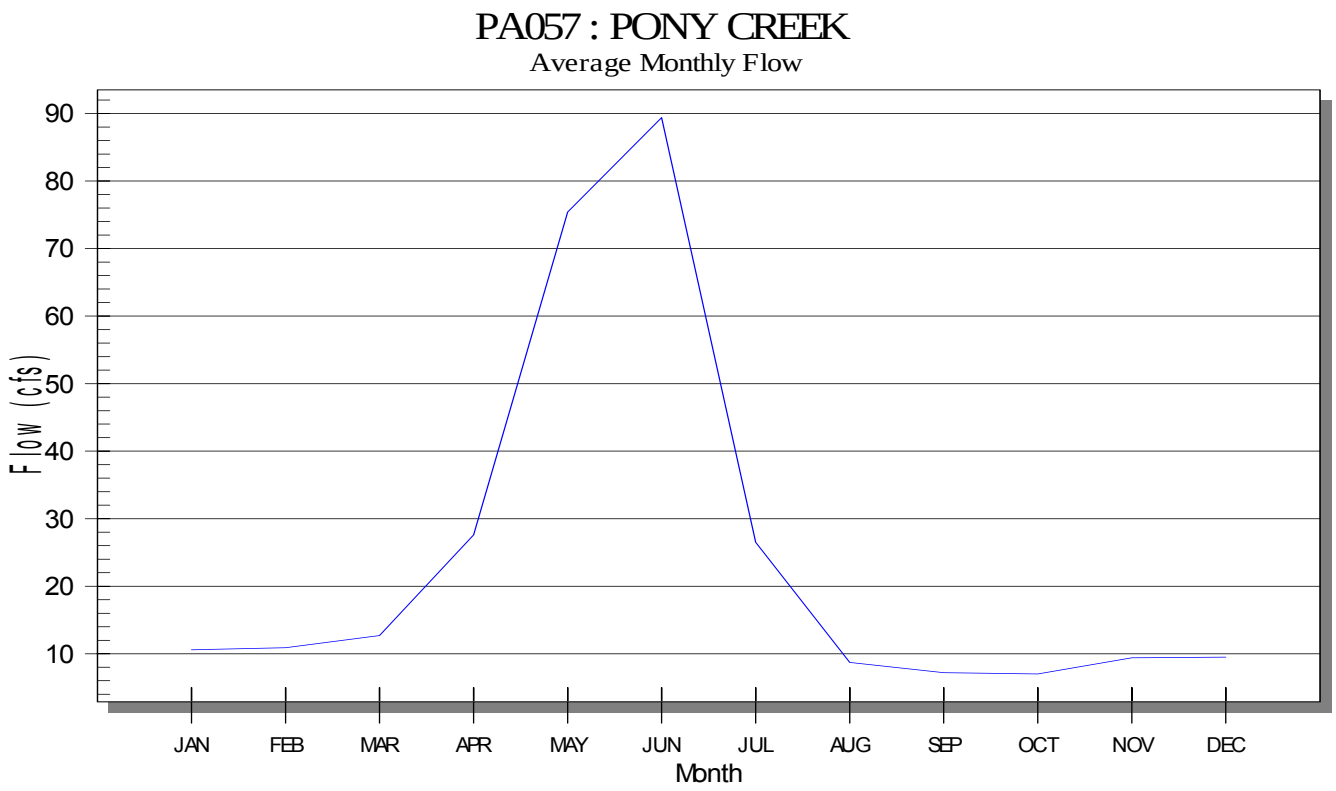

Figure 6.—Pony Creek Site PA057 average monthly flow (Snake River Adjudication Team data, on file at PNF SO).

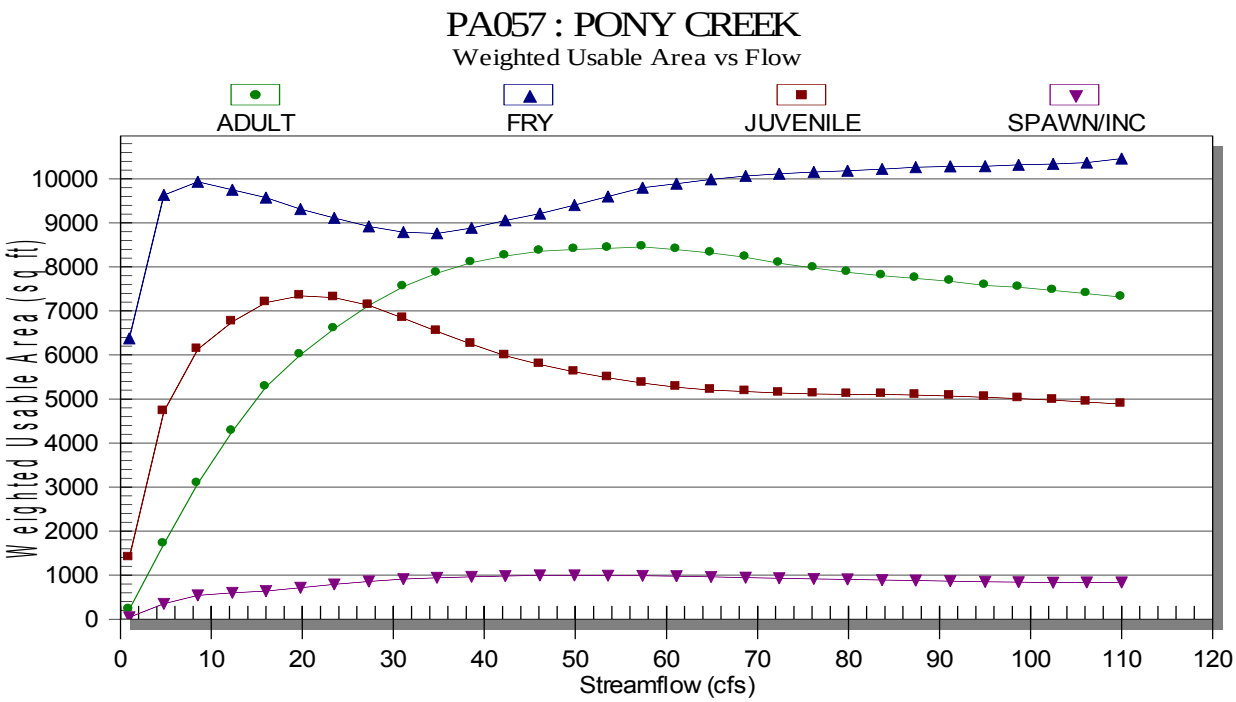

Figure 7.—Cutthroat trout – Pony Creek Site PA057 weighted usable area vs. flow (Snake River Adjudication Team data, on file at PNF SO).

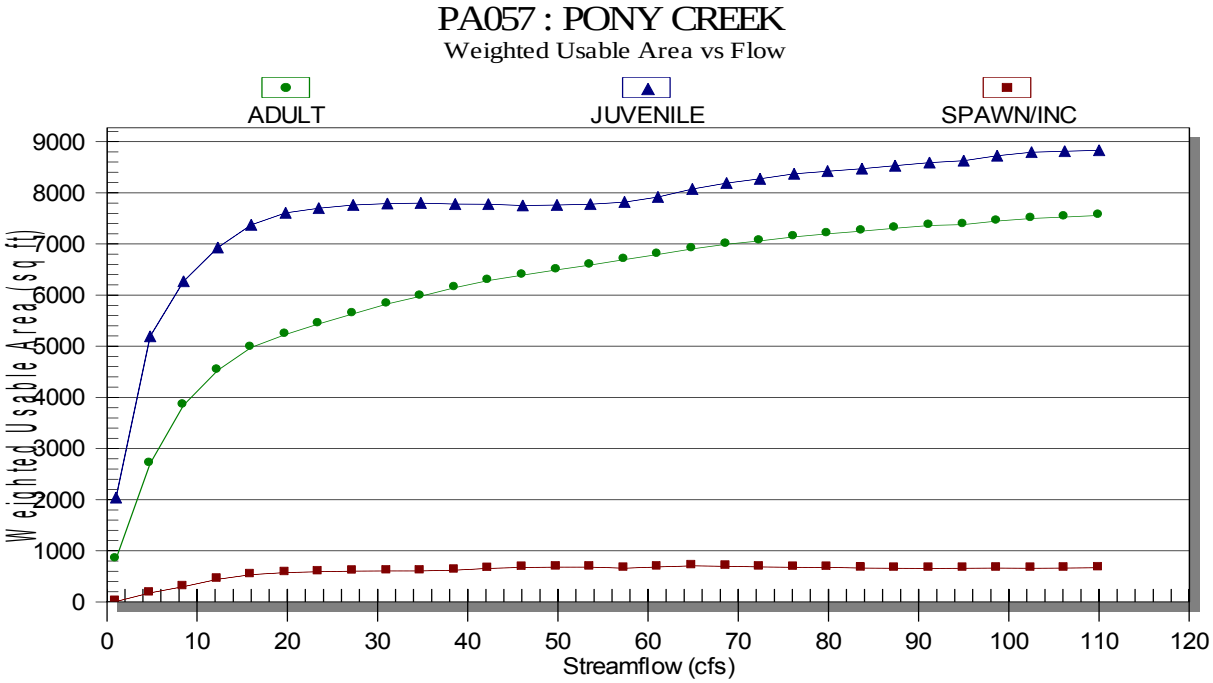

Figure 8. —Bull trout - Pony Creek Site PA057 weighted usable area vs. flow (Snake River Adjudication Team data, on file at PNF SO).

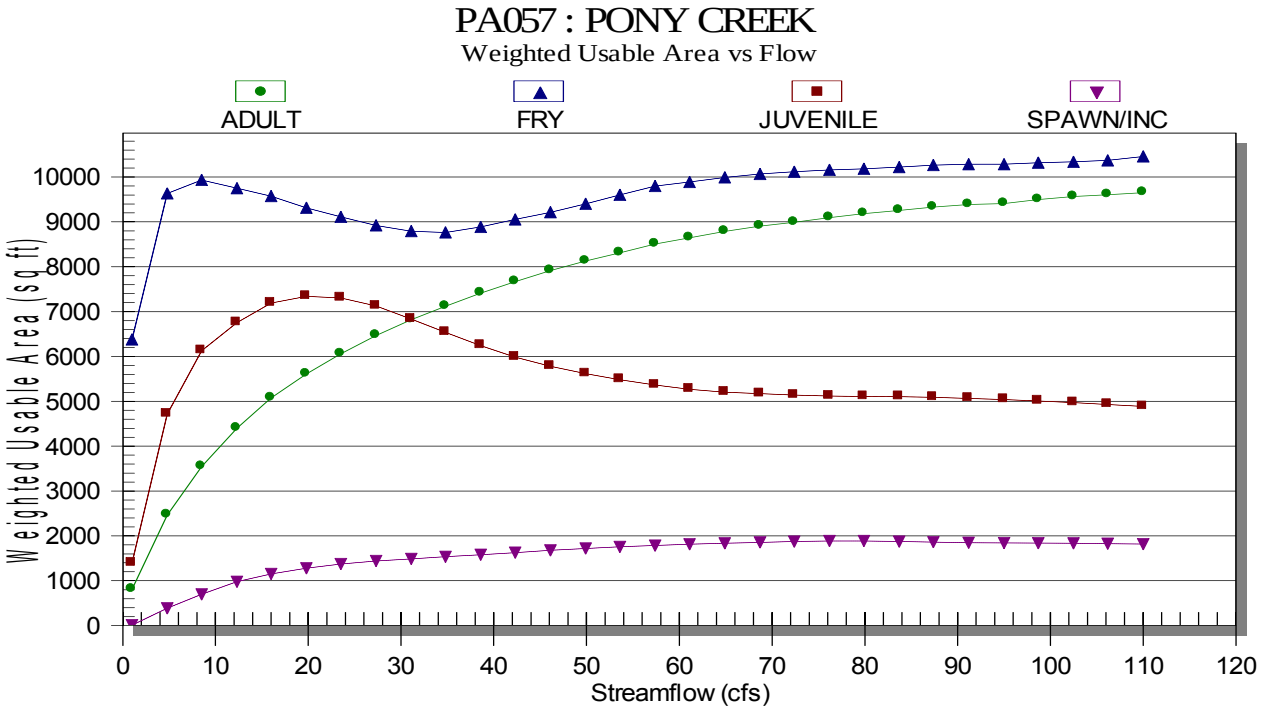

Figure 9.—Steelhead - Pony Creek Site PA057 weighted usable area vs. flow (Snake River Adjudication Team data, on file at PNF SO).

c. Badley Ranch Diversion

The Badley Ranch diversion removes 0.42 cfs from Carlson Creek, tributary to the lower SFSR (see Description of Federal Action). Carlson Creek is fishless and probably has a low flow of about 1.0 cfs (personal observation). Average monthly flow data from the Snake River Adjudication Team is not available for Carlson Creek, but is available for the SFSR (Site PA042, Figure 10) near the Krassel gauging station. At this location, the SFSR supports all three listed fish species and cutthroat trout.

Low flows of 50-100 cfs occur in the SFSR at Site PA042 (Figure 10). Flows in the SFSR at the mouth of Carlson Creek are probably three times this amount. The removal of 0.42 cfs by this diversion would be negligible compared to the subsequent small change in weighted useable area required for all life stages of cutthroat trout, bull trout, Chinook salmon, and steelhead represented in the following "area versus flow" models for the SFSR (Figures 11-14). The amount is considered to be negligible because the amount of habitat that would change (in square feet) from a withdrawal of 0.42 cfs is immeasurable, even at low flows, given the following models.

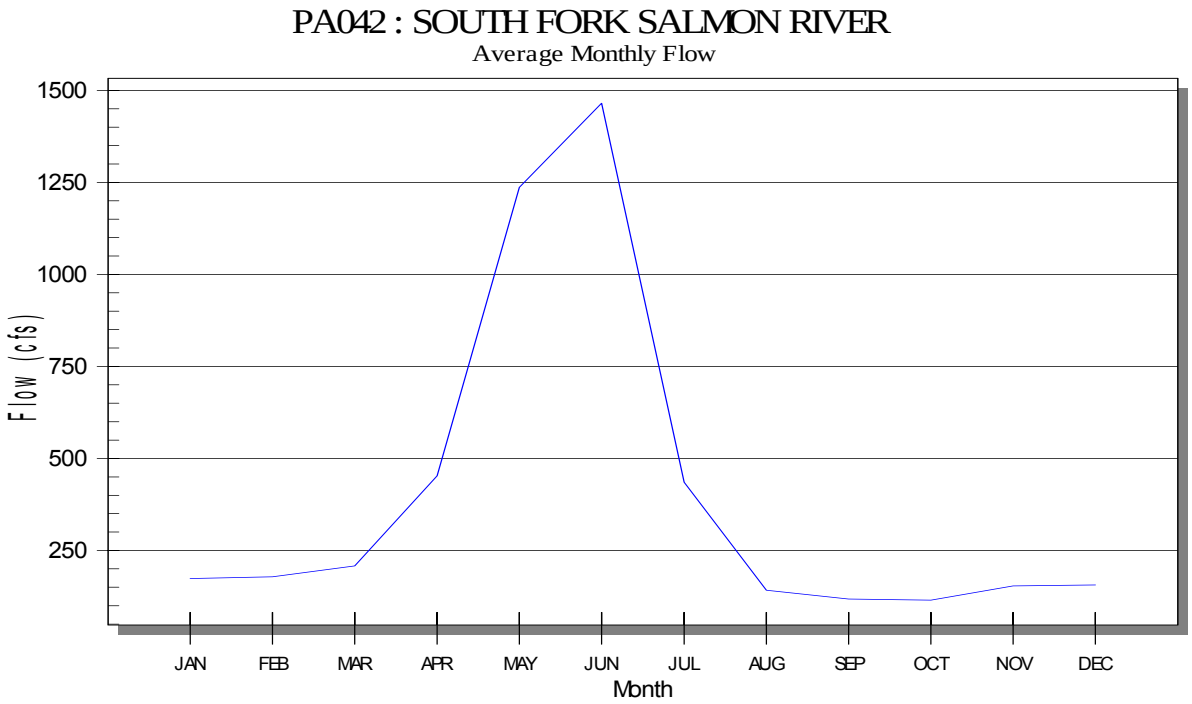

Figure 10.—South Fork Salmon River Site PA042 (near Krassel gauge) weighted usable area vs. flow (Snake River Adjudication Team data, on file at PNF SO).

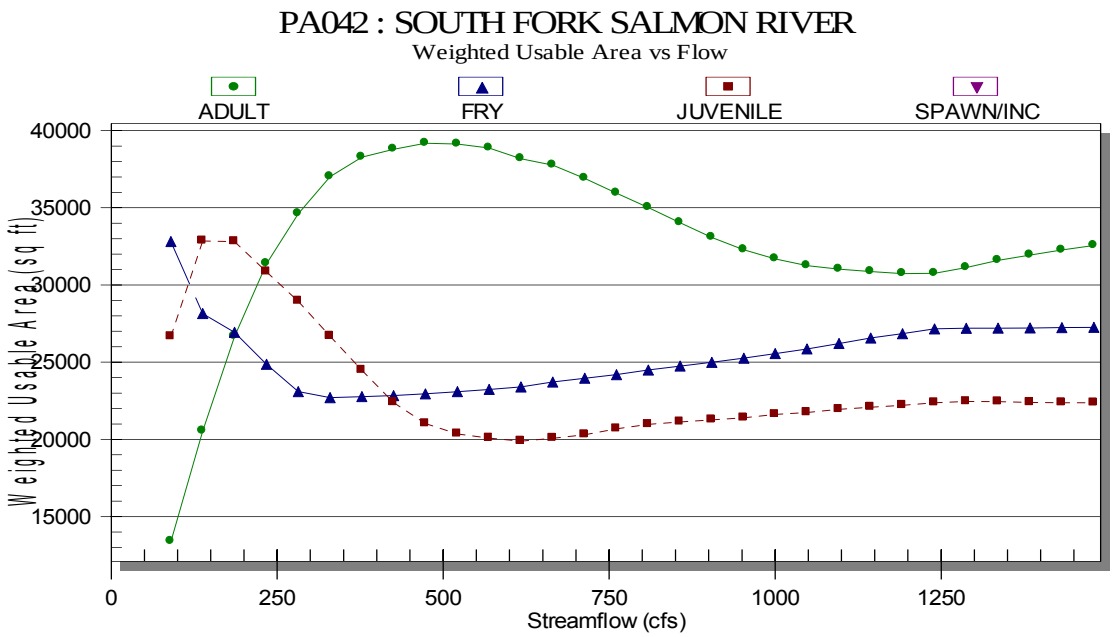

Figure 11.—Cutthroat – South Fork Salmon River near Krassel gauge, weighted usable area vs. flow (Snake River Adjudication Team data, on file at PNF SO).

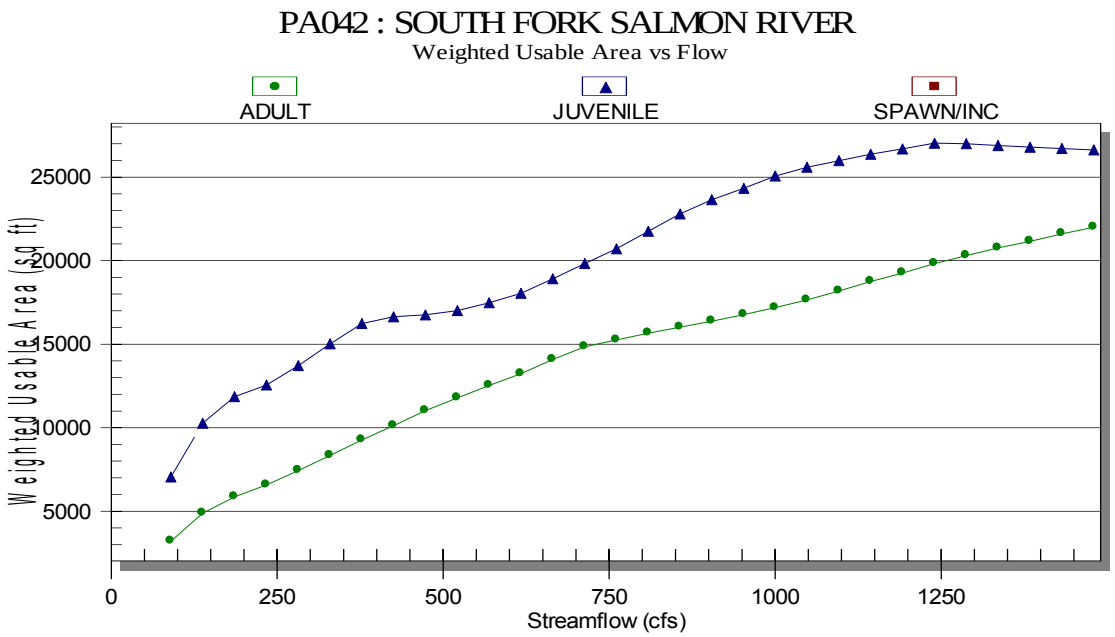

Figure 12.—Bull trout - South Fork Salmon River near Krassel gauge, weighted usable area vs. flow (Snake River Adjudication Team data, on file at PNF SO).

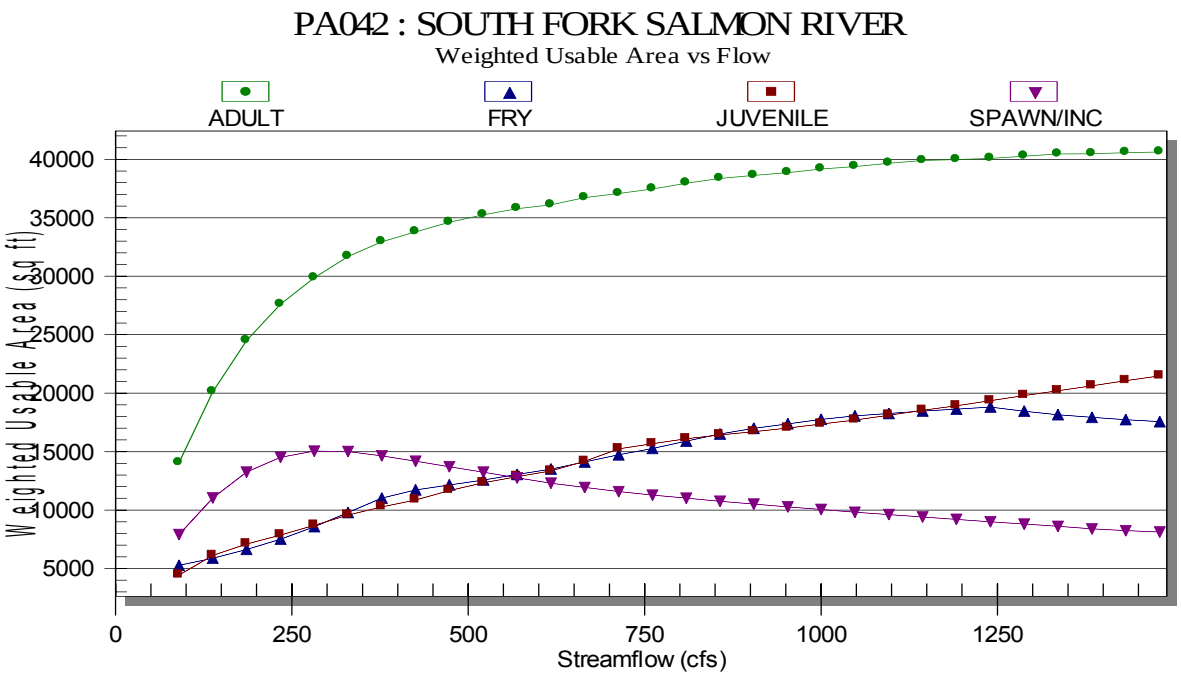

Figure 13.—Chinook - South Fork Salmon River near Krassel gauge, weighted usable area vs. flow (Snake River Adjudication Team data, on file at PNF SO).

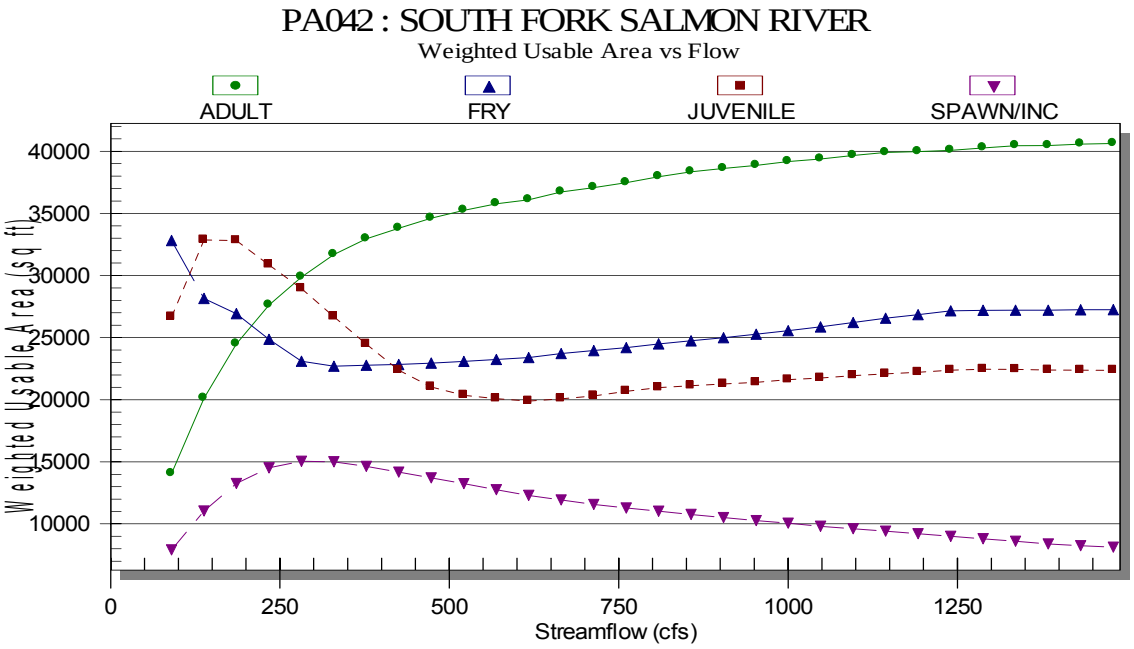

Figure 14.—Steelhead - South Fork Salmon River near Krassel gauge, weighted usable area vs. flow (Snake River Adjudication Team data, on file at PNF SO).

d, Mackey Bar Diversion

The Mackey Bar Diversion removes 2.0 cfs from Smith Creek, tributary to the Lower South Fork Salmon River (see Description of Federal Actions). All life stages of steelhead and cutthroat trout have been found in stream reaches at the facility site, and upstream.

Base flow measurements on Smith Creek were taken September 16 and 17, 1999 by Cindy Robertson of Idaho Department of Fish and Game (data on file at PNF SO). These measurements were taken below the point of diversion on private land. Baseflows for September 16 were 2.41, 2.25, 2.20, 1.84 and 2.87 cfs. Baseflows for September 17 were 1.8 and 2.34 cfs. Given that baseflows averaged 2.24 cfs below the point of diversion it estimated that the 2 cfs withdrawal represents approximately 47% of the total available base flow. Referring to Figures 1-4, it is estimated that at low flows, with 47% of flow removed from any stream, up to half of the habitat available to cutthroat trout and steelhead is removed. Losses of habitat due to the flow withdrawals by the Mackey Bar diversion represent adverse effects to these species and critical habitat.

Low flows of 50-100 cfs occur in the SFSR at Site PA042 (10). Flows in the SFSR at the mouth of Smith Creek are probably three times this amount. The removal of 2.0 cfs by this diversion would be negligible compared to the subsequent small change in weighted useable area required for all life stages of cutthroat trout, bull trout, Chinook salmon, and steelhead represented in the "area versus flow" models for the SFSR (Figures 11-14). The amount is considered to be negligible because the amount of habitat that would change (in square feet) from a withdrawal of 2.0 cfs would be immeasurable in the SFSR, even at low flows, given the above models.

11. COPENHAVER CABLE CAR SUP

The Copenhaver tramway may startle fish which happen to be located directly underneath the tram car while it is in operation. It is unknown whether listed fish spawn below the cable car, but none have been observed on several visits to the area during Chinook salmon spawning periods (August/September 2006, personal observations of the author). Because the startle effect will not affect spawning activity, any negative effects on growth or survival are expected to be intermittent and short-lived, and therefore negligible.

Maintenance would include repair of structural elements of the support system. Ground disturbance of the RCA is not anticipated. Therefore, effects of maintenance actions are considered to be negligible.

12. OUTFITTERS AND GUIDES

Potential stock and human impacts to riparian areas, pollution of streams by human and animal waste, removal of riparian vegetation, and ground disturbance leading to sediment delivery are concerns associated with this activity, especially with O&Gs with assigned camps. All of these concerns are documented on annual assigned camp inspection forms (on file at PNF SO). Past inspections have found minor and major problems, such as moving a corral or outhouse that was too close to a small tributary, or creating an off-site water trough for horses to remedy a small area of bank trampling, tree cutting within RCAs, and extensive erosion from facilities located too close to streams (Clem Pope, Payette NF Recreation Manager, personal communication). These problems are a consequence of non-compliance with the permits, and not the result of the Federal Actions as stated. Because mitigation includes continued annual inspections, and problems are required to be remedied before operation continues, and because problems have been demonstrated to have been remedied, negligible effects are expected from this action.

Fish and redd disturbance from fording of streams is also a potential concern with this activity, as O&Gs use some fords that could provide habitat for listed species. There is no information available on the extent of O&G fording, or the proportion of fords that are in listed species habitat compared to the proportion of fords not in listed species habitat. There is also no information to allow discernment of the effects of fording by O&Gs from the effects of fording by the non-outfitted general public.

Effects of fording by the non-outfitted general public are addressed in the Travel Plan federal action, and are considered negative. The evaluation of effects at fords considered in the Travel Plan was unable to discern effects of fording by O&Gs from fording by the general public, however direct negative effects of fording by the non-outfitted general public have been documented (Draft Travel Plan, USFS 2006). No direct effects to fish or redds have been documented where known fording by O&Gs has been evaluated. Further, O&Gs and their clients comprise a smaller population of users, both human and stock, than does the "non-outfitted general public". Any potential negative effects from O&Gs and their clients, should they be documented, would collectively be of lesser magnitude than those of the "non-outfitted general public".

Because mitigation measures avoid negative effects of sediment delivery, riparian disturbance, and pollution, and because no documentation exists discerning negative effects of general-public fording from O&G fording, O&G actions are considered to have negligible effects on listed fish species and critical habitat.

C. EAST FORK SOUTH FORK SALMON RIVER ANALYSIS AREA - DIRECT AND INDIRECT EFFECTS

PREVIOUSLY CONSIDERED ACTIONS:

Effects of the following actions are described above under the Lower SFSR analysis area and are the same for the EFSF analysis area:

- Miscellaneous forest products
- Mistletoe and precommercial thinning
- Fire management activities
- Fish habitat and riparian sampling
- Watershed improvements and maintenance
- Noxious weed management
- Road management
- Trails, recreation, and administrative site operation and maintenance
- Outfitter and guides

1. TRAVEL PLAN

Potential effects of this action are: increased sedimentation in streams due to motorized and non-motorized use at road and trail stream crossings, increased chances of petroleum spills, and physical harm to eggs that may be present in redds at fords and elsewhere. Soils on roads and trails at stream crossings can be delivered as sediment to streams via wind, water, and tires at fords. As described above (section V. A. 6.), this additional sediment can reduce habitat quality and adversely affect incubating eggs, and petroleum products can directly poison salmonids and their aquatic invertebrate food source (section V. A. 4.). Mortality of listed fish eggs (adverse effect) can occur should redds be trampled or driven over. Trampling can occur due to any foot or horse use in streams, including use from anglers, swimmers, people floating in watercraft, people hiking, and similar activities. There are approximately 22 road crossings and 17 stream trail crossings in the East Fork SFSR subwatershed, of which an unknown number are fords. About 90 percent of these trail crossings are assumed to be fords (Clem Pope, Recreation Manager, Payette NF, McCall, ID). Fording frequently occurs in spawning habitat because these are often the easiest places to cross a stream. Roberts and White (1992), found that twice-daily wading throughout trout egg development killed up to 96% of trout eggs and pre-emergent fry, while a single wading just before hatching killed up to 43% of eggs.

Under the new travel plan action, no motorized cross-country travel will be allowed. The reduction in fording and soil disturbance in RCAs (compared to baseline) associated with restricting motorized cross-country travel will improve the sediment and substrate embeddedness WCIs by only negligible amounts because travel across streams will still occur on authorized motorized routes, and existing areas of erosion are not remedied with the action. For the East Fork subwatershed, the number of acres open to cross-country travel will be reduced by 340 acres, compared to the previous travel plan.

Project Design Features and Best Management Practices (BMPs) will reduce sediment delivery during reroute or reconstruction of previously unauthorized routes. Specific examples of Project Design Features and BMPs to reduce sediment delivery are part of the Road and Trail Maintenance federal actions and include: construction and maintenance of water management structures such as waterbars, rolling dips, and bridges; reclamation of abandoned trails, and designing reroutes to meet current Forest Service standards. Substrate embeddedness is expected to improve in the short and long term because motorized vehicles would be limited to designated roads and trails and parking areas. No motorized travel would be allowed in a 300-foot area off designated roads and 100 feet off designated trails.

The streambank condition WCI has two definitions for this analysis. For the Travel Plan EIS (CD2: \Support Documents\Travel Plan [in Travel Plan.zip]) analysis, miles of road and trail authorized for motorized use were used as an index of streambank condition, with the assumption that the number of stream crossings would increase with mileage. In the East Fork SFSR subwatershed, streambank condition related to the number of road and trail crossings will be improved because total mileage of roads and trails will decrease by 15 miles. For the LRMP WCI definition of streambank condition, there will be a temporary improvement when cross country motorized travel is restricted due to a reduction in the amount of fording and soil disturbance in RCAs. In the short and long term, streambank condition at existing crossings will degrade with increased public use. Road and trail maintenance activities (with related mitigations) that reduce erosion and sediment delivery to stream channels will decrease the magnitude of degrading effects to sediment, substrate, and streambank condition WCIs from expected increases in public use, but will not alter the general increasing trend. Disturbance history and regime, and RCA WCIs will improve with the restriction on motorized cross-country travel.

Motorized recreation is the most likely source of petroleum contamination with this action. Because motorized trails ford streams directly adjacent to occupied habitat, and roads also occur adjacent to and cross streams, a fuel spill in these areas is likely to result in adverse effects to listed fishes.

Adverse effects to listed fishes such as harassment or redd trampling are also likely to occur from fording streams on foot, horseback, or other non-motorized travel, as mentioned above.

2. WATER DIVERSION SUPS

Effects related to all diversions are discussed above for the Lower SFSR analysis area, and are the same effects for the EFSF analysis area.

a. Eiguren and Peterson Diversions

The Eiguren (1.6 cfs from Parks Creek) and Peterson (0.94 cfs from an unnamed spring) diversions collectively divert 2.54 cfs from adjacent tributaries of the East Fork South Fork Salmon River. These tributaries enter the East Fork South Fork from the north and are located just downstream of the town of Yellow Pine (see Description of Federal Action). The unnamed spring is fishless, and Parks Creek supports cutthroat trout and bull trout.

Average monthly flow data from the Snake River Adjudication Team is not available for the affected streams, but is available for the East Fork South Fork (Site PA032, upstream of Quartz Creek). Below this site, Johnson Creek doubles the flow of the EFSF. At this location, the East Fork South Fork supports all three listed species and cutthroat trout.

Projected use of the Eiguren diversion (for which the proponent has a water right) is for 1.61 cfs from April to November 1. The estimated low summer flow of Parks Creek is 2.1 cfs (measured in an extremely low water year, 1977- R. Zuniga, retired Payette NF hydrologist, McCall, ID, personal communication). Withdrawal of 1.61 cfs from the low flows represents a 75% reduction in flow from Parks Creek. Referring to Figures 15-19, it is estimated that at low flows, with 75% of flow removed from any stream, half or more of the habitat available to cutthroat trout and bull trout is removed. Losses of habitat due to the flow withdrawals by the Eiguren diversion represent adverse effects to these species and critical habitat.

Withdrawal of 0.94 cfs from the unnamed spring tributary to the EFSF by the Peterson diversion would have negligible effects of listed species in that stream, because there are no fish in the stream.

Low flows of 60-80 cfs occur in the EFSF from August through October (at site PA032, Figure 15). Low flows can be expected to be 120-160 cfs in the EFSF at the confluence of Parks Creek and the unnamed stream which supports the Peterson diversion. The diversion of 2.54 cfs by these two diversions would be negligible compared to the subsequent small change in weighted useable area required for all life stages of cutthroat trout, bull trout, Chinook salmon, and steelhead represented in the following "area versus flow" models for the EFSF (Figures 15-19). The amount is considered to be negligible because the amount of habitat that would change (in square feet) from a withdrawal of 2.54 cfs is immeasurable, even at low flows, given the following models.

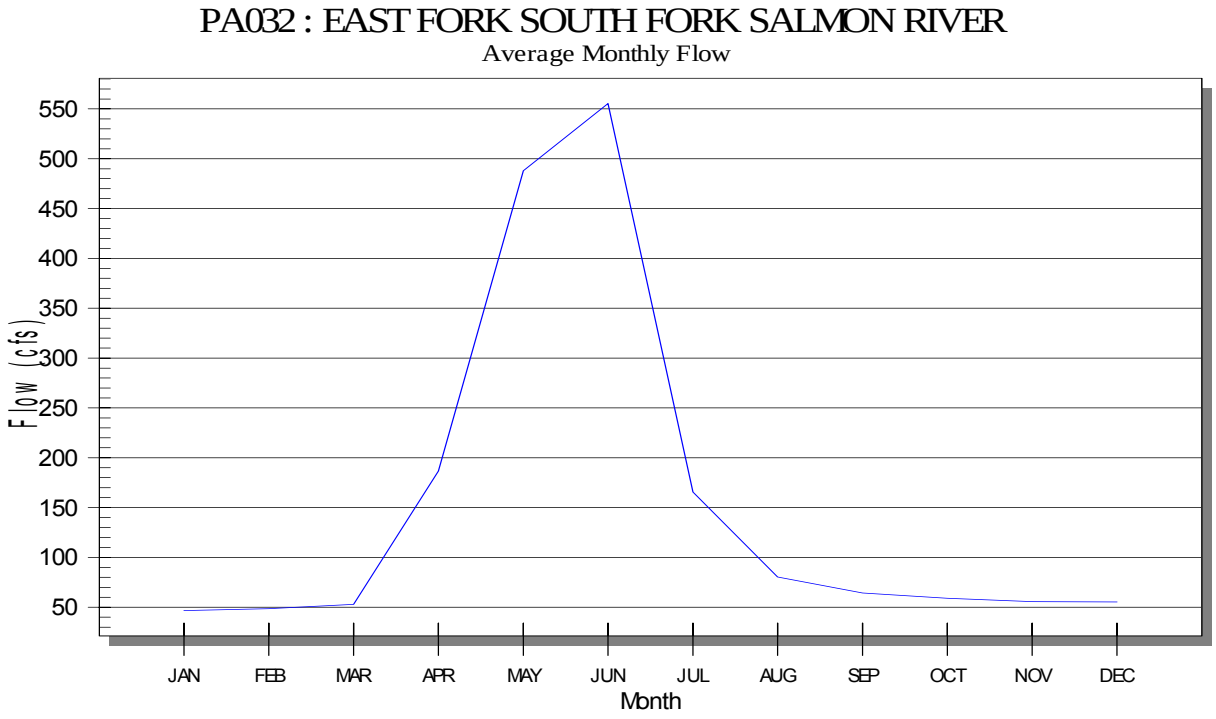

Figure 15.—East Fork South Fork Salmon River Site PA032 average monthly flow (Snake River Adjudication Team data, on file at PNF SO).

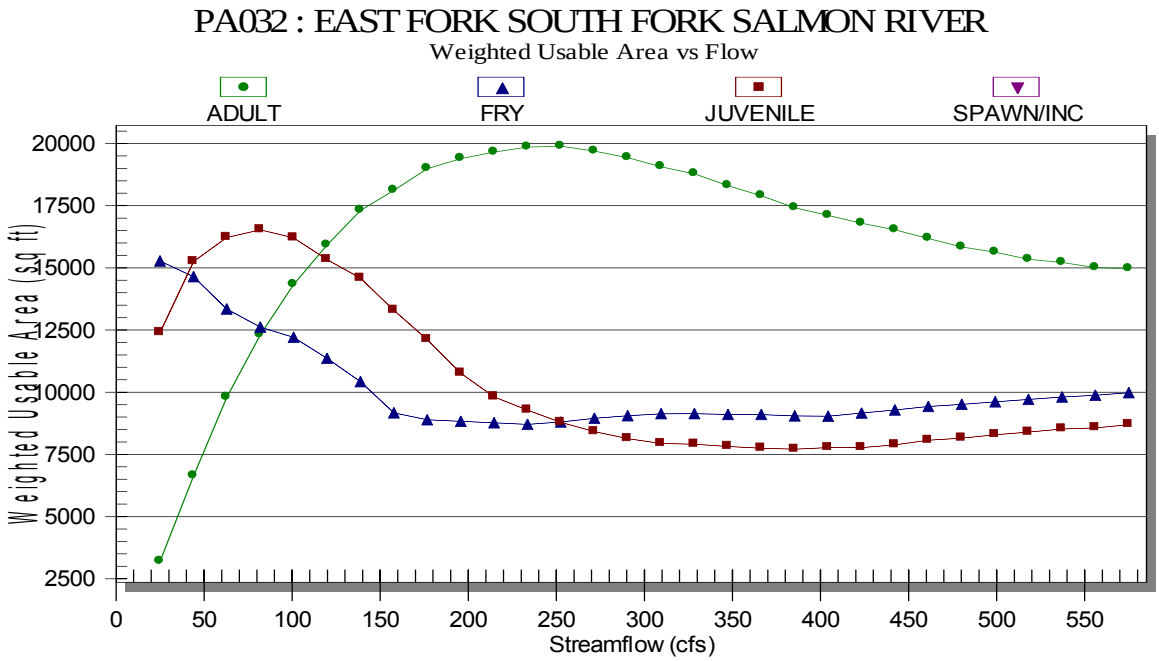

Figure 16.—Cutthroat – East Fork South Fork Salmon River Site PA032 weighted usable area vs. flow (Snake River Adjudication Team data, on file at PNF SO).

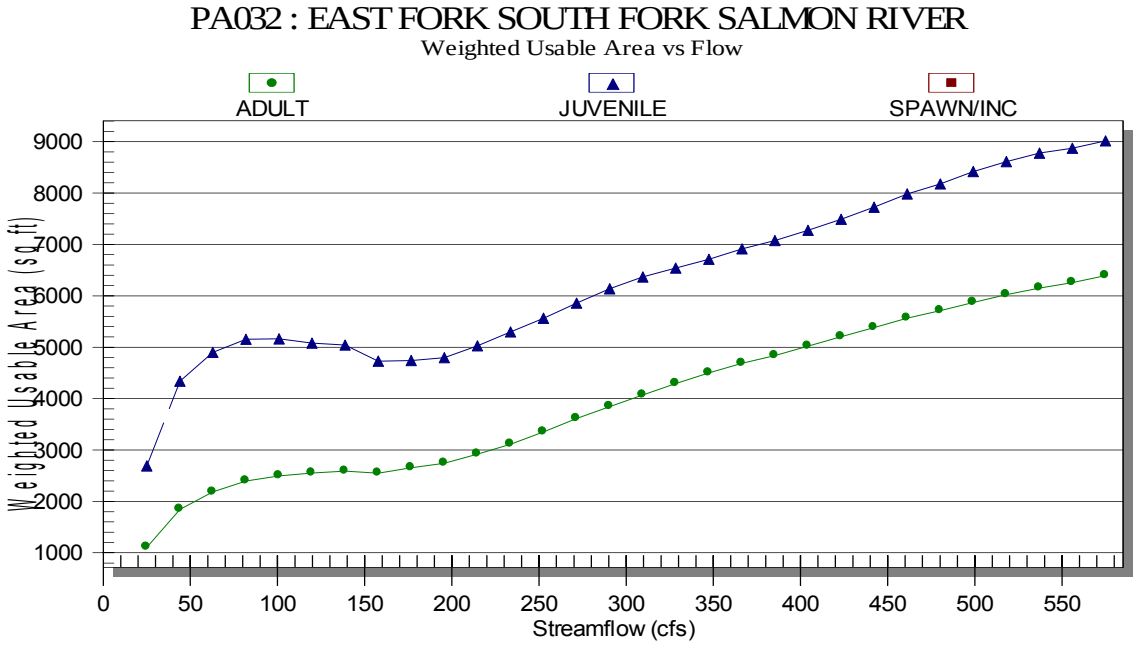

Figure 17.—Bull trout - East Fork South Fork Salmon River Site PA032 weighted usable area vs. flow (Snake River Adjudication Team data, on file at PNF SO).

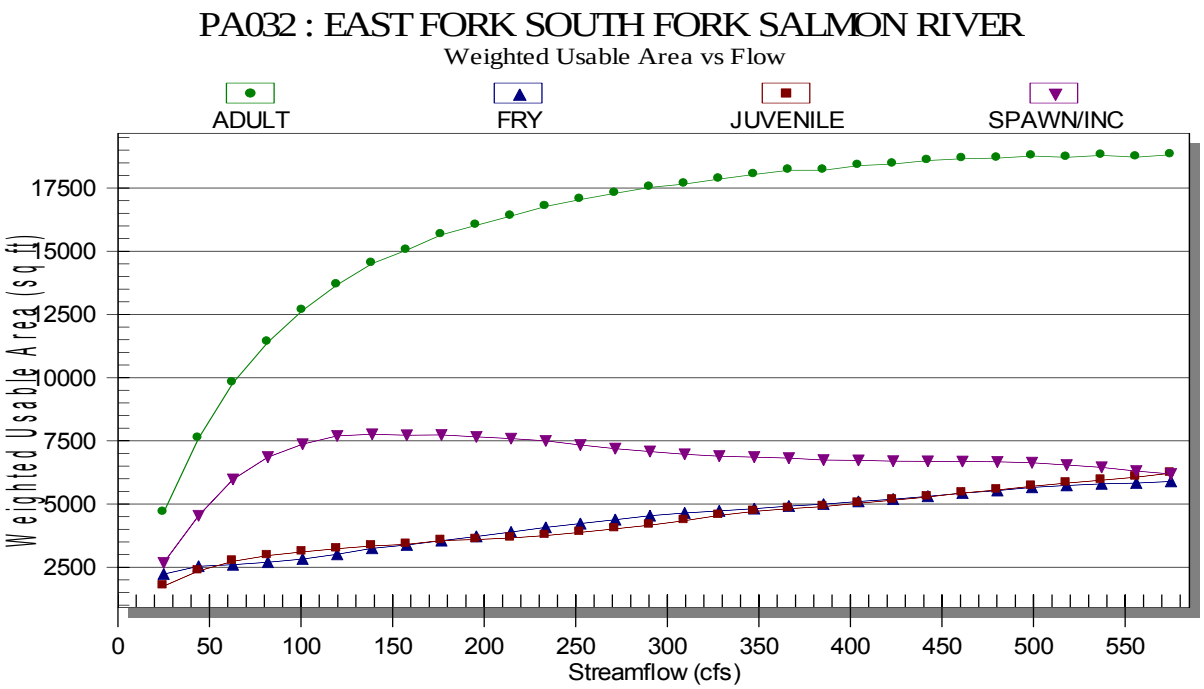

Figure 18.—Chinook - East Fork South Fork Salmon River Site PA032 weighted usable area vs. flow (Snake River Adjudication Team data, on file at PNF SO).

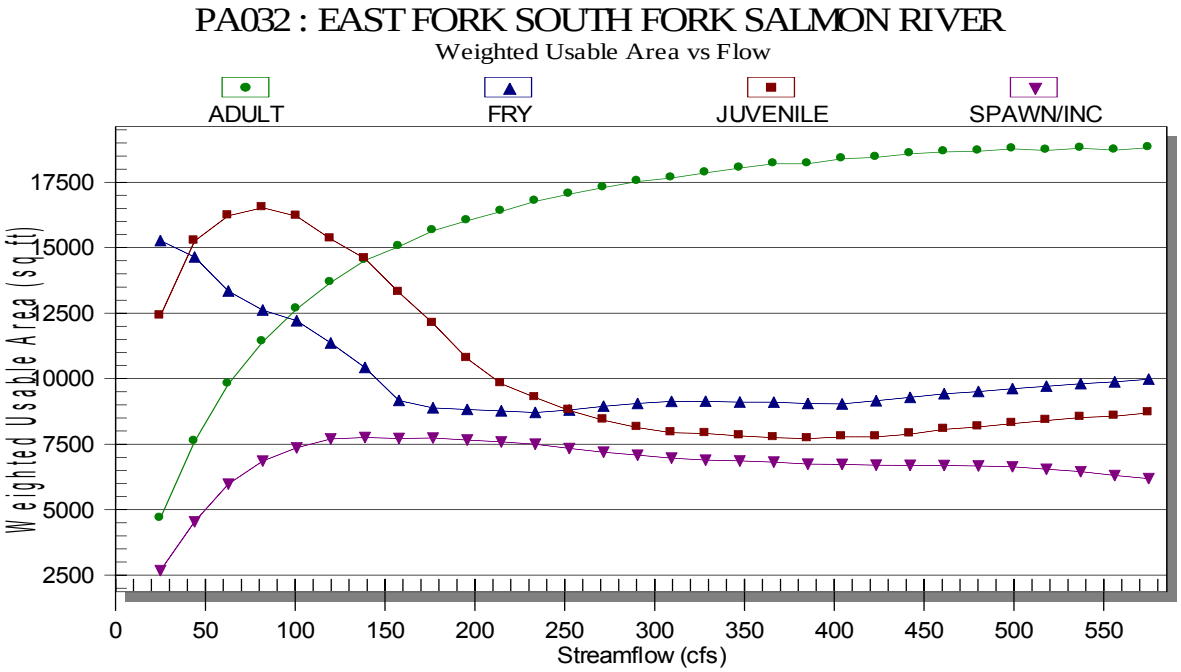

Figure 19.—Steelhead - East Fork South Fork Salmon River Site PA032 weighted usable area vs. flow (Snake River Adjudication Team data, on file at PNF SO).

3. STIBNITE MINE CLOSURE

In the long term, the continuing actions associated with the closure of Stibnite mine will reduce sediment sources, stabilize areas of ground disturbance, improve and restore drainage patterns, open up habitat previously unavailable to listed species, and reduce sources of other potential effects to the listed fish and critical habitat. Actions will continue a habitat improvement trend in the mine vicinity. The recontouring and revegetation of disturbed ground will reduce potential sediment sources and contribute to hydrologic function compared to existing and active-mining conditions.

The control of sediment production in upper Blowout Creek was identified in the 1995 BO (NMFS 1995a). These improvements were estimated to reduce sediment from historical sources. Some spot stabilization work, completed in 1992-1994 (willow plantings, slope stabilization structures, sod transplanting, ditch armoring), has reduced sources of sediment from eroding banks in the meadow and canyon areas. Further work on these areas is proposed for the future. These actions are expected to have similar effects in moving the area toward the sediment reduction goal identified by NMFS (1995). CERCLA actions will reduce the exposure of listed fish and their habitat to toxic contaminants in the Stibnite area.

Potential impacts to riparian areas, removal of riparian vegetation, and ground disturbance leading to temporary sediment delivery are associated concerns with this ultimately beneficial activity. Past monitoring and project inspections have documented these temporary sediment problems that are unavoidable consequences of some rehabilitation actions, such as moving stream channels away from toxic contaminants, and have documented that these effects have been short-lived (see Supporting Documents). Because mitigation includes continued monitoring, RCA protection, and implementation of BMPs, and because sediment effects have been demonstrated to have been short-term, only temporary, negligible adverse effects are expected from this action.

Spawning areas and redds will be avoided during project implementation, so direct adverse effects from disturbance are not expected. Because of the improving trend and the mitigation measures, and mitigation measures avoid adverse effects of sediment delivery, effects are expected to be negligible or improving.

D. SECESH RIVER ANALYSIS AREA - DIRECT AND INDIRECT EFFECTS

PREVIOUSLY CONSIDERED ACTIONS:

Effects of the following actions are described above under the Lower SFSR analysis area and are the same for the Secesh analysis area:

- Miscellaneous forest products
- Mistletoe and precommercial thinning
- Fire management activities
- Fish habitat and riparian sampling
- Watershed improvements and maintenance
- Noxious weed management
- Road management
- Trails, recreation, and administrative site operation and maintenance
- Outfitter and guides

1. TRAVEL PLAN

Potential effects of this action are: increased sedimentation in streams due to motorized and non-motorized use at road and trail stream crossings, increased chances of petroleum spills, and physical harm to eggs that may be present in redds at fords and elsewhere. Soils on roads and trails at stream crossings can be delivered as sediment to streams via wind, water, and tires at fords. As described above (section V. A. 6.), this additional sediment can reduce habitat quality and adversely affect incubating eggs, and petroleum products can directly poison salmonids and their aquatic invertebrate

food source (section V. A. 4.). Mortality of listed fish eggs (adverse effect) can occur should redds be trampled or driven over. Trampling can occur due to any foot or horse use in streams, including use from anglers, swimmers, people floating in watercraft, people hiking, and similar activities. There are approximately 87 road crossings and 53 stream trail crossings in the Secesh subwatershed, of which an unknown number are fords. About 90 percent of these trail crossings are assumed to be fords (Clem Pope, Recreation Manager, Payette NF, McCall, ID). Fording frequently occurs in spawning habitat because these are often the easiest places to cross a stream. Roberts and White (1992), found that twice-daily wading throughout trout egg development killed up to 96% of trout eggs and pre-emergent fry, while a single wading just before hatching killed up to 43% of eggs.

Under the new travel plan action, no motorized cross-country travel will be allowed. The reduction in fording and soil disturbance in RCAs (compared to baseline) associated with restricting motorized cross-country travel will improve the sediment and substrate embeddedness WCIs by only negligible amounts because travel across streams will still occur on authorized motorized routes, and existing areas of erosion are not remedied with the action. For the Secesh subwatershed, the number of acres open to cross-country travel will be reduced by 20,022 acres, compared to the previous travel plan. Project Design Features and Best Management Practices (BMPs) will reduce sediment delivery during reroute or reconstruction of previously unauthorized routes. Specific examples of Project Design Features and BMPs to reduce sediment delivery are part of the Road and Trail Maintenance federal actions and include: construction and maintenance of water management structures such as waterbars, rolling dips, and bridges; reclamation of abandoned trails, and designing reroutes to meet current Forest Service standards. Over time, increasing public use of roads and trails and related increases in sediment yield will degrade the sediment and substrate embeddedness WCIs in the short and long term. Because of the proximity of listed fish and critical habitat to roads and/or trails in this analysis area, increases in sediment due to travel plan actions are expected to have adverse effects.

The streambank condition WCI has two definitions for this analysis. For the Travel Plan EIS (CD2: \Support Documents\Travel Plan [in Travel Plan.zip]) analysis, miles of road and trail authorized for motorized use were used as an index of streambank condition, with the assumption that the number of stream crossings would increase with mileage. In the Secesh subwatershed, streambank condition related to the number of road and trail crossings will be maintained. This WCI will be maintained because, though total mileage of roads and trails will increase by 3.7 miles, those miles are within areas that are currently open to cross-country motor vehicle use. For the LRMP WCI definition of streambank condition, there will be a temporary improvement when cross country motorized travel is restricted due to a reduction in the amount of fording and soil disturbance in RCAs. In the short and long term, streambank condition at existing crossings will degrade with increased public use. Road and trail maintenance activities (with related mitigations) that reduce erosion and sediment delivery to stream channels will decrease the magnitude of degrading effects to sediment, substrate, and streambank condition WCIs from expected increases in public use, but will not alter the general increasing trend. Disturbance history and regime, and RCA WCIs will improve with the restriction on motorized cross-country travel.

Motorized recreation is the most likely source of petroleum contamination with this action. Because motorized trails ford streams directly adjacent to occupied habitat, and roads also occur adjacent to and cross streams, a fuel spill in these areas is likely to result in adverse effects to listed fishes.

Adverse effects to listed fishes such as harassment or redd trampling are also likely to occur from fording streams on foot, horseback, or other non-motorized travel, as mentioned above.

2. WATER DIVERSION SUPS

Effects related to all diversions are discussed above for the Lower SFSR analysis area, and are the same effects for the EFSF analysis area.

a. Wyatt, Phillips-Larrea, LaPaglia, Spradling, Hardy, Titus, Smith, Holly Diversions

These diversions collectively remove 0.36 cfs from unnamed, fishless springs that are tributaries to the upper Secesh River. Average monthly flow data from the Snake River Adjudication Team is not available for the affected streams, but is available for the upper Secesh River in this area (Figure 20 Site PA049). The location of site PA049 is downstream of the confluence of Summit and Lake Creeks. At this location, the Secesh River supports all three listed species and cutthroat trout.

Low flows of 40-60 cfs occur in the Secesh River at site PA049 from August through October (Figure 2a). The diversion of 0.36 cfs by this group of diversions would be negligible compared to the subsequent small change in weighted useable area required for all life stages of cutthroat trout, bull trout, Chinook salmon, and steelhead represented in the following "area versus flow" models for the upper Secesh River (Figures 21-24). The amount is considered to be negligible because the amount of habitat that would change (in square feet) from a withdrawal of 0.36 cfs is immeasurable, even at low flows, given the following models.

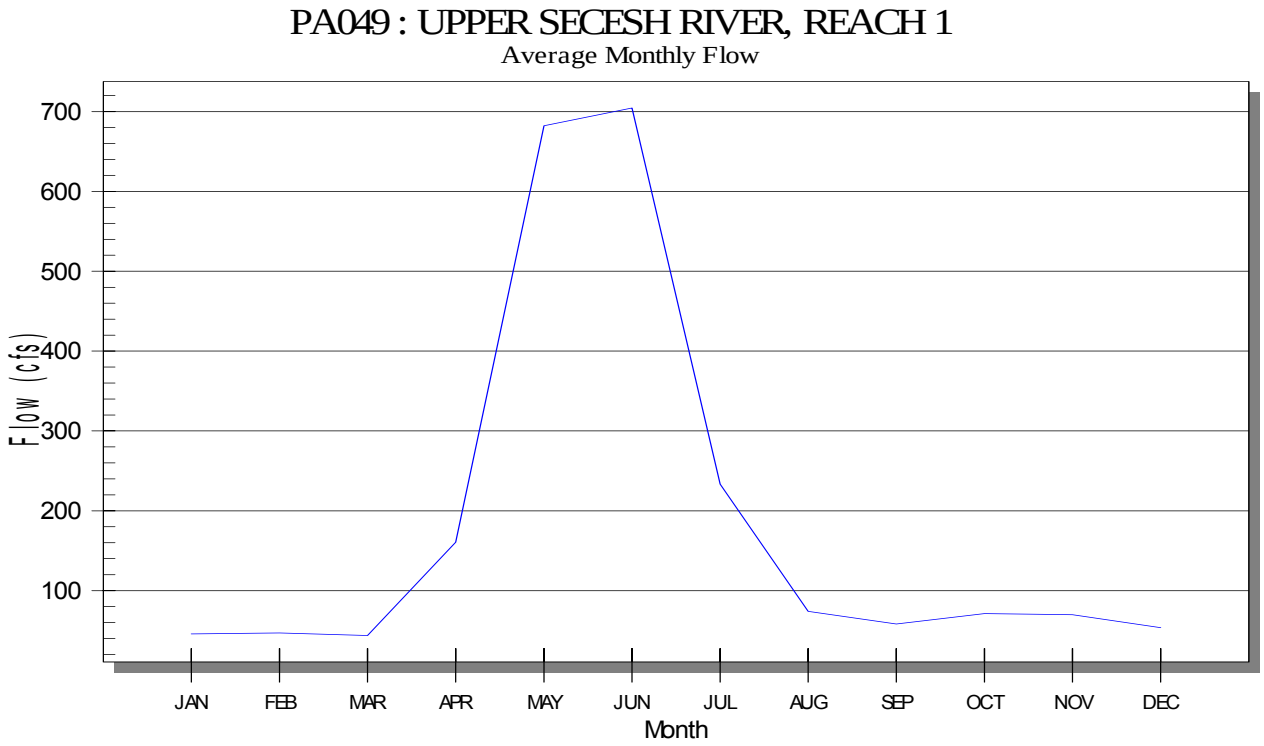

Figure 20.—Secesh River Site PA049 average monthly flow (Snake River Adjudication Team data, on file at PNF SO).

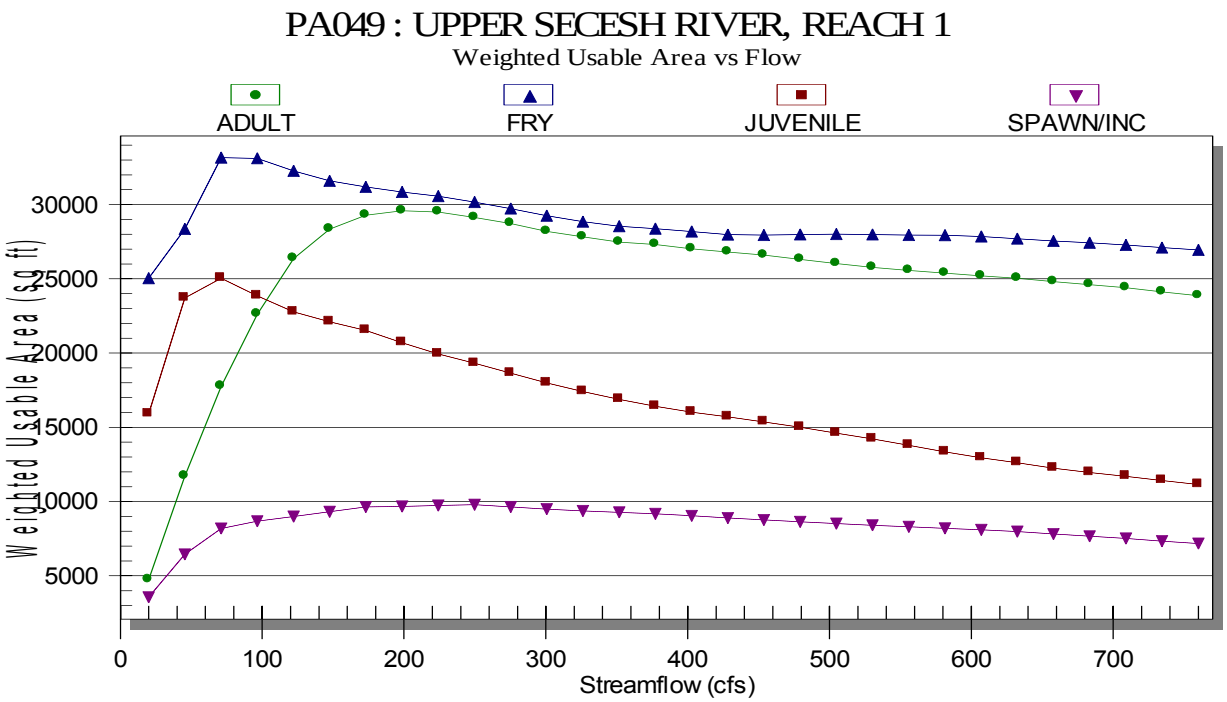

Figure 21.—Cutthroat – Upper Secesh River Site PA049, weighted usable area vs. flow (Snake River Adjudication Team data, on file at PNF SO).

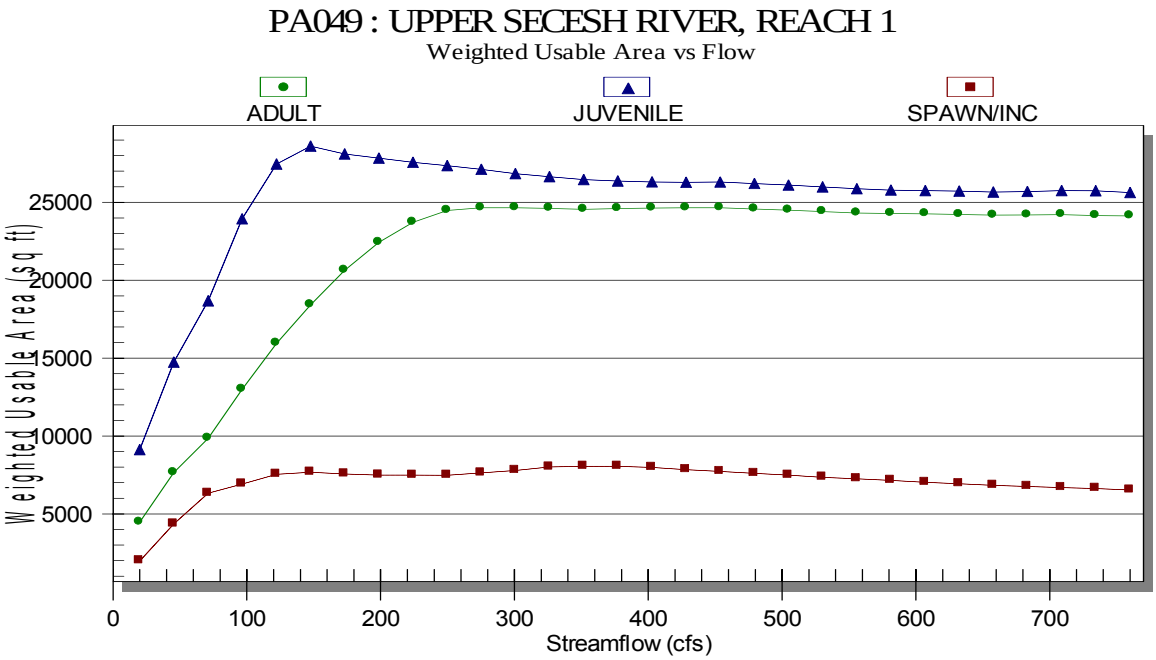

Figure 22.—Bull trout - Upper Secesh River Site PA049, weighted usable area vs. flow (Snake River Adjudication Team data, on file at PNF SO).

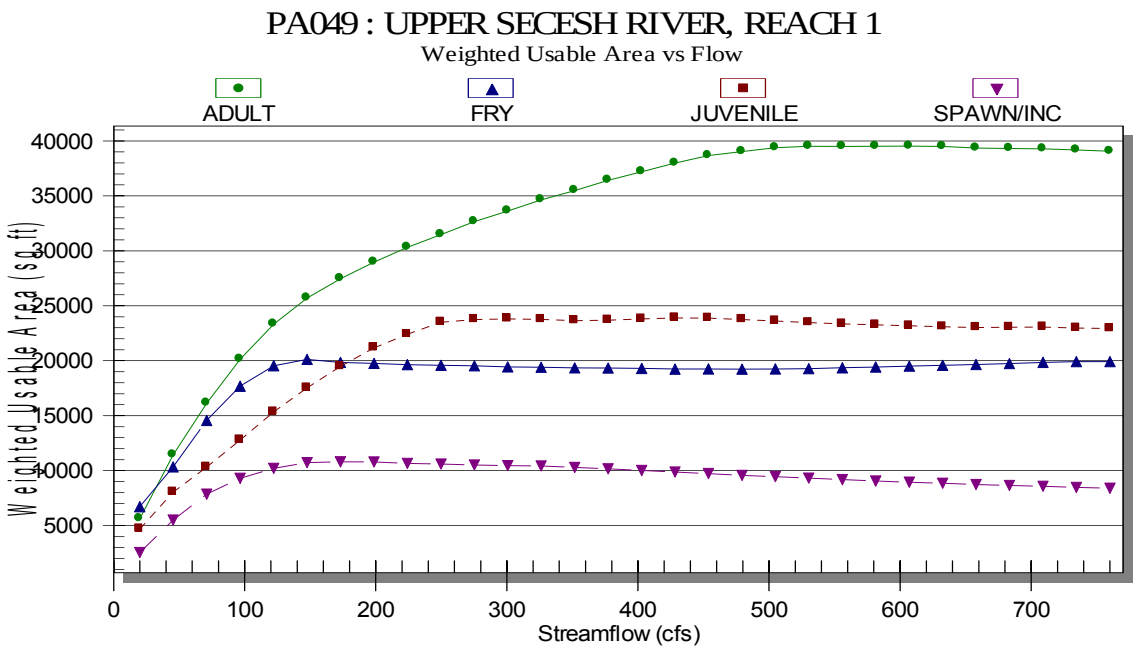

Figure 23.—Chinook salmon - Upper Secesh River Site PA049, weighted usable area vs. flow (Snake River Adjudication Team data, on file at PNF SO).

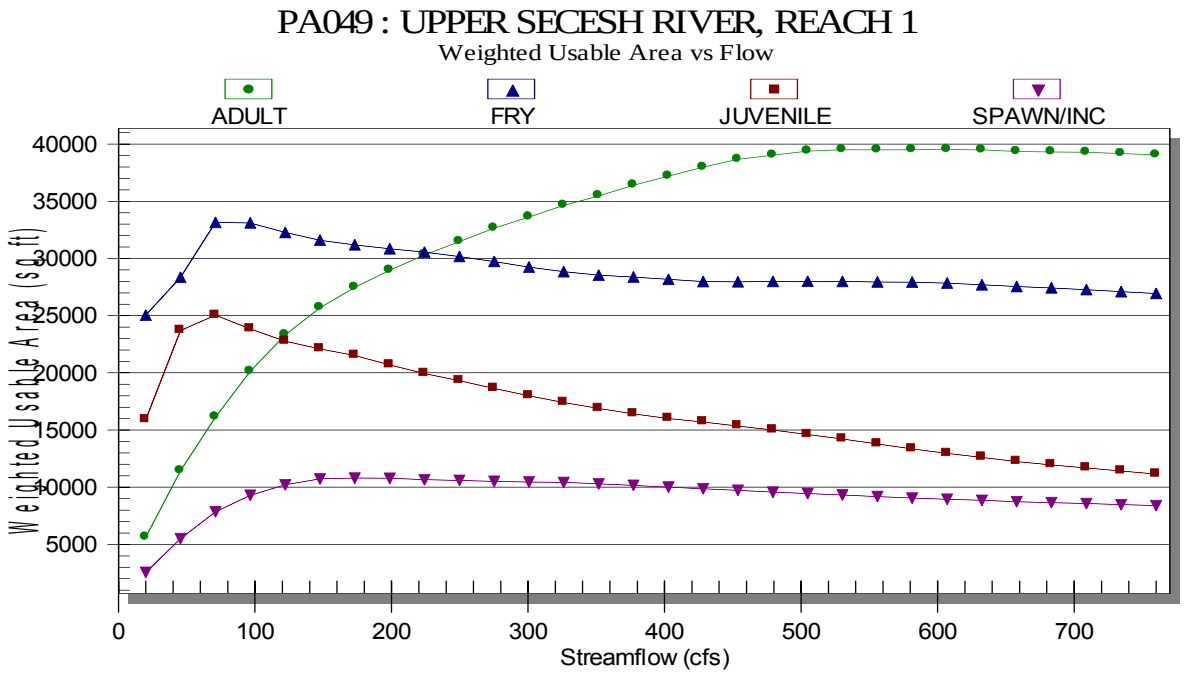

Figure 24.—Steelhead - Upper Secesh River Site PA049, weighted usable area vs. flow (Snake River Adjudication Team data, on file at PNF SO).

3. GRAZING ALLOTMENTS

a. Sheep Grazing Allotments—Five Actions (Victor Loon Allotment, Josephine Allotment, Marshall Mountain Allotment, Bear Pete Allotment, North Fork Lick Allotment)

The potential effects of this action are discussed above under General Effects (V-A). Avoidance of access or other activities that may disturb redds or other reproductive behavior will prevent trampling of eggs and adverse effects on spawning or staging. Mitigations restrict livestock salting locations, trailing, bedding, watering, and development of water sources, corrals, and other handling facilities, to locations that will not degrade WCIs such as shade providing riparian vegetation and streambank stability.; therefore, effects to listed species and critical habitat will be negligible. Sheep are trailed along the Grouse Creek Road and well away from Grouse Creek, therefore, any effects to listed species and critical habitat would be negligible. Once-over grazing limits designed not to degrade WCI's make more than negligible effects to listed species and critical habitat unlikely. In general, riparian utilization data indicate livestock use has been limited to allowable levels and therefore effects to listed species and critical habitat are likely limited to negligible levels (Nelson 2006, Zurstadt and Bonaminio 2005, Zurstadt 2004, 2003). If future monitoring (range monitoring, MIS monitoring) indicates a degrading trend or the presence of sheep in the vicinity of spawning areas, grazing practices will be modified to avoid more than negligible effects.

b. Monitoring Results

Monitoring results of grazing allotments are presented here because future effects of the federal action are expected to be similar to these results.

The 2006 Fisheries—Range Monitoring Report (Nelson 2006) summarizes approximately 13 years of sediment and temperature monitoring at fixed sites in grazed watersheds (the actual length of monitoring records varies among sites) (site maps are available in monitoring reports – Nelson 2006). In general, deleterious effects on salmonid habitat conditions from grazing were not evident, and most trends appeared to be in the direction of improving conditions; more detail is available in the annual monitoring report (2006c).

Current trends and current conditions in these indices do not show that current grazing (identical to that proposed through 2017) degrades salmonid habitat conditions. The sites in the SFSR watershed do not reveal current grazing-induced damage, and long-term studies show improvement since changes in grazing practices about 1990. In most cases, sediment conditions are favorable for salmonid species. Temperatures are typically satisfactory or higher than referred for anadromous species but often unfavorable for bull trout as defined by LRMP WCIs.

Grouse Creek, Lower Site (E062).—Embeddedness levels have fluctuated considerably over the monitoring period, but the recent values (i.e., the past five years) were mostly in the FA range (<24%), however, the five-year mean for this period was 25.1%, well within the FA range. Free matrix counts have also been consistent with high quality interstitial habitat. This watershed burned extensively in 2000 during the Burgdorf Junction Fire, and both potential sediment index trends are consistent with our belief that increased water yield after large fires may coarsen the substrate.

Temperatures were consistent with appropriate function for anadromous species prior to 2000, but have since been more consistent with FR condition for anadromous species (7d AMAX > 13.9 to 17.5°C [migration] and > 13.9 to 15.5°C [spawning and rearing]). These recent warmer water temperatures may be a result of the fire in 2000, but the upsurge appears to have been short-lived: despite a statistically highly significant increasing, temperatures appear to have stopped increasing after 2001.

Lake Creek, Corduroy Junction Site (E034).—Embeddedness levels have fluctuated considerably over the monitoring period, but the recent values (i.e., the past five years) were mostly in the FA range (<24%) and appear to be decreasing. Free matrix counts have fluctuated more than embeddedness

measurements and have been consistent with high quality interstitial habitat about half the time. The most recent measurements were in the FA to FR range. This watershed burned extensively in 1994 during the Corral Fire, and both potential sediment index trends are consistent with our belief that increased water yield after large fires may coarsen the substrate.

Unlike the other range monitoring sites, E034 is also monitored with core samples to measure habitat quality within the gravel substrate for incubating salmonid embryos because it is located within a known spawning area for Chinook and steelhead. This has typically been a "clean" (i.e., low fine sediment concentration, generally below the 28% FA limit) site, but intragravel fine sediments appear to be increasing. Nelson et al. (2006a) report that intragravel conditions at this site are still consistent with high potential for Chinook and steelhead embryo survival.

Temperatures have typically been in the FR range for anadromous species (7d AMAX > 13.9 to 17.5°C [migration] and > 13.9 to 15.5°C [spawning and rearing]) and in the FUR range for bull trout migration (7d AMAX > 15°C) and appear to be increasing.

Lake Creek, Nethker Creek Site (E035).—Embeddedness levels have fluctuated considerably over the monitoring period and tend to be relatively high. The recent values (i.e., the past five years) were in all three functional categories and averaged 31.5%, at the upper extent of the FA range (24 to 32% for five-year means) and appeared to be decreasing slightly. Free matrix counts have fluctuated more than embeddedness measurements and have been consistent with high quality interstitial habitat about half the time. The most recent measurements were in the FA to FR range and the data scatter suggest a decreasing trend.

Temperatures have typically been in the FR range for anadromous species (7d AMAX > 13.9 to 17.5°C [migration] and > 13.9 to 15.5°C [spawning and rearing]) and in the FUR range for bull trout migration (7d AMAX > 15°C).

Nethker Creek, Lower Site (E116).—Embeddedness levels have generally been decreasing at this site and now reflect FA conditions with a recent five-year average of 23%. Free matrix counts have generally been above 27%, squarely within the FA category.

Prior to 2000, temperatures were typically in the FA range for anadromous species (7d AMAX < 13.9°C) and may also be in the FA range for bull trout rearing. Most of the increase occurred prior to 2000 and has apparently leveled. This is a northeasterly oriented watershed and the stream is in a deep valley, conditions conducive to cool water temperatures.

Nethker Creek, Upper Site (E117).—Embeddedness levels have been high at this site, but have had some low values recently and now reflect FA conditions with a recent five-year average of 29%. Recent free matrix counts have generally been above 27%, squarely within the FA category. There were no temperature data for this site.

Lick Creek, Lower Site (E057).—Embeddedness levels have been generally increasing at this site and now reflect FR conditions. Free matrix counts have generally been below 27% and some recent values have been below 17%, consistent with an FR categorization.

Temperatures have typically been in the FR range for anadromous species (7d AMAX > 13.9 to 17.5°C [migration] and > 13.9 to 15.5°C [spawning and rearing]) and in the FUR range for bull trout migration (7d AMAX > 15°C) and appears to be increasing; however, most of the increase occurred prior to 2000 and has apparently leveled.

Ruby Creek, FH 21 Site (E071).—Embeddedness levels have generally been relatively high at this site and reflect FA conditions based on a recent five-year mean of 30%. Free matrix counts have fluctuated wildly, but the most recent five-year average indicates FA conditions at 26%.

Temperatures have been generally increasing. Ruby Creek supports a population of bull trout, and current temperatures were in the FUR range for bull trout migration or rearing (7d AMAX >15°C) at this site; they were also in the FUR range for anadromous species (7d AMAX > 17.7°C).

Threemile Creek, Upper Site (E142).—Embeddedness levels have generally been relatively high at this site and well into the FUR range. Free matrix counts have generally been low and within the FR range, and no trend was statistically detectable.

Temperatures have consistently been within the FA range for Chinook and steelhead (7d AMAX = 10° to 17°C) but only FR for bull trout rearing (13° to 15°C); Threemile Creek supports a bull trout population that also receives migratory fish (Watry and Scarnecchia 2005). This is a southwesterly oriented watershed where warmer temperatures would be expected compared with tributaries on the opposite side of Lake Creek.

Willow Creek, Road 246 Site (E081).—Embeddedness levels have generally been within the FR range for individual samples, but using the five-year mean (31%) value provides a better estimate of true condition and yields an FA assessment, albeit at the upper extent of the category. Free matrix counts have generally been high and well within the FA range, which is consistent with the embeddedness measurements.

Willow Creek, also a southwesterly oriented watershed, has had some relatively warm temperatures for this area and reflect FUR conditions for Chinook and steelhead (7d AMAX > 17.7°C) and bull trout. This watershed burned extensively in 1994 during the Corral Fire, and some residual effects on water temperature may be evident.

E. Upper South Fork Salmon River subwatershed – Direct and Indirect Effects

Previously considered actions

Effects of the following actions are described above under the Lower SFSR analysis area and are the same for the EFSF analysis area:

- Miscellaneous forest products
- Mistletoe control and precommercial thinning
- Fire management activities
- Fish habitat and riparian sampling
- Watershed and fish habitat improvements and maintenance
- Noxious weed management
- Road management
- Trails, recreation, and administrative site operation and maintenance
- Outfitter and guides

1. Travel Plan

Potential effects of this action are: increased sedimentation in streams due to motorized and non-motorized use at road and trail stream crossings, increased chances of petroleum spills, and physical harm to eggs that may be present in redds at fords and elsewhere. Soils on roads and trails at stream crossings can be delivered as sediment to streams via wind, water, and tires at fords. As described above (section V. A. 6.), this additional sediment can reduce habitat quality and adversely affect incubating eggs, and petroleum products can directly poison salmonids and their aquatic invertebrate food source (section V. A. 4.). Mortality of listed fish eggs (adverse effect) can occur should redds be trampled or driven over. Trampling can occur due to any foot or horse use in streams, including use from anglers, swimmers, people floating in watercraft, people hiking, and similar activities. There are approximately 93 road crossings and 134 stream trail crossings in the Upper SFSR subwatershed, of which an unknown number are fords. About 90 percent of these trail crossings are assumed to be fords (Clem Pope, Recreation Manager, Payette NF, McCall, ID). Fording frequently occurs in spawning habitat because these are often the easiest places to cross a stream. Roberts and White

(1992), found that twice-daily wading throughout trout egg development killed up to 96% of trout eggs and pre-emergent fry, while a single wading just before hatching killed up to 43% of eggs.

Under the new travel plan action, no motorized cross-country travel will be allowed. The reduction in fording and soil disturbance in RCAs (compared to baseline) associated with restricting motorized cross-country travel will improve the sediment and substrate embeddedness WCIs by only negligible amounts because travel across streams will still occur on authorized motorized routes, and existing areas of erosion are not remedied with the action. For the Upper SFSR subwatershed, the number of acres open to cross-country travel will be reduced by 727 acres, compared to the previous travel plan. Project Design Features and Best Management Practices (BMPs) will reduce sediment delivery during reroute or reconstruction of previously unauthorized routes. Specific examples of Project Design Features and BMPs to reduce sediment delivery are part of the Road and Trail Maintenance federal actions and include: construction and maintenance of water management structures such as waterbars, rolling dips, and bridges; reclamation of abandoned trails, and designing reroutes to meet current Forest Service standards. Over time, increasing public use of roads and trails and related increases in sediment yield will degrade the sediment and substrate embeddedness WCIs in the short and long term. Because of the proximity of listed fish and critical habitat to roads and/or trails in this analysis area, increases in sediment due to travel plan actions are expected to have adverse effects.

The streambank condition WCI has two definitions for this analysis. For the Travel Plan EIS (CD2: \Support Documents\Travel Plan [in Travel Plan.zip]) analysis, miles of road and trail authorized for motorized use were used as an index of streambank condition, with the assumption that the number of stream crossings would increase with mileage. In the Upper SFSR subwatershed, streambank condition related to the number of road and trail crossings will improve because total mileage of roads and trails will decrease by 15 miles. For the LRMP WCI definition of streambank condition, there will be a temporary improvement when cross country motorized travel is restricted and trail mileage is reduced due to a reduction in the amount of fording and soil disturbance in RCAs. In the short and long term, streambank condition at existing crossings will degrade with increased public use. Road and trail maintenance activities (with related mitigations) that reduce erosion and sediment delivery to stream channels will decrease the magnitude of degrading effects to sediment, substrate, and streambank condition WCIs from expected increases in public use, but will not alter the general increasing trend. Disturbance history and regime, and RCA WCIs will improve with the restriction on motorized cross-country travel.

Motorized recreation is the most likely source of petroleum contamination with this action. Because motorized trails ford streams directly adjacent to occupied habitat, and roads also occur adjacent to and cross streams, a fuel spill in these areas is likely to result in adverse effects to listed fishes.

Adverse effects to listed fishes such as harassment or redd trampling are also likely to occur from fording streams on foot, horseback, or other non-motorized travel, as mentioned above.

Recreational floating could potentially adversely affect spawning or staging steelhead and Chinook salmon in the mainstem. Potential effects exist from interactions between recreational floaters and spawning steelhead and Chinook in the mainstem SFSR. These interactions include harassment from direct physical disturbance of boats passing over or near staging or spawning fish, and trampling of redds and or direct disturbance from people launching, portaging, and paddling. Recreational floating starts each year in the spring and continues throughout the summer. There are steelhead and Chinook spawning areas in the SFSR that span the width of the river channel. These exist at large pool tailouts. In these areas, harassment of spawning fish could occur because floaters would be unable to avoid spawning areas, and floating occurs at the same time of year as spawning. The floating restrictions that are in place will reduce potentially adverse harassment effects to spawning salmon and steelhead.

2. SFSR ROAD RECONSTRUCTION

a. Area closure

Dates of implementation are unknown. The proposed area closure will close some areas open to dispersed camping use between the SFSR Road and the SFSR. Effects of the closure will be reduction of adverse effects to habitat from human access which have been observed at Native American fishing sites, and from stock waste, and erosion on streambanks from human and stock access, which have been observed near the mouth of Nasty Creek (personal observation, October 2004, and Tom Crawford, Payette NF watershed specialist, personal communication).

b. Road gravelling (One mile of McCall-Yellow Pine road from Secesh River bridge to Hamilton Bar) (Lower SFSR subwatershed)

Dates of implementation are unknown. Reductions in sediment delivered from the road surface are expected from the road gravelling, which is expected to benefit Chinook salmon (Burns 1992) and the other listed species, and to significantly improve egg-to-emerged fry survival of Chinook salmon (NMFS 1993) and other listed species. Temporary, negligible effects of sediment mobilization may occur during implementation.

c. Road closure (SFSR Road from Hamilton Bar to Threemile Creek)

Dates of implementation are unknown. Closure of the SFSR Road and conversion to a motorcycle trail will reduce the roaded surface area, remove culverts, and reduce impacts of motorized travel within this RCA. Temporary, negligible effects of sediment mobilization may occur during implementation.

d. Goat Creek culvert replacement

Effects relate to:

- Temporary sediment delivery during construction,
- Temporary stream and groundwater management during construction,
- Short and long term sediment reduction from restoration of more natural sediment transport patterns,
- Disturbance of fish during construction, and
- Restoration of fish passage To Goat Creek

e. Sediment delivery.

During project implementation, ground disturbance could cause sediment to be delivered to lower Goat Creek and the SFSR. However, use of effective, extensive mitigation measures and BMPs (Appendix 4 of Faurot & Burns 1999), pre- approved by a journey level hydrologist or fish biologist, will minimize the duration and amount of sediment mobilized and flow disruption during construction activities. Some examples of these effective mitigation measures and BMPs include (see contract specifications in Federal Action section and at CD2: \Support Documents\Roads\Goat_Creek_contract.doc [in Roads.zip]):

- Dewater Goat Creek before instream construction
- The placement of stream simulation rock and channel rock shall be done when the channel is dewatered. Before the stream is diverted back into the new channel, wash the new channel, and collect the sediments (if any) and remove the sediments from the channel via the use of SEDIMAT or approved equal. All stream simulation materials and channel rock shall be in place and the channel approved by the COR prior to the introduction of the stream.
- Prevent direct entry of surface drainage into streams
- Construct permanent and temporary settling basins to intercept sediments
- Use slash filter windrows at excavation sites to control erosion
- Use permanent and temporary control measures to minimize erosion and sedimentation during and after construction according to the contract specifications and contract permits

Similar mitigation measures developed in previous consultations with NMFS avoided short-term sediment deposition and flow alterations associated with other sediment-disturbing activities on the SFSR Road (NMFS 1993). These measures have been proven in other studies to reduce sedimentation to negligible levels (Burroughs and King 1989, Megahan et al. 1992, and Swift 1986), and should avoid more-than-negligible sediment delivery to Goat Creek and the SFSR. Effects of increased sediment delivery and flow alteration are therefore expected to be negligible.

f. Effects of surface and groundwater flow alteration.

Channel dewatering, rewatering, and instream excavation could cause alteration of surface and groundwater flow patterns. However, use of effective, extensive mitigation measures and BMPs (Appendix 4 of Faurot & Burns 1999), pre- approved by a journey level hydrologist or fish biologist, will minimize the duration and amount of flow disruption during construction activities. Some examples of these effective mitigation measures and BMPs include (see contract specifications in Federal Action section and at CD2: \Support Documents\Roads\Goat_Creek_contract.doc [in Roads.zip]) are listed above. Similar mitigation measures developed in previous consultations with NMFS avoided adverse effects from short-term flow alterations associated with other construction actions on the SFSR Road (NMFS 1993).

g. Restoration of sediment transport patterns.

Replacement of the existing culvert with an open-bottom culvert will restore a more natural sediment transport pattern in the Goat Creek system. The project will also eliminate the current sediment accumulation upstream from the culvert, and prevent such an accumulation from occurring again. Removal of road fill at the culvert will also reduce the existing mass failure risk (Burns 1992). Reducing the present sediment accumulation, restoring a more natural sediment transport pattern, and reducing the mass failure risk will improve habitat conditions for listed fish in lower Goat Creek and the SFSR.

h. Fish disturbance.

Construction activities will temporarily disrupt and disturb listed species present in the vicinity of the project in lower Goat Creek (resident rainbow only) and in the SFSR immediately upstream and downstream from the Goat Creek culvert (all listed and sensitive fish species). The construction timeframe will occur throughout July-November 2007. Construction actions have the potential to disturb Chinook salmon migrating up the SFSR past the Goat Creek confluence, and adversely affect spawning Chinook salmon in the SFSR immediately downstream of the culvert. Construction actions have the potential to adversely disturb rearing steelhead and cutthroat in the SFSR immediately downstream of Goat Creek. And construction actions have the potential to adversely disturb migrating and spawning bull trout in the SFSR. These adverse affects will be temporary, lasting for the amount of time that construction activities are occurring (July-November 2007). Once construction actions have been completed, no adverse effects due to disturbance are anticipated.

i. Restoration of fish passage.

In general, culvert replacement with an open-bottom structure, even with associated risk of fish disturbance and temporary, negligible downstream sediment mobilization, is the best remedy for restoring fish passage (Reeves et al. 1991). Up to 1.5 miles of stream habitat in Goat Creek will be reconnected to the mainstem SFSR, allowing upstream passage for any listed species.

j. Snow removal - Ongoing

Approved methods have been consistently implemented (Tom Crawford, Payette NF watershed specialist, Krassel Ranger District, personal communication, January 2006). It is likely that these methods have resulted in a reduction of sediment onto the SFSR by relieving fillslopes of snowloads by not loading more snow onto them then occurs naturally. Effects of continued implementation of this component should continue to improve baseline conditions.

k. Traffic management and enforcement of designated parking areas - Ongoing

The traffic management plan first implemented in 1995 has reduced, and will continue to reduce, the risk of a fuel spill compared to the risk for unrestricted loads by limiting loads to less than 500 gallons (personal observation of the author). Enforcement of designated parking areas (see Travel Plan)

protects the RCA from eroding effects of human and stock access, and from human disturbance of fish and redds. Effects of continued implementation of these components should continue to improve baseline conditions.

l. Stabilization of cutslopes and fillslopes - Ongoing

Stabilization of cutslopes and fillslopes has been occurring since 1992. Structural treatments (slash filters, grid structures, slab wood structures) and mulching have resulted in short-term sediment reduction, however, long-term stabilization will depend on the establishment of deep-rooted, woody plants. Eroding cut and fills have been planted, and some erosion reduction can be directly attributable to the plantings (Tom Crawford, Payette NF watershed specialist, Krassel Ranger District, personal communication, January 2006). Effects of continued implementation of this component should continue to improve baseline conditions.

n. Summary

The overall effect of the remaining actions for the SFSR Road Reconstruction project that are part of this action, is designed to improve baseline conditions and be beneficial to the listed fish. Improving trends in subsurface fine sediments coincides with recent watershed improvements, which appear to have been effective in restoring a great deal of resiliency to these systems (Nelson et al. 2004). The proposed activities could cause some temporary sediment mobilization while projects are being implemented. This mobilization would be minimized by application of BMP erosion control measures, and in the case of the Goat Creek culvert replacement, total erosion could be greater without culvert replacement. The resiliency of the SFSR is expected to enable the system to absorb potential sedimentation from this action without adverse effects to listed species or habitat. These actions may have the potential to temporarily disturb fish in the vicinity of project actions during construction, but will not hinder attainment of relevant "functioning appropriately" indicators. In the long term, these actions should help attain appropriately functioning indicators.

F. CUMULATIVE EFFECTS, STATE AND PRIVATE

Cumulative effects are effects of State or private activities that are reasonably certain to occur in the watershed where the Federal action occurs. Ongoing and future actions on State and private land that are reasonably certain to occur are: mining, subdivision and residential development of private land, water diversions/withdrawals, tourist/guest ranch businesses, recreational use, and road construction, maintenance and use.

The Lower SFSR subwatershed has several parcels of private land as well as several State school sections (undeveloped), lands managed by the Idaho Department of Lands (where timber harvest occurs), and other Fish and Game owned land. Private land is located at the Davis Ranch (240 acres), Fritzers (60 acres), McClain Ranch (160 acres), Elk Creek Ranch (160 acres), Grouse Creek (120 acres), Hettinger Ranch (400 acres), and Badley Ranch (400 acres). Total undeveloped State land consists of 4,000 acres, while total private inholdings consist of 1,260 acres. Development has occurred mostly on private land where ranches have been subdivided, including the McClain and Badley Ranches. All of the private land could be subject to further subdividing. Private land owners are entitled to the right of reasonable access under the Alaska National Interest Lands Conservation Act (ANILCA). The State of Idaho harvested timber and reconstructed roads from the school sections from 1996-1999 (Contux timber sale). County road maintenance practices include herbicide application in RCAs and sidecasting of sediments from road blading. Cumulative effects are expected to maintain or improve the existing environmental baseline at the subwatershed scale, with the exception of Travel Plan, Noxious Weed Management, and the Mackey Bar water diversion SUP, which have adverse effects.

The East Fork SFSR subwatershed has several parcels of private land (Stibnite, Red Metal, and Cinnabar Mine Areas, Eiguren Ranch, and Ryan Creek) as well as several State school sections (undeveloped). Effects on non-Federal lands include the beneficial effects of CERCLA and State mining reclamation actions in the Stibnite Area; actions related to the town of Yellow Pine that may be adverse, and Valley County road maintenance practices on the EFSFSR Road that have been documented as adverse (e.g., herbicide application in RCAs, sidecasting of sediments from road

blading, removal of logjams and subsequent destruction of redds) (on file at PNF SO). Cumulative effects are expected to maintain or improve the existing environmental baseline at the subwatershed scale, except for the effects of the Travel Plan and Noxious Weeds management, which are expected to be adverse.

The Secesh subwatershed has several parcels of private land as well as several State school sections (undeveloped). Effects can occur associated with private land from operation of the commercial hot spring and lodging facility at Burgdorf Hot Springs, mining at Crystal Mountain, maintenance of roads by Idaho and Valley Counties, and subdivision development in Secesh Meadows. Cumulative effects are expected to maintain or improve the existing environmental baseline at the analysis area scale, except for the Travel Plan and Noxious Weed Management, which have adverse effects.

The Upper SFSR subwatershed has a parcel of private land (Reed Ranch, scheduled for exchange to the USFS) as well as a State school section (undeveloped). Valley County maintains most of the roads within the analysis area under easements, except the mainstem SFSR Road. Cumulative effects are expected to maintain or improve the existing environmental baseline at the subwatershed and watershed scales, except for effects of the Travel Plan and Noxious Weed Management actions, which have adverse effects.

G. Combined Effects, including those from Interrelated and Interdependent Federal Actions

Most of the ongoing and new actions maintain, improve, or restore each of the population and habitat indicators considered in the environmental baseline. The combined effect of these actions will be to slowly move the environmental baseline towards the condition described as “functioning appropriately”, except WCIs adversely affected by the Travel Plan, Noxious Weed Management, and the Mackey Bar water diversion SUP.

VI. MITIGATION MEASURES

All mitigation measures have been incorporated into the federal actions.

VII. MONITORING AND EVALUATION

All monitoring and evaluation has been incorporated into the federal actions.

VIII. DETERMINATIONS

Table 16.—Determinations for federal actions in the SFSR Section 7 watershed. All determinations are valid until LRMP revision.

Federal Action	Listed Species or Critical Habitat				
	Chinook, Steelhead	Chinook C. Habitat	Steelhead C. Habitat	Bull Trout	Cutthroat
Miscellaneous Forest Products	NLAA	NLAA	NLAA	NLAA	NLLL
Mistletoe Control and Precommercial Thinning	NLAA	NLAA	NLAA	NLAA	NLLL
Fire Management Activities	NLAA	NLAA	NLAA	NLAA	NLLL
Fish Habitat and Riparian Sampling	NLAA	NLAA	NLAA	NLAA	NLLL
Watershed and Fish Habitat Improvement and Maintenance	NLAA	NLAA	NLAA	NLAA	NLLL
Noxious Weed Management	LAA	LAA	LAA	LAA	NLLL
Road Management Trails, Recreation and Administrative Site Operation and Maintenance Travel Plan	LAA	LAA	LAA	LAA	NLLL
Water Diversion SUPs					
Eiguren	NLAA	NLAA	NLAA	NLAA	NLLL
Peterson	NLAA	NLAA	NLAA	NLAA	NLLL
Wyatt, Phillips-Larrea, LaPaglia, Spradling, Hardy, Titus, Smith, Holly	NLAA	NLAA	NLAA	NLAA	NLLL
Sandy Cove	NLAA	NLAA	NLAA	NLAA	NLLL
Badley	NLAA	NLAA	NLAA	NLAA	NLLL
Mackey Bar	LAA	LAA	LAA	LAA	NLLL
Other Actions					
Copenhaver cable SUP	NLAA	NLAA	NLAA	NLAA	NLLL
Outfitter and Guides	NLAA	NLAA	NLAA	NLAA	NLLL
Stibnite Mine Closure	NLAA	NLAA	NLAA	NLAA	NLLL
Grazing Allotments	NLAA	NLAA	NLAA	NLAA	NLLL
SFSR Road Reconstruction	NLAA	NLAA	NLAA	NLAA	NLLL

NOTE: See Acronyms and Abbreviations (Appendix 4) for explanation of species and determination acronyms

A. RATIONALE

All actions were screened for effects to individual habitat elements using the WCI tables (Appendix 3). Actions were determined “Not Likely to Adversely Affect” the listed species or critical habitat because population characteristics or habitat elements would either be maintained, improved, or not affected by the actions. Actions were determined “ Likely to Adversely Affect” the listed species or critical habitat because population characteristics or habitat elements would be degraded by the actions. The determinations are based on the scope of activities described in the plans of operation, project plans, or other supporting documents for each project. This includes the implementation of all mitigation measures that are a part of the action. Adverse effects are expected for the Travel Plan, one Water Diversion SUP, and Noxious Weed Management actions.

1. MISCELLANEOUS FOREST PRODUCTS

The considered action is **not likely to adversely affect** listed species or critical habitat and **may affect individuals, but is not likely to lead to listing** of cutthroat trout. These activities are expected to yield negligible effects to fish and/or their habitat because required mitigation measures address fuel handling, and preclude actions in RCAs unless both a journey level hydrologist and fisheries biologist agree that required mitigations are met. For a complete discussion of effects see sections V.A. through F.

2. MISTLETOE CONTROL AND PRE-COMMERCIAL THINNING

The considered action is **not likely to adversely affect** listed species or critical habitat and **may affect individuals, but is not likely to result in a trend toward federal listing** of cutthroat trout. These activities are expected to yield negligible effects to fish and/or their habitat because required mitigation measures address fuel handling, and preclude actions in RCAs unless both a hydrologist

and fisheries biologist agree that required mitigations are met. For a complete discussion of effects see sections V.A. through F.

3. Fire Management Activities

The considered action is **not likely to adversely affect** listed species or critical habitat and **may affect individuals, but is not likely result in a trend toward federal listing** of cutthroat trout. To address potential effects, the federal action provides direction such as screening pumps, not dropping retardant in RCAs or streams, containing fuel, proper handling and use of chemicals, not removing RCA trees unless they present a hazard, and rehabilitating disturbed areas (e.g., fireline, helispots, camps). In addition, direction will be implemented to assure that fire personnel are briefed and familiar with fire management guidelines in this BA, and that oversight and continued education/briefing is provided to fire personnel by resource advisors. This action is expected to have only negligible effects due to implementation of mitigation measures and guidelines, continued education of fire personnel, and use of resource advisors. For a complete discussion of effects see section V.A.2.

4. Fish Habitat and Riparian Sampling

The considered action is **not likely to adversely affect** listed species or critical habitat and **may affect individuals, but is not likely to result in a trend toward federal listing** of cutthroat trout. Required mitigation measures are intended to prevent adverse to listed fishes or eggs. Fish displacements due to personnel presence are judged to be biologically negligible because of the extremely short duration of disturbance. Sediment that is generated due to sampling is expected to settle out within the prescribed buffer distance (one stream width or within one habitat unit of any redd). Buffers are also judged to be effective in eliminating any potential harassment of adjacent fish. For a complete discussion of effects see sections V.A. through F.

5. Watershed and Fish Habitat Improvements and Maintenance

The considered action is **not likely to adversely affect** listed species or critical habitat and **may affect individuals, but is not likely to result in a trend toward federal listing** of cutthroat trout because the species and habitat criteria will be maintained or improved. Mitigations described in the Federal action will insure that any temporary degrading effects are negligible. Restrictions on use of mechanized equipment within RCA buffers will insure that any soil, streambank, or streambed disturbance and associated sediment delivery to the stream channel is temporary and minimal so that effects to listed fishes are negligible. Furthermore, a journey level fisheries biologist will insure that activities do not proceed if there is potential for more than negligible effects to individual listed fish, or their eggs. For a complete discussion of effects see sections V.A. through F.

6. Noxious Weed Management

The considered action is **likely to adversely affect** listed species or critical habitat and **may affect individuals, but is not likely to result in a trend toward federal listing** of cutthroat trout. Mitigation measures are expected to minimize effects, but sub-lethal effects to listed fish and their food sources are probable, therefore adverse effects are expected from this action. For a complete discussion of effects see section IV.F.

7. Road Management, Trails, Recreation, and Administrative Site Operation and Maintenance, and Travel Plan

Because these actions are interrelated and interdependent with each other, and the Travel Plan action has been determined to be likely to adversely affect listed fishes or critical habitat, these actions are determined to be **likely to adversely affect** listed species or critical habitat and **may affect individuals, but are not likely to result in a trend toward federal listing** of cutthroat trout. For the Travel Plan, proximity of listed fishes and critical habitat to roads and/or trails in this analysis area, and decreases in streambank stability due to use and increased use of existing trails, road, and fords are expected to have adverse effects. Adverse effects to listed fishes such as harassment or redd trampling are also likely to occur from fording streams on foot, horseback, or other non-motorized travel. On their own, the Road Management and Trails actions are expected to have negligible effects on listed fishes and critical habitat due to mitigation measures that address sediment delivery and

removal of LWD from RCAs, minimize potential for petroleum or other chemical contamination, and provide for aquatic organism passage. In addition, where these activities run the risk of affecting or disturbing listed fishes in the immediate area (i.e., harassment, redd destruction, sediment effects) a fisheries biologist must first approve the activity. For a complete discussion of effects see sections V.A. through F.

8. WATER DIVERSION SUPS

The Eiguren, Peterson, Wyatt, Phillips-Larrea, LaPaglia, Spradling, Hardy, Titus, Smith, Holly, Sandy Cove, and Badley water diversion SUP actions are **not likely to adversely affect** listed species or habitat and **may affect individuals, but are not likely to result in a trend toward federal listing** of cutthroat trout. The amount of water diverted by these users would be negligible compared to the subsequent small change in weighted useable area required for all life stages of cutthroat trout, bull trout, Chinook salmon, and steelhead represented in the "area versus flow" models for the Secesh River or its tributaries. The amount is considered to be negligible because the amount of habitat that would change (in square feet) from the withdrawals is immeasurable, even at low flows, given the models.

The Mackey Bar water diversion SUP action is **likely to adversely affect** listed species or habitat and **may affect individuals, but are not likely to result in a trend toward federal listing** of cutthroat trout. Given that baseflows averaged 2.24 cfs below the point of diversion it estimated that the 2 cfs withdrawal represents approximately 47% of the total available base flow. It is estimated that at low flows, with 47% of flow removed from any stream, up to half of the habitat available to cutthroat trout and steelhead is removed. Losses of habitat due to the flow withdrawals by the Mackey Bar diversion represent adverse effects to this species and critical habitat.

9. COPENHAVER CABLE CAR SUP

The Copenhaver cable car SUP action is **not likely to adversely affect** listed species or habitat and **may affect individuals, but are not likely to result in a trend toward federal listing** of cutthroat trout. Because the potential startling effect to listed fishes that may be swimming under the cable car at the time that it is being used will not affect spawning activity, effects are expected to be intermittent and short-lived, and therefore negligible. Maintenance would include repair of structural elements of the support system. Ground disturbance of the RCA is not anticipated. Therefore, effects of maintenance actions are considered to be negligible.

10. OUTFITTER AND GUIDES

The considered action is **not likely to adversely affect** listed species or critical habitat and **may affect individuals, but is not likely to result in a trend toward federal listing** of cutthroat trout. Negligible effects from camp use are expected because past problems have been identified and remedied, and annual inspections will continue to see that camps are meeting LRMP standards and that changes are made should there be potential effects to fish or fish habitat. To reduce the risk of redd trampling or other effects, training to avoid adverse effects will be provided to outfitters and guides. For a complete discussion of effects see sections V.A. through F.

11. GRAZING ALLOTMENTS

The considered action is **not likely to adversely affect** listed species or critical habitat and **may affect individuals, but is not likely to result in a trend toward federal listing** of cutthroat trout. Due to use of bridges for sheep to cross streams, and watering and fording in only areas without listed fishes or with no spawning habitat, only negligible effects on spawning listed fish are expected. Mitigation measures that include utilization standards, salting areas, handling facilities, trailing, once only grazing, and use of bedding and watering sites ensure that only negligible effects result from this action on listed fishes and critical habitat. For a complete discussion of effects see sections V.A. through F.

12. SFSR ROAD RECONSTRUCTION

The considered action is **not likely to adversely affect** listed species or critical habitat and **may affect individuals, but is not likely to result in a trend toward federal listing** of cutthroat trout. The overall effect of the remaining actions for the SFSR Road Reconstruction project is expected to improve baseline conditions and be beneficial to the listed fish. Improving trends in subsurface fine sediments coincides with recent watershed improvements, which appear to have been effective in restoring a great deal of resiliency to these systems (Nelson et al. 2004). The proposed activities could cause some temporary sediment mobilization while projects are being implemented. This mobilization would be minimized by application of BMP erosion control measures, and in the case of the Goat Creek culvert replacement, total erosion could be greater without culvert replacement. The resiliency of the SFSR is expected to enable the system to absorb potential sedimentation from this action without adverse effects to listed species or habitat. These actions may have the potential to temporarily disturb fish in the vicinity of project actions during construction, but will not hinder attainment of relevant "functioning appropriately" indicators. In the long term, these actions should help attain appropriately functioning indicators.

13. STIBNITE MINE CLOSURE

The considered action is **not likely to adversely affect** listed species or critical habitat and **may affect individuals, but is not likely to result in a trend toward federal listing** of cutthroat trout. Potential impacts to riparian areas, removal of riparian vegetation, and ground disturbance leading to temporary sediment delivery are associated concerns with this ultimately beneficial activity. Past monitoring and project inspections have documented these temporary sediment problems that are unavoidable consequences of some rehabilitation actions, such as moving stream channels away from toxic contaminants, and have documented that these effects have been short-lived (see CD2: \Supprot Documents\Minerals for Stibnite documents). Because mitigation includes continued monitoring, RCA protection, and implementation of BMPs, and because sediment effects have been demonstrated to have been short-term, only temporary, negligible adverse effects are expected from this action.

Spawning areas and redds will be avoided during project implementation, so direct adverse effects from disturbance are not expected. Because of the improving trend and the mitigation measures, and mitigation measures avoid adverse effects of sediment delivery, effects are expected to be negligible or improving.

IX. REFERENCES

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X. APPENDICES

A. APPENDIX 1. FEDERAL ACTIONS IN THE SOUTH FORK SALMON RIVER (UPPER SFSR, LOWER SFSR, SECESH, AND EFSF ANALYSIS AREAS) AND THEIR STATUS.

Volume & Title	Author & Year	Federal Action & Mitigation that was Incomplete or Ongoing in Wagoner and Burns (2001)	Status	Effect
1. Mining Projects and Associated Activities	Lund and Burns 1993	Comfort Lode Mine Sediment control mitigation	Completed	Reduced sediment from historical mining
		Stibnite Mine Reclamation (see additional actions in Vols. 24 and 26)	Ongoing	Reduced erosion and sediment delivery, improved hydrologic function, revegetated disturbed sites, removal of hazardous materials
		Skipper Lode Mine reclamation Backfill adit, site cleanup	Completed	Improved hydrologic function
		Polaris Mine reclamation Eliminate occupancy and reclaim site	Incomplete	Minor effects from existing historical mine site related to ground disturbance and erosion
2. Engineering (1994-2000) Road Maintenance and Facility Projects	Lund and Burns 1993	Culvert/ditch inspection Dust abatement additives Wet season closure of unsurfaced roads Reclamation of non-system roads	Ongoing	Reduction of road-related sediment
3. Timber Harvest and Associated Activities	Lund and Burns 1993	South Fork small sales	Completed	Project mitigation prevented adverse effects to baseline erosion and sedimentation processes
4. SUPs and Watershed Improvement Projects	Lund and Burns 1993	Ruby Meadows	Completed	Reduction of ATV and motorcycle trail-related sediment
5. Miscel-laneous Projects	Lund and Burns 1994	Trails and Campground Maintenance	Ongoing	Reduction of trail-related sediment
		Watershed and Habitat Improvement	Ongoing	Watershed and habitat improvement - various
6. Bear Track, War Eagle, Gold Pan Plaza Mineral Exploration and Rehabilitation	Lund and Burns 1995	War Eagle Mine Road Reclamation	Completed	Reduction of road-related sediment
7. Tailholt Research Study	Faurot and Burns 1995		Cancelled	None
8. Secesh subdivision	Jacob-son and Burns 1995	Road buildling	Complete	Increased road mileage within analysis area
9. Victor Loon Sheep Allotment	Wag-oner and Burns 1995	Sheep grazing	Ongoing	See Volume 24
10. SFSR Road Reconstruc-tion	Burns 1996	Numerous actions See Volume 24	Ongoing	See Volume 24
11. Lower SFSR Post-fire	Faurot and	Helicopter harvest, 3607 acres. Various mitigation. Fuel haul.	Complete	No documented adverse effects from harvest. Road

Volume & Title	Author & Year	Federal Action & Mitigation that was Incomplete or Ongoing in Wagoner and Burns (2001)	Status	Effect
Projects and fuel haul	Burns 1995			gravelling and other mitigation has helped to reduce road-related erosion along mainstem Secesh River.
12. Road Use Agreements in Lower SFSR	Jacob-son and Burns 1996	IDL, IDFG, Mackay Corp. Road Use for Fuel Haul and Timber Haul	Complete	Road gravelling and other mitigation has helped to reduce road-related erosion
13. Marshall Mtn., Bear Pete, and Josephine Sheep Allotments	Arm-strong and Burns 1996	Sheep grazing	Ongoing	See Volume 24
14. Stibnite-West End Extension	Faurot and Burns 1996	Road building and mine pit development	Complete	New roads added to analysis area, increased ground disturbance due to pit. Much of the disturbance has been reclaimed in subsequent actions.
15. Don Clark SUP	Wagon-er and Burns 1996	Water Development permit	Permit dropped	None
16. Prescribed Fire and Yellow Pine Fuels reduction	Faurot and Burns 1997	Prescribed burning	Complete	No adverse effects documented to fish or fish habitat
17. Brundage-Reed Land Exchange	Burns 1997	Land exchange	Incomplete	None
18. Road re-construction, EWP projects in Lower SFSR	Walker and Burns 1997	Road reconstruction and emergency watershed protection (Elk Creek) Replacement of Midvale Telephone Lines, Road Use Agreement, Erosion control, fuel haul mitigation	Complete	Short-term adverse effects due to reconstruction
19. Ongoing Actions (Steelhead)	Faurot and Burns 1998	Road maintenance Travel Plan O&M Trails and Rec sites Misc Harvest, Small Sales Watershed and Hab. Improvement SUPs-Water development Mackey Bar SUPs SUPs-Outfitter/Guides Victor Loon sheep allotment Marshall/Bear/Josephine allotment Mitigation: SFSR floating restrictions	Ongoing Ongoing Ongoing Ongoing Ongoing Ongoing Ongoing Ongoing Ongoing Ongoing Ongoing Complete	See Volume 24 See Volume 24 See Volume 24 See Volume 24 See Volume 24 See Volume 24 See Volume 24 See Volume 24 See Volume 24 See Volume 24 See Volume 24 Reduction in adverse effects from contact between floaters and spawning fish
20. Mackay Bar Grazing SUP	Wagon-er and Burns 1998	Grazing SUP	Cancelled	None
21. Time-Critical Removal Actions at Cinnabar and Meadow Creek	Faurot and Burns 1998	Removal of contaminant exposure to the environment (CERCLA)	Complete	Exposure of Sugar and Meadow Creeks to arsenic, cyanide, mercury, and other heavy metals was reduced
22. Ongoing Actions (Bull Trout)	Faurot and Burns 1998		Ongoing Ongoing Ongoing Ongoing Ongoing Ongoing	See Volume 24 See Volume 24 See Volume 24 See Volume 24 See Volume 24 See Volume 24

Volume & Title	Author & Year	Federal Action & Mitigation that was Incomplete or Ongoing in Wagoner and Burns (2001)	Status	Effect
			Ongoing Ongoing Ongoing Ongoing Complete Ongoing Incomplete	See Volume 24 See Volume 24 See Volume 24 See Volume 24 See Volume 24 See Volume 24 See Volume 24
23. Grouped Actions	Faurot and Burns 1999		Ongoing Ongoing Ongoing Ongoing Complete	See Volume 24 See Volume 24 See Volume 24 See Volume 24 Project mitigation prevented adverse effects to fish
24. Ongoing Actions	Wag-oner and Burns 2001	Fish Habitat and Riparian Sampling	Ongoing	Project mitigation has prevented any documented adverse disturbance effects to fish or eggs
		Road maintenance Travel Plan O&M Trails and Rec sites Brundage-Reed Land Exchange Misc Harvest, Small Sales SUPs-Water diversions Mackey Bar SUPs SUPs-Outfitter/Guides Victor Loon sheep allotment Marshall/Bear/Josephine allotment Comfort Lode Mine SFSR Road Reconstruction South Fork Houselog	Ongoing	Localized areas have documented effects of reduced LWD in RCAs due to firewood harvest
		Trails End SUP Eiguren SUP SFSR Road Reconstruction Stibnite Reclamation/Closure Daddy Dels 1 Mine	Ongoing	Site-specific critieria for RCA buffers has prevented any documented adverse effects
		Road Management	Ongoing	Road management practices not within criteria in Wagoner and Burns has resulted in localized areas of fine sediment input and reduction of LWD. This has especially been evident on the EFSF where county practices have resulted in redd destruction and sediment input at replaced culvert sites.
		Trails, Rec, Admin Site O&M	Ongoing	Trail maintenance has reduced erosion in specific locations. Existing adverse effects due to trail crossings have not been systematically inventoried, and ford-related impacts are ongoing.
		Travel Plan	Ongoing	Existing adverse effects due to road and trail crossings have not been systematically inventoried, and ford-related impacts are ongoing. Off-road access has caused documented adverse effects to stream channels.

Volume & Title	Author & Year	Federal Action & Mitigation that was Incomplete or Ongoing in Wagoner and Burns (2001)	Status	Effect
		Watershed and Fish Habitat Improvements and Mtc	Ongoing	Localized areas of rehabilitation and long-term reductions in sediment delivery and improved hydrologic function.
		Wildland Fire Suppression	Ongoing	Some adverse effects have been documented such as accidental retardant drops
		Water Diversion SUPs	Ongoing	Minor reductions (potentially immeasurable) in habitat from water withdrawals, exacerbated in low water years
		Outfitter and Guides SUPs	Ongoing	No adverse effects have been documented
		Grazing Allotments Victor Loon Josephine/Marshall Mtn/Bear Pete	Ongoing	At most monitoring sites, there are no discernable upward or downward trends in cobble embeddedness. The exceptions are Grouse Creek E062, which has a statistically significant downward trend, and Lick Creek E057, which has a significant upward trend. Lick Creek has not been grazed since 1992; therefore, the upward trend cannot be attributed to grazing (Zurstadt 2004).
		South Fork Houselog Small Timber Sales	Incomplete	None
		Burgdorf Bridge Relocation	Complete	Short-term adverse effects due to construction, improved location benefits hydrologic condition
		SFSR Road Reconstruction	Ongoing	Monitoring of past actions has demonstrated positive effects. Goat Creek culvert site remains unstable and as a fish migration barrier. Grants are being pursued to fund this activity for 2006-2007.
		Stibnite Mine Closure	Ongoing	Continuing actions associated with Stibnite Mine closure have reduced sediment sources, stabilized areas of ground disturbance, improved and restored drainage patterns, and reduced sources of contaminants to listed fish and habitat.
		Parks Eiguren Prescribed Burn	Complete	No adverse effects to fish have been documented
		Willowbasket Trail Relocation	Complete	Adverse trail effects have been reduced by trail relocation
25. Daddy Dels 2 Mine	Faurot and Burns 2001	Mine exploration and reclamation	Complete	Project mitigation prevented adverse effects to fish
26. Fitsum Prescribed Burn and Meadow	Faurot and Burns	Fitsum Prescribed Burn and Meadow Creek Relocation	Burn not yet initiated, relocation is	Meadow Creek relocation has removed heavy metals contamination from the

Volume & Title	Author & Year	Federal Action & Mitigation that was Incomplete or Ongoing in Wagoner and Burns (2001)	Status	Effect
Creek Relocation	2004		complete	stream and has improved channel and other fish habitat characteristics
Nick Ck Retardant Drop	Faurot and Burns 2005	Emergency BA: Accidental drop of retardant into Nick Creek	Complete	Probable adverse effects to downstream fish
27. Burgdorf Roads	Faurot and Burns 2005	Roads and mine reclamation, as described in the Burgdorf RAP	Incomplete	None

B. APPENDIX 2. ENVIRONMENTAL BASELINE MATRICES.

1. EAST FORK SOUTH FORK SALMON RIVER

Agency/Unit:	:PNF Krassel and McCall RDs	HU Code & Name:	17060208-02 Upper East Fork South Fork Salmon River 5th 17060208-04 Lower East Fork South Fork Salmon River 5th HU
Fish Species Present:	Chinook salmon, steelhead, bull trout, cutthroat	Spatial Scale of Matrix:	Two 5th HUs
(Anad. Sp.) Population:	South Fork Salmon River	Subpopulation:	East Fork South Fork Salmon River
(Bull trout) Core Area:	South Fork Salmon River	Local Population:	
Management Action(s):	Ongoing Actions 2006		

Pathways Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline**	**Discussion of Baseline – Current Condition**
Subpopulation Character			
Subpopulation Size	**Bull trout** - Mean total local population size or local habitat capacity more than several thousand individuals. Adults in local population > 500. All life stages are represented within the local population.	FR: PJ	Population size unknown. A recent tagging study of bull trout in the EFSFSR (Hogen, 2002) found the fish dispersed throughout the main river as well as in several tributaries, primarily Profile.

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(Bull trout) Core Area:	South Fork Salmon River	Local Population:	
Management Action(s):	Ongoing Actions 2006		

Pathways Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline**	**Discussion of Baseline – Current Condition**
Growth and Survival	**Bull trout** - Local population has the resilience to recover from temporary or short-term disturbances (e.g., catastrophic events, etc.) or local population declines within 1 to 2 generations (5-10 years). The local population is characterized as increasing or stable. At least 10 years of data support this estimate.	FR: PJ	
Life History Diversity and Isolation	**Bull trout** - The migratory form is present and the local populations are in close proximity to each other. Migratory corridors and rearing habitat (lake or larger river) are in good to excellent condition for the species. Neighboring local populations are large with high likelihood of producing surplus individuals or straying adults that will mix with other local populations.	FR: PJ	
Persistence and Genetic Integrity	**Bull trout -** Connectivity is high among multiple (5 or more) local populations with at least several thousand fish each. Each of the relevant local populations has a low risk of extinction. The probability of hybridization or displacement by competitive species is low to nonexistent	FR: PJ (see above)	

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Pathways Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline**	**Discussion of Baseline – Current Condition**
Water Quality			
Temperature (7 day average. Maximum, °C)	**Bull trout:** Incubation (Sept-Mar): 2-5°C Rearing (year-round): 4-12°C Spawning (Sept): 4-9°C Migration (June-Sept): NTE 15°C	FR D	Wagoner and Burns (2001): FA Though temperature values are within the FR/FUR ranges (unpublished data on file at PNF SO), data are considered to reflect a natural temperature regime in most of the SFSR drainage because there is little evidence of management effects in these watersheds that would contribute to elevated temperatures. Given the stream elevation, topography, aspect, and riparian vegetation characteristics, this data likely reflects the natural range of variability, except along the mainstem roads, where shading is compromised. Unpublished data (7d avg max degrees Centigrade) on file at PNF SO: Meadow Creek 2004: 17.3 Upper EFSF at Rabbit Creek 2004: 12.8 Sugar Creek 2003: 15 Tamarack Creek 2004: 15.6 EFSF Mouth 2004: 17.66 Parks Creek 2003: 15.9
Temperature (7 day average maximum, °C)	**Chinook/steelhead:** Spawning, rearing, & migration: 10-13.9 °C As directed by the NOAA BO on the LRMP (NOAA 2003), these default WCI values are being revised to appropriate values for this subbasin based on the best available data on functioning habitat conditions for ESA-listed fish within the subbasin.	FR D	See above
Intragravel Quality (in areas of spawning and incubation for anadromous fishes)	LRMP definition: <12%fines (<0.85mm) in gravel. Surface fines(≤ 6mm) ≤ 20%	see Interstitial Sediment WCI	NA

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Management Action(s):	Ongoing Actions 2006		

Pathways Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline**	**Discussion of Baseline – Current Condition**
Chemical Contaminants/Nutrients	Low levels of chemical contamination from agricultural, industrial, and other sources; no excess nutrients, no 303 (d) water quality limited water bodies.	FUR D	Entire EFSFSR listed under 303(d); sediment and unknown metals as parameters of concern.
Habitat Access			
Physical Barriers	Any man-made barriers present in watershed allow upstream and downstream fish passage at all flows.	FR D	Reegan Creek culvert and possibly other culverts are likely barriers at low flows (Wagoner and Burns (2001), Hogen 2002, Thurow 1987) Deadman and Caton Creeks have natural barriers to fish passage (Deadman: boulder with 8-foot drop 30m above EFSF Road). EFSF Road could present a man-made barrier in Reegan, Williams and Dutch Oven Creeks (Data on file at the PNF Supervisor's Office, McCall, Idaho). The Glory Hole and Box Culvert in the mainstem EFSF is likely a barrier at low flows (Wagoner and Burns (2001), Hogen 2002, Thurow 1987).

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Pathways Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline**	**Discussion of Baseline – Current Condition**
Habitat Elements			
Interstitial Sediment Deposition	LRMP definition Dominant substrate is ravel or cobble, or embeddedness is<20%	FR D,PJ	Nelson et al. 2006b describe the EFSF sampling sites as follows: "we would classify only the Tamarack Creek site as FA, with FR classifications applied to E050 and the two Sugar Creek sites and FUR classifications for the two mainstem EFSFSR sites (free matrix)." "Cobble embeddedness measurements were consistent with free matrix counts, with the Tamarack and Profile Creek sites being least embedded and the sites downstream of the Stibnite area being most embedded." The current existence, use and maintenance of the mainstem EFSFSR Road, Quartz Creek Road and historical mining disturbance in the Stibnite area continue to be a source of existing and potential anthropogenic sediment to the EFSFSR adjacent to these 6th HUs
Large Woody Debris	>20 pieces per mile, >12 in. in diameter, >35 feet in length, and adequate sources of large woody debris for both long and short-term recruitment.	FUR D, PJ	(Upper) EFSFSR Watershed Analysis (Kuzis 1997): EFSFSR 1-4 pieces/mi (may not be PACFISH wood) Limited recruitment due to Stibnite mining disturbance and mainstem EFSFSR, Profile, Sugar and Quartz Creek Roads. Unpublished data on file at PNF SO: Meadow Creek survey 2004, less than 1 piece per mile.

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Management Action(s):	Ongoing Actions 2006		

Pathways Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline**	**Discussion of Baseline – Current Condition**
Pool Frequency	**Bull trout**: Wetted Width (ft.) / Number of Pools/Mile 0-5: 39 5-10: 60 10-15: 48 15-20: 39 20-30: 23 30-35: 18 35-40: 10 40-65: 9 65-100: 4 **Chinook/steelhead:** Channel Width (ft.) / Number of Pools/Mile 0-5: 184 5-10: 96 10-15: 70 15-20: 56 20-25: 47 25-50: 26 50-75: 23 75-100: 18	FR D, PJ	Wagoner and Burns (2001): FUR EFSFSR Watershed Analysis (Upper EFSFSR 5th HU) (Kuzis 1997): Upper EFSFSR 5-15 ft wide 4 - 7 pools/mi FUR Parks Creek 13.4 ft wide 55.8 pools/mi FR Quartz Creek 23 ft wide 45.1 pools/mi FR No Mans Creek 13.4 ft wide 137.9 pools/mi FA Reegan Creek 13.8 ft wide 76.6 pools/mi FA Unpublished data on file at PNF SO, Meadow Creek survey 2004: 43-47 pools/mile (7-29 ft width) FR

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Pathways Indicators	Population and Environmental Baseline		
	Desired Condition	Baseline	Discussion of Baseline – Current Condition
Pool Quality	Each reach has many large pools >3.28 feet (1 meter) deep. Pools have good cover and cool water, and only minor reduction of pool volume by sediment.	FR D, PJ	Reaches have few large pools orinadequate cover/temperature (see temperature and RCA WCIs) (Kuzis 1997)
Off-Channel Habitat	Watershed has many ponds, oxbows, backwaters, and other off-channel areas with cover; side channels are low energy areas.	FR PJ	Wagoner and Burns (2001): FR Upper EFSF has experienced continual rerouting and diversions. Roaded RCAs have confined off-channel habitats (EFSF, Meadow Creek, Profile Creek, Sugar Creek, Quartz Creek)

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Pathways Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline**	**Discussion of Baseline – Current Condition**
Refugia	**Bull trout -** Habitats capable of supporting strong and significant local populations are protected and are well distributed and connected for all life stages and forms of the species. **Chinook/steelhead** - Habitat refugia exist and are adequately buffered (e.g., by intact RCAs); existing refugia are sufficient in size, number, and connectivity to maintain viable populations.	FR PJ	Wagoner and Burns (2001): FR The Tamarack Creek drainage, which is located almost entirely in the Wilderness, provides high-quality refugia within this analysis area. However, perennial stream RCAs in the UEFSFare 38% disturbed (Kuzis 1997), roads have substantially affected RCAs along EFSFSR, Profile, Sugar, and Quartz Creek, and Burns et al. (2005) and Kuzis (1997) document that the Bradley Pit isolates the upper EFSF from upstream fish migrations and that portions of this watershed have had extensive habitat modification and degradation. Reegan Ck – EFSFSR rd culvert is a barrier Diversion on Parks Creek Diversion on un-named trib W. of Eiguren ranch (pvt. land)
Channel Condition and Dynamics			
Avg Width/Maximum Depth Ratios in scour pools	</= 10	FR PJ	Weighted average width/max depth ratios in scour pools from Fbase outputs on file at PNF SO. Fiddle Creek 2004: 5.9 The following data may include dam pools. These numbers are not FBase output. These unweighted numbers were calculated from raw data by averaging pool widths for a reach, then dividing by average maximum pool depths for that reach. They cannot be compared to default WCIs, but are provided here for reference (unpublished data on file at PNF SO): Parks Creek – 6.3 (2002) Quartz Creek – 4.7 (2002) No Mans Creek 5.5 (2002) Reegan Creek 7.2 (2002) Based on personal observation, width/depth ratios for this analysis area are Functioning at Risk. Wagoner and Burns (2001): FUR
Streambank Condition	>90% of any stream reach has stable banks relative to the percent of inherent stable streambanks associated with a similar unmanaged stream system.	FR PJ	EFSFSR road affects EFSFSR streambanks adjacent to project area (personal observation). Wagoner and Burns (2001): FUR EFSF Watershed Analysis (Kuzis 1997): Mean of Upper EFSF 5th HU: 88%

Agency/Unit:	:PNF Krassel and McCall RDs	HU Code & Name:	17060208-02 Upper East Fork South Fork Salmon River 5th 17060208-04 Lower East Fork South Fork Salmon River 5th HU
Fish Species Present:	Chinook salmon, steelhead, bull trout, cutthroat	Spatial Scale of Matrix:	Two 5th HUs
(Anad. Sp.) Population:	South Fork Salmon River	Subpopulation:	East Fork South Fork Salmon River
(Bull trout) Core Area:	South Fork Salmon River	Local Population:	
Management Action(s):	Ongoing Actions 2006		

Pathways Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline**	**Discussion of Baseline – Current Condition**
Floodplain Connectivity	Within RCAs, floodplains and wetlands are hydrologically linked to the main channel; overbank flows occur and maintain wetland/floodplain functions; and riparian vegetation succession.	FR PJ	Wagoner and Burns (2001): FR (EFSFSR 4th HU) Quartz, Sugar, Profile, and mainstem EFSF roads lie close to the stream and have likely affected links to floodplains or wetlands. EFSFSR road has reduced links to floodplain and wetlands. Severely reduced linkage to floodplains and wetlands due to impacted RCAs in Stibnite mining area (personal observation). EFSF Watershed Analysis (Kuzis 1997): Meadow Creek and the EFSF experienced almost continual rerouting and diversion beginning in the early 1900s. Perennial stream RCAs are 38% disturbed LEFSF tribs (Williams, Dutch Oven, Deadman Creeks) are relatively intact drainages and likely to have functioning floodplains (personal observation)
Flow/Hydrology			
Change in Peak/Base Flows	Watershed hydrograph indicates peak flow, base flow, and flow timing characteristics comparable to an undisturbed watershed of a similar size, geomorphology and climatology.	FR PJ	LEFSF tribs are relatively intact drainages and likely to have little change in flows (personal observation). Diversions affect base flows in portions of Boulder Creek and un-named EFSFSR trib. on private lands near Yellow Pine.. Roads, the Glory Hole and other historical diversions in the Stibnite Mining Area have affected flow timing in the Upper EFSF, Profile Creek, and along the mainstem EFSF. EFSF Watershed Analysis (Kuzis 1997): "In general, water flow volume and peak flow conditions have been little affected …"
Drainage Network Increase	Zero or minimum change in active channel length correlated with human caused disturbance.	FUR PJ	LEFSF tribs are relatively intact drainages and likely to have little drainage network increase. Extensive channel rerouting and diversion beginning in the early 1900s, and a high percentage of roads within RCAs, have changed channel lengths in the Upper EF due to mining and RCA roads (personal observations).
Watershed Conditions			
Road Density and Location	Total road density <0.7 miles/square mile of subwatershed, no road within RCAs.	FR PJ	Total road density = 0.7 mi/sq. mi. RCA road density=2.2 mi/sq mi, many roads within RCAs, (CD1: \Support Documents\Maps\total_roads.pdf)

Agency/Unit:	:PNF Krassel and McCall RDs	HU Code & Name:	17060208-02 Upper East Fork South Fork Salmon River 5th 17060208-04 Lower East Fork South Fork Salmon River 5th HU
Fish Species Present:	Chinook salmon, steelhead, bull trout, cutthroat	Spatial Scale of Matrix:	Two 5th HUs
(Anad. Sp.) Population:	South Fork Salmon River	Subpopulation:	East Fork South Fork Salmon River
(Bull trout) Core Area:	South Fork Salmon River	Local Population:	
Management Action(s):	Ongoing Actions 2006		

Pathways Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline**	**Discussion of Baseline – Current Condition**
Disturbance History	<15% ECA (entire watershed) with no concentration of disturbance in areas with landslide or landslide prone areas, and/or refugia, and/or RCAs.	FUR PJ	ECA = 4%, (CD1: \Support Documents\Maps\eca_slp.pdf LRMP WARS database) Disturbance is concentrated in RCAs (roads, mining) in upper watershed. Extensive channel rerouting and diversion beginning in the early 1900s, and a high percentage of roads within RCAs, have changed channel lengths in the Upper EF due to mining and RCA roads (personal observation).
Riparian Conservation Areas	The riparian conservation areas within the subwatershed(s) have historic and occupied refugia for listed, sensitive or native/desired nonnative fish species which are present and provide: adequate shade, large woody debris recruitment, sediment buffering, connectivity, and habitat protection and connectivity to adequately minimize adverse effects from land management activities (>80% intact). All vegetative components are within desired conditions identified in Appendix A of the Forest Plan. RCA functions and processes are intact, providing resiliency from adverse affects associated with land management activities. Co	FUR PJ	Roads along EFSFSR, Sugar, Profile and Quartz Creek s, and mining in the upper watershed, have affected RCA function(personal observation). RCAs observed to be 62% intact for upper EFSF (Kuzis 1997) passage barriers at Reegan Creek-EFSFSR road culvert and Glory Hole; sediment delivery to tributaries crossing EFSFSR road, and water diversions on Parks Creek, Boulder Creek, and un-named tributary E. of Reegan Creek. LEFSF tribs are relatively intact drainages and likely to have >80% intact RCAs (personal observation).
Disturbance Regime	Disturbance resulting from land management activities are negligible or temporary. Streamflow regimes are appropriate to the local geomorphology, potential vegetation and climatology resulting in appropriate high quality habitat and watershed complexity that provide refugia and rearing space for all life stages or multiple life-history forms. Ecological processes are within historical ranges.–Resiliency of habitat to recover from land management disturbances is high.	FR PJ	See above Adjacent road has affected EFSFSR, Quartz, Profile, and Sugar Creeks' resiliency (personal observation). Disturbance from land management actions such as mining and roads (riparian) is not negligible or temporary. Resiliency of habitat to recover from land management disturbances is moderate throughout most of the analysis area, but low in the Stibnite area (personal observation).

Agency/Unit:	:PNF Krassel and McCall RDs	HU Code & Name:	17060208-02 Upper East Fork South Fork Salmon River 5th 17060208-04 Lower East Fork South Fork Salmon River 5th HU
Fish Species Present:	Chinook salmon, steelhead, bull trout, cutthroat	Spatial Scale of Matrix:	Two 5th HUs
(Anad. Sp.) Population:	South Fork Salmon River	Subpopulation:	East Fork South Fork Salmon River
(Bull trout) Core Area:	South Fork Salmon River	Local Population:	
Management Action(s):	Ongoing Actions 2006		

Pathways Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline**	**Discussion of Baseline – Current Condition**
Integration of Species and Habitat Conditions	**Bull trout** - Habitat quality and connectivity among subpopulations is high. Disturbance has not altered channel equilibrium. Fine sediments and other habitat characteristics influencing survival and growth are consistent with the desired conditions for the habitat. The subpopulation has the resilience to recover from short-term disturbance within one to two generations (5-10 years). The subpopulation is fluctuating around an equilibrium or is growing.	FR PJ	Sediments and suitable habitat availability have been altered and may not return to pre-disturbance conditions within 5 years (see above WCIs and personal observation). Survival and growth rates for bull trout are reduced (see population character WCIs and Burns et al. 2005). Local populations are stable or fluctuating in a downward trend for all listed species (57FR14653, 60FR43937, 63FR31647). Connectivity among local populations occurs but habitats are fragmented (Burns et al. 2005).

1 – FA = Functioning Appropriately, FR = Functioning at Risk, FUR = Functioning at Unacceptable Risk, N = Not Applicable, M = monitoring data, SR = survey data, PJ = professional judgment, FR = field reviews

2 - Project area redband rainbow are residents, remaining in smaller tributaries their entire lives and are the same species as redband/steelhead that migrate to the ocean and return to natal streams to spawn. The Forest Plan temperature WCI for redband has not yet been developed. The temperature WCI for steelhead is used for redband because they are the same species occupying similar habitats within the analysis area, and are expected to prefer similar temperatures.

3 – functional determinations apply to all three 6th HUs unless described otherwise.

2. *SECESH RIVER*

Agency/Unit	Payette NF, McCall RD	HU Code and Name	Upper Secesh 17060208-05-01 Summit Creek 17060208-05-02 Victor Creek 17060208-05-03 Loon Creek 17060208-05-04 Lick Creek 17060208-05-06 Secesh R-Zena Creek 17060208-05-07
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th level HU (Secesh 17060208-05), 6 6th HUs
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline Desired Condition	Baseline Condition See PNF LRMP App B, Table B-1 for complete definitions of conditions	Discussion of Baseline and Current Condition
Local Population Character (Bull trout only)			
Local Population Size	Mean total local population size or local habitat capacity more than several thousand individuals. Adults in local population > 500. All life stages are represented within the local population.	**Functioning at Risk** **D**	Burns et al. 2005: "Spawning and rearing habitat for bull trout occurs throughout the area, and fluvial bull trout are known to ascend Pete Creek and Threemile Creek, small tributaries of Lake Creek, a principal tributary of the Secesh River; in addition, Loon Lake supports adfluvial bull trout (Watry and Scarnecchia, 2004.) With few exceptions (e.g., Zena Creek) there is good habitat connectivity throughout the drainage. All three life histories are present in the SFSR. Fluvial individuals have been documented in the Secesh River (Watry and Scarnecchia 2004); in addition, Hogen (2002) and Watry and Scarnecchia (2004) documented adfluvial bull trout in the EFSFSR and Secesh River, respectively. These two studies were especially revealing in that they documented some unexpected behaviors: in both systems, adfluvial bull trout migrated downstream from a lake then moved upstream to spawning areas. In the case of the Secesh River population, some fish moved into a very small stream that we formerly thought would be unlikely to contain any fish; presumably, these fluvial bull trout are spawning with their natal population."
Growth and Survival	Local population has the resilience to recover from temporary or short-term disturbances (e.g., catastrophic events, etc.) or local population declines within 1 to 2 generations (5-10 years). The local population is characterized as increasing or stable. At least 10 years of data support this estimate.	**Functioning at Risk** **PJ**	See above WCI - If "...a trend cannot be confirmed, a local population will be considered at risk until enough data is available to accurately determine its trend" (from definition of Functioning at Risk in LRMP App. B, Table B-1)
Life History Diversity and Isolation	The migratory form is present and the local populations are in close proximity to each other. Migratory corridors and rearing habitat (lake or larger river) are in good to excellent condition for the species. Neighboring local populations are large with high likelihood of producing surplus individuals or straying adults that will mix with other local populations.	**Functioning Appropriately** **D**	Burns et al. 2005: All three life histories are present in the SFSR. Fluvial individuals have been documented in the Secesh River (Watry and Scarnecchia 2004); in addition, Hogen (2002) and Watry and Scarnecchia (2004) documented adfluvial bull trout in the EFSFSR and Secesh River, respectively. These two studies were especially revealing in that they documented some unexpected behaviors: in both systems, adfluvial bull trout migrated downstream from a lake then moved upstream to spawning areas. In the case of the Secesh River population, some fish moved into a very small stream that we formerly thought would be unlikely to contain any fish; presumably, these fluvial bull trout are spawning with their natal population. Fluvial and adfluvial bull trout migrate from the Salmon River into the analysis area (Watry 2003). Some habitat fragmentation is likely in the upper portion of the analysis area from culverts and mining activity. Neighboring populations exist in the East Fork South Fork Salmon River (Hogen 2002).

Agency/Unit	Payette NF, McCall RD	HU Code and Name	Upper Secesh 17060208-05-01 Summit Creek 17060208-05-02 Victor Creek 17060208-05-03 Loon Creek 17060208-05-04 Lick Creek 17060208-05-06 Secesh R-Zena Creek 17060208-05-07
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th level HU (Secesh 17060208-05), 6 6th HUs
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline Desired Condition	Baseline Condition See PNF LRMP App B, Table B-1 for complete definitions of conditions	Discussion of Baseline and Current Condition
Persistence and Genetic Integrity	Connectivity is high among multiple (5 or more) local populations with at least several thousand fish each. Each of the relevant local populations has a low risk of extinction. The probability of hybridization or displacement by competitive species is low to nonexistent.	**Functioning at Risk** **D** **PJ**	Burns et al. 2005: "With few exceptions (e.g., Zena Creek) there is good habitat connectivity throughout the drainage. Overall, there appears to have been little reduction in viability due to anthropogenic actions in this watershed except potential due to brook trout introduction. All life history forms are present and the watershed can be considered a bull trout stronghold. It is one of the few watersheds known to support adfluvial bull trout, which occur in at least two of the four subwatersheds. However the presence of brook trout potentially compromises viability of bull trout similarly to other Salmon River tributaries." Watry and Scarnecchia 2004: "One fish, captured at the Lake Creek video weir, was identified as a possible bull trout x brook trout (S. fontinalis) hybrid and is currently overwintering in Loon Lake; this fish did not enter a spawning tributary in 2003."
Water Quality			
Temperature	**Bull trout:** 7-day average maximum temperature in a reach during the following life history stages: Incubation: 2-5°C or 35.6-41.0°F Rearing: 4-12°C or 39.2-53.6°F Spawning: 4-9°C or 39.2-48.2°F Also temperatures do not exceed 15°C or 59.0°F in areas used by adults during migration (no thermal barriers) **Chinook/steelhead**: 7-day average minimum. Spawning, rearing and migration: 50-57°F (10-13.9°C) As directed by the NOAA BO on the LRMP (NOAA 2003), these default WCI values are being revised to appropriate values for this subbasin based on the best available data on functioning habitat conditions for ESA-listed fish within the subbasin.	**Functioning at Risk** **D** **PJ**	2003 Range Monitoring Report (Zurstadt 2004): "In Grouse Creek, Stream temperatures do not appear to have increased after the Burgdorf fire, and long term trends are not substantially different from the control sites. In 2003, State of Idaho spawning and rearing temperature standards were exceeded in Lake and Ruby Creeks in 2003, but long-term trends appear to be similar to control sites. Lake Creek flows through open meadow above the thermograph site, which may explain the relatively warm stream temperatures. Water temperatures in Threemile Creek are relatively cold and appear to be on long-term trend similar to the control sites. The temperature in other tributaries to Lake Creek (Threemile and Nethker) has been 4 - 5 °C cooler than in Willow Creek. The warm temperatures may be a result of the topography, heating by hot springs, the 1994 fire, timber harvest, road construction, grazing, or mining. Temperatures are relatively warm, but the long term trend appears to be similar to control sites." Though temperature values are within the FR/FUR ranges (unpublished data on file at PNF SO), data are considered to reflect a natural temperature regime in most of the SFSR drainage because there is little evidence of management effects in these watersheds that would contribute to elevated temperatures. Given the stream elevation, topography, aspect, and riparian vegetation characteristics, this data likely reflects the natural range of variability, except along the mainstem roads, where shading is compromised. Unpublished 2004 data on file PNF SO (7d avg max degrees Centigrade) . Lake Creek (upper site) 2004 temperature: 14.8 Pete Creek 2004 temperature: 17.8 Nethker Creek 2005 temperature: 17.8 Threemile Creek 2004 temperature: 12.7 Willow Creek 2005 temperature: 18.3 Ruby Creek 2005 temperature:19.5 Grouse Creek 2004 temperature:16.4 Secesh R @ Chinook Campground 2004:18.9 Secesh River @ Mouth Creek 2001:21.4 Loon Creek at the inlet 2004:16.4 Lick Creek 2004 temperature:16.6 Zena Creek 2004 temperature:16

Agency/Unit	Payette NF, McCall RD	HU Code and Name	Upper Secesh 17060208-05-01 Summit Creek 17060208-05-02 Victor Creek 17060208-05-03 Loon Creek 17060208-05-04 Lick Creek 17060208-05-06 Secesh R-Zena Creek 17060208-05-07
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th level HU (Secesh 17060208-05), 6 6th HUs
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition** **See PNF LRMP App B, Table B-1 for complete definitions of conditions**	**Discussion of Baseline and Current Condition**
Intragravel Quality (in areas of spawning and incubation for anadromous fishes) **"Sediment" WCI has been replaced by new report in Nelson and Burns 2005**	**Revised WCI for PNF, Nelson and Burns 2005** High intragravel quality is indicated by: (a) 5-year mean fines < 6.3 mm concentrations at depth of 28% or less with no more than two years between 28% and 36%. OR (b) 5-year mean fines < 6.3 mm concentrations at depth between 28% and 36% with a decreasing trend over at least 10 years.	**Functioning Appropriately (except for Threemile , which is Functioning at Risk)** **D**	Nelson et al. 2006a: "Fine sediments have consistently been lower in the Lake Creek and Secesh River spawning areas than in the mainstem upper SFSR spawning areas, except for the anomalous Threemile Creek site (E033) that continues to be influenced by unconsolidated mine spoils nearby (Nelson et al. 2001). Fine sediment concentrations were generally near but slightly higher than their long-term mean levels, except for the Corduroy Junction (E034) and Secesh Meadows (E096) sites. All of these sites except the Threemile Creek site, would currently receive a rating of "functioning appropriately" (FA) under the revised WCI guidelines. These sites were used as reference sites for generating the revised ratings because they usually exhibit sediment conditions similar to those of the wilderness Chamberlain Basin sites (Nelson and Burns 2005). The Threemile Creek site, however, is clearly "functioning at risk" (FR) and is not far from the "functioning at unacceptable risk" (FUR) category for intragravel fine sediments. Long-term trends in fine sediments were similar to those reported in Nelson et al. (2004) and comprised primarily increasing fine sediment concentrations. Over the short term, there appeared to be fewer trends, but a positive trend in percent fines of all size classes was detected at the Burgdorf site (E048) where no long-term trend was observed. Conversely, at the Corduroy Junction and Threemile Creek sites, no short-term trends were apparent except for a moderately significant increasing trend in small fines (< 0.85mm) at the latter, but, over the long term, an upward trend in large and coarse (< 4.75mm) fines at the former and all classes of fines at the Threemile Creek site were observed. Initial modeling of sediment trends in the Secesh River system tentatively identified increasing trend in fine sediments before implementation of the first PNF Land and Resource Management Plan (LRMP) and a decreasing trend thereafter (Nelson et al. 1996), and these two trends were subsequently statistically identified (Nelson et al. 1999). More recently, we reported that this post-LRMP may be reversing itself (Nelson et al. 2004), which still appears to be the case. We have not explicitly attempted to model these two periods here, but support comes from the fact that our short-term or recent modeling revealed no coarsening trends at any site in the Secesh River watershed. Statistical comparison of watersheds showed that intragravel conditions at all sites were more or less similar in the Secesh River watershed except for the problematic Threemile Creek site. These conditions appear generally to provide habitat with the potential for high salmon and steelhead embryo survival except at the Threemile Creek site. Conditions at the Threemile Creek site are unlikely to improve without stabilization of the finer mine tailings shown in Nelson et al. (2001), but their influence appears to be restricted to a relatively small area.
Chemical Contaminants and/or Nutrients	Low levels of chemical contamination from agricultural, industrial, and other sources; no excess nutrients, no 303(d) water quality limited water bodies.	**Functioning Appropriately** **PJ**	Streams are not known to be contaminated within the analysis area.

Agency/Unit	Payette NF, McCall RD	HU Code and Name	Upper Secesh 17060208-05-01 Summit Creek 17060208-05-02 Victor Creek 17060208-05-03 Loon Creek 17060208-05-04 Lick Creek 17060208-05-06 Secesh R-Zena Creek 17060208-05-07
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th level HU (Secesh 17060208-05), 6 6th HUs
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline Desired Condition	Baseline Condition See PNF LRMP App B, Table B-1 for complete definitions of conditions	Discussion of Baseline and Current Condition
Habitat Access			
Physical Barriers	Any man-made barriers present in watershed allow upstream and downstream fish passage at all flows.	**Functioning Appropriately** **D**	Unpublished 2005 data on file PNF SO: It was noted in the snorkel surveys of Loon Creek (2005) that the waterfalls between Reaches 1 and 2 could be a potential fish barrier.
Habitat Elements			
Interstitial Sediment Deposition "Substrate Embeddedness" WCI has been replaced by new report in Nelson and Burns 2005	Adequate interstitial space is indicated by: (a) Any single measured mean embeddedness value less than or equal to 24%. OR (b) Any single mean free matrix count over 27% OR (c) A five-year mean measured cobble embeddedness level of 32% or less OR (d) A five-year mean free matrix count of 17% or more.	**Functioning Appropriately** **D** -	This WCI was FR in Wagoner and Burns (2001). Nelson et al. 2006b state: "Both of the Secesh River area primary sites could be categorized as FA based on recent mean free matrix counts." "…cobble embeddedness results are consistent with the free matrix analysis…".
Large Woody Debris	> 20 pieces per mile, > 12 inches in diameter, > 35 feet length; and adequate sources of large woody debris for both long and short-term recruitment in RCAs.	**Functioning at Risk** **D**	unpublished data on file, PNF Supervisors Office: Grouse Ck 2001, pieces/mi: 16 – 55 pieces Sand Ck, 2001: 2 – 30 pieces Lake Ck above Corduroy Jct: 16 pieces Dugaw et al., 2005: Large Woody Debris (PACFish)/mile Lick Creek = 29 Zena Creek = 0 Piah Creek = 0 Unpublished data 2004 on file PNF SO: From the snorkel survey report on Zena Creek, it was noted that there were "some PACFish LWD in Reach 2" and that "most of the wood in Reach 3 was PACFish LWD." From the snorkel survey report on Cow Creek, it was noted that all four reaches had LWD of PACFish size. "Reach 4 had one PACFish log inhibiting data collection in Habitat Unit 4."

Agency/Unit	Payette NF, McCall RD	HU Code and Name	Upper Secesh 17060208-05-01 Summit Creek 17060208-05-02 Victor Creek 17060208-05-03 Loon Creek 17060208-05-04 Lick Creek 17060208-05-06 Secesh R-Zena Creek 17060208-05-07
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th level HU (Secesh 17060208-05), 6 6th HUs
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition** **See PNF LRMP App B, Table B-1 for complete definitions of conditions**	**Discussion of Baseline and Current Condition**
Pool Frequency	**Bull trout:** Pools have good cover and cool water, and only minor reduction of pool volume by fine sediment. Large woody debris recruitment standards for functioning appropriately (above) are met and pool frequency in a reach closely approximates: Wetted Width (m.) / Number of Pools/100 m 0-2: 2.4 2-3: 3.7 3-5: 3.0 5-6: 2.4 6-9: 1.4 9-11: 1.1 11-12: 0.6 12-20: 0.6 20-30: 0.2 **Chinook/steelhead:** Pools have good cover and cool water, and only minor reduction of pool volume by fine sediment. Large woody debris recruitment standards for functioning appropriately (above) are met and pool frequency in a reach closely approximates: Channel Width (m.) / Number of Pools/100 m 0-2: 11.4 2-3: 6.0 3-5: 4.3 5-6: 3.5 6-8: 2.9 8-15: 1.6 15-23: 1.4 23-30: 1.1	**Functioning Appropriately** **D** -	Unpublished data on file at PNF SO, McCall, ID. R=Reach Grouse 2001 R1 124 pools/3096m = 4 pools /100m @ 5.7m width *FA* R2 29 pools /573 = 5 pools /100m @ 5.4m width *FA* R3 35 pools /554 = 6.3 pools /100m @ 5.6m width *FA* R4 37 pools /968 3.8 pools /100m @ 5.9m width *FA* Lake 2001 (above Corduroy Ck) 31 pools /495m = 6.3 pools /100m @ 4.2m width *FA* Sand 2001 63 pools /1251m = 5 pools /100m @ 4.7m width *FA* 132 pools /2071m = 6.4 pools @ 4.1 m width *FA* Zena Creek 2004 R1= 4pools/100m @ 4.7m width *FA* R2 = 7pools/100m @ 7.1m width *FA* R3= 5pools/100m @ 5.1m width *FA* Cow Creek 2004 R1 = 9pools/100m @ 3.6m width *FA* R2 = 4 pools/100m @ 3.1m width *FA* R3 = 12pools/100m @ 3.4m width *FA* R4 = 5pools/100m @ 2.9m width *FA* Dugaw et al, 2005: Lick Creek: 2.5pools/100m @15.3m width *FA* Zena Creek: 4.4pools/100m @ 6.75m width *FA* Piah Creek: 10.5pools/100m @3.6m width *FA*
Pool Quality	Each reach has many large pools > 3.28 feet (1 meter deep). Pools have good cover and cool water, and only minor reduction of pool volume by fine sediment.	**Functioning Appropriately** **D**	See Pool Frequency above

Agency/Unit	Payette NF, McCall RD	HU Code and Name	Upper Secesh 17060208-05-01 Summit Creek 17060208-05-02 Victor Creek 17060208-05-03 Loon Creek 17060208-05-04 Lick Creek 17060208-05-06 Secesh R-Zena Creek 17060208-05-07
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(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline Desired Condition	Baseline Condition See PNF LRMP App B, Table B-1 for complete definitions of conditions	Discussion of Baseline and Current Condition
Off-Channel Habitat	Watershed has many ponds, oxbows, backwaters, and other off-channel areas with cover; side channels are low energy areas.	**Functioning Appropriately** **D**	Unpublished data on file at PNF SO, McCall, ID: Sand Ck 2001 – "Braided channels with vegetated islands are present and lateral marshy areas in meadowed section"… meadow area wet and marsh-like meandering with many lateral units and some side channels, beaver dams, and vegetated islands." Grouse Creek 2001 – "large amounts of LWD causing side channel dams, a large oxbow due to dams, multiple complex pools and braids." Zena Creek 2004: "Just above the Zena Creek Ranch there is a dammed pond. There was no other off-channel habitat surveyed." Cow Creek 2004: Little to no off-channel habitat was recorded for Cow Creek.
Refugia	**Bull trout:** Habitats capable of supporting strong and significant local populations are protected and are well distributed and connected for all life stages and forms of the species. **Chinook/steelhead:** Habitat refugia exist and are adequately buffered (e.g., by intact riparian conservation areas); existing refugia are sufficient in size, number, and connectivity to maintain viable populations or sub-population	**Functioning Appropriately** **PJ -**	Burns et al, 2005: "The Secesh River analysis area comprises about 158,000 acres. Spawning and rearing habitat for bull trout occurs throughout the area, and fluvial bull trout are known to ascend Pete Creek and Threemile Creek, small tributaries of Lake Creek, a principal tributary of the Secesh River; in addition, Loon Lake supports adfluvial bull trout." Watry, 2003: "Fluvial and adfluvial bull trout (Watry 2003) migrate from the Salmon River into the analysis area. Habitats are well-distributed and connected. Habitat appears to be supporting viable populations of Chinook and steelhead"
Channel Condition and Dynamics			
Width/Maximum Depth Ratio	≤10	**Functioning Appropriately** **PJ**	Weighted average width/max depth ratios in scour pools are not available for this analysis area from Fbase outputs on file at PNF SO. The following data may include dam pools. These numbers are not FBase output. These unweighted numbers were calculated from raw data by averaging pool widths for a reach, then dividing by average maximum pool depths for that reach. They cannot be compared to default WCIs, but are provided here for reference: Unpublished data on file at PNF SO. Grouse Creek 2001: 7.5 – 10.2 FA Lake Creek 2001:R1 = 9.3 *FA* Sand Creek 2001: 5.7-7.5 F*A* Zena Creek 2004: 6-11.2 Cow Creek 2004: 5.2- 7.9 *FA* Based on personal observation, width/depth ratios are Functioning Appropriately for this analysis area.

Agency/Unit	Payette NF, McCall RD	HU Code and Name	Upper Secesh 17060208-05-01 Summit Creek 17060208-05-02 Victor Creek 17060208-05-03 Loon Creek 17060208-05-04 Lick Creek 17060208-05-06 Secesh R-Zena Creek 17060208-05-07
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th level HU (Secesh 17060208-05), 6 6th HUs
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition** **See PNF LRMP App B, Table B-1 for complete definitions of conditions**	**Discussion of Baseline and Current Condition**
Streambank Condition	>90% of any stream reach has stable banks relative to the percent of inherent stable streambanks associated with a similar unmanaged stream system.	**Functioning Appropriately** **D** -	Streambank stability is > 90% in the analysis area (Unpublished data on file at PNF SO, McCall, ID, 2001) Dugaw et al., 2005: Lick Creek: 100% bank stability Zena Creek: 98% bank stability Piah Creek: 93% bank stability
Floodplain Connectivity	Within RCAs, floodplains and wetlands are hydrologically linked to the main channel; overbank flows occur and maintain wetland/floodplain functions; and riparian vegetation succession.	**Functioning at Risk** **PJ**	Effects to stream channels and riparian areas from historic mining, roads-stream crossings, private land development, and ATV use (USFS 2002, Burgdorf RAP.).
Flow/Hydrology			
Change in Peak/Base Flows	Watershed hydrograph indicates peak flow, base flow, and flow timing characteristics comparable to an undisturbed watershed of a similar size, geomorphology and climatology.	**Functioning at Risk** **PJ**	There are no current flow data for the analysis area. Photopoints on file at the PNF show no channel changes from Burgdorf Junction Fire. There is no evidence that peak/base flows have been altered in the rest of the analysis area.
Drainage Network Increase	Zero or minimum change in active channel length correlated with human caused disturbance.	**Functioning at Risk** PJ	Effects to stream channels and riparian areas from roads-stream crossing, historic mining, ATV use, and private land subdivision development have occurred.
Watershed Conditions			
Road Density and Location	Total road density < 0.7 miles/square mile of subwatershed, no roads within RCAs.	**Functioning at Risk** **D** -	Road densities are 1 mi/sq. mi, with 1.5 mi/sq. mi within RCAs, 16% of roads are in RCAs. (CD1: \Support Documents\Maps\total_roads.pdf
Disturbance History	< 15% ECA (entire watershed) with no concentration of disturbance in areas with landslide or landslide prone areas, and/or refugia, and/or RCAs.	**Functioning at Risk** **D**	ECA = 10% (CD1: \Support Documents\Maps\eca_lsp.pdf) Localized areas have high road densities and historic mining disturbance within RCAs. Nelson et al. 2004: "We cannot confirm that even high ECA, as estimated on the PNF to date, has any observable effect on salmonid habitat. This suggests that estimated ECA on the PNF says little about the potential for affected streams to support salmonids. We cannot determine whether there is some threshold value above which habitat conditions would be unacceptably altered…".

Agency/Unit	Payette NF, McCall RD	HU Code and Name	Upper Secesh 17060208-05-01 Summit Creek 17060208-05-02 Victor Creek 17060208-05-03 Loon Creek 17060208-05-04 Lick Creek 17060208-05-06 Secesh R-Zena Creek 17060208-05-07
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th level HU (Secesh 17060208-05), 6 6th HUs
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition** **See PNF LRMP App B, Table B-1 for complete definitions of conditions**	**Discussion of Baseline and Current Condition**
Riparian Conservation Areas	The riparian conservation areas within the subwatershed(s) have historic and occupied refugia for listed, sensitive or native/desired nonnative fish species which are present and provide: adequate shade, large woody debris recruitment, sediment buffering, connectivity, and habitat protection and connectivity to adequately minimize adverse effects from land management activities (>80% intact). All vegetative components are within desired conditions identified in Appendix A of the Forest Plan. RCA functions and processes are intact, providing resiliency from adverse affects associated with land management activities. Conditions fully support habitat for aquatic species.	**Functioning at Risk** **D** **PJ**	Streambanks in the analysis area are generally stable but roads, ATV use, historic mining and private land development have altered riparian ecosystems in certain areas (personal observation) leading to loss of shade, LWD recruitment, and sediment buffering capabilities. Unpublished data on file, PNF Supervisors Office.
Disturbance Regime	Disturbance resulting from land management activities are negligible or temporary. Streamflow regimes are appropriate to the local geomorphology, potential vegetation and climatology resulting in appropriate high quality habitat and watershed complexity that provide refugia and rearing space for all life stages or multiple life-history forms. Ecological processes are within historical ranges.–Resiliency of habitat to recover from land management disturbances is high.	**Functioning at Risk** **D** - **PJ**.	Roads, unauthorized ATV use, historical mining, and other development have occurred in parts of the analysis area (unpublished data on file, PNF Supervisors Office). Unpublished data on file McCall District Office (CD1: \Support Docs\Miscellaneous\Short Grouse RIparian Survey): the following areas of concern were identified. 1) located along Trail 144 (Pete Creek Trail) at 6460' el. and also between 6700' and 6760' elevations where motorized vehicles have caused resource damage in wetlands and stream/trail crossing areas. 2) located on Nethker Creek Trail 143 between 7400' and 7600' elevations where a gullied intermittent stream and 40' long ruts in a wetland were identified and ¼ mile of trail between 7570' and 7280' el. channels sediment into the Burgdorf Creek drainage. 3) located at 7600' el. where motorized vehicles have cause damage in Willow Creek.
Integration of Species and Habitat Conditions **Chinook, steelhead, bull trout, westslope cutthroat *t*rout**	Habitat quality and connectivity among local populations is high. The migratory form is present. Disturbance has not altered channel equilibrium. Fine sediments and other habitat characteristics influencing survival and growth are consistent with pristine habitat. The local population has the resilience to recover from short-term disturbance within one to two generations (5 to 10 years). The local population is fluctuating around an equilibrium or is growing.	**Functioning at Risk** **D** , PJ	All WCIs are FA or FR. Roads, ATV use, historical mining, and private land development have altered fish habitat and connectivity (CD2: \Support Documents\Roads\RAPs [in Roads.zip]). Steelhead, bull trout, cutthroat, and Chinook salmon spawning and rearing occur within the analysis area.. As a result of habitat alteration, survival and growth rates for steelhead, Chinook salmon, bull trout, and westslope cutthroat trout may have been reduced from those in the "best habitats", but population trends are unknown. Burns et al, 2005: "With few exceptions (e.g., Zena Creek) there is good habitat connectivity throughout the drainage. There are data from the drainage showing areas of bull trout and brook trout overlap, and in these areas hybridization is likely, and, indeed, we have observed probable hybrids in some; viability is undoubtedly reduced in these areas."

3. LOWER SOUTH FORK SALMON RIVER

Agency/Unit	Payette NF, Krassel and McCall RDs	6th HU Code and Name	17060208-06-01 Rock Creek 17060208-06-02 Creek 17060208-06-03 Bear Creek 17060208-06-04 Elk Creek 17060208-06-05 Grouse Creek 17060208-06-06 Pony Creek 17060208-06-07 Porphyry Creek 17060208-06-08 Lower SFSR
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th HU (17060208-06 Lower SFSR), 8 6th HUs
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
Local Population Character (Bull trout only)			
Local Population Size	Mean total local population size or local habitat capacity more than several thousand individuals. Adults in local population > 500. All life stages are represented within the local population.	**FA** **PJ**	Burns et al. 2005: "Bull trout populations have been documented throughout the SFSR watershed. Thurow (1986) documented the presence of both resident and fluvial stocks in all reaches and 18 tributaries that were surveyed. Tributaries function as spawning and rearing areas for fluvial and resident stocks, and the mainstem SFSR serves as a migration corridor and over wintering area for both emigrating juveniles and adult fish. Thurow (1987) reported that bull trout populations are viable; however the status of discrete populations is unknown. The lower SFSR analysis area encompasses the area downstream from the Secesh River. Elevations range from 3,650 feet at the Secesh confluence to 2,166 feet at the Main Salmon River. The main SFSR in this area is primarily a migration corridor for and rearing area for anadromous species and fluvial bull trout, though we suspect that some important tributaries like Porphyry Creek and Sheep Creek may support resident populations and provide spawning and rearing habitat as well. With few exceptions there is good habitat connectivity throughout the drainage. All life history forms are present and the watershed can be considered a bull trout stronghold. It is one of the few watersheds known to support adfluvial bull trout, which occur in at least two of the four sub watersheds."
Growth and Survival	Local population has the resilience to recover from temporary or short-term disturbances or local population declines within 1 to 2 years). The local population is characterized as increasing or stable.	**FR** **PJ**	There are not sufficient trend data to characterize growth and
Life History Diversity and Isolation	The migratory form is present and the local populations are in close proximity to each other. Migratory corridors and rearing habitat (lake or larger river) are in good to excellent condition for the species. Neighboring local populations are large with high likelihood of producing surplus individuals or straying adults that will mix with other local populations.	**FA** **PJ**	Burns et al. 2005: "Bull trout spawn from late August through mid-October in the SFSR and its tributaries (R. Thurow, Fisheries Scientist, Rocky Mountain Experimental Station, personal communication). In the SFSR, migration of adult bull trout probably begins in March or April as adults move slowly upriver and arrive near spawning areas in July. Large bull trout were observed staging in some SFSR tributaries in August and September (Thurow, 1986). All bull trout life history strategies are present in the SFSR watershed, which contributes to long term population viability. There are very few human caused or natural barriers that fragment occupied or suitable bull trout habitat. Therefore, the populations of bull trout in the drainage are well connected, which enhances long term viability. There are data from the SFSR drainage showing areas of bull trout and brook trout overlap, and in these areas hybridization is likely, and, indeed, we have observed probable hybrids in some; viability is undoubtedly reduced in these areas."
Persistence and Genetic Integrity	Connectivity is high among multiple (5 or more) local populations with at least several thousand fish each. Each of the relevant local populations has a low risk of extinction. The probability of hybridization or displacement by competitive species is low to nonexistent.	**FA** **PJ**	Burns et al. 2005: "With few exceptions there is good habitat connectivity throughout the drainage. All bull trout life history strategies are present in the SFSR watershed, which contributes to long term population viability. There are very few human caused or natural barriers that fragment occupied or suitable bull trout habitat. Therefore, the populations of bull trout in the drainage are well connected, which enhances long term viability. There are data from the SFSR drainage showing areas of bull trout and brook trout overlap, and in these areas hybridization is likely, and, indeed, we have observed probable hybrids in some; viability is undoubtedly reduced in these areas. Brook trout are widely distributed in the SFSR watershed; however, there has been surprisingly little increase in the distribution of brook trout since the 1970s (Adams et al. 2002). Given this and the fact that bull trout populations continue to express their full range of life history

Agency/Unit	Payette NF, Krassel and McCall RDs	6th HU Code and Name	17060208-06-01 Rock Creek 17060208-06-02 Creek 17060208-06-03 Bear Creek 17060208-06-04 Elk Creek 17060208-06-05 Grouse Creek 17060208-06-06 Pony Creek 17060208-06-07 Porphyry Creek 17060208-06-08 Lower SFSR
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th HU (17060208-06 Lower SFSR), 8 6th HUs
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
			forms, resident and migratory bull trout stocks that have managed to maintain a high degree of genetic purity are unlikely to be at imminent risk of hybridization; however, the extent of hybridization in the watershed is unknown. Overall, we rate bull trout viability as high in this watershed…"
Water Quality			
Temperature	**Bull trout:** 7-day average maximum temperature in a reach during the following life history stages: Incubation: 2-5°C or 35.6-41.0°F Rearing: 4-12°C or 39.2-53.6°F Spawning: 4-9°C or 39.2-48.2°F Also temperatures do not exceed 15°C or 59.0°F in areas used by adults during migration (no thermal barriers) **Chinook/steelhead**: 7-day average minimum. Spawning, rearing and migration: 50-57°F (10-13.9°C) As directed by the NOAA BO on the LRMP (NOAA 2003), these default WCI values are being revised to appropriate values for this subbasin based on the best available data on functioning habitat conditions for ESA-listed fish within the subbasin.	**FR-D,PJ**	Though temperature values are within the FR/FUR ranges (unpublished data on file at PNF SO), data are considered to reflect a natural temperature regime in most of the SFSR drainage because there is little evidence of management effects in these watersheds that would contribute to elevated temperatures. Given the stream elevation, topography, aspect, and riparian vegetation characteristics, this data likely reflects the natural range of variability, except along the mainstem roads, where shading is compromised. Unpublished 2004 data on file PNF SO (7d avg max degrees Centigrade) . Elk Creek (2004) 17.5 *FUR* Pony Creek (2004) 19.1 *FUR* Due to the remote, unroaded character of other drainages in the LSFSR, other drainages are likely to be FA or FR (personal observation)
Intragravel Quality (in areas of spawning and incubation for anadromous fishes) **"Sediment" WCI has been replaced by new report in Nelson and Burns 2005**	**Revised WCI for PNF, Nelson and Burns 2005** High intragravel quality is indicated by: (a) 5-year mean fines < 6.3 mm concentrations at depth of 28% or less with no more than two years between 28% and 36%. OR (b) 5-year mean fines < 6.3 mm concentrations at depth between 28% and 36% with a decreasing trend over at least 10 years.	**See "Interstitial Sediment", below**	Intragravel quality data is not available for this analysis area
Chemical Contaminants and/or Nutrients	Low levels of chemical contamination from agricultural, industrial, and other sources; no excess nutrients, no 303(d) water quality limited water bodies.	**FR** **PJ**	The mainstem South Fork Salmon River is 303 (d) listed. No tributaries are listed.

Agency/Unit	Payette NF, Krassel and McCall RDs	6th HU Code and Name	17060208-06-01 Rock Creek 17060208-06-02 Creek 17060208-06-03 Bear Creek 17060208-06-04 Elk Creek 17060208-06-05 Grouse Creek 17060208-06-06 Pony Creek 17060208-06-07 Porphyry Creek 17060208-06-08 Lower SFSR
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th HU (17060208-06 Lower SFSR), 8 6th HUs
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline Desired Condition	Baseline Condition	Discussion of Baseline and Current Condition
Habitat Access			
Physical Barriers	Any man-made barriers present in watershed allow upstream and downstream fish passage at all flows.	FR PJ	Unpublished data on file PNF SO: A possible fish barrier was noted in reach 2 of the 2002 Grouse Creek survey. It was commented that the cause of the barrier was related to an old road along the creek that had recently washed out, depositing sediment and debris in the creek. In a 2003 survey of Pony Creek, it was noted that a large waterfall above the Pony Creek bridge could be a potential barrier to fish passage. Two barriers to fish passage exist in Elk Creek, and one in Bear Creek.
Habitat Elements			
Interstitial Sediment Deposition (all listed fishes in tributary systems) **"Substrate Embeddedness" WCI has been replaced by new report in Nelson and Burns 2005**	Adequate interstitial space is indicated by: (a) Any single measured mean embeddedness value less than or equal to 24%. OR (b) Any single mean free matrix count over 27% OR (c) A five-year mean measured cobble embeddedness level of 32% or less OR (d) A five-year mean free matrix count of 17% or more.	FUR D,PJ	Nelson and Burns 2004: Elk Creek site E030 Free Matrix 1999-2003: 3.9-35.9 %*FUR* 5-yr mean 15.7% *FR* Nelson et al. 2006b state: "Using the revised WCI values (free matrix) of Nelson and Burns (2005), only site E054 would be classified FA, the two more developed watersheds (Elk and Pony) would be FR." "Comparison among the sites based on what data exist suggests that all three would be classified as FA based on most recent five-year embeddedness means." Minshall, Rugenski and Relyea 2005: The following Cobble embeddedness percentage calculations were derived from using visual estimation of 100 randomly selected substrata (Minshall protocol). Circle End Creek 2000-2004: 9-46 %*FR* 5-yr mean 23.2% *FA* Tailholt Creek 2000-2004: 11-48 %*FR* 5-yr mean 28% *FR* Fritzer Creek 2000-2004: 16-32 %*FA* 5-yr mean 22.2 %*FA* Smith Creek 2000-2004: *FR* 5-yr mean 28.4% *FR* Big Flat Creek 2000-2004: 9-24 %*FA* 5-yr mean 16.8 %*FA*
Large Woody Debris	> 20 pieces per mile, > 12 inches in diameter, > 35 feet length; and adequate sources of large woody debris for both long and short-term recruitment in RCAs.	FA D FR – Elk, Pony Creeks PJ,D	See Wagoner and Burns (2001) for survey data pre 2001 Wagoner and Burns (2001): *FR* Dugaw et al 2005: Bear Creek 50 pieces/mile *FA* Pony Creek 80 pieces/mile *FA*

Agency/Unit	Payette NF, Krassel and McCall RDs	6th HU Code and Name	17060208-06-01 Rock Creek 17060208-06-02 Creek 17060208-06-03 Bear Creek 17060208-06-04 Elk Creek 17060208-06-05 Grouse Creek 17060208-06-06 Pony Creek 17060208-06-07 Porphyry Creek 17060208-06-08 Lower SFSR
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th HU (17060208-06 Lower SFSR), 8 6th HUs
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
Pool Frequency	**Bull trout:** Pools have good cover and cool water, and only minor reduction of pool volume by fine sediment. Large woody debris recruitment standards for functioning appropriately (above) are met and pool frequency in a reach closely approximates: Wetted Width (ft.) / Number of Pools/Mile 0-5: 39 5-10: 60 10-15: 48 15-20: 39 20-30: 23 30-35: 18 35-40: 10 40-65: 9 65-100: 4 **Chinook/steelhead:** Pools have good cover and cool water, and only minor reduction of pool volume by fine sediment. Large woody debris recruitment standards for functioning appropriately (above) are met and pool frequency in a reach closely approximates: Channel Width (ft.) / Number of Pools/Mile 0-5: 184 5-10: 96 10-15: 70 15-20: 56 20-25: 47 25-50: 26 50-75: 23 75-100: 18	FA D FR – Elk, Pony Creeks PJ,D	Dugaw et al. 2005: Bear Creek: 110 pools/mile, avg width 15.3 ft *FA* Grouse Creek: 75 pools/mile, avg width 17.7 ft *FA* Pony Creek: 189 pools/mile, avg 7.8 ft *FA* Unpublished data on file PNF SO: (FBase output) Pony Creek 2003 survey: 92.8 pools/mile, avg width 15.4 ft *FA* *The following data was calculated from raw data by counting the pools in a given reach, converting that number to pools per mile covered by that reach, and also calculating the average wetted width of that given reach* Grouse Creek 2002 survey Reaches 1-4: 64-192 pools/mile, avg width 7.5-10.5 ft *FA* Bear Creek 2002: 80 pools/mile, avg width 6.5 ft *FA* See Wagoner and Burns (2001) for survey data pre 2001 Wagoner and Burns (2001): *FR*
Pool Quality	Each reach has many large pools > 3.28 feet (1 meter deep). Pools have good cover and cool water, and only minor reduction of pool volume by fine sediment.	See pool frequency, above	See Wagoner and Burns (2001) for survey data pre 2001 Wagoner and Burns (2001): *FR*
Off-Channel Habitat	Watershed has many ponds, oxbows, backwaters, and other off-channel areas with cover; side channels are low energy areas.	FA	See Wagoner and Burns (2001) for survey data pre 2001 Wagoner and Burns (2001): *FA*

Agency/Unit	Payette NF, Krassel and McCall RDs	6th HU Code and Name	17060208-06-01 Rock Creek 17060208-06-02 Creek 17060208-06-03 Bear Creek 17060208-06-04 Elk Creek 17060208-06-05 Grouse Creek 17060208-06-06 Pony Creek 17060208-06-07 Porphyry Creek 17060208-06-08 Lower SFSR
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th HU (17060208-06 Lower SFSR), 8 6th HUs
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
Refugia	**Bull trout:** Habitats capable of supporting strong and significant local populations are protected and are well distributed and connected for all life stages and forms of the species. **Chinook/steelhead:** Habitat refugia exist and are adequately buffered (e.g., by intact riparian conservation areas); existing refugia are sufficient in size, number, and connectivity to maintain viable populations or sub-population	FA PJ	Burns et al.2005: "There are very few human caused or natural barriers that fragment occupied or suitable bull trout habitat. Therefore, the populations of bull trout in the drainage are well connected, which enhances long term viability." Elk and Pony Creeks may be an exception due to the presence of riparian roads along the lower reaches (Personal observation).
Channel Condition and Dynamics			
Width/Max Depth Ratio	≤10	FA D	Weighted average width/max depth ratios in scour pools from Fbase outputs (on file at PNF SO): Pony: 6.4 FA The following data may include dam pools. These numbers are not FBase output. These unweighted numbers were calculated from raw data by averaging pool widths for a reach, then dividing by average maximum pool depths for that reach. They cannot be compared to default WCIs, but are provided here for reference (unpublished data on file at PNF SO): Grouse Creek 2002 survey reaches 1-4: 4.1-5.1 *FA* Bear Creek 2002 survey: 4.9 *FA*
Streambank Condition	>90% of any stream reach has stable banks relative to the percent of inherent stable streambanks associated with a similar unmanaged stream system.	FR D	Dugaw et al. 2005: Bear Creek 95% stable Grouse Creek 81% stable Pony Creek 100% stable All sites are in the upper/headwater regions of each creek. Unpublished data on file PNF SO: It was noted in the 2003 survey of Pony Creek that, "recent hydrologic changes had occurred, such as heavy erosion and blowouts, and that revegetation was occurring slowly." From the 2002 survey of Grouse Creek it was recorded that in Reach 1 "banks were highly eroded from previous blowout." In reach 2 it was commented that there was poor bank stability. For reaches 3 and 4 more stable banks were reported.
Floodplain Connectivity	Within RCAs, floodplains and wetlands are hydrologically linked to the main channel; overbank flows occur and maintain wetland/floodplain functions; and riparian vegetation succession.	FA PJ	Elk and Pony Creeks may be an exception due to the presence of a floodplain road along the lower reaches (personal observation).

Agency/Unit	Payette NF, Krassel and McCall RDs	6th HU Code and Name	17060208-06-01 Rock Creek 17060208-06-02 Creek 17060208-06-03 Bear Creek 17060208-06-04 Elk Creek 17060208-06-05 Grouse Creek 17060208-06-06 Pony Creek 17060208-06-07 Porphyry Creek 17060208-06-08 Lower SFSR
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th HU (17060208-06 Lower SFSR), 8 6th HUs
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline Desired Condition	Baseline Condition	Discussion of Baseline and Current Condition
Flow/Hydrology			
Change in Peak/Base Flows	Watershed hydrograph indicates peak flow, base flow, and flow timing characteristics comparable to an undisturbed watershed of a similar size, geomorphology and climatology.	FA PJ Elk and Pony Creeks: FR PJ	Roads in Pony and Elk Creek drainages are likely to cause FR there. Other draiages are remote and unroaded and likely to be FA (personal observation)
Drainage Network Increase	Zero or minimum change in active channel length correlated with human caused disturbance.	FA PJ Elk and Pony Creeks: FR PJ	. Roads in Pony and Elk Creek drainages are likely to cause FR there. . Other draiages are remote and unroaded and likely to be FA (personal observation)
Watershed Conditions			
Road Density and Location	Total road density < 0.7 miles/square mile of subwatershed, no roads within RCAs.	FR D	Unpublished data on file at PNF SO: Road density 0.4mi/mi^2 (*FA*). Road density in RCA 0.9mi/mi^2, 18.6% of total roads (*FR*) CD1: \Support Documents\Maps\total_roads.pdf
Disturbance History	< 15% ECA (entire watershed) with no concentration of disturbance in areas with landslide or landslide prone areas, and/or refugia, and/or RCAs.	FR D	ECA is 19% for the analysis area (CD1: \Support Documents\Maps\eca_lsp.pdf) Nelson et al. 2004: "We cannot confirm that even high ECA, as estimated on the PNF to date, has any observable effect on salmonid habitat. This suggests that estimated ECA on the PNF says little about the potential for affected streams to support salmonids. We cannot determine whether there is some threshold value above which habitat conditions would be unacceptably altered…". Some disturbance from roads in landslide prone areas and RCAs (personal observation)
Riparian Conservation Areas	The riparian conservation areas within the sub watershed(s) have historic and occupied refugia for listed, sensitive or native/desired nonnative fish species which are present and provide: adequate shade, large woody debris recruitment, sediment buffering, connectivity, and habitat protection and connectivity to adequately minimize adverse effects from land management activities (>80% intact). All vegetative components are within desired conditions identified in Appendix A of the Forest Plan. RCA functions and processes are intact, providing resiliency from adverse affects associated with land management activities. Conditions fully support habitat for aquatic species.	FA FR Pony, Elk PJ	Most RCAs have historic and occupied refugia for listed, sensitive or native/desired nonnative fish species which are present and provide LWD, shade, sediment buffering, except for Elk and pony drainages, which are disturbed by roads.

Agency/Unit	Payette NF, Krassel and McCall RDs	6th HU Code and Name	17060208-06-01 Rock Creek 17060208-06-02 Creek 17060208-06-03 Bear Creek 17060208-06-04 Elk Creek 17060208-06-05 Grouse Creek 17060208-06-06 Pony Creek 17060208-06-07 Porphyry Creek 17060208-06-08 Lower SFSR
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th HU (17060208-06 Lower SFSR), 8 6th HUs
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
Disturbance Regime	Disturbance resulting from land management activities are negligible or temporary. Streamflow regimes are appropriate to the local geomorphology, potential vegetation and climatology resulting in appropriate high quality habitat and watershed complexity that provide refugia and rearing space for all life stages or multiple life-history forms. Ecological processes are within historical ranges.–Resiliency of habitat to recover from land management disturbances is high.	FA FR Pony, Elk PJ	There are very few human caused or natural barriers that fragment occupied or suitable habitat. Disturbance in r Elk and Pony drainages, is caused by roads.
Integration of Species and Habitat Conditions	Habitat quality and connectivity among local populations is high. The migratory form is present. Disturbance has not altered channel equilibrium. Fine sediments and other habitat characteristics influencing survival and growth are consistent with pristine habitat. The local population has the resilience to recover from short-term disturbance within one to two generations (5 to 10 years). The local population is fluctuating around equilibrium or is growing.	FR PJ	Bull trout viability is unknown in the SFSR and threatened by brook trout (Burns et al. 2005)

4. UPPER SOUTH FORK SALMON RIVER

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	17060208-01-12 Fitsum 17060208-01-11 Buckhorn 17060208-01-10 Camp 17060208-01-09 Fourmile 17060208-01-08 Blackmare 17060208-01-07 Goat
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th HU (Upper SFSR 17060208-01) (6 6th-level HUs)
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
Local Population Character (Bull trout only)			
Local Population Size	Mean total local population size or local habitat capacity more than several thousand individuals. Adults in local population > 500. All life stages are represented within the local population.	**FR** **PJ**	Burns et al., 2005: "Bull trout populations have been documented throughout the SFSR watershed. Thurow (1986) documented the presence of both resident and fluvial stocks in all reaches and 18 tributaries that were surveyed. Fish densities for the mainstem and tributaries ranged from 0.26 to 0.51 fish per 100 m^2. Tributaries function as spawning and rearing areas for fluvial and resident stocks, and the mainstem SFSR serves as a migration corridor and over wintering area for both emigrating juveniles and adult fish. Thurow (1987) reported that bull trout populations are viable; however the status of discrete populations is unknown. Tributary streams have steeper gradients than the mainstem, but spawning and rearing habitat for bull trout occurs throughout the area. With few exceptions (e.g. Goat Creek) there is good habitat connectivity throughout the drainage. In addition, there are data from radio telemetry, passive integrated transponder (PIT) tagging, and screw traps that document long distance bull trout movement within the drainage (Hogen 2002; Watry and Scarnnechia 2004). All three life histories are present in the SFSR. It is one of the few watersheds known to support adfluvial bull trout, which occur in at least two of the four sub watersheds."
Growth and Survival	Local population has the resilience to recover from temporary or short-term disturbances (e.g., catastrophic events, etc.) or local population declines within 1 to 2 generations (5-10 years). The local population is characterized as increasing or stable. At least 10 years of data support this estimate.	**FR** **PJ**	See above WCI There are not sufficient trend data to characterize growth and survival. - If "...a trend cannot be confirmed, a local population will be considered at risk until enough data is available to accurately determine its trend" (from definition of Functioning at Risk in LRMP App. B, Table B-1) See above for Local Population Size.
Life History Diversity and Isolation	The migratory form is present and the local populations are in close proximity to each other. Migratory corridors and rearing habitat (lake or larger river) are in good to excellent condition for the species. Neighboring local populations are large with high likelihood of producing surplus individuals or straying adults that will mix with other local populations.	**FA** **PJ**	Burns et al., 2005:"Bull trout spawn from late August through mid-October in the SFSR and its tributaries (R. Thurow, Fisheries Scientist, Rocky Mountain Experimental Station, personal communication). In the SFSR, migration of adult bull trout probably begins in March or April as adults move slowly upriver and arrive near spawning areas in July. Large bull trout were observed staging in some SFSR tributaries in August and September (Thurow, 1986). All bull trout life history strategies are present in the SFSR watershed, which contributes to long term population viability. There are very few human caused or natural barriers that fragment occupied or suitable bull trout habitat. Therefore, the populations of bull trout in the drainage are well connected, which enhances long term viability. "

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	17060208-01-12 Fitsum 17060208-01-11 Buckhorn 17060208-01-10 Camp 17060208-01-09 Fourmile 17060208-01-08 Blackmare 17060208-01-07 Goat
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th HU (Upper SFSR 17060208-01) (6 6th-level HUs)
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
Persistence and Genetic Integrity	Connectivity is high among multiple (5 or more) local populations with at least several thousand fish each. Each of the relevant local populations has a low risk of extinction. The probability of hybridization or displacement by competitive species is low to nonexistent.	**FR** **PJ**	Burns et al., 2005: "With few exceptions (e.g., Goat Creek) there is good habitat connectivity throughout the drainage. All bull trout life history strategies are present in the SFSR watershed, which contributes to long term population viability. There are very few human caused or natural barriers that fragment occupied or suitable bull trout habitat. Therefore, the populations of bull trout in the drainage are well connected, which enhances long term viability. There are data from the SFSR drainage showing areas of bull trout and brook trout overlap, and in these areas hybridization is likely, and, indeed, we have observed probable hybrids in some; viability is undoubtedly reduced in these areas. Brook trout are widely distributed in the SFSR watershed; however, there has been surprisingly little increase in the distribution of brook trout since the 1970s (Adams et al. 2002). Given this and the fact that bull trout populations continue to express their full range of life history forms, resident and migratory bull trout stocks that have managed to maintain a high degree of genetic purity are unlikely to be at imminent risk of hybridization; however, the extent of hybridization in the watershed is unknown. Overall, we rate bull trout viability as high in this watershed compared to other watersheds on the PNF."
Water Quality			
Temperature	**Bull trout:** 7-day average maximum temperature in a reach during the following life history stages: Incubation: 2-5°C or 35.6-41.0°F Rearing: 4-12°C or 39.2-53.6°F Spawning: 4-9°C or 39.2-48.2°F Also temperatures do not exceed 15°C or 59.0°F in areas used by adults during migration (no thermal barriers) **Chinook/steelhead**: 7-day average minimum. Spawning, rearing and migration: 50-57°F (10-13.9°C)	**FR** **PJ**	Though temperature values are within the FR/FUR ranges, data are considered to reflect a natural temperature regime in most of the upper SFSR drainage because there is little evidence of management effects in these watersheds that would contribute to elevated temperatures. Given the stream elevation, topography, aspect, and riparian vegetation characteristics, the data likely reflects the natural range of variability, except along the mainstem SFSR Road, where shading is compromised. Unpublished data on file at PNF SO, McCall, ID (7d avg max degrees Centigrade) Fitsum Creek (2004) 16.5 NF Fitsum (2004) 16.3 Buckhorn Creek (2003) 17.6 SFSR Poverty Flat site E084 (2004) 21.6 SFSR Glory Hole site E085 (2003) 22

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	17060208-01-12 Fitsum 17060208-01-11 Buckhorn 17060208-01-10 Camp 17060208-01-09 Fourmile 17060208-01-08 Blackmare 17060208-01-07 Goat
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th HU (Upper SFSR 17060208-01) (6 6th-level HUs)
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
Intragravel Quality (in areas of spawning and incubation for anadromous fishes) **"Sediment" WCI has been replaced by new report in Nelson and Burns 2005**	**Revised WCI for PNF, Nelson and Burns 2005** High intragravel quality is indicated by: (a) 5-year mean fines < 6.3 mm concentrations at depth of 28% or less with no more than two years between 28% and 36%. OR (b) 5-year mean fines < 6.3 mm concentrations at depth between 28% and 36% with a decreasing trend over at least 10 years.	**FR – Poverty and Oxbow (upper)** **FA – Glory (lower)** **D**	Nelson et al. 2006a "All size classes of fine particles have increased at the two SFSR sites on the BNF since the previous report (Nelson et al. 2004), while declining somewhat at the more downstream sites on the PNF and at the Johnson Creek site. Inspection of the WCI table from Nelson and Burns (2005) shows intragravel functional condition based on mean large fines (< 6.3mm in particle diameter) for the SFSR spawning areas as "functioning at risk" (FR) for Stolle, Dollar, Poverty and Oxbow, and "functioning appropriately" (FA) for Glory and Ice Hole. Except for the Poverty Flat spawning area, the sites classified as FA generally possessed higher levels of fine sediments in 2005 than their long-term (29-year) average values. Overall, the spawning areas show trends in sediment conditions similar to those reported previously, though trends consistent with improving conditions have appeared to weaken somewhat while those consistent with deteriorating conditions seem to have strengthened slightly. These can be summarized as more or less stable conditions at the Dollar Creek (B082), Poverty Flat (E084), Glory (E085), and Ice Hole (B152) sites, coarsening of the streambed at the Oxbow site (E083), an area of ongoing channel readjustment following the breach that cutoff the oxbow reach itself, and deterioration at Stolle Meadows. Despite little in the way of apparent trends in most fine sediments at the Poverty Flat spawning area, the trend toward coarsening with removal of the small fines appears to be continuing. Over the past 10 years (which we have called "recent" modeling), the situation was similar, except that incipient trends were less pronounced over the shorter time span. At this scale, the gradual coarsening of the bed at Poverty Flat was only marginally detectable, and trends were statistically insignificant for individual size classes. Serial autocorrelation with ordinary least squares (OLS) regression was significant for all variates at both time scales, so only statistically detectable trends from autoregressive modeling were considered valid."
Chemical Contaminants and/or Nutrients	Low levels of chemical contamination from agricultural, industrial, and other sources; no excess nutrients, no 303(d) water quality limited water bodies.	**FR** **PJ**	The mainstem South Fork Salmon River is 303 (d) listed. No tributaries of the Upper SFSR are 303 (d) listed.
Habitat Access			
Physical Barriers	Any man-made barriers present in watershed allow upstream and downstream fish passage at all flows.	**FR** **D**	Fitsum R1/R4 habitat inventory: At least one culvert was observed that does not meet PNF fish passage criteria (Data on file at the PNF Supervisor's Office, McCall, Idaho) A road-stream crossing culvert at the mouth of Goat Creek blocks upstream fish migration (unpublished data on file PNF SO). A barrier exists at Indian Creek near the Krassel work station.

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	17060208-01-12 Fitsum 17060208-01-11 Buckhorn 17060208-01-10 Camp 17060208-01-09 Fourmile 17060208-01-08 Blackmare 17060208-01-07 Goat
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th HU (Upper SFSR 17060208-01) (6 6th-level HUs)
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline Desired Condition	Baseline Condition	Discussion of Baseline and Current Condition
Habitat Elements			
Interstitial Sediment Deposition **"Substrate Embeddedness" WCI has been replaced by new report in Nelson and Burns 2005**	Adequate interstitial space is indicated by: (a) Any single measured mean embeddedness value less than or equal to 24%. OR (b) Any single mean free matrix count over 27% OR (c) A five-year mean measured cobble embeddedness level of 32% or less OR (d) A five-year mean free matrix count of 17% or more.	FUR D	Nelson et al. 2006b describe the Upper SFSR sampling sites as follows: "All of the sites would be classified as FR for the revised embeddedness WCIs because the five-year means exceed 32% but are less than 42%". For free matrix, "The primary Buckhorn Creek site (E016) had the fewest streambed free particles on average and the 5-year mean places it in the "Functioning at Unacceptable Risk" (FUR) category according to the revised SFSR WCIs (< 11%). Only the Blackmare Creek site could be classified as "Functioning Appropriately" (FA), with the undeveloped Fourmile Creek site and the somewhat developed Fitsum Creek site being similar but "Functioning at Risk" (FR) for sediment according to the revised sediment WCIs." Nelson et al. (2006b) describe the SFSR Road sampling sites as follows: "Both of these (control) sites were clearly in the FA range (free matrix), and were the only sites that were; the Fourmile Creek sites were near the lower limit of the FR range while the Camp Creek sites had the lowest proportions of free particles and were solidly in the FUR range." "Both of these (Fourmile) sites would be classified FR based on cobble embeddedness, just as they were using free matrix measurements."
Large Woody Debris	> 20 pieces per mile, > 12 inches in diameter, > 35 feet length; and adequate sources of large woody debris for both long and short-term recruitment in RCAs.	**FA** **D**	Fitsum Creek 2002/2003 survey FBase output 158 pieces/mile The following data was estimated from raw data sheets by counting the number of pieces of LWD that were recorded, and dividing by the number of miles covered in the survey (unpublished data on file at PNF SO) Cougar Creek 2005 : 31-128 pieces/mile FA Fourmile Creek 2005 Reaches 1-4: 32-224 pieces/mile *FA* Blackmare Creek 2005 48 pieces/mile *FA* Camp Creek 2005 64 pieces/mile *FA* Phoebe Creek 2005 32 pieces/mile *FA* Nasty Creek 2005 16 pieces/mile *FR*
Pool Frequency	**Bull trout:** Pools have good cover and cool water, and only minor reduction of pool volume by fine sediment. Large woody debris recruitment standards for functioning appropriately (above) are met and pool frequency in a reach closely approximates: Wetted Width (ft.) / Number of Pools/Mile 0-5: 39 5-10: 60 10-15: 48 15-20: 39 20-30: 23 30-35: 18 35-40: 10 40-65: 9 65-100: 4	FA for most of the Analysis area FUR for Buckhorn Creek 6th HU D	See Wagoner and Burns (2001) for survey data pre 2001. Wagoner and Burns (2001): *FR* Unpublished data on file at PNF SO: *The following data was calculated from raw data by counting the pools in a given reach, converting that number to pools per mile covered by that reach, and also calculating the average wetted width of that given reach* Fitsum Creek 2002/2003 survey *FA* Reaches 1-5: 19.9-67.9 pools/mile, avg width 14.8-29.2ft Cougar Creek 2005 survey *FA* Reaches 1-4: 64-128 pools/mile, avg width 11.2-21.3ft (estimates from raw data) Fourmile Creek 2005 survey *FA* Reaches 1-4: 48-96 pools/mile, avg width 15.4-18.7ft (estimates from raw data) Blackmare Creek 2005 survey *FA* Reach 1: 65 pools/mile, avg width 14.8-25.6ft (estimates from raw data)

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	17060208-01-12 Fitsum 17060208-01-11 Buckhorn 17060208-01-10 Camp 17060208-01-09 Fourmile 17060208-01-08 Blackmare 17060208-01-07 Goat
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th HU (Upper SFSR 17060208-01) (6 6th-level HUs)
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
	Chinook/steelhead: Pools have good cover and cool water, and only minor reduction of pool volume by fine sediment. Large woody debris recruitment standards for functioning appropriately (above) are met and pool frequency in a reach closely approximates: Channel Width (ft.) / Number of Pools/Mile 0-5: 184 5-10: 96 10-15: 70 15-20: 56 20-25: 47 25-50: 26 50-75: 23 75-100: 18		Phoebe Creek 2005 survey *FA* Reach 1: 144 pools/mile, avg width 4.6-14.8ft (estimates from raw data) Camp Creek 2005 survey *FA* Reach 1: 160 pools/mile, avg width 6.6-20.4ft (estimates from raw data) Nasty Creek 2005 survey *FA* Reach 1 96 pools/mile, avg width 4.9-12.5ft (estimates from raw data) Mainstem Buckhorn 1993 survey *FUR* Reaches 1-5 21 pools/mile, avg width 19.4ft
Pool Quality	Each reach has many large pools > 3.28 feet (1 meter deep). Pools have good cover and cool water, and only minor reduction of pool volume by fine sediment.	FA PJ	Unpublished data on file PNF SO: *The following data was calculated from raw data by counting the number of pools greater than 1 m deep in a given reach,* Fitsum Creek 2002/2003 survey *FR* Reaches 1-5: 1-4.6 pools > 3.28ft Cougar Creek 2005 survey *FR* Reaches 1-4: 1 pool >3.28ft (estimate from raw data) Fourmile Creek 2005 survey *FR* Reaches 1-4: 1 pool > 3.28ft (estimate from raw data) Blackmare Creek 2005 survey *FUR* Reach 1: no pools > 3.28ft (estimate from raw data) Phoebe Creek, Camp Creek and Nasty Creek 2005 surveys *FUR* Reach 1: no pools > 3.28ft (estimate from raw data) Pools have good cover and cool water, and only minor reduction of pool volume by fine sediment.

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	17060208-01-12 Fitsum 17060208-01-11 Buckhorn 17060208-01-10 Camp 17060208-01-09 Fourmile 17060208-01-08 Blackmare 17060208-01-07 Goat
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th HU (Upper SFSR 17060208-01) (6 6th-level HUs)
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
Off-Channel Habitat	Watershed has many ponds, oxbows, backwaters, and other off-channel areas with cover; side channels are low energy areas.	FR PJ	Unpublished data on file PNF SO: Fitsum Creek 2002/2003 survey, Reaches 1-5: side channels were observed in all five reaches of Fitsum Creek that were continuously R1/R4 surveyed. Oxbows were observed in Reaches 4 and 5, "none longer than 50m." Cougar Creek 2005 survey, Reaches 1-4: no off channel habitat was observed. Fourmile Creek 2005 survey, Reaches 1-4: a few side channel habitats were noted in reaches 3 and 4. Blackmare Creek 2005 survey, Reach 1 had "a few off channel habitats" observed. Phoebe Creek 2005, Reach 1: no off channel habitat was observed. Camp Creek and Nasty Creek 2005 surveys, Each 100m reach had side channels reported. The ones in Nasty Creek were reported as "two small side channels" and Camp Creek had "several side channels." No off channel habitat information for Buckhorn Creek or Goat Creek.
Refugia	**Bull trout:** Habitats capable of supporting strong and significant local populations are protected and are well distributed and connected for all life stages and forms of the species. **Chinook/steelhead:** Habitat refugia exist and are adequately buffered (e.g., by intact riparian conservation areas); existing refugia are sufficient in size, number, and connectivity to maintain viable populations or sub-population	FR PJ	Faurot and Burns 2004: "Fitsum Creek USFS R1/R4 Fitsum survey data 2002/2003 indicates well-distributed and connected habitats with relatively intact RCAs except on the mainstem SFSR." Mainstem SFSR RCAs are disturbed by a road, culverts, and localized recreational disturbance. RCAs in some side drainages are intact (Fourmile, Goat, Fitsum, Blackmare), where others have experienced effects of riparian roads, failed and existing fish passage barrier culverts, and timber harvest (Buckhorn, Camp, Phoebe, NFork Fitsum) (personal observation).

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	17060208-01-12 Fitsum 17060208-01-11 Buckhorn 17060208-01-10 Camp 17060208-01-09 Fourmile 17060208-01-08 Blackmare 17060208-01-07 Goat
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th HU (Upper SFSR 17060208-01) (6 6th-level HUs)
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	Baseline Condition	Discussion of Baseline and Current Condition
Channel Condition and Dynamics			
Width/Max Depth Ratio	≤10	FR PJ	Weighted width:max depth ratioin pools from FBase output Fitsum: 7 NF Fitsum: 9.4 The following data may include dam pools. These numbers are not FBase output. These unweighted numbers were calculated from raw data by averaging pool widths for a reach, then dividing by average maximum pool depths for that reach. They cannot be compared to default WCIs, but are provided here for reference: Unpublished data on file PNF SO (estimates from raw data): Cougar Creek 2005 survey *FR* Reaches 1-4: 6.6-12.2 (estimate from raw data) Fourmile Creek 2005 survey *FR* Reaches 1-4: 7.7-10.8 (estimate from raw data) Blackmare Creek 2005 survey *FA* Reach 1: 10.1 (estimate from raw data) Phoebe Creek 2005 survey *FA* Reach 1: 9.6 (estimate from raw data) Camp Creek 2005 survey *FR* Reach 1: 12.5 (estimate from raw data) Nasty Creek 2005 survey *FA* Reach 1: 8.1 (estimate from raw data) The only data available for Buckhorn Creek is from 1993 where width/depth ratio was calculated without using max depths.
Streambank Condition	>90% of any stream reach has stable banks relative to the percent of inherent stable streambanks associated with a similar unmanaged stream system.	FR PJ	Unpublished data on file PNF SO: This is not FBAse output, it was estimated from a review of the raw data. Fitsum Creek 2002/2003 survey *FR* Reaches 1-5 = 80-99% stable Cougar Creek 2005 survey *FA* Reaches 1-4: 95-100% stable Fourmile Creek 2005 survey *FR* Reaches 1-4: 80-100% Blackmare Creek 2005 survey *FA* Reach 1: 100% Phoebe Creek 2005 survey *FA* Reach 1: 100% Camp Creek 2005 survey *FA* Reach 1: 100% Nasty Creek 2005 survey *FA* Reach 1: 100% Buckhorn Creek 1993 survey *FR*

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	17060208-01-12 Fitsum 17060208-01-11 Buckhorn 17060208-01-10 Camp 17060208-01-09 Fourmile 17060208-01-08 Blackmare 17060208-01-07 Goat
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th HU (Upper SFSR 17060208-01) (6 6th-level HUs)
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	Baseline Condition	Discussion of Baseline and Current Condition
			88.6% stable
Floodplain Connectivity	Within RCAs, floodplains and wetlands are hydrologically linked to the main channel; overbank flows occur and maintain wetland/floodplain functions; and riparian vegetation succession.	FR PJ	Faurot and Burns 2004: "Fitsum Creek USFS R1/R4 Fitsum survey data 2002/2003 indicates intact RCAs. Some abandoned culverts may be affecting floodplain function." Mainstem SFSR RCAs are disturbed by a road, culverts, and localized recreational disturbance. RCAs in some side drainages are intact (Fourmile, Fitsum, Blackmare), where others have experienced effects of riparian roads, failed and existing fish passage barrier culverts, and timber harvest (Buckhorn, Camp, Phoebe, NFork Fitsum) (personal observation).
Flow/Hydrology			
Change in Peak/Base Flows	Watershed hydrograph indicates peak flow, base flow, and flow timing characteristics comparable to an undisturbed watershed of a similar size, geomorphology and climatology.	FR PJ	Mainstem SFSR RCAs are disturbed by a road, culverts, and localized recreational disturbance. RCAs in some side drainages are intact (Fourmile,Fitsum, Blackmare), where others have experienced effects of riparian roads, failed and existing fish passage barrier culverts, and timber harvest (Buckhorn, Camp, Phoebe, NFork Fitsum).
Drainage Network Increase	Zero or minimum change in active channel length correlated with human caused disturbance.	FR PJ	Mainstem SFSR RCAs are disturbed by a road, culverts, and localized recreational disturbance. RCAs in some side drainages are intact (Fourmile, Goat, Fitsum, Blackmare), where others have experienced effects of riparian roads, failed and existing fish passage barrier culverts, and timber harvest (Buckhorn, Camp, Phoebe, NFork Fitsum).
Watershed Conditions			
Road Density and Location	Total road density < 0.7 miles/square mile of subwatershed, no roads within RCAs.	FR D	Road densityis 0.5mi/mi^2 (*FA*). Road density in RCA 1.1mi/mi^2, 33.2% of total roads (*FR*). CD1: \Support Documents\Maps\total_roads.pdf
Disturbance History	< 15% ECA (entire watershed) with no concentration of disturbance in areas with landslide or landslide prone areas, and/or refugia, and/or RCAs.	FR PJ	ECA is 5% for the analysis area (CD1: \Support Documents\Maps\eca_lsp.pdf). Nelson et al. 2004: "We cannot confirm that even high ECA, as estimated on the PNF to date, has any observable effect on salmonid habitat. This suggests that estimated ECA on the PNF says little about the potential for affected streams to support salmonids. We cannot determine whether there is some threshold value above which habitat conditions would be unacceptably altered…". There is a concentration of disturbance in some RCAs (personal observation).

Agency/Unit	Payette NF, Krassel RD	HU Code and Name	17060208-01-12 Fitsum 17060208-01-11 Buckhorn 17060208-01-10 Camp 17060208-01-09 Fourmile 17060208-01-08 Blackmare 17060208-01-07 Goat
Fish Species Present	Chinook, steelhead, bull trout	Spatial Scale of this Matrix	One 5th HU (Upper SFSR 17060208-01) (6 6th-level HUs)
(Anad. Sp.) Population:		Subpopulation:	
Core Area (Bull Trout)		Local Population	
Management Actions	Ongoing Actions 2006		

Pathways & Indicators	Population and Environmental Baseline		
	Desired Condition	**Baseline Condition**	**Discussion of Baseline and Current Condition**
Riparian Conservation Areas	The riparian conservation areas within the sub watershed(s) have historic and occupied refugia for listed, sensitive or native/desired nonnative fish species which are present and provide: adequate shade, large woody debris recruitment, sediment buffering, connectivity, and habitat protection and connectivity to adequately minimize adverse effects from land management activities (>80% intact). All vegetative components are within desired conditions identified in Appendix A of the Forest Plan. RCA functions and processes are intact, providing resiliency from adverse affects associated with land management activities. Conditions fully support habitat for aquatic species.	FR PJ	Faurot and Burns 2004: "Fitsum Creek RCAs >80% intact." There is a concentration of disturbance in some RCAs (personal observation). Road density in RCA 1.1mi/mi^2 (CD1: \Support Documents\Maps\total_roads.pdf) Some RCA-oriented habitat WCIs are FR and FUR (see above)
Disturbance Regime	Disturbance resulting from land management activities are negligible or temporary. Streamflow regimes are appropriate to the local geomorphology, potential vegetation and climatology resulting in appropriate high quality habitat and watershed complexity that provide refugia and rearing space for all life stages or multiple life-history forms. Ecological processes are within historical ranges.–Resiliency of habitat to recover from land management disturbances is high.	FR PJ	Disturbance from land management actions such as timber harvest, abandoned logging roads, and currently-used riparian roads is not negligible or temporary. Resiliency of habitat to recover from land management disturbances is moderate (personal observation).
Integration of Species and Habitat Conditions	Habitat quality and connectivity among local populations is high. The migratory form is present. Disturbance has not altered channel equilibrium. Fine sediments and other habitat characteristics influencing survival and growth are consistent with pristine habitat. The local population has the resilience to recover from short-term disturbance within one to two generations (5 to 10 years). The local population is fluctuating around an equilibrium or is growing.	FR PJ	With a few exceptions (e.g. Goat Creek) there is good habitat connectivity throughout the drainage. In addition, there are data from radio telemetry, passive integrated transponder (PIT) tagging, and screw traps that document long distance bull trout movement within the drainage (Hogen 2002; Watry and Scarnnechia 2004; Nez Perce tribe, unpublished data). All three life histories are present in the SFSR. All bull trout life history strategies are present in the SFSR watershed, which contributes to long term population viability. There are very few human caused or natural barriers that fragment occupied or suitable bull trout habitat. Therefore, the populations of bull trout in the drainage are well connected, which enhances long term viability . There is a concentration of disturbance in some RCAs. Some habitat WCIs are FR and FUR (see above). Disturbance from land management actions such as timber harvest, abandoned logging roads, and currently-used riparian roads is not negligible or temporary Sediments and suitable habitat availability have been altered and may not return to pre-disturbance conditions within 5 years (see above WCIs and personal observation). Survival and growth rates for bull trout are reduced (see population character WCIs and Burns et al. 2005). Local populations are stable or fluctuating in a downward trend for all listed species (57FR14653, 60FR43937, 63FR31647). Connectivity among local populations occurs but habitats are fragmented (Burns et al. 2005).

C. APPENDIX 3. EFFECTS MATRIX TABLES

1. MISCELLANEOUS FOREST PRODUCTS AND MISTLETOE/PRECOMMERCIAL THINNING

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Miscellaneous Forest Products and Mistletoe/Precommercial thinning – All SFSR Analysis Areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Local Population Character					
Local Population Size FR except Lower SFSR FA	N	none	none	none	No influence
Growth and Survival FR	N	none	none	none	No influence
Life History Diversity and Isolation FA	N	none	none	none	No influence
Persistence and Genetic Integrity FR except Lower SFSR FA	N	none	none	none	No influence
Water Quality					
Temperature FR	M	-*	-*	-*	Mitigations and LRMP standards that would apply for actions within RCA, such as pre-commercial thinning or miscellaneous forest product removal, will insure that any reduction in stream shade is negligible.
Intragravel Quality (Sediment) Upper SF FR Secesh FA	M	-*	-*	-*	Mitigations and LRMP standards that would apply for actions within RCAs, such as pre-commercial thinning or miscellaneous forest product removal, will insure that any sediment delivery related to the actions is temporary and negligible.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Miscellaneous Forest Products and Mistletoe/Precommercial thinning – All SFSR Analysis Areas		

Pathways & Indicators	**Effects of the Management Action(s)**				
	Effects I=improve/D=degrade/M=maintain/N=no influence	**Expected Trend - negative, + positive, * negligible, none**			**Discussion of Effects**
		Temporary	**Short-term**	**Long-term**	
Chemical Contaminants and/or Nutrients Upper, Lower SF FR EFSF FUR Secesh FA	M	-*	-*	-*	Mitigative restrictions concerning refueling in RCAs, fuel and chemical spill prevention and cleanup requirements, will reduce the likely hood of chemical contamination to negligible levels.
Habitat Access					
Physical Barriers FR except Secesh FA	N	none	none	none	No influence
Habitat Elements					
Interstitial Sediment Deposition (Substrate Embeddedness) Upper SF FUR EFSF FR Secesh FA Lower SF FR/FUR	M	-*	-*	-*	Mitigations and LRMP standards that would apply for actions within RCAs, such as pre-commercial thinning or miscellaneous forest product removal, will insure that any sediment delivery related to the actions is temporary and negligible.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Miscellaneous Forest Products and Mistletoe/Precommercial thinning – All SFSR Analysis Areas		

Pathways & Indicators	**Effects of the Management Action(s)**				
	Effects I=improve/D=degrade/M=maintain/N=no influence	**Expected Trend - negative, + positive, * negligible, none**			**Discussion of Effects**
		Temporary	**Short-term**	**Long-term**	
Large Woody Debris Upper SF FA EFSF FUR Secesh FR Lower SF FA/ FR	M	-*	-*	-*	Mitigations and LRMP standards that would apply for actions within RCA, such as pre-commercial thinning or miscellaneous forest product removal, will insure that any reduction of potential LWD recruitment is negligible. In some cases thinning encroaching conifers (e.g., grand fir) and moving the stand toward more historic conditions will improve the vigor of the remaining trees (e.g., ponderosa pine) which could accelerate recruitment of the larger size classes (>35 ft) of LWD.
Pool Frequency FA except EFSF FR	N	none	none	none	No influence
Pool Quality FA except EFSF FR	N	none	none	none	No influence
Off-Channel Habitat Upper, EFSF FR Secesh, Lower SF FA	N	none	none	none	No influence

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Miscellaneous Forest Products and Mistletoe/Precommercial thinning – All SFSR Analysis Areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Refugia Upper SF, EFSF FR Secesh, Lower SF FA	N	none	none	none	The actions will have no influence on refugia.
Channel Condition and Dynamics					
Width/MaxDepth Ratio Upper, EFSF FR Secesh, Lower SF FA	M	none	none	none	No influence
Streambank Condition Upper, EFSF FR Secesh, Lower SF FA	I	none	none	none	No influence
Floodplain Connectivity FR except Lower SF FA	I	none	none	none	No influence
Flow/Hydrology					
Change in Peak/Base Flows FR except Lower SF FA/FR	N	none	none	none	Due to the small scale of the pre-commercial thinning, and miscellaneous forest product removal, there would be no influence on the WCI.
Drainage Network Increase Upper SF, Secesh FR	N	none	none	none	No influence

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Miscellaneous Forest Products and Mistletoe/Precommercial thinning – All SFSR Analysis Areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
EFSF FUR Lower SF FA /FR					
Watershed Conditions					
Road Density and Location FR	N	none	none	none	No influence
Disturbance History FR except EFSF FUR	M	-*	-*	-*	The small scale of the actions along with mitigations and LRMP standards that would apply for actions (inside and outside of RCAs) such as pre-commercial thinning, and miscellaneous forest product removal, will insure that any alterations of WCIs that contribute to disturbance history are negligible or an improvement (e.g., moving toward LRMP desired vegetation conditions).
Riparian Conservation Areas Upper SF, Secesh FR EFSF FUR Lower SF FA except Pony, Elk FR	M	-*	-*	-*	Mitigations and LRMP standards that would apply for actions within RCAs, such as pre-commercial thinning or miscellaneous forest product removal, will insure that any alterations of WCIs that influence RCAs are negligible or an improvement (e.g., moving toward LRMP desired vegetation conditions, or releasing deciduous understory by thinning encroaching conifers).
Disturbance Regime FR except Lower SF FA except Pony, Elk FR	M	-*	-*	-*	Mitigations and LRMP standards that would apply for actions, such as pre-commercial thinning, and miscellaneous forest product removal will insure that any alteration of WCIs that influence disturbance regime will be negligible or an improvement (e.g., moving toward LRMP desired

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Miscellaneous Forest Products and Mistletoe/Precommercial thinning – All SFSR Analysis Areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					vegetation conditions).
Integration of Species and Habitat Conditions **FR except Lower SF FA except Pony, Elk FR**	M	-*	-*	-*	Mitigations and LRMP standards that would apply for actions, such as pre-commercial thinning, and miscellaneous forest product removal, will insure that any alterations of the WCIs listed above will be negligible or an improvement (e.g., moving toward LRMP desired vegetation conditions).

2. FIRE MANAGEMENT ACTIVITIES - ALL SFSR ANALYSIS AREAS

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Fire Management Activities – All SFSR analysis areas		

Pathways & Indicators	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Local Population Character					
Local Population Size FR except Lower SFSR FA	M	*-	*-	*-	Fire management activities are expected to have negligible effects on these WCIs due to: (1) proper screening of pumps to prevent fish being impinged or sucked into pumps, (2) leaving trees fallen in RCAs to keep benefits of LWD there (3) avoiding fish mortality from toxic chemicals by not dropping of retardant in streams, proper use of chemicals, and having fuel in containment, (4) fire personnel being briefed and familiar with fire guidelines, (5) fire guidelines will be applied to both wildland and prescribed fire, (6) resource advisors providing input on camp locations and layout, ongoing education of fire personnel about guidelines and resource concerns,

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Fire Management Activities – All SFSR analysis areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					continual monitoring of suppression actions and addressing problems.
Growth and Survival FR	M	*-	*-	*-	
Life History Diversity and Isolation FA	**M**	***-**	***-**	***-**	
Persistence and Genetic Integrity FR except Lower SFSR FA	N	none	none	none	No influence.
Water Quality					
Temperature FR	M	*-	*-	*-	Prescribed fire that is allowed to back into RCAs, and fire line construction within RCAs would alter stream shade by a negligible amount in the temporary and short term. Monitoring has shown that large stand replacing wildfires have not adversely affected fish habitat quality (Minshall et al 1994, Royer and Minshall 1996, Bowman and Minshall 1999).
Intragravel	M	*-	*-	*-	Resource advisors will provide input for

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Fire Management Activities – All SFSR analysis areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Quality (Sediment) Upper SF FR Secesh FA					camp location and setup to minimize potential sediment delivery and effects on RCA filtering ability. Fire personnel will be briefed and become familiar with guidelines, specifically "every effort should be made to minimize sedimentation". Resource advisors provide information and oversight to help meet this guideline. Post-fire rehabilitation of fireline, camps or other areas where soils is disturbed would be expected to result in negligible temporary sediment delivery. Monitoring has shown that large stand replacing wildfires have not

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Fire Management Activities – All SFSR analysis areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					adversely affected fish habitat quality (Minshall et al 1994, Royer and Minshall 1996, Bowman and Minshall 1999).
Chemical Contaminants and/or Nutrients Upper, Lower SF FR EFSF FUR Secesh FA	M	*-	*-	*-	Negligible risk of chemical contamination expected because fire personnel will be briefed and familiarized with guidelines, guidelines include no dropping of retardant in streams, proper use of chemicals, and fuel containment. Also, ongoing education of fire personnel and oversight by resource advisors will serve to minimize deviations during suppression activities.
Habitat Access					
Physical Barriers FR except Secesh FA	N	none	none	none	No influence.
Habitat Elements					
Interstitial Sediment Deposition	M	*-	*-	*-	Resource advisors will provide input for camp

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Fire Management Activities – All SFSR analysis areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
(Substrate Embeddedness) **Upper SF FUR** **EFSF FR** **Secesh FA** **Lower SF FR/FUR**					location and setup to minimize potential sediment delivery and effects on RCA filtering ability. Fire personnel will be briefed and become familiar with guidelines, specifically "every effort should be made to minimize sedimentation". Resource advisors provide information and oversight to help meet this guideline. Post-fire rehabilitation of fireline, camps or other areas where soils is disturbed would be expected to result in negligible temporary sediment delivery. Monitoring has shown that large stand replacing wildfires have not adversely affected fish habitat quality (Minshall et al 1994, Royer and Minshall 1996, Bowman and Minshall 1999).

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Fire Management Activities – All SFSR analysis areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Large Woody Debris Upper SF FA EFSF FUR Secesh FR Lower SF FA/ FR	M	*-	*-	*-	Trees may be fallen in RCAs during suppression activities. Negligible effect on this WCI is expected as number of trees fallen would be minor at the 6th field HU, and as per guidelines, trees would be left in RCAs. Prescribed fire that is allowed to back into RCAs, and fire line construction within RCAs could alter LWD recruitment by negligible amounts in the temporary and short term. Monitoring has shown that large stand replacing wildfires have not adversely affected fish habitat quality (Minshall et al 1994, Royer and Minshall 1996, Bowman and Minshall 1999).
Pool Frequency FA except EFSF FR	M	*-	*-	*-	Negligible effects on these WCIs are expected due to expected negligible effects on sediment and LWD WCIs.
Pool Quality FA except	M	*-	*-	*-	Negligible effects on these WCIs are expected due to expected negligible effects

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Fire Management Activities – All SFSR analysis areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
EFSF FR					on sediment and LWD WCIs.
Off-Channel Habitat Upper, EFSF FR Secesh, Lower SF FA	N	none	none	none	**No influence is expected on this WCI because (1) as, per guidelines, trees fallen in RCAs will be left in RCAs, and (2) negligible effect on flows are expected as vegetation removed during suppression will be minor at the 6th HU scale, and as per guidelines, prescribed fire can not increase ECA above 15%,. In addition monitoring has shown that large stand replacing wildfires have not adversely affected fish habitat quality (Minshall et al 1994, Royer and Minshall 1996, Bowman and Minshall 1999).**

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Fire Management Activities – All SFSR analysis areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Refugia Upper SF, EFSF FR Secesh, Lower SF FA	**N**	**none**	**none**	**none**	**No influence.**
Channel Condition and Dynamics					
Width/MaxDepth Ratio Upper, EFSF FR Secesh, Lower SF FA	M	*-	*-	*-	Negligible effect on this WCI is expected due to expected effects on sediment & substrate & change in peak/base flow WCIs (this table).
Streambank Condition Upper, EFSF FR Secesh, Lower SF FA	M	*_	*-	*-	Negligible effects on this WCI are expected because fire personnel will be briefed and become familiar with guidelines, specifically "to expend every effort to minimize stream course disturbance", and resource advisors will provide information and oversight to help meet this guideline.
Floodplain Connectivity FR except Lower SF FA	**N**	**none**	**none**	**none**	**No influence.**
Flow/Hydrology					
Change in Peak/Base	N	none	none	none	No influence is expected

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Fire Management Activities – All SFSR analysis areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Flows FR except Lower SF FA/FR					on this WCI because (1) as, per guidelines, trees fallen in RCAs will be left in RCAs, and (2) negligible effect on flows are expected as vegetation removed during suppression will be minor at the 6th HU scale, and as per guidelines, prescribed fire can not increase ECA above 15%. In addition monitoring has shown that large stand replacing wildfires have not adversely affected fish habitat quality (Minshall et al 1994, Royer and Minshall 1996, Bowman and Minshall 1999).
Drainage Network Increase Upper SF, Secesh FR EFSF FUR Lower SF FA /FR	N	none	none	none	No influence.
Watershed Conditions					
Road Density and Location FR	N	none	none	none	No influence.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Fire Management Activities – All SFSR analysis areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Disturbance History FR except EFSF FUR	M	*-	*-	*-	Negligible effect on this WCI expected as vegetation disturbance during suppression efforts, i.e., fireline, helispots, safety zones, etc. is relatively minor at the 6th HU scale, and these areas are rehabilitated. Prescribed fire that is allowed to back into RCAs, and fire line construction within RCAs expected to alter vegetation there by negligible amounts in the temporary and short term. Prescribed fire will not increase ECA above 15% in corresponding 6th level HUs. Prescribed fire would improve the WCI in the short and long term by moving vegetation towards the desired condition. Monitoring has shown that large stand replacing wildfires have not adversely affected fish habitat quality (Minshall et al 1994, Royer and Minshall 1996, Bowman

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Fire Management Activities – All SFSR analysis areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					and Minshall 1999).
Riparian Conservation Areas Upper SF, Secesh FR EFSF FUR Lower SF FA except Pony, Elk FR	M	*-	*-	*-	Depending on site-specific conditions, fire suppression can alter RCAs (move vegetation away from LRMP desired condition) by allowing encroachment of shade tolerant conifer species (e.g., grand fir), and suppressing deciduous understory, while prescribed fire can offset some of these effects. Prescribed fire that is allowed to back into RCAs, and fire line construction within RCAs would alter RCA vegetation by negligible amounts in the temporary and short term. In either case the small scale of prescribed fire and low frequency of wildfire in the analysis area along with mitigations make it unlikely that effects to RCAs would be more than negligible. Monitoring has shown that large stand replacing wildfires have not adversely affected fish

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Fire Management Activities – All SFSR analysis areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					habitat quality (Minshall et al 1994, Royer and Minshall 1996, Bowman and Minshall 1999).
Disturbance Regime FR except Lower SF FA except Pony, Elk FR	M	*-	*-	*-	**This action is expected to maintain watershed function and resiliency (i.e., ability to recover from land management disturbance). Negligible effect on vegetation as disturbance during suppression efforts, i.e., fireline, helispots, safety zones, etc. is relatively minor at the 6th HU scale, and these areas are rehabilitated. Prescribed fire mitigation to not increase ECA above 15% in corresponding 6th level HUs will be implemented. Prescribed fire would improve the WCI in the short and long term by moving vegetation towards the desired condition. Monitoring has shown that large stand replacing wildfires have not adversely**

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Fire Management Activities – All SFSR analysis areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					affected fish habitat quality (Minshall et al 1994, Royer and Minshall 1996, Bowman and Minshall 1999).
Integration of Species and Habitat Conditions **FR except Lower SF FA except Pony, Elk FR**	**M**	***-**	***-**	***-**	**As fire management actions are expected to have no or negligible effect on all WCIs, negligible effects on listed fishes or critical habitat are also expected.**

3. FISH HABITAT/RIPARIAN SAMPLING, WATERSHED/FISH HABITAT IMPROVEMENTS/MAINTENANCE

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Fish habitat/riparian sampling and Watershed/fish habitat improvements and Maintenance		

Pathways & Indicators	Effects of the Management Action(s) Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none Temporary	Short-term	Long-term	Discussion of Effects
Local Population Character					
Local Population Size **FR except** **Lower SFSR FA**	I	+	+	+	Watershed improvement projects that open up new habitat or reduce sediment delivery could increase local population size.
Growth and Survival **FR**	I	+	+	+	The actions that reduce sediment delivery could improve growth and survival.
Life History Diversity and Isolation **FA**	N	none	none	none	No influence
Persistence and Genetic Integrity **FR except** **Lower SFSR FA**	N	none	none	none	No influence
Water Quality					
Temperature **FR**	I	+	+	+	Watershed and habitat improvement will decrease summer stream temperatures in some areas. Mitigations will maintain temperature in all other actions.
Intragravel Quality (Sediment) **Upper SF FR** **Secesh FA**	M	-*	-*	-*	• There may be negligible amounts of temporary sediment delivery from habitat improvement, but actions, such as bank stabilization and road obliteration with required mitigations, will decrease sediment

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Fish habitat/riparian sampling and Watershed/fish habitat improvements and Maintenance		

Pathways & Indicators	Effects of the Management Action(s) Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none Temporary	Short-term	Long-term	Discussion of Effects
					delivery in the short and long-term by a greater amount than any temporary increase. 1. Sediment in the streambed may be stirred up and redistributed during fish habitat sampling, but there will be no net increase in sediment and the effect will be temporary and negligible.
Chemical Contaminants and/or Nutrients Upper, Lower SF FR EFSF FUR Secesh FA	M	-*	-*	-*	Restrictions concerning refueling in RCAs and spill prevention and cleanup requirements will reduce the likely hood of chemical contamination to negligible levels.
Habitat Access					
Physical Barriers FR except Secesh FA	I	+	+	+	Removal or replacement of fish barriers, such as old culverts, will improve connectivity.
Habitat Elements					
Interstitial Sediment Deposition (Substrate Embeddedness) Upper SF FUR EFSF FR Secesh FA Lower SF FR/FUR	M	-*	-*	-*	• There may be negligible amounts of temporary sediment delivery (which results in substrate embeddedness) from all actions described, but habitat improvements with required mitigations, will decrease sediment delivery in the short and long-term by a greater amount than any temporary increase.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Fish habitat/riparian sampling and Watershed/fish habitat improvements and Maintenance		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					• Sediment in the streambed may be stirred up and redistributed during fish habitat sampling, but there will be no net increase in sediment and the effect will be temporary and negligible.
Large Woody Debris Upper SF FA EFSF FUR Secesh FR Lower SF FA/ FR	I	+	+	+	Watershed and habitat improvement may increase the current quantity of LWD and future recruitment in some areas. Mitigations will maintain LWD in all other actions.
Pool Frequency FA except EFSF FR	I	+	+	+	Watershed and habitat improvement may increase pool frequency in some areas. Mitigations will maintain pool frequency in all other actions.
Pool Quality FA except EFSF FR	I	+	+	+	Watershed and habitat improvement may increase the pool quality in some areas. Mitigations will maintain pool quality in all other actions.
Off-Channel Habitat Upper, EFSF FR Secesh, Lower SF FA	M	+*	+*	+*	Watershed and habitat improvement may increase off-channel habitat in some areas by negligible levels. Mitigations will maintain off channel habitat in all other actions.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Fish habitat/riparian sampling and Watershed/fish habitat improvements and Maintenance		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Refugia Upper SF, EFSF FR Secesh, Lower SF FA	N	none	none	none	The actions will have no influence on refugia.
Channel Condition and Dynamics					
Width/MaxDepth Ratio Upper, EFSF FR Secesh, Lower SF FA	M	+	+	+	Watershed and habitat improvement may decrease width to max depth ratio in some areas. Mitigations will maintain width to max depth ratio in all other actions.
Streambank Condition Upper, EFSF FR Secesh, Lower SF FA	I	+	+	+	Watershed and habitat improvement may increase bank stability in some areas. Mitigations will maintain bank stability in all other actions.
Floodplain Connectivity FR except Lower SF FA	I	+	+	+	Watershed and habitat improvement such as RCA road obliteration may increase floodplain connectivity in some areas. Mitigations will maintain floodplain connectivity in all other actions.
low/Hydrology					

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Fish habitat/riparian sampling and Watershed/fish habitat improvements and Maintenance		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Change in Peak/Base Flows FR except Lower SF FA/FR	I	+	+	+	Watershed and habitat improvement such as road obliteration may return peak and base flow to a more normative regime in some areas. Mitigations will maintain peak and base flow in all other actions.
Drainage Network Increase Upper SF, Secesh FR EFSF FUR Lower SF FA /FR	I	+	+	+	Watershed and habitat improvement such as road obliteration, and appropriate road and trail maintenance will improve hydrologic processes and diffuse the drainage network in some areas. Mitigations will maintain drainage network in all other actions.
Watershed Conditions					
Road Density and Location FR	I	+	+	+	Watershed and habitat improvement, such as road obliteration, will reduce road density in some areas including RCAs. Mitigations will maintain road density all other actions.
Disturbance History FR except EFSF FUR	I	+	+	+	Watershed and habitat improvement, such as road obliteration, and removal of old culverts will cause a temporary disturbance, but will result in a short and long term decrease in anthropogenic disturbance. Mitigations will maintain disturbance history in all other actions.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Fish habitat/riparian sampling and Watershed/fish habitat improvements and Maintenance		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Riparian Conservation Areas **Upper SF, Secesh FR** **EFSF FUR** **Lower SF FA except Pony, Elk FR**	I	+	+	+	Watershed and habitat improvement, such as road obliteration, or willow planting will restore RCA function (LWD recruitment, sediment buffering, root mass bank stabilization etc.) in some area. Mitigations will maintain road density all other actions.
Disturbance Regime **FR except Lower SF FA except Pony, Elk FR**	I	+	+	+	Watershed and habitat improvement, such as road obliteration in RCAs, and appropriate road and trail maintenance, will improve watershed resilience to disturbance. Mitigations will maintain the disturbance regime all other actions.
Integration of Species and Habitat Conditions **FR except Lower SF FA except Pony, Elk FR**	I	+	+	+	The actions with mitigations will improve, maintain or have no effect on all WCIs listed above; therefore, the integration of species and habitat conditions WCI will improve.

4. NOXIOUS WEED MANAGEMENT

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Noxius Weed Management – All SFSR Analysis Areas		

Pathways & Indicators	Effects of the Management Action(s)				
		Expected Trend - negative, + positive, * negligible, none			
	Effects I=improve/D=degrade/M=maintain/N=no influence	Temporary	Short-term	Long-term	Discussion of Effects
Local Population Character					
Local Population Size FR except Lower SFSR FA	N	none	none	none	No influence
Growth and Survival FR	D	-	-	-	Sub-lethal effects to listed fish and their food sources are probable
Life History Diversity and Isolation FA	N	none	none	none	No influence
Persistence and Genetic Integrity FR except Lower SFSR FA	N	none	none	none	No influence
Water Quality					
Temperature FR	M	-*	-*	-*	Shade and subsequent loss of riparian vegetation due to chemical application is negligible due to buffers.
Intragravel Quality	M	-*	-*	-*	Loss of negligible amounts of vegetation from the landscape due

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Noxius Weed Management – All SFSR Analysis Areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
(Sediment) Upper SF FR Secesh FA					from the landscape due to herbicide application may cause un-measurable increases in erosion and sedimentation.
Chemical Contaminants and/or Nutrients Upper, Lower SF FR EFSF FUR Secesh FA	D	-	-	-	Sub-lethal effects to listed fish and their food sources are probable
Habitat Access					
Physical Barriers FR except Secesh FA	N	none	none	none	No influence
Habitat Elements					
Interstitial Sediment Deposition (Substrate Embeddedness) Upper SF FUR EFSF FR Secesh FA Lower SF FR/FUR	M	-*	-*	-*	Loss of negligible amounts of vegetation from the landscape due to herbicide application may cause un measurable increases in erosion and sedimentation.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Noxius Weed Management – All SFSR Analysis Areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Large Woody Debris Upper SF FA EFSF FUR Secesh FR Lower SF FA/ FR	M	-*	-*	-*	Loss of negligible amounts of vegetation from the landscape due to herbicide application may cause un-measurable increases in erosion and sedimentation.
Pool Frequency FA except EFSF FR	N	none	none	none	No influence
Pool Quality FA except EFSF FR	N	none	none	none	No influence
Off-Channel Habitat Upper, EFSF FR Secesh, Lower SF FA	N	none	none	none	No influence

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Noxius Weed Management – All SFSR Analysis Areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Refugia Upper SF, EFSF FR Secesh, Lower SF FA	N	none	none	none	No influence
Channel Condition and Dynamics					
Width/MaxDepth Ratio Upper, EFSF FR Secesh, Lower SF FA	M	None	none	none	none
Streambank Condition Upper, EFSF FR Secesh, Lower SF FA	M	-*	-*	-*	**Loss of negligible amounts of vegetation from the landscape due to herbicide application may cause un-measurable increases in erosion and sedimentation.**
Floodplain Connectivity FR except Lower SF FA	I	None	none	none	none
Flow/Hydrology					

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Noxius Weed Management – All SFSR Analysis Areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Change in Peak/Base Flows FR except Lower SF FA/FR	N	none	none	none	No influence
Drainage Network Increase Upper SF, Secesh FR EFSF FUR Lower SF FA /FR	N	none	none	none	No influence
Watershed Conditions					
Road Density and Location FR	N	none	none	none	No influence
Disturbance History FR except EFSF FUR	M	-*	-*	-*	Loss of negligible amounts of vegetation from the landscape due to herbicide application may cause un-measurable increases in erosion and sedimentation.
Riparian Conservation Areas Upper SF, Secesh FR EFSF FUR Lower SF FA except Pony, Elk FR	M	-*	-*	-*	Shade and subsequent loss of riparian vegetation due to chemical application is negligible due to buffers.
Disturbance Regime	M	-*	-*	-*	Loss of negligible amounts of vegetation

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Noxius Weed Management – All SFSR Analysis Areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
FR except Lower SF FA except Pony, Elk FR					amounts of vegetation from the landscape due to herbicide application may cause un-measurable decreases in landscape stability
Integration of Species and Habitat Conditions **FR except Lower SF FA except Pony, Elk FR**	D	-	-	-	Loss of negligible amounts of vegetation from the landscape due to herbicide application may cause un-measurable changes in physical habitat, but sub-lethal effects to listed fish and their food sources are probable

5. ROAD MANAGEMENT, TRAILS/REC/ADMIN SITE O&M, TRAVEL PLAN – UPPER SFSR

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Upper SFSR		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Local Population Character					
Local Population Size FR	D	-	-	-	• Fording streams on foot, horseback, or other non-motorized travel is likely to result in redd trampling and egg mortality, which would degrade the WCI. • Road management and trail maintenance will help reduce travel plan related sediment effects on local population size.
Growth and Survival FR	D	-	-	-	• Fording streams on foot, horseback, or other non-motorized travel is likely to result in redd trampling and egg mortality, which would degrade the WCI. • Road management and trail maintenance will help reduce travel plan related

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Upper SFSR		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					sediment effects on local population size.
Life History Diversity and Isolation FA	I	+	+	+	• Road management related removal or replacement of fish barriers, such as old culverts, will improve connectivity. • New or re-built trail culverts and fords will provide for aquatic organism passage.
Persistence and Genetic Integrity FR	I	+	+	+	• Road management related removal or replacement of fish barriers, such as old culverts, will improve connectivity. • New or re-built trail culverts and fords will provide for aquatic organism passage.
Water Quality					
Temperature FR	M	-*	-*	-*	• The travel plan will have no influence on temperature • Mitigations in the road management and trail maintenance actions preventing excessive brushing

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Upper SFSR		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					and other alternation of riparian vegetation will result in negligible effects on stream shade and temperature
Intragravel Quality (Sediment) FR	D	+	-	-	• Restricting cross-country motorized travel will result in fewer incidences of motorized stream fording and driving in RCAs. At some point in the long term, sediment delivery from erosion on trails and roads related to increased motorized and non-motorized will surpass benefits from restricted travel. • Road management and trail maintenance will help reduce travel plan related sediment effects at all time scales..

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Upper SFSR		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Chemical Contaminants and/or Nutrients FR	M	+*	-*	-*	• As motorized travel increases there is a negligible chance that petroleum could be spilled where roads and trails cross streams in motorized use areas. • Restrictions concerning refueling in RCAs and spill prevention and cleanup requirements will reduce the likely hood of chemical contamination during road management and trail maintenance activities. • Proper use of treated wood that meets BMPs will minimize potential for effects. •The binding nature of dust-abatement salts, combined with restrictions on applications near waterways, low concentration of use and spill

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Upper SFSR		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					containment measures, reduce the likelihood of effects to negligible levels.
Habitat Access					
Physical Barriers FR	I	+	+	+	• Road management related removal or replacement of fish barriers, such as old culverts, will improve connectivity. • New or re-built trail culverts and fords will provide for aquatic organism passage.
Habitat Elements					
Interstitial Sediment Deposition (Substrate Embeddedness) FUR	D	+	-	-	• Restricting cross-country motorized travel will result in fewer incidences of motorized stream fording and driving in RCAs. At some point in the long term sediment delivery from erosion on trails and roads related to increased motorized and non-motorized will surpass benefits

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Upper SFSR		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					from restricted travel. • Road management and trail maintenance will help reduce travel plan related substrate embeddedness effects at all time scales.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Upper SFSR		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Large Woody Debris FA	M	-*	-*	-*	Mitigations will prevent more than negligible effects to LWD recruitment from road management and trail maintenance.
Pool Frequency FA	N	none	none	none	No influence
Pool Quality FA	M	+	-	-	• Restricting cross-country motorized travel expected to temporarily reduce sedimentation in pools due to less ground disturbance and fewer incidences of motorized stream fording and driving in RCAs. At some point sediment delivery from erosion on trails and roads related to increased motorized and non-motorized use will surpass benefits from restricted travel. • Road management, and trail maintenance will reduce the travel plan related effects on pool quality.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Upper SFSR		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Off-Channel Habitat FR	N	none	none	none	No influence

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Upper SFSR		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Refugia FR	N	none	none	none	The actions will have no influence on refugia.
Channel Condition and Dynamics					
Width/MaxDepth Ratio FR	D	+	-	-	• Travel plan related degradation of streambank condition will degrade width to max depth ratio at road and trail crossings. • Road and trail maintenance will reduce travel plan related degradation of streambank condition reducing effects to width/max depth ratio.
Streambank Condition (Travel Plan) FUR	I	+	+	+	Road/trail mileage decreases by 15 mi, improving this WCI.
Streambank Condition (LRMP) FR	D	+	-	-	• After a temporary improvement from restricting cross-country travel, the travel plan will result in short and long term degraded streambank

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Upper SFSR		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					condition where road and trails cross streams. Road and trail maintenance will reduce travel plan related degradation of streambank condition.
Floodplain Connectivity FR	N	none	none	none	No influence
Flow/Hydrology					
Change in Peak/Base Flows FR	N	none	none	none	No influence
Drainage Network Increase FR	N	none	none	none	No influence
Watershed Conditions					
Road Density and Location FR	N	none	none	none	No influence
Disturbance History FR	I	+	+	+	Restricting cross-country motorized travel will result in fewer incidences of resource damage to landslide or landslide prone areas, and to RCAs.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Upper SFSR		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Riparian Conservation Areas FR	I	+	+	+	Restricting cross-country motorized travel will result in fewer incidences of resource damage to RCAs Mitigations will minimize road management and trail maintenance related riparian disturbance to negligible levels.
Disturbance Regime FR	I	+	+	+	Restricting cross-country motorized travel will result in fewer incidences of resource damage across the landscape.
Integration of Species and Habitat Conditions FR	D	+	-	-	• The travel plan will result in improvement to some WCIs and degrade others. • Road management and trail maintenance will reduce some of the degrading effects of the travel plan.

6. ROAD MANAGEMENT, TRAILS/REC/ADMIN SITE O&M, TRAVEL PLAN – EFSF

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Two 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – EFSF		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Local Population Character					
Local Population Size FR	D	-	-	-	• Fording streams on foot, horseback, or other non-motorized travel is likely to result in redd trampling and egg mortality, which would degrade the WCI. • Road management and trail maintenance will help reduce travel plan related sediment effects on local population size.
Growth and Survival FR	D	-	-	-	• Fording streams on foot, horseback, or other non-motorized travel is likely to result in redd trampling and egg mortality, which would degrade the WCI. • Road management and trail maintenance will help reduce travel

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Two 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – EFSF		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					plan related sediment effects on local population size.
Life History Diversity and Isolation FR	I	+	+	+	• Road management related removal or replacement of fish barriers, such as old culverts, will improve connectivity. • New or re-built trail culverts and fords will provide for aquatic organism passage.
Persistence and Genetic Integrity FR	I	+	+	+	• Road management related removal or replacement of fish barriers, such as old culverts, will improve connectivity. • New or re-built trail culverts and fords will provide for aquatic organism passage.
Water Quality					
Temperature FR	M	-*	-*	-*	• The travel plan will have no influence on temperature • Mitigations in the road management and trail maintenance

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Two 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – EFSF		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					actions preventing excessive brushing and other alternation of riparian vegetation will result in negligible effects on stream shade and temperature
Intragravel Quality (Sediment) NA	I	+*	+*	+*	• Restricting cross-country motorized travel will result in fewer incidences of motorized stream fording and driving in RCAs. At some point in the long term, sediment delivery from erosion on trails and roads related to increased motorized and non-motorized will negligibly surpass benefits from restricted travel. • Road management and trail maintenance will help reduce travel plan related sediment effects at all time scales..

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Two 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – EFSF		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Chemical Contaminants and/or Nutrients FUR	M	+*	-*	-*	• As motorized travel increases there is a negligible chance that petroleum could be spilled where roads and trails cross streams in motorized use areas. • Restrictions concerning refueling in RCAs and spill prevention and cleanup requirements will reduce the likely hood of chemical contamination during road management and trail maintenance activities. • Proper use of treated wood that meets BMPs will minimize potential for effects. •The binding nature of dust-abatement salts, combined with restrictions on applications near waterways, low concentration of use

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Two 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – EFSF		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					and spill containment measures, reduce the likelihood of effects to negligible levels.
Habitat Access					
Physical Barriers FR	I	+	+	+	• Road management related removal or replacement of fish barriers, such as old culverts, will improve connectivity. • New or re-built trail culverts and fords will provide for aquatic organism passage.
Habitat Elements					
Interstitial Sediment Deposition (Substrate Embeddedness) FR	I	+	+*	+*	• Restricting cross-country motorized travel will result in fewer incidences of motorized stream fording and driving in RCAs. At some point in the long term sediment delivery from erosion on trails and roads related to increased motorized

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Two 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – EFSF		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					and non-motorized will negligibly surpass benefits from restricted travel. • Road management and trail maintenance will help reduce travel plan related substrate embeddedness effects at all time scales.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Two 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – EFSF		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Large Woody Debris FUR	M	-*	-*	-*	Mitigations will prevent more than negligible effects to LWD recruitment from road management and trail maintenance.
Pool Frequency FR	N	none	none	none	No influence
Pool Quality FR	M	+	-	-	• Restricting cross-country motorized travel expected to temporarily reduce sedimentation in pools due to less ground disturbance and fewer incidences of motorized stream fording and driving in RCAs. At some point sediment delivery from erosion on trails and roads related to increased motorized and non-motorized use will surpass benefits from restricted travel. • Road management, and trail maintenance will reduce the travel plan related effects

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Two 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – EFSF		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					on pool quality.
Off-Channel Habitat FR	N	none	none	none	No influence

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Two 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – EFSF		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Refugia FR	N	none	none	none	The actions will have no influence on refugia.
Channel Condition and Dynamics					
Width/MaxDepth Ratio FR	D	+	-	-	• Travel plan related degradation of streambank condition will degrade width to max depth ratio at road and trail crossings. • Road and trail maintenance will reduce travel plan related degradation of streambank condition reducing effects to width/max depth ratio.
Streambank Condition (Travel Plan) FUR	I	+	+	+	Road/trail mileage decreases by 15 mi, improving this WCI.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Two 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – EFSF		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Streambank Condition (LRMP) FR	D	+	-	-	• After a temporary improvement from restricting cross-country travel, the travel plan will result in short and long term degraded streambank condition where road and trails cross streams. Road and trail maintenance will reduce travel plan related degradation of streambank condition.
Floodplain Connectivity FR	N	none	none	none	No influence
Flow/Hydrology					
Change in Peak/Base Flows FR	N	none	none	none	No influence
Drainage Network Increase FUR	N	none	none	none	No influence
Watershed Conditions					
Road Density and Location FR	N	none	none	none	No influence
Disturbance History FUR	I	+	+	+	Restricting cross-country motorized travel will result in fewer incidences of resource damage to landslide or landslide prone areas, and to

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Two 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – EFSF		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					RCAs.
Riparian Conservation Areas FUR	I	+	+	+	Restricting cross-country motorized travel will result in fewer incidences of resource damage to RCAs Mitigations will minimize road management and trail maintenance related riparian disturbance to negligible levels.
Disturbance Regime FR	I	+	+	+	Restricting cross-country motorized travel will result in fewer incidences of resource damage across the landscape.
Integration of Species and Habitat Conditions FR	D	+	-	-	• The travel plan will result in improvement to some WCIs and degrade others. • Road management and trail maintenance will reduce some of the degrading effects of the travel plan.

7. ROAD MANAGEMENT, TRAILS/REC/ADMIN SITE O&M, TRAVEL PLAN – SECESH

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Secesh Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Local Population Character					
Local Population Size FR	D	-	-	-	• Fording streams on foot, horseback, or other non-motorized travel is likely to result in redd trampling and egg mortality, which would degrade the WCI. • Road management and trail maintenance will help reduce travel plan related sediment effects on local population size.
Growth and Survival FR	D	-	-	-	• Fording streams on foot, horseback, or other non-motorized travel is likely to result in redd trampling and egg mortality, which would degrade the WCI. • Road management and trail maintenance will help reduce travel

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Secesh Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					plan related sediment effects on local population size.
Life History Diversity and Isolation FA	I	+	+	+	• Road management related removal or replacement of fish barriers, such as old culverts, will improve connectivity. • New or re-built trail culverts and fords will provide for aquatic organism passage.
Persistence and Genetic Integrity FR	I	+	+	+	• Road management related removal or replacement of fish barriers, such as old culverts, will improve connectivity. • New or re-built trail culverts and fords will provide for aquatic organism passage.
Water Quality					
Temperature FR	M	-*	-*	-*	• The travel plan will have no influence on temperature • Mitigations in the road management and trail maintenance actions preventing

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Secesh Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					excessive brushing and other alternation of riparian vegetation will result in negligible effects on stream shade and temperature
Intragravel Quality (Sediment) FA	D	+*	-	-	• Restricting cross-country motorized travel will result in fewer incidences of motorized stream fording and driving in RCAs. At some point in the long term, sediment delivery from erosion on trails and roads related to increased motorized and non-motorized will surpass benefits from restricted travel. • Road management and trail maintenance will help reduce travel plan related sediment effects at all time scales..

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Secesh Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Chemical Contaminants and/or Nutrients FA	M	+*	-*	-*	• As motorized travel increases there is a negligible chance that petroleum could be spilled where roads and trails cross streams in motorized use areas. • Restrictions concerning refueling in RCAs and spill prevention and cleanup requirements will reduce the likely hood of chemical contamination during road management and trail maintenance activities. • Proper use of treated wood that meets BMPs will minimize potential for effects. •The binding nature of dust-abatement salts, combined with restrictions on applications near waterways, low concentration of use and spill

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Secesh Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					containment measures, reduce the likelihood of effects to negligible levels.
Habitat Access					
Physical Barriers FA	I	+	+	+	• Road management related removal or replacement of fish barriers, such as old culverts, will improve connectivity. • New or re-built trail culverts and fords will provide for aquatic organism passage.
Habitat Elements					
Interstitial Sediment Deposition (Substrate Embeddedness) FA	D	+*	-	-	• Restricting cross-country motorized travel will result in fewer incidences of motorized stream fording and driving in RCAs. At some point in the long term sediment delivery from erosion on trails and roads related to increased motorized and non-motorized will surpass

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Secesh Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					benefits from restricted travel. • Road management and trail maintenance will help reduce travel plan related substrate embeddedness effects at all time scales.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Secesh Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Large Woody Debris FR	M	-*	-*	-*	Mitigations will prevent more than negligible effects to LWD recruitment from road management and trail maintenance.
Pool Frequency FA	N	none	none	none	No influence
Pool Quality FA	M	+	-	-	• Restricting cross-country motorized travel expected to temporarily reduce sedimentation in pools due to less ground disturbance and fewer incidences of motorized stream fording and driving in RCAs. At some point sediment delivery from erosion on trails and roads related to increased motorized and non-motorized use will surpass benefits from restricted travel. • Road management, and trail maintenance will reduce the travel plan related effects on pool quality.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Secesh Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Off-Channel Habitat FA	N	none	none	none	No influence

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Secesh Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Refugia FA	N	none	none	none	The actions will have no influence on refugia.
Channel Condition and Dynamics					
Width/MaxDepth Ratio FA	D	+	-	-	• Travel plan related degradation of streambank condition will degrade width to max depth ratio at road and trail crossings. • Road and trail maintenance will reduce travel plan related degradation of streambank condition reducing effects to width/max depth ratio.
Streambank Condition (Travel Plan) FUR	M	+*	-*	-*	Road/trail mileage increases by 3.7 mi, but in areas open to cross-country motor vehicle use. Opportunities increase and Project Design features are applied.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Secesh Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Streambank Condition (LRMP) FA	D	+	-	-	• After a temporary improvement from restricting cross-country travel, the travel plan will result in short and long term degraded streambank condition where road and trails cross streams. Road and trail maintenance will reduce travel plan related degradation of streambank condition.
Floodplain Connectivity FR	N	none	none	none	No influence
Flow/Hydrology					
Change in Peak/Base Flows FR	N	none	none	none	No influence
Drainage Network Increase FR	N	none	none	none	No influence
Watershed Conditions					
Road Density and Location FR	N	none	none	none	No influence
Disturbance History FR	I	+	+	+	Restricting cross-country motorized travel will result in fewer incidences of resource damage to landslide or landslide prone areas, and to RCAs.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Secesh Analysis Area		

Pathways & Indicators	**Effects of the Management Action(s)**				
	Effects I=improve/D=degrade/M=maintain/N=no influence	**Expected Trend - negative, + positive, * negligible, none**			**Discussion of Effects**
		Temporary	**Short-term**	**Long-term**	
Riparian Conservation Areas FR	I	+	+	+	Restricting cross-country motorized travel will result in fewer incidences of resource damage to RCAs Mitigations will minimize road management and trail maintenance related riparian disturbance to negligible levels.
Disturbance Regime FR	I	+	+	+	Restricting cross-country motorized travel will result in fewer incidences of resource damage across the landscape.
Integration of Species and Habitat Conditions FR	D	+	-	-	• The travel plan will result in improvement to some WCIs and degrade others. • Road management and trail maintenance will reduce some of the degrading effects of the travel plan.

8. ROAD MANAGEMENT, TRAILS/REC/ADMIN SITE O&M, TRAVEL PLAN – LOWER SFSR

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Lower SFSR Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Local Population Character					
Local Population Size FA	D	-	-	-	• Fording streams on foot, horseback, or other non-motorized travel is likely to result in redd trampling and egg mortality, which would degrade the WCI. • Road management and trail maintenance will help reduce travel plan related sediment effects on local population size.
Growth and Survival FR	D	-	-	-	• Fording streams on foot, horseback, or other non-motorized travel is likely to result in redd trampling and egg mortality, which would degrade the WCI. • Road management and trail maintenance will help reduce travel plan related

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Lower SFSR Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					sediment effects on local population size.
Life History Diversity and Isolation FA	I	+	+	+	• Road management related removal or replacement of fish barriers, such as old culverts, will improve connectivity. • New or re-built trail culverts and fords will provide for aquatic organism passage.
Persistence and Genetic Integrity FA	I	+	+	+	• Road management related removal or replacement of fish barriers, such as old culverts, will improve connectivity. • New or re-built trail culverts and fords will provide for aquatic organism passage.
Water Quality					
Temperature FR	M	-*	-*	-*	• The travel plan will have no influence on temperature • Mitigations in the road management and trail maintenance actions preventing excessive brushing and other alternation

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Lower SFSR Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					of riparian vegetation will result in negligible effects on stream shade and temperature
Intragravel Quality (Sediment) NA	D	+*	-	-	• Restricting cross-country motorized travel will result in fewer incidences of motorized stream fording and driving in RCAs. At some point in the long term, sediment delivery from erosion on trails and roads related to increased motorized and non-motorized will surpass benefits from restricted travel. • Road management and trail maintenance will help reduce travel plan related sediment effects at all time scales..

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Lower SFSR Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Chemical Contaminants and/or Nutrients FR	M	+*	-*	-*	• As motorized travel increases there is a negligible chance that petroleum could be spilled where roads and trails cross streams in motorized use areas. • Restrictions concerning refueling in RCAs and spill prevention and cleanup requirements will reduce the likely hood of chemical contamination during road management and trail maintenance activities. • Proper use of treated wood that meets BMPs will minimize potential for effects. •The binding nature of dust-abatement salts, combined with restrictions on applications near waterways, low concentration of use and spill

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Lower SFSR Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					containment measures, reduce the likelihood of effects to negligible levels.
Habitat Access					
Physical Barriers FR	I	+	+	+	• Road management related removal or replacement of fish barriers, such as old culverts, will improve connectivity. • New or re-built trail culverts and fords will provide for aquatic organism passage.
Habitat Elements					
Interstitial Sediment Deposition (Substrate Embeddedness) FR/FUR	D	+*	-	-	• Restricting cross-country motorized travel will result in fewer incidences of motorized stream fording and driving in RCAs. At some point in the long term sediment delivery from erosion on trails and roads related to increased motorized and non-motorized will surpass benefits from restricted

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Lower SFSR Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					travel. • Road management and trail maintenance will help reduce travel plan related substrate embeddedness effects at all time scales.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Lower SFSR Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Large Woody Debris FA/FR	M	-*	-*	-*	Mitigations will prevent more than negligible effects to LWD recruitment from road management and trail maintenance.
Pool Frequency FA	N	none	none	none	No influence
Pool Quality FA	M	+	-	-	• Restricting cross-country motorized travel expected to temporarily reduce sedimentation in pools due to less ground disturbance and fewer incidences of motorized stream fording and driving in RCAs. At some point sediment delivery from erosion on trails and roads related to increased motorized and non-motorized use will surpass benefits from restricted travel. • Road management, and trail maintenance will reduce the travel plan related effects on pool quality.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Lower SFSR Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Off-Channel Habitat FA	N	none	none	none	No influence

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Lower SFSR Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Refugia FA	N	none	none	none	The actions will have no influence on refugia.
Channel Condition and Dynamics					
Width/MaxDepth Ratio FA	D	+	-	-	• Travel plan related degradation of streambank condition will degrade width to max depth ratio at road and trail crossings. • Road and trail maintenance will reduce travel plan related degradation of streambank condition reducing effects to width/max depth ratio.
Streambank Condition (Travel Plan) FUR	M	+*	-*	-*	No change in road/trail mileage

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Lower SFSR Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Streambank Condition (LRMP) FR	D	+	-	-	• After a temporary improvement from restricting cross-country travel, the travel plan will result in short and long term degraded streambank condition where road and trails cross streams. Road and trail maintenance will reduce travel plan related degradation of streambank condition.
Floodplain Connectivity FA	N	none	none	none	No influence
Flow/Hydrology					
Change in Peak/Base Flows FA/FR	N	none	none	none	No influence
Drainage Network Increase FA/FR	N	none	none	none	No influence
Watershed Conditions					
Road Density and Location FR	N	none	none	none	No influence
Disturbance History FR	I	+	+	+	Restricting cross-country motorized travel will result in fewer incidences of resource damage to landslide or landslide prone areas, and to RCAs.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Lower SFSR Analysis Area		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Riparian Conservation Areas FR	I	+	+	+	Restricting cross-country motorized travel will result in fewer incidences of resource damage to RCAs Mitigations will minimize road management and trail maintenance related riparian disturbance to negligible levels.
Disturbance Regime FR	I	+	+	+	Restricting cross-country motorized travel will result in fewer incidences of resource damage across the landscape.
Integration of Species and Habitat Conditions FR	D	+	-	-	• The travel plan will result in improvement to some WCIs and degrade others. • Road management and trail maintenance will reduce some of the degrading effects of the travel plan.

9. MACKEY BAR WATER DIVERSION SUPS – LOWER SFSR ANALYSIS AREA

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Lower SFSR Analysis Area		

	Effects of the Management Action(s)				
		Expected Trend - negative, + positive, * negligible, none			
Pathways & Indicators	**Effects I=improve/D=degrade/M=maintain/N=no influence**	**Temporary**	**Short-term**	**Long-term**	**Discussion of Effects**
Local Population Character					
Local Population Size FA	D	-	-	-	For the Mackey bar SUP, at low flows, with 47% of flow removed from Smith Creek, up to half of the habitat available to cutthroat trout and steelhead is removed. Losses of habitat due to the flow withdrawals by the Mackey Bar diversion represent adverse effects to these species and critical habitat.
Growth and Survival FR	D	-	-	-	For the Mackey bar SUP, at low flows, with 47% of flow removed from Smith Creek, up to half of the habitat available to cutthroat trout and steelhead is removed. Losses

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Lower SFSR Analysis Area		

	Effects of the Management Action(s)				
		Expected Trend - negative, + positive, * negligible, none			
Pathways & Indicators	**Effects I=improve/D=degrade/M=maintain/N=no influence**	**Temporary**	**Short-term**	**Long-term**	**Discussion of Effects**
					of habitat due to the flow withdrawals by the Mackey Bar diversion represent adverse effects to these species and critical habitat.
Life History Diversity and Isolation FA	N	none	none	none	No influence.
Persistence and Genetic Integrity FA	N	none	none	none	No influence.
Water Quality					
Temperature FR	N	none	none	none	No influence.
Intragravel Quality (Sediment) NA	M	-*	-*	-*	Negligible effects occur due to minor erosion and sediment generated by diversion facilities
Chemical Contaminants and/or Nutrients FR	N	none	none	none	No influence.
Habitat Access					
Physical Barriers FR	D	-	-	-	the Mackey Bar water diversion has significant diversions water

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name		Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix		One 5th HU
Core Area (Bull Trout)		Local Population		
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Lower SFSR Analysis Area			

	Effects of the Management Action(s)				
		Expected Trend - negative, + positive, * negligible, none			
Pathways & Indicators	**Effects I=improve/D=degrade/M=maintain/N=no influence**	**Temporary**	**Short-term**	**Long-term**	**Discussion of Effects**
					withdrawal compared to Smith Creek (47%), and could dewater the stream to the extent that passage is likely to be impaired.
Habitat Elements					
Interstitial Sediment Deposition (Substrate Embeddedness) FR/FUR	M	-*	-*	-*	Negligible effects occur due to minor erosion and sediment generated by diversion facilities
Large Woody Debris FA/FR	N	none	none	none	No influence.
Pool Frequency FA	N	none	none	none	No influence.
Pool Quality FA	N	none	none	none	No influence.
Off-Channel Habitat FA	N	none	none	none	No influence.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Lower SFSR Analysis Area		

	Effects of the Management Action(s)				
		Expected Trend - negative, + positive, * negligible, none			
Pathways & Indicators	**Effects I=improve/D=degrade/M=maintain/N=no influence**	**Temporary**	**Short-term**	**Long-term**	**Discussion of Effects**
Refugia FA	N	none	none	none	The actions will have no influence on refugia.
Channel Condition and Dynamics					
Width/MaxDepth Ratio FA	N	none	none	none	No influence.
Streambank Condition (Travel Plan) FUR	M	-*	-*	-*	Negligible effects occur due to minor erosion and sediment generated by diversion facilities
Streambank Condition (LRMP) FR	N	none	none	none	No influence.
Floodplain Connectivity FA	N	none	none	none	No influence
Flow/Hydrology					
Change in Peak/Base Flows FA/FR	D	-	-	none	Withdrawals could decrease flows more than negligibly
Drainage Network Increase FA/FR	N	none	none	none	No influence.
Watershed Conditions					
Road Density and Location FR	N	none	none	none	No influence

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	Upper Secesh 17060208-05-01
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	Road Management, Trails, Recreation, and Administrative Site O&M, and Travel Plan – Lower SFSR Analysis Area		

	Effects of the Management Action(s)				
		Expected Trend - negative, + positive, * negligible, none			
Pathways & Indicators	**Effects I=improve/D=degrade/M=maintain/N=no influence**	**Temporary**	**Short-term**	**Long-term**	**Discussion of Effects**
Disturbance History FR	N	none	none	none	No influence.
Riparian Conservation Areas FR	M	-*	-*	-*	Negligible effects occur due to minor erosion and sediment generated by diversion facilities
Disturbance Regime FR	N	none	none	none	No influence.
Integration of Species and Habitat Conditions FR	D	-*	-*	-*	The diversions will result in no effect to some WCIs and a long term degrade to other WCIs from decrease in flow, increase in potential passage barriers, and direct take of juvenile fish.

10. WATER DIVERSION SUPS – EFSF, SECESH, AND LOWER SFSR ANALYSIS AREAS

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Four 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Eiguren, Peterson, Wyatt, Phillips-Larrea, Lapaglia, Spradling, Hardy, Titus, Smith, Holly, Sandy Cove, And Badley Water Diversion Sups – Efsf, Secesh, And Lower Sfsr Analysis Areas		

	Effects of the Management Action(s)				
		Expected Trend - negative, + positive, * negligible, none			
Pathways & Indicators	**Effects I=improve/D=degrade/M=maintain/N=no influence**	**Temporary**	**Short-term**	**Long-term**	**Discussion of Effects**
Local Population Character					
Local Population Size FR except Lower SFSR FA	M	-*	-*	-*	The amount diverted is considered to be negligible because the amount of habitat that would change from the withdrawal is unmeasurable in the EFSF, Secesh, Pony Creek, and SFSR, even at low flows, given the models. Since the amount of habitat is immeasurable, population size would be maintained.
Growth and Survival FR	M	-*	-*	-*	The amount diverted is considered to be negligible because the amount of habitat that would change from the withdrawal is unmeasurable in the EFSF, Secesh, Pony Creek, and SFSR, even at low flows, given the

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Four 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Eiguren, Peterson, Wyatt, Phillips-Larrea, Lapaglia, Spradling, Hardy, Titus, Smith, Holly, Sandy Cove, And Badley Water Diversion Sups – Efsf, Secesh, And Lower Sfsr Analysis Areas		

	Effects of the Management Action(s)				
		Expected Trend - negative, + positive, * negligible, none			
Pathways & Indicators	**Effects I=improve/D=degrade/M=maintain/N=no influence**	**Temporary**	**Short-term**	**Long-term**	**Discussion of Effects**
					models. Since the amount of habitat is immeasurable, growth and survival would be maintained.
Life History Diversity and Isolation FA	N	none	none	none	No influence
Persistence and Genetic Integrity FR except Lower SFSR FA	N	none	none	none	No influence
Water Quality					
Temperature FR	N	none	none	none	No influence.
Intragravel Quality (Sediment) Secesh FA	M	-*	-*	-*	Negligible effects occur due to minor erosion and sediment generated by diversion facilities
Chemical Contaminants and/or Nutrients Lower SF FR EFSF FUR Secesh FA	N	none	none	none	No influence.
Habitat Access					

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Four 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Eiguren, Peterson, Wyatt, Phillips-Larrea, Lapaglia, Spradling, Hardy, Titus, Smith, Holly, Sandy Cove, And Badley Water Diversion Sups – Efsf, Secesh, And Lower Sfsr Analysis Areas		

	Effects of the Management Action(s)				
		Expected Trend - negative, + positive, * negligible, none			
Pathways & Indicators	**Effects I=improve/D=degrade/M=maintain/N=no influence**	**Temporary**	**Short-term**	**Long-term**	**Discussion of Effects**
Physical Barriers FR except Secesh FA	M	-*	-*	-*	Streamflows from these diversions will not be enough to dewater streams to the extent that they develop passage barriers
Habitat Elements					
Interstitial Sediment Deposition (Substrate Embeddedness) EFSF FR Secesh FA Lower SF FR/FUR	M	-*	-*	-*	Negligible effects occur due to minor erosion and sediment generated by diversion facilities
Large Woody Debris EFSF FUR Secesh FR Lower SF FA/ FR	N	none	none	none	No influence.
Pool Frequency FA except EFSF FR	N	none	none	none	No influence.
Pool Quality FA except EFSF FR	N	none	none	none	No influence.
Off-Channel Habitat	N	none	none	none	No influence.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Four 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Eiguren, Peterson, Wyatt, Phillips-Larrea, Lapaglia, Spradling, Hardy, Titus, Smith, Holly, Sandy Cove, And Badley Water Diversion Sups – Efsf, Secesh, And Lower Sfsr Analysis Areas		

	Effects of the Management Action(s)				
		Expected Trend - negative, + positive, * negligible, none			
Pathways & Indicators	**Effects I=improve/D=degrade/M=maintain/N=no influence**	**Temporary**	**Short-term**	**Long-term**	**Discussion of Effects**
EFSF FR Secesh, Lower SF FA					
Refugia EFSF FR Secesh, Lower SF FA	N	none	none	none	No influence.
Channel Condition and Dynamics					
Width/MaxDepth Ratio Upper, EFSF FR Secesh, Lower SF FA	N	none	none	none	No influence.
Streambank Condition EFSF FR Secesh, Lower SF FA	M	-*	-*	-*	Negligible effects occur due to minor erosion and sediment generated by diversion facilities
Floodplain Connectivity FR except Lower SF FA	N	none	none	none	No influence.
Flow/Hydrology					

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Four 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Eiguren, Peterson, Wyatt, Phillips-Larrea, Lapaglia, Spradling, Hardy, Titus, Smith, Holly, Sandy Cove, And Badley Water Diversion Sups – Efsf, Secesh, And Lower Sfsr Analysis Areas		

	Effects of the Management Action(s)				
		Expected Trend - negative, + positive, * negligible, none			
Pathways & Indicators	**Effects I=improve/D=degrade/M=maintain/N=no influence**	**Temporary**	**Short-term**	**Long-term**	**Discussion of Effects**
Change in Peak/Base Flows FR except Lower SF FA/FR	M	-*	-*	-*	Withdrawals from water diversions compared to the streams would not decrease flows more than negligibly
Drainage Network Increase Secesh FR EFSF FUR Lower SF FA /FR	N	none	none	none	No influence.
Watershed Conditions					
Road Density and Location FR	N	none	none	none	No influence.
Disturbance History FR except EFSF FUR	N	none	none	none	No influence.
Riparian Conservation Areas Secesh FR EFSF FUR Lower SF FA except Pony, Elk FR	M	-*	-*	-*	Negligible effects occur due to minor erosion and sediment generated by diversion facilities
Disturbance Regime FR except Lower SF FA	N	none	none	none	No influence.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Four 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Eiguren, Peterson, Wyatt, Phillips-Larrea, Lapaglia, Spradling, Hardy, Titus, Smith, Holly, Sandy Cove, And Badley Water Diversion Sups – Efsf, Secesh, And Lower Sfsr Analysis Areas		

	Effects of the Management Action(s)				
		Expected Trend - negative, + positive, * negligible, none			
Pathways & Indicators	**Effects I=improve/D=degrade/M=maintain/N=no influence**	**Temporary**	**Short-term**	**Long-term**	**Discussion of Effects**
except Pony, Elk FR					
Integration of Species and Habitat Conditions FR except Lower SF FA except Pony, Elk FR	M	-*	-*	-*	The diversions will result in no effect to some WCIs and a negligible effects to others, maintaining this WCI.

11. OUTFITTER AND GUIDES, AND COPENHAVER CABLE CAR SUP – ALL SFSR ANALYSIS AREAS

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Outfitter and Guides, and Copenhaver Cable Car SUP – All SFSR Analysis Areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Local Population Character					
Local Population Size FR except Lower SFSR FA	N	none	none	none	No influence
Growth and Survival FR	M	-*	-*	-*	If a client or guide crosses the stream on foot or with livestock there may some minor alteration of the stream bank leading to sediment delivery to the channel, but the amount of sediment and effects would be negligible. Recommendations to avoid spawning areas reduce the likelihood of effects to listed fish. Because any startle effect from the cable car will not affect spawning activity, any negative effects on growth or survival are expected to be intermittent and short-lived, and therefore negligible.
Life History Diversity and Isolation FA	N	none	none	none	No influence
Persistence and Genetic Integrity FR except Lower SFSR FA	N	none	none	none	No influence

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Outfitter and Guides, and Copenhaver Cable Car SUP – All SFSR Analysis Areas		

Pathways & Indicators	Effects of the Management Action(s) Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none Temporary	Short-term	Long-term	Discussion of Effects
Water Quality					
Temperature FR	N	none	none	none	No influence
Intragravel Quality (Sediment) Upper SF FR Secesh FA	M	-*	-*	-*	If a client or guide crosses the stream on foot or with livestock there may some minor alteration of the stream bank leading to sediment delivery to the channel, but the amount of sediment and effects would be negligible. Actions associated with cable car operations and maintenance include little if any ground disturbance. Sources of sediment delivery related to operations and maintenance activities have not been observed (personal observation of the author).
Chemical Contaminants and/or Nutrients Upper, Lower SF FR EFSF FUR Secesh FA	N	none	none	none	O&Gs No influence
Habitat Access					
Physical Barriers FR except Secesh FA	N	none	none	none	No influence

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Outfitter and Guides, and Copenhaver Cable Car SUP – All SFSR Analysis Areas		

Pathways & Indicators	Effects of the Management Action(s)				
		Expected Trend - negative, + positive, * negligible, none			
	Effects I=improve/D=degrade/M=maintain/N=no influence	Temporary	Short-term	Long-term	Discussion of Effects
Habitat Elements					
Interstitial Sediment Deposition (Substrate Embeddedness) Upper SF FUR EFSF FR Secesh FA Lower SF FR/FUR	M	-*	-*	-*	If a client or guide crosses the stream on foot or with livestock there may some minor alteration of the stream bank leading to sediment delivery to the channel, but the amount of sediment and effects would be negligible. Recommendations to avoid spawning areas further reduce the likelihood of effects to listed fish. Actions associated with cable car operations and maintenance include little if any ground disturbance. Sources of sediment delivery related to operations and maintenance activities have not been observed (personal observation of the author).

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Outfitter and Guides, and Copenhaver Cable Car SUP – All SFSR Analysis Areas		

Pathways & Indicators	Effects of the Management Action(s)				
		Expected Trend - negative, + positive, * negligible, none			
	Effects I=improve/D=degrade/M=maintain/N=no influence	Temporary	Short-term	Long-term	Discussion of Effects
Large Woody Debris Upper SF FA EFSF FUR Secesh FR Lower SF FA/ FR	N	none	none	none	No influence
Pool Frequency FA except EFSF FR	N	none	none	none	No influence
Pool Quality FA except EFSF FR	N	none	none	none	No influence
Off-Channel Habitat Upper, EFSF FR Secesh, Lower SF FA	N	none	none	none	No influence

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Outfitter and Guides, and Copenhaver Cable Car SUP – All SFSR Analysis Areas		

Pathways & Indicators	Effects of the Management Action(s)				
		Expected Trend - negative, + positive, * negligible, none			
	Effects I=improve/D=degrade/M=maintain/N=no influence	Temporary	Short-term	Long-term	Discussion of Effects
Refugia Upper SF, EFSF FR Secesh, Lower SF FA	N	none	none	none	No
Channel Condition and Dynamics					
Width/MaxDepth Ratio Upper, EFSF FR Secesh, Lower SF FA	M	-*	-*	-*	If a client or guide crosses the stream on foot or with livestock there may some minor alteration of the stream bank, but the effects would be negligible. Recommendations to avoid spawning areas further reduce the likelihood of effects to listed fish.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Outfitter and Guides, and Copenhaver Cable Car SUP – All SFSR Analysis Areas		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Streambank Condition Upper, EFSF FR Secesh, Lower SF FA	M	-*	-*	-*	If a client or guide crosses the stream on foot or with livestock there may some minor alteration of the stream bank, but the effects to bull trout would be negligible. Recommendations to avoid spawning areas further reduce the likelihood of effects to listed fish. Actions associated with cable car operations and maintenance include little if any streambank disturbance. Sources of sediment delivery related to operations and maintenance activities have not been observed (personal observation of the author).
Floodplain Connectivity FR except Lower SF FA	N	none	none	none	No influence
Flow/Hydrology					
Change in Peak/Base Flows FR except Lower SF FA/FR	N	none	none	none	No influence
Drainage Network Increase Upper SF, Secesh FR	N	none	none	none	No influence

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Outfitter and Guides, and Copenhaver Cable Car SUP – All SFSR Analysis Areas		

Pathways & Indicators	**Effects of the Management Action(s)**				
	Effects I=improve/D=degrade/M=maintain/N=no influence	**Expected Trend - negative, + positive, * negligible, none**			**Discussion of Effects**
		Temporary	**Short-term**	**Long-term**	
EFSF FUR Lower SF FA /FR					
Watershed Conditions					
Road Density and Location FR	N	none	none	none	No influence
Disturbance History FR except EFSF FUR	M	-*	-*	-*	If a client or guide crosses an RCA on foot or with livestock there may some minor alteration of the vegetation, but the effects would be negligible. Recommendations to avoid spawning areas further reduce the likelihood of effects to listed fish.

Agency/Unit	PNF Krassel and McCall RDs	HU Code and Name	17060208-01 Upper SFSR 5th HU 17060208-02 Upper EFSF 5th HU 17060208-04 Lower EFSF 5th HU 17060208-05 Secesh River 5th HU 17060208-06 Lower SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	Five 5th HUs
Core Area (Bull Trout)		Local Population	
Management Actions	Outfitter and Guides, and Copenhaver Cable Car SUP – All SFSR Analysis Areas		

Pathways & Indicators	Effects of the Management Action(s)				
		Expected Trend - negative, + positive, * negligible, none			
	Effects I=improve/D=degrade/M=maintain/N=no influence	Temporary	Short-term	Long-term	Discussion of Effects
Riparian Conservation Areas **Upper SF, Secesh FR** **EFSF FUR** **Lower SF FA except Pony, Elk FR**	M	-*	-*	-*	If a client or guide crosses an RCA on foot or with livestock there may some minor alteration of the vegetation, but the effects would be negligible. Recommendations to avoid spawning areas further reduce the likelihood of effects to listed fish. Actions associated with cable car operations and maintenance include little if any disturbance to RCAs. Sources of sediment delivery related to operations and maintenance activities have not been observed (personal observation of the author).
Disturbance Regime **FR except Lower SF FA except Pony, Elk FR**	N	none	none	none	No influence
Integration of Species and Habitat Conditions **FR except Lower SF FA except Pony, Elk FR**	M	-*	-*	-*	Effects to WCIs would be negligible to none.

12. STIBNITE MINE CLOSURE

Agency/Unit	USDA Forest Service / Payette National Forest	HU Code and Name	17060208-02 East Fork SFSR
Fish Species Present	Chinook salmon, steelhead, bull trout, cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)	SFSR	Local Population	East Fork SFSR
Management Actions	Stibnite Mine closure -		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects	Expected Trend (improve/degrade/maintain/no effect)			Discussion of Effects
		Temporary	Short-term	Long-term	
Local Population Character					
Local Population Size FR	I	+	+	+	Stibnite reclamation actions that open up new habitat or reduce sediment delivery could increase local population size.
Growth and Survival FR	I	-*	+	+	Effects of sediment from ground disturbance during reclamation may have negligible temporary effects on growth and survival. Reclamation actions that ultimately reduce sediment delivery could improve growth and survival in the short and long term.
Life History Diversity and Isolation FR	I	+	+	+	Stibnite reclamation actions that open up new habitat or reduce sediment delivery could increase local population size.
Persistence and Genetic Integrity FR	N	none	none	none	No influence
Water Quality					
Temperature FUR	I	none	+	+	Stibnite reclamation actions will decrease summer stream temperatures in some areas of riparian restoration in the short and long term.
Intragravel Quality (Sediment) No data See "Interstitial Sediment", below	I	-*	+	+	There may be negligible amounts of temporary sediment, but reclamation actions , with required mitigations, will decrease sediment delivery in the short and long-term. Sediment in the streambed may be stirred up and redistributed during implementation, but there will be no net increase in sediment and the effect will be temporary and negligible.
Chemical Contaminants and/or Nutrients FUR	I	+	+	+	Stibnite/CERCLA reclamation actions will decrease exposure of fish and fish habitat to contaminants in the EFSF and downstream in the Lower SFSR. Restrictions concerning refueling in RCAs and spill prevention and cleanup requirements will reduce the likelihood of chemical contamination to negligible levels

Agency/Unit	USDA Forest Service / Payette National Forest			HU Code and Name	17060208-02 East Fork SFSR
Fish Species Present	Chinook salmon, steelhead, bull trout, cutthroat			Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)	SFSR			Local Population	East Fork SFSR
Management Actions	Stibnite Mine closure -				
	Effects of the Management Action(s)				
		Expected Trend (improve/degrade/maintain/no effect)			
Pathways & Indicators	**Effects**	**Temporary**	**Short-term**	**Long-term**	**Discussion of Effects**
Habitat Access					
Physical Barriers **FR**	I	+	+	+	Stibnite CERCLA/reclamation actions would eliminate some migration barriers.
Habitat Elements					
Interstitial Sediment Deposition (Substrate Embeddedness) **FR**	I	-*	+	+	There may be negligible amounts of temporary sediment delivery (which results in substrate embeddedness) from all actions described, but reclamation actions, with required mitigations, will decrease sediment delivery in the short and long-term
Large Woody Debris **FUR**	I	+	+	+	Stibnite reclamation actions will increase the current quantity of LWD and future recruitment in some areas.
Pool Frequency **FR**	I	+	+	+	Stibnite reclamation actions may increase pool frequency in some areas. Mitigations will maintain pool frequency in all other areas.
Pool Quality **FR**	I	+	+	+	Stibnite reclamation actions may increase pool quality in some areas. Mitigations will maintain pool quality in all other areas.
Off-Channel Habitat **FR**	I	-*	+	+	Stibnite reclamation actions may negligibly affect this WCI temporarily, but will increase off-channel habitat quality in the short and long term in some areas. Mitigations will maintain this WCI in all other areas.
Refugia **FR**	I	+	+	+	Stibnite reclamation actions may negligibly affect this WCI temporarily, but will increase refugia quality in some areas in the short and long term. Mitigations will maintain this WCI in all other areas.

Agency/Unit	USDA Forest Service / Payette National Forest			HU Code and Name	17060208-02 East Fork SFSR
Fish Species Present	Chinook salmon, steelhead, bull trout, cutthroat			Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)	SFSR			Local Population	East Fork SFSR
Management Actions	Stibnite Mine closure -				
	Effects of the Management Action(s)				
		Expected Trend (improve/degrade/maintain/no effect)			
Pathways & Indicators	**Effects**	**Temporary**	**Short-term**	**Long-term**	**Discussion of Effects**
Channel Condition and Dynamics					
Width/Depth Ratio (max) FUR	I	+	+	+	Stibnite reclamation actions may decrease this WCI in some areas. Mitigations will maintain this WCI in all other areas.
Streambank Condition FR	I	+	+	+	Stibnite reclamation actions may increase bank stability in some areas. Mitigations will maintain bank stability in all other areas.
Floodplain Connectivity FR	I	+	+	+	Stibnite reclamation actions may increase floodplain connectivity in some areas. Mitigations will maintain this WCI in all other areas.
Flow/Hydrology					
Change in Peak/Base Flows FR	I	+	+	+	Stibnite reclamation actions may return peak and base flow to a more normative regime in some areas.
Drainage Network Increase FUR	I	+	+	+	Stibnite reclamation actions will improve hydrologic processes and diffuse the drainage network in some areas
Watershed Conditions					
Road Density and Location FR	I	+	+	+	Stibnite reclamation actions will reduce road density in some areas including RCAs. Mitigations will maintain road density all other areas.
Disturbance History FUR	I	-*	+	+	Stibnite reclamation actions may cause a temporary disturbance, but will result in a short and long term decrease in anthropogenic disturbance. Mitigations will maintain disturbance history in all other areas.
Riparian Conservation Areas FUR	I	+	+	+	Stibnite reclamation actions (eg willow planting) will improve RCA function (LWD recruitment, sediment buffering, root mass bank stabilization etc.) in some areas. Mitigations will maintain RCAs all other areas.
Disturbance Regime	I	+	+	+	Stibnite reclamation actions will improve watershed resilience to

Agency/Unit	USDA Forest Service / Payette National Forest			HU Code and Name	17060208-02 East Fork SFSR
Fish Species Present	Chinook salmon, steelhead, bull trout, cutthroat			Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)	SFSR			Local Population	East Fork SFSR
Management Actions	Stibnite Mine closure -				
	Effects of the Management Action(s)				
		Expected Trend (improve/degrade/maintain/no effect)			
Pathways & Indicators	**Effects**	**Temporary**	**Short-term**	**Long-term**	**Discussion of Effects**
FR					disturbance.
Integration of Species and Habitat Conditions FR	I	+	+	+	The actions with mitigations will improve, maintain or have no effect on all WCIs listed above; therefore the integration of species and habitat conditions WCI will improve.

13. GRAZING ALLOTMENTS

Agency/Unit	USDA Forest Service / Payette National Forest	HU Code and Name	Upper Secesh 17060208-05-01 Summit Creek 17060208-05-02 Victor Creek 17060208-05-03 Loon Creek 17060208-05-04 Lick Creek 17060208-05-06 Secesh R-Zena Creek 17060208-05-07
Fish Species Present	Chinook, Steelhead, Bull trout, Cutthroat	Spatial Scale of this Matrix	One 5th level HU (Secesh 17060208-05), 6 6th HUs
Core Area (Bull Trout)	SFSR	Local Population	Secesh River
Management Actions	Victor Loon, Josephine, Marshall Mountain, Bear Pete, North Fork Lick Sheep Allotments		

	Effects of the Management Action(s)				
		Expected Trend (improve/degrade/maintain/no effect)			
Pathways & Indicators	**Effects**	**Temporary**	**Short-term**	**Long-term**	**Discussion of Effects**
Local Population Character					
Local Population Size **FR**	M	-*	-*	-*	Because of sheep herding practices redd trampling would be negligible
Growth and Survival **FR**	M	-*	-*	-*	Because of sheep herding practices redd trampling would be negligible
Life History Diversity and Isolation **FA**	N	none	none	none	No influence
Persistence and Genetic Integrity **FR**	N	none	none	none	No influence
Water Quality					
Temperature **FR**	M	-*	-*	-*	Negligible because mitigations restrict livestock salting locations, trailing, bedding, watering, and development of water sources, corrals, and other handling facilities, to locations that will not degrade WCIs such as shade providing riparian vegetation and streambank stability.; therefore, effects to listed species and critical habitat will be negligible.
Sediment **Intragravel Quality** **FA**	M	-*	-*	-*	Occasional sheep trailing across RCAs will result in negligible amounts of sediment delivery from soil disturbance. Mitigations and restriction on use will minimize the effects. In general, deleterious effects on salmonid habitat conditions from grazing have not been

Agency/Unit	USDA Forest Service / Payette National Forest		HU Code and Name	Upper Secesh 17060208-05-01 Summit Creek 17060208-05-02 Victor Creek 17060208-05-03 Loon Creek 17060208-05-04 Lick Creek 17060208-05-06 Secesh R-Zena Creek 17060208-05-07
Fish Species Present	Chinook, Steelhead, Bull trout, Cutthroat		Spatial Scale of this Matrix	One 5th level HU (Secesh 17060208-05), 6 6th HUs
Core Area (Bull Trout)	SFSR		Local Population	Secesh River
Management Actions	Victor Loon, Josephine, Marshall Mountain, Bear Pete, North Fork Lick Sheep Allotments			

Pathways & Indicators	Effects of the Management Action(s)				
	Effects	Expected Trend (improve/degrade/maintain/no effect)			Discussion of Effects
		Temporary	Short-term	Long-term	
					effects on salmonid habitat conditions from grazing have not been evident, and most trends appear to be in the direction of improving conditions; more detail is available in the annual monitoring report (Nelson 2006). Current trends and current conditions in these indices do not show that current grazing (identical to that proposed through 2017) degrades salmonid habitat conditions. The sites in the SFSR watershed do not reveal current grazing-induced damage, and long-term studies show improvement since changes in grazing practices about 1990 (Nelson 2006).
Chemical Contaminants and/or Nutrients FA	M	-*	-*	-*	Occasional sheep trailing across headwater stream channels will have a negligible influence on this WCI. Mitigations and restriction on use will minimize the effects. In general, deleterious effects on salmonid habitat conditions from grazing have not been evident, and most trends appear to be in the direction of improving conditions; more detail is available in the annual monitoring report (Nelson 2006). Current trends and current conditions in these indices do not show that current grazing (identical to that proposed through 2017) degrades salmonid habitat conditions. The sites in the SFSR watershed do not reveal current grazing-induced damage, and long-term studies show improvement since changes in grazing practices about 1990 (Nelson 2006).
Habitat Access					
Physical Barriers FA	N	none	none	none	No influence
Habitat Elements					
Substrate Embeddedness Interstitial Sediment FA	M	-*	-*	-*	Occasional sheep trailing across headwater RCAs will result in negligible amounts of sediment delivery from soil disturbance. Mitigations and restriction on use will minimize the effects. . In general, deleterious effects on salmonid habitat conditions from grazing have not been evident, and most trends appear to be in the

Agency/Unit	USDA Forest Service / Payette National Forest	HU Code and Name	Upper Secesh 17060208-05-01 Summit Creek 17060208-05-02 Victor Creek 17060208-05-03 Loon Creek 17060208-05-04 Lick Creek 17060208-05-06 Secesh R-Zena Creek 17060208-05-07
Fish Species Present	Chinook, Steelhead, Bull trout, Cutthroat	Spatial Scale of this Matrix	One 5th level HU (Secesh 17060208-05), 6 6th HUs
Core Area (Bull Trout)	SFSR	Local Population	Secesh River
Management Actions	Victor Loon, Josephine, Marshall Mountain, Bear Pete, North Fork Lick Sheep Allotments		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects	Expected Trend (improve/degrade/maintain/no effect)			Discussion of Effects
		Temporary	Short-term	Long-term	
					direction of improving conditions; more detail is available in the annual monitoring report (Nelson 2006). Current trends and current conditions in these indices do not show that current grazing (identical to that proposed through 2017) degrades salmonid habitat conditions. The sites in the SFSR watershed do not reveal current grazing-induced damage, and long-term studies show improvement since changes in grazing practices about 1990 (Nelson 2006).
Large Woody Debris FR	N	none	none	none	No influence
Pool Frequency FA	N	none	none	none	No influence
Pool Quality FA	N	none	none	none	No influence
Off-Channel Habitat FA	N	none	none	none	No influence
Refugia FA	N	none	none	none	No influence
Channel Condition and Dynamics					
Width/Max Depth Ratio FA	N	none	none	none	No influence
Streambank Condition FA	M	-*	-*	-*	Streambank condition will continue to be altered by occasional sheep trailing across headwater streams. Mitigations and restrictions on use will limit effects to negligible levels. In general, deleterious effects on salmonid habitat conditions from grazing have not been evident, and most trends appear to be in the direction of improving conditions; more detail is available in the annual monitoring report (Nelson 2006). Current trends and current conditions in these indices do not show

Agency/Unit	USDA Forest Service / Payette National Forest	HU Code and Name	Upper Secesh 17060208-05-01 Summit Creek 17060208-05-02 Victor Creek 17060208-05-03 Loon Creek 17060208-05-04 Lick Creek 17060208-05-06 Secesh R-Zena Creek 17060208-05-07
Fish Species Present	Chinook, Steelhead, Bull trout, Cutthroat	Spatial Scale of this Matrix	One 5th level HU (Secesh 17060208-05), 6 6th HUs
Core Area (Bull Trout)	SFSR	Local Population	Secesh River
Management Actions	Victor Loon, Josephine, Marshall Mountain, Bear Pete, North Fork Lick Sheep Allotments		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects	Expected Trend (improve/degrade/maintain/no effect)			Discussion of Effects
		Temporary	Short-term	Long-term	
					that current grazing (identical to that proposed through 2017) degrades salmonid habitat conditions. The sites in the SFSR watershed do not reveal current grazing-induced damage, and long-term studies show improvement since changes in grazing practices about 1990 (Nelson 2006).
Floodplain Connectivity FR	N	none	none	none	No influence
Flow/Hydrology					
Change in Peak/Base Flows FR	N	none	none	none	No influence
Drainage Network Increase FR	N	none	none	none	No influence
Watershed Conditions					
Road Density and Location FR	N	none	none	none	No influence
Disturbance History FR	M	-*	-*	-*	Disturbance history will continue to be altered by livestock use. Mitigations and restrictions on use (e.g. once over grazing) will limit effects to negligible levels.

Agency/Unit	USDA Forest Service / Payette National Forest	HU Code and Name	Upper Secesh 17060208-05-01 Summit Creek 17060208-05-02 Victor Creek 17060208-05-03 Loon Creek 17060208-05-04 Lick Creek 17060208-05-06 Secesh R-Zena Creek 17060208-05-07
Fish Species Present	Chinook, Steelhead, Bull trout, Cutthroat	Spatial Scale of this Matrix	One 5th level HU (Secesh 17060208-05), 6 6th HUs
Core Area (Bull Trout)	SFSR	Local Population	Secesh River
Management Actions	Victor Loon, Josephine, Marshall Mountain, Bear Pete, North Fork Lick Sheep Allotments		

	Effects of the Management Action(s)				
		Expected Trend (improve/degrade/maintain/no effect)			
Pathways & Indicators	**Effects**	**Temporary**	**Short-term**	**Long-term**	**Discussion of Effects**
Riparian Conservation Areas FR	M	-*	-*	-*	RCA vegetation will remain altered from livestock use in RCAs. Mitigations and restrictions on use will limit effects to negligible levels. Avoidance of access or other activities that may disturb redds or other reproductive behavior will prevent trampling of eggs and adverse effects on spawning or staging. Mitigations restrict livestock salting locations, trailing, bedding, watering, and development of water sources, corrals, and other handling facilities, to locations that will not degrade WCIs such as shade providing riparian vegetation and streambank stability.; therefore, effects to listed species and critical habitat will be negligible. Sheep are trailed along the Grouse Creek Road and well away from Grouse Creek, therefore, any effects to listed species and critical habitat would be negligible. Once-over grazing limits designed not to degrade WCI's make more than negligible effects to listed species and critical habitat unlikely. In general, riparian utilization data indicate livestock use has been limited to allowable levels and therefore effects to listed species and critical habitat are likely limited to negligible levels (Nelson 2006, Zurstadt and Bonaminio 2005, Zurstadt 2004, 2003).
Disturbance Regime FR	M	-*	-*	-*	Disturbance regime will continue to be altered by livestock use. Mitigations and restrictions on use (once over grazing) will limit effects to negligible levels. Avoidance of access or other activities that may disturb redds or other reproductive behavior will prevent trampling of eggs and adverse effects on spawning or staging. Mitigations restrict livestock salting locations, trailing, bedding, watering, and development of water sources, corrals, and other handling facilities, to locations that will not degrade WCIs such as shade providing riparian vegetation and streambank stability.; therefore, effects to listed species and critical habitat will be negligible. Sheep are trailed along the Grouse Creek Road and well away from Grouse Creek, therefore, any effects to listed species and critical habitat would be negligible. Once-over grazing limits designed not to degrade WCI's make more than negligible effects to listed species and critical habitat unlikely. In

Agency/Unit	USDA Forest Service / Payette National Forest	HU Code and Name	Upper Secesh 17060208-05-01 Summit Creek 17060208-05-02 Victor Creek 17060208-05-03 Loon Creek 17060208-05-04 Lick Creek 17060208-05-06 Secesh R-Zena Creek 17060208-05-07
Fish Species Present	Chinook, Steelhead, Bull trout, Cutthroat	Spatial Scale of this Matrix	One 5th level HU (Secesh 17060208-05), 6 6th HUs
Core Area (Bull Trout)	SFSR	Local Population	Secesh River
Management Actions	Victor Loon, Josephine, Marshall Mountain, Bear Pete, North Fork Lick Sheep Allotments		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects	Expected Trend (improve/degrade/maintain/no effect)			Discussion of Effects
		Temporary	Short-term	Long-term	
					general, riparian utilization data indicate livestock use has been limited to allowable levels and therefore effects to listed species and critical habitat are likely limited to negligible levels (Nelson 2006, Zurstadt and Bonaminio 2005, Zurstadt 2004, 2003).
Integration of Species and Habitat Conditions FR	M	-*	-*	-*	The mitigations and restrictions on use will limit the effects to negligible levels for all WCIs above. Avoidance of access or other activities that may disturb redds or other reproductive behavior will prevent trampling of eggs and adverse effects on spawning or staging. Mitigations restrict livestock salting locations, trailing, bedding, watering, and development of water sources, corrals, and other handling facilities, to locations that will not degrade WCIs such as shade providing riparian vegetation and streambank stability.; therefore, effects to listed species and critical habitat will be negligible. Sheep are trailed along the Grouse Creek Road and well away from Grouse Creek, therefore, any effects to listed species and critical habitat would be negligible. Once-over grazing limits designed not to degrade WCI's make more than negligible effects to listed species and critical habitat unlikely. In general, riparian utilization data indicate livestock use has been limited to allowable levels and therefore effects to listed species and critical habitat are likely limited to negligible levels (Nelson 2006, Zurstadt and Bonaminio 2005, Zurstadt 2004, 2003).

14. SFSR ROAD RECONSTRUCTION (E.G. GOAT CREEK)

Agency/Unit	PNF Krassel RD	HU Code and Name	17060208-01 Upper SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	SFSR Road Reconstruction (e.g. Goat Creek)		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Local Population Character					
Local Population Size FR	I	-	+	+	In the temporary timeframe, the Goat Creek culvert action could cause adverse effects to local populations, that could occur due to fish disturbance from construction actions. Goat Creek culvert replacement opens up new habitat and reduces sediment delivery that could increase local population size in the short and long term.
Growth and Survival FR	I	-	+	+	In the temporary timeframe, the Goat Creek culvert action could cause adverse effects to growth and survival, that could occur due to fish disturbance from construction actions. Goat Creek culvert replacement opens up new habitat and reduces sediment delivery that could increase growth and survival in the short and long term. Area closure and enforcement of designated parking areas will reduce human-fish adverse disturbances by limiting access in RCAs.
Life History Diversity and Isolation FA	M	+	+	+	Goat Creek culvert replacement actions open up new habitat that benefits connectivity.
Persistence and Genetic Integrity FR	N	none	none	none	No influence.
Water Quality					
Temperature FR	I	+	+	+	Ongoing stabilization of cut and fillslopes, which will allow establishment and growth of riparian vegetation, together with the riparian planting

Agency/Unit	PNF Krassel RD	HU Code and Name	17060208-01 Upper SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	SFSR Road Reconstruction (e.g. Goat Creek)		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
					vegetation, together with the riparian planting from the Goat Creek culvert project, may reduce stream temperatures in some areas by increased riparian shading.
Intragravel Quality (Sediment) FR Poverty, Oxbow FA Glory	I	-*	+	+	There may be negligible amounts of temporary sediment delivery from all actions described, but habitat improvements from the Goat Creek culvert project, including culvert replacement, bank stabilization, and riparian planning, as well as other components of the SFSR road reconstruction action, such as road-to-trail conversion, road gravelling, snow removal methods, and stabilization of cut and fillslopes, with required mitigations, will decrease sediment delivery in the short and long-term. Any effects of sediment generated during project implementation will be temporary and negligible.
Chemical Contaminants and/or Nutrients FR	I	*-	+	+	Restrictions concerning refueling in RCAs, traffic management, and spill prevention and cleanup requirements will reduce the likelihood of chemical contamination during construction actions to negligible levels. Ongoing traffic management mitigation has demonstrated short and long-term reduction of risk of spills.
Habitat Access					
Physical Barriers FR	I	+	+	+	Goat Creek culvert replacement removes an impassable fish barrier. Road –to-trail conversion of the Hamilton Bar area will further remove culverts.
Habitat Elements					

Agency/Unit	PNF Krassel RD	HU Code and Name	17060208-01 Upper SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	SFSR Road Reconstruction (e.g. Goat Creek)		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Interstitial Sediment Deposition (Substrate Embeddedness) FUR	D	-	-	-	There may be negligible amounts of temporary sediment delivery from all actions described, but habitat improvements from the Goat Creek culvert project, including culvert replacement, bank stabilization, and riparian planning, as well as other components of the SFSR road reconstruction action, such as road-to-trail conversion, road gravelling, snow removal methods, and stabilization of cut and fillslopes, with required mitigations, will decrease sediment delivery in the short and long-term. Any effects of sediment generated during project implementation will be temporary and negligible. .

Agency/Unit	PNF Krassel RD	HU Code and Name	17060208-01 Upper SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	SFSR Road Reconstruction (e.g. Goat Creek)		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Large Woody Debris FA	M	+	+	+	Goat Creek culvert replacement project's riparian revegetation, and stabilization of cut and fillslopes, and removal of roads from RCAs by road-to-trail conversion, may increase the current quantity of LWD and future recruitment in some areas. Mitigations will maintain LWD in all other areas.
Pool Frequency FA except Buckhorn FUR	M	+	+	+	Instream work on the Goat Creek project will increase pool frequency and quality in that localized area; reduction of sediment delivery from all other actions should increase pool frequency and quality in the short and long term.
Pool Quality FA except Buckhorn FUR	M	+	+	+	Instream work on the Goat Creek project will increase pool frequency and quality in that localized area; reduction of sediment delivery from all other actions should increase pool frequency and quality in the short and long term.
Off-Channel Habitat FR	I	-*	+	+	Off-channel habitats will be temporarily affected during project implementation due to excavation and ground disturbance of RCAs. Goat Creek culvert replacement project's riparian revegetation, and stabilization of cut and fillslopes, and removal of roads from RCAs by road-to-trail conversion, may increase the current quality of off-channel habitat in some areas. Mitigations will maintain this WCI in all other areas.

Agency/Unit	PNF Krassel RD	HU Code and Name	17060208-01 Upper SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	SFSR Road Reconstruction (e.g. Goat Creek)		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Refugia FR	I	+	+	+	Goat Creek culvert replacement will open up refugia for species downstream.
Channel Condition and Dynamics					
Width/Depth Ratio (max) FR	I	+	+	+	Goat Creek culvert action will decrease width to depth (max) ratio within Goat Creek. Mitigations will maintain width to depth ratio in all other areas.
Streambank Condition FR	I	+	+	+	SFSR Road reconstruction actions will increase bank stability in some areas. Mitigations will maintain bank stability in all other areas.
Floodplain Connectivity FR	I	+	+	+	Actions in SFSR Road Reconstruction may increase floodplain connectivity in some areas. Mitigations will maintain floodplain connectivity in all other areas.
Flow/Hydrology					
Change in Peak/Base Flows FR	I	+	+	+	Actions such as road to trail conversion and Goat Creek culvert replacement may return peak and base flow to a more normative regime in some areas. Mitigations will maintain peak and base flow in all other areas.
Drainage Network Increase FR	I	+	+	+	Actions within SFSR Road Reconstruction, will improve hydrologic processes and diffuse the drainage network in some areas. Mitigations will maintain drainage network in all other areas.
Watershed Conditions					
Road Density and	I	+	+	+	Road to trail conversion actions will reduce road

Agency/Unit	PNF Krassel RD	HU Code and Name	17060208-01 Upper SFSR 5th HU
Fish Species Present	Bull trout, Chinook, steelhead, westslope cutthroat	Spatial Scale of this Matrix	One 5th HU
Core Area (Bull Trout)		Local Population	
Management Actions	SFSR Road Reconstruction (e.g. Goat Creek)		

Pathways & Indicators	Effects of the Management Action(s)				
	Effects I=improve/D=degrade/M=maintain/N=no influence	Expected Trend - negative, + positive, * negligible, none			Discussion of Effects
		Temporary	Short-term	Long-term	
Location FR					density in some areas including RCAs. Mitigations will maintain road density all other areas.
Disturbance History FR	I	-*	+	+	Actions within SFSR Road Reconstruction, will cause a temporary disturbance, but will result in a short and long term decrease in anthropogenic disturbance. Mitigations will maintain disturbance history in all other areas.
Riparian Conservation Areas FR	I	-*	+	+	Actions within SFSR Road Reconstruction, though having temporary negligible effects during construction, will improve RCA function (LWD recruitment, sediment buffering, root mass bank stabilization etc.) in some areas. Mitigations will maintain RCAs all other areas.
Disturbance Regime FR	I	+	+	+	Actions within SFSR Road Reconstruction will improve watershed resilience to disturbance. Mitigations will maintain the disturbance regime all other areas.
Integration of Species and Habitat Conditions FR	I	+	+	+	The actions with mitigations will improve, maintain or have no effect on all WCIs listed above; therefore the integration of species and habitat conditions WCI will improve.

D. APPENDIX 4. STANDARD ACRONYMS, ABBREVIATIONS AND CONVERSIONS

1. ACRONYMS

a. General

AMP	Allotment Management Plan
AOP	Annual Operating Provisions
AUM	Animal Unit Month
BA	Biological Assessment
BE	Biological Evaluation
BLM	Bureau of Land Management
BMP	Best Management Practices
BNF	Boise National Forest
BO	Biological Opinion
BR	Brownlee Reservoir or Brownlee, a PNF ESA §7 Watershed
C&H	Cattle and horse, a grazing allotment use designation
CFR	Code of Federal Regulations
CWA	Clean Water Act
DC	Deep Creek, a PNF ESA §7 Watershed
DEIS	Draft Environmental Impact Statement
EFSFSR	East Fork South Fork Salmon River
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FCRONRW	Frank Church River Of No Return Wilderness
FDR	Forest Development Road
FEIS	Final Environmental Impact Statement
FH	Forest Highway
FT	Forest Trail
FONSI	Finding Of No Significant Impact
FR	Federal Register
HM	Head Months
HU	Hydrologic Unit, used in the form “Brownlee Reservoir 4th level hydrologic unit”
HUC	Hydrologic Unit Code, used in the form “the 4th level hydrologic unit code is 17050201”
IDE	Idaho Division of Environment
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Department of Fish and Game.
IDL	Idaho Department of Lands
IDWR	Idaho Department of Water Resources
INCD	Idaho Natural Conditions Database
IWWA	Inland West Watershed Assessment
LOC	Letter of Concurrence.
LRMP	Land and Resource Management Plan; also called Forest Plan
LSR	Little Salmon River, also used for the PNF ESA §7 Watershed of the same name
LWD	Large Woody Debris
MBF	Thousand Board Feet
MFSR	Middle Fork Salmon River
MFT	Middle Fork Tribs or Middle Fork Salmon River Tributaries, a PNF ESA §7 Watershed
MMBF	Million Board Feet
MSSE	Main Salmon SE or Main Salmon River Tributaries (Southeast: South Fork Salmon River to Middle Fork Salmon River), a PNF ESA §7 Watershed
MSSW	Main Salmon SW or Main Salmon River Tributaries (Southwest: Little Salmon River to South Fork Salmon River), a PNF ESA §7 Watershed
MYOP	Multi-Year Operating Plan
NFPR	North Fork Payette River, also used for the PNF ESA §7 Watershed of the same ame

NFS	National Forest System (e.g., NFS lands).
NMFS	National Marine Fisheries Service
NPNF	Nez Perce National Forest
NPT	Nez Perce Tribe
O&M	Operation and Maintenance
PNF	Payette National Forest
RA	Resource Area
RCA	Riparian Conservation Area
WCI	Riparian Management Objective
ROD	Record of Decision
RPA	Reasonable and Prudent Alternative
S&G	Sheep and goat, a grazing allotment use designation
SBT	Shoshone-Bannock Tribe
SFSR	South Fork Salmon River, also used for the PNF ESA §7 Watershed of the same name
SUP	Special Use Permit
TES	Threatened, endangered, sensitive
TS	Timber Sale
TSI	Timber Stand Improvement
USC	United States Code
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WFU	Wildland Fire Use
WR	Weiser River, also used for the PNF ESA §7 Watershed of the same name

b. Fish Species

BT	Columbia River bull trout (*Salvelinus confluentus*)
EB	Eastern brook trout (*Salvelinus fontinalis*)
LT	Lake trout (*Salvelinus namaycush*)
MS	Mottled sculpin (*Cottus bairdi*)
PL	Pacific lamprey (*Lampetra tridentata*)
RB	Redband trout (*Oncorhynchus mykiss gairdneri*)
RBT	Rainbow trout (*Oncorhynchus mykiss irideus*)
SP	Splake (*Salvelinus fontinalis x S. namaycush*)
SpCS	Spring chinook salmon (*Oncorhynchus tshawytscha*)
SpSCS	Spring/summer chinook salmon (*Oncorhynchus tshawytscha*)
SpSSFCS	Spring/summer and fall chinook salmon (*Oncorhynchus tshawytscha*)
SST	Snake River summer steelhead (*Oncorhynchus mykiss gairdneri*)
WCT	Westslope cutthroat trout (*Oncorhynchus clarki lewisi*)
YCT	Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*)

c. Determinations—Listed Species and Critical Habitat

LAA	May Affect, Likely to Adversely Affect
NE	No Effect
NLAA	May Affect, Not Likely to Adversely Affect

d. Determinations—Species and Critical Habitat Proposed for Listing

LJ	Likely to Jeopardize
LRDAM	Likely to Lead to Destruction or Adverse Modification
NLJ	Not Likely to Jeopardize
NLRDAM	Not Likely to Lead to Destruction or Adverse Modification

e. Determinations—Sensitive Species

LLL	Likely to Lead to Listing
NLLL	Not Likely to Lead to Listing

2. ABBREVIATIONS

a. Units of Measure

ac	acre.
a.e./L	acid equivalents per liter.
ai/ac	active ingredient per acre.
ai/ac/year	active ingredient per acre per year.
cfs	cubic feet per second.
cms	cubic meters per second.
ft	feet.
ha	hectare.
hr	hour.
km	kilometer.
km ²	square kilometer.
lb	pound.
lb/ac	pounds per acre (alternatively lb/acre).
lb/ai/ac	pounds of active ingredient per acre.
m	meters.
mg/L	milligrams per liter.
:g	microgram.
:g/L	micrograms per liter.
mi	mile.
mi ²	square mile.
ppm	parts per million.

b. Toxicology

ai	Active ingredient.
a.e.	Acid equivalents.
EC_{50}	Toxicant concentration causing an observable effect in 50% of test organisms.
EEC	Estimated environmental concentration.
LC_{50}	Lethal concentration that kills half of a test population.
NOEC	No-observable-effect concentration.
NOEL	No-observable-effects limits.

3. CONVERSIONS

The following were used to convert between English and metric units of measure:

ac = ha ∗ 2.4710
ha = ac ∗ 0.4047
in = cm ∗ 0.39
cm = in ∗ 2.54
mi = km ∗ 0.622
km = mi ∗ 1.609
mi ² = km² ∗ 0.386
km² = mi² ∗ 2.589
mi/mi² = km/km ² ∗ 1.609
km/km² = mi/mi ² ∗ 0.622
cms = cfs * 0.02832