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Reply to: 2672.4 Date: April 7, 2008

Subject: Biological Assessment & Evaluation for Fisheries Resources
Gold Crown Fuels Project
To: Richard Kramer, Sandpoint District Ranger
Cc: Jennifer Costich-Thompson, Project Leader
Cavan Maloney, Project Watershed Specialist
Jason Gritzner, North Zone Aquatics Program Manager

The U. S. Fish and Wildlife Service (USFWS) lists two fish species that occur, potentially occur, and/or habitat exists within the Kaniksu portion of the Idaho Panhandle National Forests as endangered or threatened under the Endangered Species Act (ESA) of 1973 (Biannual Forest Wide Species List: FWS 1-9-08-SP-0067; April 9, 2008). The Kootenai River population of the white sturgeon (*Acipenser transmontanus*) is listed as "endangered" (Federal Register, Volume 59, No. 171, September 6, 1994) and the Columbia River Distinct Population Segment of bull trout (*Salvelinus confluentus*) is listed as "threatened" (Federal Register, Volume 63, No. 111, June 10, 1998). For bull trout, Critical Habitat was designated on September 26, 2005 (Federal Register, Volume 70, No. 185). Three additional fish species; burbot (*Lota lota*), Interior redband trout (*Oncorhynchus mykiss gairdneri*), and westslope cutthroat trout (*Oncorhynchus clarki lewisi*) are listed as "species of special concern" by USFWS and as "sensitive" by the Regional Forester.

The purpose of this document is to analyze the effects of the proposed project, described below, on these five fish species. It was prepared in accordance with Section 7(c) of ESA, and manual direction to review all Forest Service activities to ensure that such activities do not contribute to a downward trend in population numbers or density of sensitive species and/or a downward trend in habitat capability, either of which might ultimately result in the need for federal listing (FSM 2672.1 and 2672.4). This biological evaluation documents how this project meets National Forest Management Act (NFMA 1976) requirements; to provide for diversity of animal communites [inclucing fish habitat]; to document the effects on these management indicator species (MIS)species (36 CFR 219.19(a)(1)). Furthermore, this document describes the measurable effects of this activity on aquatic habitat and the fish species that rely upon those habitats as required under the National Environmental Policy Act and Idaho Panhandle Forest Plan (USDA 1987, as amended 1995, 2005).

Summary of Activity

Activity:
The Sandpoint Ranger District proposes to to reduce wildland fuels on approximately 573 acres of NFS lands and lessen the risks associated with a landscape fire event in the area between Bottle Bay and Sagle Slough. A secondary objective of this project is to improve the overall health and resilience of the residual forest stands. Reducing

competition and enhancing diversity of species will increase the forest's ability to not only withstand catastrophic fire effects, but also enhance resistance to insect and disease outbreaks. Fuel reduction and silvicultural improvements would include mechanical removal of trees in the form of timber harvest and slash treatment, hand slashing and burning of ground and ladder fuels in some areas, and precommercial thinning of certain stands of younger, sapling-size trees. Six general types of fuel treatments would be used to accomplish the project's objectives (see Table 1). As proposed, approximately 129 acres of forest stands would be commercially-thinned; approximately 213 acres would be treated through a combination of thinning and group selection harvests; approximately 208 acres would be treated with a regeneration harvest; approximately 6 acres would be treated through removal of the overstory trees and precommercial thinning of the saplings in the understory; approximately 6 acres would be treated by hand slashing and piling; and the remaining approximately 11 acres would be a special treatment for rock outcrops treated by removal of tree in-growth and prescribed underburning. The slash for these treatment types would be treated in a variety of methods, depending upon the site conditions and residual stand characteristics: mechanical piling (grapple-piling) and burning; machine piling of skyline corridors and burning; prescribed broadcast burning; hand piling and burning; or yarding of unmerchantable material, with piling and burning to take place at landings (Table 1). Please refer to the project map for details and locations of units.

Table 1. Summary of treatments for the Gold Crown Fuels Reduction Project

Silvicultural Treatment	Acres	Slash/ Fuels Treatment	Acres
Thinning	128	Grapple Pile & Burn	86
		No slash treatment necessary	7
		Corridor Piles & Burn	35
Thinning with Group Selections	214	Grapple Pile & Burn	99
		Prescribed Broadcast Burn	110
		Yard Unmerchantable Material; Landing Pile & Burn	5
Regeneration Harvest	208	Prescribed Broadcast Burn	148
		Yard Unmerchantable Material; Landing Pile & Burn	39
		No slash treatment necessary	15
		Grapple Pile & Burn	6
Overstory Removal; Precommercially Thin saplings	6	Hand Pile & Burn (adjacent to road)	1
		No slash treatment necessary	5
Special- Hazardous Fuels Harvest on Rock Outcrops	11	Prescribed Broadcast Burn	11
Hand Thin	6	Hand Pile & Burn	6
Total Acres	**573**		**573**

Through the treatments, merchantable trees would be harvested and /or skidded using different methods, depending upon site conditions and silvicultural prescriptions (see Table 2 and Map).

Table 2. Summary of how fuels and timber will be removed for the Gold Crown Fuels Reduction Project

Harvest Method	Acres
Hand equipment for treating fuels and slash	6
Helicopter yarding	65
Skyline Yarding	238
Mechanical: Tractor or Cut-To-Length Harvester	203
Tractor yard; Swing to Skyline	11
Combination of Tractor with unsuspended cable yarding	50
APPROXIMATE TREATMENT ACRES	**573**

A complete roads analysis plan was not prepared for this project area; however, geotechnical and engineering specialist closely reviewed the road network to determine access needs, current conditions, and environmental risks of the roads being used for this project. Access to fuel reduction and forest restoration treatment areas would require new road construction, road reconditioning, and road maintenance activities (Table 3 and Map). The four proposed new permanent road segments total 2.2 miles in length, while new temporary roads total 0.13 mile. New roads would be constructed in compliance with applicable best management practices and Forest Plan standards (INFS standards and guides for Road Management: RF-2.b, RF-2.c.3, RF-2.c.5, RF-2.d, RF-3.a, RF-3.c). The new road segments would cross two seasonal streams, both of which are tributaries to Gold Gulch. To access the fuel treatment areas, approximately 8.5 miles of existing roads would require some maintenance activities. In particular, the culverts (pipes and open top box culverts) along FS road 2642 should be cleaned, including ditches, before and after the project to avoid culvert plugging and road washouts. Approximately 0.3 miles of existing road would require some reconditioning (upgrading culverts, improving drainage, rocked stream crossings, grading, brush clearing, and road widening along corners). Refer to the project map for details about road locations.

Table 3. Summary of Proposed Road Work

Transportation Activity Summary	
Action	**Miles**
Road Maintenance on 2642	8.50
Reconditioning of Existing Roads	0.30
Permanent Road Construction	2.20
Temp Road Construction	0.13
Grand Total	**11.13**

Traffic on newly constructed roads and on roads opened for the project would be limited to project related activities. The long-term status of existing roads within the project area

will not change. At the end of the project, new temporary roads would be decommissioned after all treatment activities are completed. New permanent roads and existing closed roads which are re-opened for the project would be put into storage upon completion of the project or remain gated to provide future administrative and management access.

With respect to road use on all Forest Service roads, timber hauling would occur in accordance with Forest Service Timber Sale contract provisions for environmental protections (B5.12 "Use of Roads by Purchaser"). Provisions explicitly state that the [purchaser] is authorized to use existing National Forest roads when such use would not cause damage to the roads or National Forest resources and when hauling can be done safely. For protection of soil and water quality, timber hauling on Forest Service controlled roads would be restricted when there are excessively wet weather conditions. Compliance with such restriction shall remain the responsibility of the timber sale administrator (Forest Service representative) for the life on the project. In addition, hauling would adhere to the Inland Native Fish Strategy (INFS) guidelines, Clean Water Act, Idaho Forest Practices Act, Bonner County Road and Bridge Department Standards, and Idaho Department of Transportation Standards.

In addition to the aforementioned activities, the interdisciplinary team has identified the following road improvements for stream quality and/or fish habitat:

- Apply a 6 inch lift of crushed rock and improve surface and ditch drainage to all road crossings over perennial streams, particularly those that drain into Gold Gulch.
- Repair failing drainage features on 2642 main road and 2642C road. At the time of implementation there may be additional drainage features along the road network that need to be repaired.

Location: (see Project File Maps)
This project would occur on the West Face of Lake Pend Oreille, in the vicinity of Bottle Bay and Contest Point. The legal description of the NFS lands in the project area include: sections 5, 6, and 8 in Township 56 North, Range 1 West of the Boise Meridian; sections 30-32 in Township 57 North, Range 1 West of the Boise Meridian; and section 25 in Township 57 North, Range 2 West of the Boise Meridian—all in Bonner County, Idaho. Designated critical habitat for bull trout occurs adjacent to the project area within Lake Pend Oreille proper.

Duration:
Project activities would likely start in the summer of 2009 and be completed by fall of 2014.

Timeline:
Roadwork would be detailed in engineer's road package and completed as prehaul maintenance. Road maintenance activities, including culvert replacement and rocked stream crossings, would begin in summer 2009. Harvesting, yarding, and decking logs

would begin during this same timeframe within the limits of Best Management Practices (USDA Forest Service 1988); however, hauling timber would not occur until the project-related road maintenance activities have been completed.

Prefield/Field Review

In late September 2007, stream reviews were conducted along roads in the project area, with particular emphasis on Gold Gulch. Sensitive areas of most proposed harvest units, temporary road locations, existing stream conditions, and existing road conditions were examined during this field review (see Fisheries Field/Survey Notes in project file). Field reviews were performed with Hydrology staff. A road survey was performed on August 23, 2006 to assess general road conditions and existing risks of road drainage features to aquatic resources and focused on the main road. Road condition surveys conducted in 1990 for the Gill Hill Timber Sale also provided information into the condition and locations of drainage features along the 2642 road. Delineations between seasonal and perennial stream classes for adequate riparian and streamside protections were made based on culvert crossing descriptions from road surveys and from hydrology surveys. Potential habitat quality for fish was determined based on field observations of stream channels along Bottle Bay Road (February 25, 2008) and a regionally-adapted habitat suitability model (Brian Fransen, Chris Tretter, personal communications) as well as conceptual frameworks from published models on constraints and upstream limits of fish in headwater streams (Fransen et al. 2006, Needham 2005, Cole et al. 2003, Kruse et al. 1997, Latterell et al. 2002). Additional resource analysis was performed using a GIS interface to examine unit proximities to waterbodies, erosion hazards, and for small intermittent streams. During these reviews, aquatic habitat status was evaluated in comparison with the fish habitat suitability model results. Streams similar to Hays and Gold Gulches in the Lake Pend Oreille area were determined examined to characterize the fish community composition based on professional judgment. The North Zone fisheries databases and archives (USDA Forest Service 2008) were examined for relevant fisheries data on Management Indicator Species (MIS), westslope cutthroat trout and bull trout as well as other fish species and fisheries habitat information.

Status of Fish Species and Habitat

The Inland Native Fish Strategy (INFS) (USDA Forest Service 1995) established six Riparian Management Objectives (RMO) for continued persistence and recovery of inland native fish: pool frequency, water temperature, large woody debris, bank stability, lower bank angle, and width/depth ratios. INFS standards and guidelines were established to ensure that projects do not prevent the attainment of RMOs. In other words, projects should be designed to avoid any degradation of fisheries habitat, riparian habitat, or other aquatic resources. The following subsections describe westslope cutthroat trout life history, describe fish habitat requirements, and assess existing fish populations and habitat conditions in the project area.

In general, the function of headwater streams and their importance to downstream fisheries has been reviewed by Bilby and Likens (1980) and Schlosser (1982). Their work suggests that organic debris dams are an important component of small stream ecosystems and that their loss results in considerable seasonal and annual variation in the trophic structure and total biomass of aquatic ecosystems. Debris jams retain nutrients vital to fisheries productivity and moderate sediment pulses from exceeding channel capacities downstream (Meehan 1991). These processes are sustained by intact riparian areas throughout the length of a stream that continually supply large woody debris to the forest floor and active floodprone areas.

Stream channel equilibrium (stability) is the balance between sediment yield, water yield, and channel morphology, which exists within a stream system. Studies indicate that shifts away from channel equilibrium can result in negative changes in the structure and function of stream ecosystems (Bilby and Likens 1980, Schlosser 1982) and their dependent fish populations. Bisson and Sedell (1982) reported that where stream channels have become destabilized, riffles elongate and in many cases extend through former pool locations resulting in loss of pool volume. They suggested that declines in older fish might be the result of their dependency upon deeper water habitats. As evidenced in other systems, the persistence of native fish over time can best be provided by maintaining lateral and instream habitat complexity in association with channel stability (Gorman and Karr 1978, Karr and Dudley 1981, Karr and Freemark 1983). Similarly, westslope cutthroat trout populations in headwater streams can best be perpetuated by maintaining pool frequencies, pool depths, stable stream margins, and habitat complexity (McIntyre and Rieman 1995, Harig and Fausch 2002).

Project Area Fish Populations

There are three primary fish species that may currently inhabit a few of the streams within the project area. Those species are westslope cutthroat trout, eastern brook trout *Salvelinus fontinalis* (invasive non-native), longnose dace *Rhinichthys cataractae* and shorthead sculpin *Cottus confusus*. Bull trout occur in Lake Pend Oreille, but do not inhabit any streams within the project area because Hays Gulch and Gold Gulch are not large enough to provide adequate spawning habitat or navigable passage for large migratory adults. Fish community structure and habitat use in streams within the project area are controlled by physical barriers, steep gradients, flow regime, and size of habitat patches. Based upon comparison to similar size streams tributary to Lake Pend Oreille (Tumbledown Creek, North Twin Creek, Garfield Creek, Mirror Creek, Old Maid Creek, and Cape Horn Creek) and the history of fires and land use of the project area, the fish composition is likely dominated by westslope cutthroat trout and eastern brook trout, particularly in the headwater reaches (USDA Forest Service 2008).

Westslope Cutthroat Trout

Within the Lower Clark Fork River Basin, westslope cutthroat trout are known to exhibit both resident and migratory forms on waters flowing through the Idaho Panhandle National Forest; however, streams within the project area are likely too small to be used

by migratory cutthroat trout. These trout spawn in the spring when temperatures rise to about 10º C, and fry typically emerge from the spawning beds in late July (McIntyre and Rieman 1995) and most notably found in cold, nutrient waters (Rieman and Apperson 1989). Pools are a particularly important habitat component as cutthroat trout occupy pool habitat more than 70 percent of the time (Mesa 1991). Other key features of westslope cutthroat habitat are large woody debris (LWD) for persistent cover and habitat diversity as well as small headwater streams for spawning and early rearing (Wydoski and Whitney 2003).

A 2002 population status review of westslope cutthroat trout (WCT) in Idaho determined that populations in northern Idaho have declined over their historic distribution with viable populations existing in only 36 percent of the original Idaho range. The primary cause of the decline was found to be habitat degradation (Rieman and Apperson 1989); however, interactions with non-native species and habitat fragmentation (dams, diversions, etc.) have played a role in the loss of cutthroat and perhaps worked synergistically to depress some populations. A broader examination across the western U.S. by this same group of scientists (Shepard et al. 2003) concluded that WCT currently occupy the majority of their historical range. Within the immediate area of this analysis, the risk factors to local cutthroat populations, in order from greatest to least, are interactions with non-native species, habitat fragmentation, and habitat degradation.

Project Area Habitat Conditions

There are nine small streams within the project area that drain the Gold Hill area (Table 3). These streams are relatively small (1st to 3rd order), similar in geomorphic structure, and most drain into Lake Pend Oreille. The majority of the streams are intermittent or seasonal in hydrography; however, five of the streams have perennial sections[1] and two of the streams have perennial sections that most likely[2] support fish. The two suitable fish-bearing streams are Gold Gulch and Hays Gulch (see Project Map). The middle reaches of these streams have flow permanence[3], gradients[4], and habitat patch sizes[5] capable of supporting low density resident cutthroat trout populations. Other fish species (sculpin, dace, etc.), if present, are more likely to use stream sections closest to the lake. There are no known naturally-occuring, physical barriers near the mouths of these stream that would preclude fish from colonizing Gold and Hays Gulch. Field observations near the mouths of Hays and Gold Gulch indicate these streams are indeed large enough and have well-formed pools and channel materials capable of supporting fish (see field photos

[1] The determination of stream hydrography is based soley on field observations made during later summer (low flow conditions) from stand exams, road surveys, and hydrologic field surveys.
[2] For this analysis, habitat was considered likely occupied if the stream gradient was less than 12%.
[3] Permanence here refers to the minimum size (3 feet wide) of pool habitats experienced during baseflow.
[4] Gradients were examined from sections of streams where fish do not occur or where fish-bearing end points had been approximately determined. In other face streams around Lake Pend Oreille, fish have not been found where gradients exceed 20%. Fish may use these steep reaches seasonally during runoff.
[5]Gold Gulch and Hays Gulch have contiguous habitat patches of at least 1.5 and 0.5 mile, respectively. In other north Idaho streams, isolated populations have been found in streams in with as little as 0.25 mile of contiguous habitat .

in Project File). Thus, our best available information indicates that Hays and Gold Gulch may be fish-bearing.

Table 3. Descriptive information for streams within the Gold Crown Fuels Project Area.

Name	Flow Regime	Stream Order	Stream Gradient (%)	Catchment Area (acres)
Hays Gulch	Perennial	1st to 3rd	19.0	580
Gold Gulch	Perennial	1st to 3rd	13.0	1350
Tributary to Gold Gulch	Perennial	1st	31.0	50
Gold Gulch tributaries	Seasonal	1st to 2nd	> 20.0	256
West Fork Gold Gulch	Perennial	1st to 2nd	19.0	245
Section 6 stream	Perennial	1st to 2nd	21.0	637
West Contest Point stream	Seasonal	1st	27.0	54
East Contest Point stream	Seasonal	1st to 2nd	38.0	195
Section 30 stream	Perennial	1st to 2nd	27.7	284
Providence Lake Tributary	Seasonal	1st	1.0	313
Garfield Creek and tribs	Perennial	1st to 3rd	5.0	3037
Section 31 NE stream	Intermittent	1st	23.8	212

The suitability of fish habitat was assessed using a suite of physical habitat criteria: catchment area, stream gradient, stream order, elevation, and wetted widths (see Fisheries Project File), all factors deemed relevant to the distribution of cutthroat trout in headwater streams (Fransen et al. 2006 [western Washington], Needham 2005 [eastern Washington], Kruse et al. 1997, Latterell et al. 2002). Distribution studies in other intermountain west streams have shown that in climates drier than North Idaho, cutthroat trout rarely occur in watersheds smaller than 3630 acres (Harig and Fausch 2002) or in stream reaches over 10% gradient (Kruse et al. 1997). Streams in the Gold Crown project area are much smaller and steeper than these published criteria for WY, CO, and NM; however, streams within the vicinity of the project that are similar in size and geology contain resident populations. In eastern Washington (i.e., more similar to North Idaho), efforts to empirically model fish-presence showed that despite annual variation in points definining 'end of fish' in headwater streams, the terminus of fish presence most frequently occurred at sites where wetted widths were less than 2 m and stream gradients from 6 to 15% (Cole and Lemke 2003, Cole et al. 2003). However, headwater streams with adequate pool frequencies (step-pool structure), widths, and baseflows were still occupied by native trout at gradients exceeding 20%. Clearly, using stream gradient alone as the end points of suitable fish habitat is not always reliable, particularly in step-pool reaches.

In light of the ambiguity of thresholds for fish habitat suitability for North Idaho, a logistic regression model was used to determine fish-bearing end points in Hays and Gold Gulches. The model applies catchment area, gradient upstream of a point, gradient downstream of a point, elevation of a point on the stream, and precipitation to provide a probabalistic determination of fish presence/absence. The model also employs a "stopping rule" once the probability of fish falls below 40% (Needham 2005 adapted from Fransen et al. 2006). The limitations of this model must be acknowledged and include the following: predicted "End of Fish-Bearing" points do not always accurately portray reality, high levels of error for model outputs are associated with the presence of unknown fish passage barriers, and moderate levels of error are associated with marginal habitat (lower quality), streams that originate from headwater lakes, and streams of low topographic relief. Given the general trends from these models, we have conservatively interpretted the results to depict the most upstream point of potential fish habitat as well as the INFS categorization of streams (refer to Map for locations). While this information will suffice for resource analysis, true resource protection will be provided by verifying RHCAs in the field.

The 2642 road network overall is in good condition with few drainage and erosion problems. Grading and drainage maintenance are performed frequently on the main road; however, some spur roads are overgrown with brush and receive no maintenance. ATV use of these un-maintained roads appear to be exacerbating isolated areas of resource damage from road erosion. Specifically, portions of the 2642C road have poor drainage and one stream crossing is receiving above-background levels of fine sediment. This sediment is being delivered downstream (approximately 100 m) to portions of Gold Gulch. Current channel conditions in Gold Gulch do not appear to be outside of the natural range of variability for sediment input in the downstream fish-bearing reaches (see Project File Photographs). Hydrology surveys describe these streams as structurally controlled with straight and steep channel forms (Rosgen channel type A) that are capable of transporting suspended sediment downstream. Fish-bearing reaches closer to the lake are less steep, but are still confined (Rosgen channel type B) and capable of routing minor amounts of sediment without dramatically altering habitat features. For additional information about water quality, channel conditions, and streamflow for the project area streams please refer to the Hydrology Report.

Table 4. Summation of the Analysis of Effects for Endangered, Threatened, and Sensitive Species for the Gold Crown Fuels Reduction Project

Species	Habitat Present	Habitat Absent	Species Present	Species Absent	Cumulative Effects
Endangered:					
White sturgeon *Acipenser transmontanus*		X		X	Not Applicable
Threatened:					
Bull trout *Salvelinus confluentus*		X		X	NO
Sensitive/Species of Concern:					
Burbot *Lota lota*		X		X	Not Applicable
Interior redband trout *Oncorhynchus mykiss gairdneri*		X		X	Not Applicable
Westslope cutthroat trout *Oncorhynchus clarki lewisi*	X		X		NO

Further explanations for above table:

- White sturgeon and burbot are not found outside the Kootenai River drainage on the North Zone of the Idaho Panhandle National Forests.
- Bull trout only occur in Lake Pend Oreille and do not occur in any of the streams within the project area.
- Interior redband trout are not known to inhabit any portion of the Lake Pend Oreille Basin.

Determination of Effects and Rationale

The purpose of this section is to provide an analysis of the anticipated changes in habitat conditions and fish populations as a result of implementing this project. This section documents the direct and indirect effects to aquatic habitat elements (i.e., INFS Riparian Management Objectives [RMO]) relevant to this project and overall effects to sensitive species (Table 6).

Direct/Indirect Effects

The activities of the Gold Crown Fuels Reduction Project are largely separated from the aquatic environment as most units occur on ridges or the upper portions of slopes. In addition, all of the project's ground-disturbing activities are located on landtypes with either low or moderate sensitivities (USDA Forest Service 2008 [landtype database], Soils Analysis), which reduces the overall risk/potential for sediment yield and delivery to streams. Through an individual unit analysis, RHCAs have been classified into appropriate categories to provide protection to those waterbodies and to maintain current riparian conditions adjacent to those waterbodies. By protecting riparian areas, the channel processes that form and maintain quality aquatic habitat along the entire length of these small streams would be retained. Important habitat developmental processes occur in headwater regions and although the exact linkages are poorly understood to date,

they are vital determinants of the productivity and stability of aquatic habitats downstream (Gomi et al 2002). That said, it is critical that adequate riparian and streamside protection be provided to these streams by correctly and even conservatively designating RHCA status (see Mandatory Conservation Measures). By adhering to this principle, this project would not directly affect temperature, sediment regime, habitat cover/complexity, pool frequency, or width/depth ratios because there are no fuel treatment units or yarding scheduled to occur within/across any RHCA.

Road construction, reconstruction, and maintenance activities do, however, have the potential to indirectly affect Riparian Management Objectives (RMOs) and sediment inputs into stream channels. Road networks and road construction, in general, have the capacity to disrupt natural stream processes relevant to fish through three primary mechanisms: altered sediment regime, altered hydrology (discussed later), and habitat fragmentation (Gucinski et al. 2000).

Construction of new roads, road reconstruction, and road maintenance would occur within riparian zones of several headwater streams. This work would be performed so as to avoid delivery of sediment to live streams and minimize vegetative and soil damage in RHCAs. Two new permanent roads would cross two separate seasonal/perennial streams with hardened ford crossings. The hardened fords would be constructed after streams have run dry for the season and when riparian soil disturbance and sediment delivery would have the least impact. Road work, including new road construction and road improvements, may indirectly affect native cutthroat trout by temporarily increasing sediment delivery into the stream networks of Gold Gulch. The effect of sediment delivery will be short-lived (1-2 years) and will only impact short (<50 m in Gold Gulch) habitat segments in the upper most fish-bearing portions of Gold Gulch. Over the mid-term (1-10 years), the improvements made to the existing road network for this project should reduce the amount of road-derived fine sediment delivered to Gold Gulch, Hays Gulch, and Garfield Creek and the several other unnamed streams, particularly when roads are used by commercial vehicles (Reid and Dunne 1984, Bilby et al. 1989). There are no road-stream crossings on FS roads that currently impede fish passage and no road-stream crossing are proposed that would fragment fish habitat.

Sediment delivered to the stream channels as a result of road work may reach the fish-bearing portions of the Gold Gulch, but the quantities would be low. The sediment-related effects to fish as described below would affect short-sections of habitat (<50 m) and would only persist for 1 to 2 years. Effects to fish could potentially result from elevated turbidity (>25 NTUs; Waters 1995), which could temporarily displace or cause physiological stress to individual fish within the immediate vicinity (100 m downstream). Also, the deposition of sediments into the streambed of fish-bearing reaches of Gold Gulch could reduce the productivity of individual habitat units due to losses in macroinvertebrate production. However, effects will be insulated by the distances between ground disturbing activities and potential fish-bearing stream reaches (the closest is greater than 1000 feet). The construction of hardened fords for new road construction has the greatest potential to deliver sediment to Gold Gulch. Other road reconstruction, maintenance activity, and road use on perennial stream crossings have

potential to deliver small quantities of sediment to downstream reaches occupied by fish. Mitigation measures (Appendix 1) and best management practices (USDA Forest Service 1988; FSH 2509.22) would limit the increased risk in sediment production/delivery to low levels. In addition, the anticipated impacts to sediment yield as a result of implementing this project do not indicate measurable impacts[6] to the headwater streams.

The proposed timber removal treatments and road construction will create additional canopy openings within some of the drainages that potentially could increase water yield and impact streamflows; however, the proportional change in acreage of canopy opening as a result of the project are not expected to cause measurable changes in peak flows for streams within the project area (see Hydrology Report).

Determination of Effects on Bull Trout

Although bull trout are regular inhabitants of Lake Pend Oreille, there are no streams or waterbodies within close enough proximity to this project's activities to affect this species or any of the habitats on which it depends. Because bull trout do not use any of the streams within the project area, the closest Designated Critical Habitat for bull trout is Lake Pend Oreille and there are no direct or indirect effects from this project that could affect bull trout within the lake. Therefore, this project would result in ***No Effect*** to bull trout.

Determination of Effects to Sensitive Species

Westslope cutthroat trout likely occupy portions of Gold Gulch and Hays Gulch (see Fisheries Analysis Map). The habitats in these first and second order streams are typical of steep headwaters and contain woody debris jams and step – pool habitat formations. Project activities are more concentrated in the Gold Gulch watershed than in Hays Gulch. In Gold Gulch, road building and reconstruction will occur and several units abut the streamcourse RHCAs. A conservative approach has been applied to classify the Riparian Habitat Conservation Areas (RHCAs) into fish bearing (Category I) and perennial non-fish bearing (Category II) streams. In addition, these classifications, including Category IV streams would be verified by a biologist during layout.

Most project activities, such as the majority of fuel treatments would not affect individual fish or the populations to which they belong; however, road construction, reconditioning, and maintenance pose varied risks of affecting fish and degrading fish habitat, by increasing sediment loads in project area streams in the short-term. These effects would occur for a short duration (1-2 years) and would only affect short segments (<50 m) of habitat in the upper fish-bearing portions of Gold Gulch. Sediment-related impacts to streams could affect westslope cutthroat trout through gill irritation, displacement, temporarily altered feeding habits, and even death (Bash et al. 2001, Meehan 1991). Sediment contributed from road building and maintenance activities would be low based on site-specific timing restrictions (i.e., not between spawning and emergence) and would not occur when embryos or fry were most susceptible to entrapment or oxygen deprivation. Sedimentation could displace individual fish and could reduce the

[6] "WEPP (Water Erosion Prediction Project) modeling shows an increase from road use and maintenance activities to approximately 0.27 tons/yr for 1 to 2 years while project activities are occurring." – from Hydrology Report

productivity of individual habitat units due to losses in macroinvertebrate production. The risk of long term impacts of degraded habitat as a result of sediment transport downstream into fish-inhabited streams is very low given the predicted volume of sediment[7]. Based upon the low likelihood and anticipated short duration of negative effects, the effects of this project are not great enough to threaten the persistence of the westslope cutthroat trout population in Gold Gulch, Hays Gulch, or Garfield Creek. Therefore, I find that this project ***May Impact Individuals, But would Not Likely Result in a Trend Toward Federal Listing or Reduced Viability for the Population or Species*.**

Cumulative Effects

Management Indicator Species (NEPA-based Cumulative Effects)
This section addresses how this project contributes cumulatively to the past, ongoing, and reasonably foreseeable activities' effects to MIS and fisheries resources as defined by the National Environmental Policy Act of 1970. The cumulative effects area for fisheries is the same as the project area boundary and encompasses approximately 8,601 acres. The Gold Crown Fuels Project occurs within a specific area of the Lake Pend Oreille Riparian Composite 5th level watershed (5th Level HUC No. 1701021401). Less than seven percent of the project area is actually proposed for treatment on National Forest System Lands. This project has a low likelihood of contributing site-specific, measurable effects (via sediment related impacts) to fisheries resources. No other timber sales on Forest Service System Lands are proposed in the immediate vicinity of the project area at this time.

Other actions that have affected fisheries resources in the past include two catastrophic, landscape-scale wildfires that burned over 70% of Hays Gulch and 90% of Gold Gulch in the 1920s (see Historic Landscape Photographs in Project File). Large fires alone are not unusual in the intermountain west and should be consider as a critical structuring mechanism for aquatic habitats and fauna (see Gresswell 1999). Salvage logging of remnant stands and riparian areas occurred in Gold Gulch and Hays Gulch areas following fires. Logging was not widespread and likely was done by homesteaders. Encroachments on riparian areas of these streams have persisted into this century as private lands have been developed along the lakefront.

The 2642 road was originally constructed in the 1960s and the road network was expanded upon in 1995 with the Gold Hill Timber Sale. Road systems on private lands originated at various times and records as to original construction times are not available. The initial pulses of sediment from construction of hillslope roads (i.e., traversing FS land) have now faded; however, road prisms do yield more fine sediment than forested land each year. Road conditions, maintenance, and landtypes dictate the level of impact the additional yield has upon the streams those roads cross. The existing road network currently has little impact on the streams (see Hydrology Report). Although road maintenance does put sediment in streams, it is performed periodically and is designed to

[7] Sediment model outputs (Hydrology Report) for road building, maintenance, and use are predict to increase by 0.27 tons/year for 1-2 years after road construction and are expected to begin returning to current background levels of less than or equal to 0.13 tons/year after the project.

minimize long-term erosion of forest roads. The legacy effects of those projects have already been incorporated into the analysis of this project by the establishment of a current environmental baseline. The actions tied to this project have low-risk effects, thus, there are no effects that would contribute to a cumulative effect over the long-term. Therefore the small short-term effect of sediment delivery would not add to a cumulative effect of total sediment delivered.

Ongoing and reasonably foreseeable activities in the vicinity of the sale area are: routine road maintenance (every 2-4 years), noxious weed treatment, recreation access to Gold Hill Trail, public firewood collection, fire suppression, and development on private land. Routine road maintenance will maintain proper road drainage over time and minimize sediment delivery to streams by addressing point sources of chronic sediment delivery to streams; however, sediment inputs to streams will persist. Noxious weed activities would follow guidelines established by the Sandpoint Noxious Weeds Control Project EIS (USDA Forest Service 1998).

Mandatory Conservation Requirements

In order for the Effects Determinations for this project to remain valid, the following provisions must be met throughout the planning and implementation phases:

1. Appropriate Riparian Habitat Conservation Area designations shall be verified by a qualified field biologist during unit layout and if needed shall be adjusted conservatively to provided adequate resource protection.
2. Ground disturbing activities would be prohibited within the RHCA, with the exception of road construction and maintenance activities.
3. All project related activities would occur in accordance with the Soil and Water Conservation Handbook (USDA Forest Service 1988; FSH 2509.22).
4. The project must meet the relevant Inland Native Fish Strategy (INFS) Standards and Guidelines that relate to the proposed action.
5. Operations for opening roads (i.e., brushing and blading) and restoring adequate drainage features would follow the Project Design Criteria from the IPNF Road Maintenance Programmatic Biological Assessment (USDA Forest Service 2004).

Consistency with Forest Plan Standards

The Gold Crown Hazardous Fuels Project is consistent with the Forest Plan for the Idaho Panhandle National Forests (IPNF) (USDA Forest Service 1987) as amended by the Inland Native Fish Strategy (INFS) (USDA Forest Service 1995) and susequent changes (USDA Forest Service 2005). The project's consistency with INFS standards and RMOs are addressed in the above *Determination of Effects and Rationale* section of this joint Biological Assessment and Biological Evaluation.

TM – 1 Prohibit timber harvest… in Riparian Habitat Conservation Areas.

All harvest units and harvest activities, including yarding and yarding corridors, will occur outside of RHCAs for fish-bearing, perennial non-fish bearing, and intermittent/seasonal streams as well as small wetlands. Resource analysis indicates that some units abut RHCA boundaries, but do not encroach upon the RHCA itself. RHCA boundaries will be verified by a biologist during unit layout.

RF – 2 For each existing or planned road, meet the Riparian Management Objectives and avoid adverse effects to inland native fish by:

b. minimizing road and landing locations in RHCAs

Access to units attempted to minimize new road construction and utilize existing road prisms that already occur on the landscape. The new permanent roads that will cross RHCAs are designed with fords, outsloped, and without culverts so as to minimize landslide risks. These roads have been designed to by hydrologically inert on they are put into storage status.

c. initiating development and implementation of a Road Management Plan or a Transportation Management Plan. At a minimum, address the following items.

2. Road management objectives for each road.

An abbreviated Road Analysis Procedure (RAP) was performed for those roads being used within the project area to determine if they are still needed or could possibly be decommissioned (Project File – RAP Spreadsheet). For those existing roads which will be used for the project, engineers will determine specific required maintenance needs at the time of the sale package preparation, including those design features included in both the Fisheries and Hydrology reports. Roads lacking short-term access needs following the project and that the FS has sole control over have been identified and will be rendered hydrologically inert (road storage) after the project.

5. Regulation of traffic during wet periods to minimize erosion and sediment delivery and accomplish other objectives.

Operational controls have been established and will be accounted for in the Timber Sale Contract to meet this standard.

d. avoiding sediment delivery to streams from the road surface.

Operational controls, special management of riparian zones, road drainage improvements, and road surface treatments have been incorporated to meet this standard.

RF – 3 Determine the influence of each road on the Riparian Management Objectives. Meet Riparian Management Objectives and avoid adverse effects on inland native fish by:

a. reconstructing road and drainage features that …do not retard attainment of Riparian Management Objectives.

Road reconditioning and drainage improvements will be made to the 2642 and 2642C roads, particularly where roads cross streamcourses to reduce inputs of road-derived sediments into streams and hence, negative impacts to fish.

c. closing and obliterating roads not needed in the future based on the ecological value of the riparian resources.

Approximately 2.6 miles of road that will be opened or constructed for this project will be rendered hydrologically inert after completion of project activities.

FM – 1 Design fuel treatment…actions so as not to prevent attainment of Riparian Management Objectives, and to minimize disturbance of riparian ground cover and vegetation.

Fuels treatment units for this project do not treat any RHCA and should not indirectly affect the capacity of RMO attainment within the RHCAs.

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