UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

October 25, 2002

Greg Nicholson
Bureau of Indian Affairs
Colville Indian Agency
Post Office Box 111
Nespelem, Washington 99155-0111

Re: Biological Opinion and Essential Fish Habitat Consultation for the Omak Creek Channel Restoration and Bank Stabilization (NOAA Fisheries No. 2002/01062).

Dear Mr. Nicholson:

The attached document transmits the NOAA Fisheries Biological Opinion (Opinion) on the proposed Omak Creek Channel Restoration and Bank Stabilization Project in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531). The Bureau of Indian Affairs (BIA) has determined that the proposed action was likely to adversely affect the Upper Columbia River (UCR) steelhead (Oncorhynchus mykiss) Evolutionarily Significant Unit (ESU). Formal consultation was initiated on August 19, 2002.

This Opinion reflects formal consultation and an analysis of effects covering the UCR steelhead in Omak Creek and its tributaries near Omak, Washington. The Opinion is based on information provided in the biological assessment sent to NOAA Fisheries by the BIA on August 16, 2001, as well as subsequent information transmitted by telephone conversations and electronic mail. A complete administrative record of this consultation is on file at the Washington Habitat Branch Office.

NMFS concludes that the implementation of the proposed project is not likely to jeopardize the continued existence of UCR steelhead. Please note that the incidental take statement, which includes reasonable and prudent measures and terms and conditions, was designed to minimize take. If you have any questions, please contact Justin Yeager of the Ellensburg Field office, Washington Habitat Branch Office at (509) 925-2618 x224.

Sincerely,

for Michael R Course

D. Robert Lohn
Regional Administrator

Enclosure

Endangered Species Act - Section 7
Biological Opinion
and
Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Omak Creek Stream Channel Reconfiguration and Bank Stabilization
Okanogan County, Washington

NOAA Fisheries No. 2002/01062

Agency: Bureau of Indian Affairs

Consultation Conducted By: National Marine Fisheries Service
Northwest Region

Issued by: Michael R Crouse
For
D. Robert Lohn
Regional Administrator

Date: October 25, 2002

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1.0 INTRODUCTION

1.1 Background and Consultation History

On August 16, 2002, National Marine Fisheries Service (National Oceanic and Atmospheric Administration [NOAA Fisheries]) received a Biological Assessment (BA) and Essential Fish Habitat (EFH) Assessment requesting Endangered Species Act (ESA) section 7 formal consultation and EFH consultation from the Bureau of Indian Affairs (BIA) for the Omak Creek reconfiguration and bank stabilization project. The BA described a proposal to restore bank stability to Omak Creek and improve fish passage.

This document contains the Biological Opinion (Opinion) and EFH consultation, which are based on the information presented in the BA and EFH assessment, phone conversations, electronic mail correspondence, and a site visit on August 8, 2002.

The proposed project area occurs within the Upper Columbia River (UCR) steelhead (*Oncorhynchus mykiss*) Evolutionarily Significant Unit (ESU). The BIA has determined that the project "may affect, and is likely to adversely affect" UCR steelhead. Species with designated EFH in the project area are limited to chinook salmon (*O. tshawytscha*).

The objective of the Opinion is to determine whether the proposed project is likely to jeopardize the continued existence of UCR steelhead. The standards for determining jeopardy are described in section 7(a)(2) of the ESA and further defined in 50 C.F.R. 402.14. The objective of the EFH consultation is to determine whether the proposed project will adversely affect designated EFH, and to recommend conservation measures to avoid, minimize or otherwise offset any such adverse effects.

1.2 Description of the Proposed Action

The BIA proposes to partially fund a stream restoration project on two reaches of Omak Creek. The lower reach near River Mile (RM) 0.5 is adjacent to the Colville Indian Power and Veneer Plant and the upper reach (RM 4.6 to RM 2.9) is downstream of Mission Falls (RM 5.1). The purpose of the project is to restore bank stability on a newly constructed stream channel and restore 17 sites within a 1.7-mile reach of Omak Creek. Completion of this project will improve fish passage and habitat quality, particularly stream bed composition. This project will also increase canopy closure and reduce peak water temperatures in the lower five miles of Omak Creek. In addition to benefits for fish, the proposed action will also reduce the risk of flood damage to nearby structures, including a county road, state highway bridge, and timber mill.

Lower Reach (RM 0.5)

The first component of the project is to stabilize approximately 2,800 feet of Omak Creek which steelhead utilize as a migration corridor and to a lesser extent as spawning habitat (two redds in 2002). The proposed treatment is intended to maintain channel stability (bed and bank), provide

improved passage of adult steelhead, and reduce high stream temperatures and sedimentation. Treatments include, excavating material to allow floodplain development, and contouring streambanks to improve stabilization and reduce erosion. The existing streambed to the floodway margin will be sloped from 10:1 to 20:1 depending upon the reach. The slope between the floodway margin and the outer limit of the floodplain will range from 2.5:1 to 4:1. The creation of the lower terrace and floodplain will be excavated in the "dry." The excavation of the floodplain will be conducted first, then materials, primarily large bed elements and hard rock toes will be placed in the stream channel. Previously installed log structures which are no longer functional and currently detrimental to the stabilization of the channel will be removed. This proposed design addresses the lower reach in two sections.

The upper section, beginning approximately 100 feet upstream of a bottomless arch culvert, has an average gradient of one percent. The treatment for this area is to construct a floodplain excavated to a width of approximately 60 to 80 feet. Approximately 15,000 cubic yards of material will be excavated to develop the floodplain. This material will be deposited in large 10-acre pits approximately 0.5 miles downstream of the project site and approximately 300 feet from Omak Creek. Existing riparian vegetation (four-year old, five-foot average height) will be salvaged during the excavation of the floodplain and re-planted after project construction. Additional native riparian vegetation will be planted unevenly across the floodplain at a density of 500 stems per acre. Cottonwood and willow cuttings will be planted within three feet of the floodway margin. Other species, such as quaking aspen will be planted further from the floodway margin. Riparian vegetation plantings will occur during April and/or May of 2003. Irrigation will be provided for three years (2003 thru 2005) to establish riparian vegetation and increase the survival rate.

The lowermost section, downstream of the bottomless-arch culvert, is substantially steeper (2.75%) than the upper section. The design for this section is based upon stable stream reaches with a similar gradient located further upstream (approx. RM 5.0). The channel will have a straighter alignment than the current channel with an excavated floodplain width of approximately 32 feet. All excavated material (~55,000 cubic yards) will be removed from the floodplain and deposited in an existing pit approximately 0.5 miles from the project site and approximately 300 feet from Omak Creek. This section will contain large bed elements (two to four feet diameter) to dissipate erosive forces from high-energy flows and provide resting areas for migrating adult steelhead. Also, four engineered pools will be created to provide holding areas within this higher gradient channel. The outlet of these pools will contain large bed elements as hydrological controls. Furthermore, the outlets of these pools will be designed and constructed to provide passage of adult steelhead during all flow conditions. Riparian vegetation planting will follow the same procedures as proposed for the upper section.

Upper Reach (RM 2.9 to 4.6)

The second component of this project is directed at stabilizing actively eroding stream banks and reestablishing riparian vegetation along a 1.7-mile reach (RM 2.9 to RM 4.6) which steelhead currently utilize as a spawning area (38 redds in 2002). The resulting channel will have the capability to maintain channel stability (bed and bank), likely improve incubation and emergence of steelhead, and improve fry survival due to decreased stream temperatures. Channel design is based upon field surveys (cross sections, channel profiles) and stream flow data. The design is consistent with the hydrological characteristics of the watershed (runoff volume, base flow, etc.) and ensure that the instream structures, constructed and installed in the stream channel, will be functional for all anticipated flows.

The proposed treatment should provide for a stable channel by directing high-energy stream flow from actively eroding stream banks, thus reducing the amount of sediment deposited in the stream channel. The project should also reduce stream temperatures by narrowing channel width and aid in the establishment of riparian vegetation. The construction of 40 instream structures (24 J-hook vanes, 16 cross vanes) at the 17 sites will require heavy machinery, likely an excavator. Logs, originating from burned trees in the watershed, but not from riparian areas, will be used for the instream structures. Stream banks at each site will be excavated to a slope (~ 5%) similar to stable stream banks in proximity of the site. Soil removed from the site during excavation will either be used for bank sloping or spread at a depth that allows vegetation to become established. Each site will be planted with native riparian vegetation in the same manner as the lower reach.

The BIA has proposed the following Best Management Practices (BMPs) to minimize the impacts of the proposed bank stabilization project to listed salmonids.

General BMP's

- All heavy machinery used on this project will be free of external grease and will have no oil leaks.
- No heavy machinery will enter the active stream channel during this project.
- All heavy machinery will have an emergency spill kit.
- All fueling of heavy machinery will occur at least 100 feet from the active stream channel.
- All fuel will be stored at least 200 feet from the active stream channel.

At the lower reach, the following measures will be incorporated to minimize effects to listed fish:

- Prior to the construction of the floodplain, silt fencing will be installed along the stream banks of the project site to minimize loose soil from being deposited in the active stream channel.

- Prior to instream construction, fish will be removed from the project area (~ 0.5 mile reach) by experienced personnel from the Colville Confederated Tribes Fish and Wildlife Department.

- Electro-fishing will be conducted by a team of three (one operator, two netters) experienced personnel.

- The electro-fishing unit will be set (pulsed DC) to the minimum level needed to collect fish.

- Once a small number of fish (~ 10) are collected, they will be evaluated for injuries. If injuries are observed, the electro-fishing unit will be reset and fish will be collected again and evaluated for injuries.

- All fish will be placed upstream of the project area, via a tank truck, to minimize any exposure to excessive levels of suspended sediment during project construction.

- To prevent fish from re-entering the project area, block nets will be installed at the upstream and downstream end of the project area.

- Block nets will be maintained for the duration of the project.

Erosion and sediment control measures:

- Construction of the reconfigured channel (lower reach) will be accomplished under non-flowing conditions.

- Stream flow will be diverted through a 24-inch diameter plastic flexible pipe within the newly-constructed floodplain.

- The flexible pipe will be secured in position with sandbags and fence posts.

- If high water conditions exceed the capacity of the 24-inch diameter flexible pipe, water will be routed into the re-configured stream channel.

- During high-water conditions (exceeding capacity of flexible pipe), instream construction activity will cease until normal stream flow conditions return.

- During construction, silt fences will be installed at each active construction site to minimize delivery of any sediment into the stream channel.

- Once the silt-fence is removed, all loose, unconsolidated material will be removed from the construction area.

At the upper reach, the following measures will be incorporated to minimize effects to listed fish:

- Block nets will be placed upstream and downstream of each of the 17 sites. Fish will be removed from between the block nets.

- Prior to instream construction, fish will be removed from each site by electro-fishing conducted by experienced personnel from the Colville Confederated Tribes Fish and Wildlife Department.

- Fish will be returned to the stream channel in five-gallon buckets upstream of the project site to reduce exposure to increased sediment created by installing structures.

- Collected fish will not remain in five-gallon buckets for more than 10 minutes.

- Silt fences will be placed along the stream bank at each construction site to reduce the amount of sediment delivered to the stream channel.

- Steam banks at each site will be sloped to mimic nearby stable stream banks and reduce the risk of accelerated erosion.

- Heavy-machinery will access each site by transportation on a low-boy to minimize ground disturbance, particularly near the stream channel.

The proposed construction activities coincide with low flow conditions in Omak Creek. Therefore, accelerated erosion and excessive amounts of sediment delivered to or suspended in the stream channel should be reduced. If however, conditions exist which are unsafe (high flow conditions) or adverse to aquatic resources (i.e. observation of stressed fish), construction of this project will cease until favorable conditions exist. Environmental conditions will be assessed and determined by Colville Confederated Tribes Fish and Wildlife personnel.

1.3 Description of the Action Area

The Action Area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 C.F.R. 402.02). The Action Area includes Omak Creek and the surrounding riparian vegetation from Mission Creek Falls at River Mile 5.1 to the confluence of Omak Creek with the Okanogan River. The Action Area also includes all areas affected by the project including any staging areas and roadways.

2.0 ENDANGERED SPECIES ACT

2.1 Biological Opinion

2.1.1 Status of Species

2.1.1.1 Upper Columbia River Steelhead

UCR steelhead were listed as an endangered species under the ESA on August 18, 1997 (62 Fed. Reg. 43937).

Range-wide factors for the decline of west coast steelhead stocks are primarily attributed to the destruction and modification of habitat, overutilization for recreational purposes, and natural and human-made factors (Busby et al. 1996). Forestry, agriculture, mining, and urbanization have degraded, simplified, and fragmented habitat. Water diversions for agriculture, flood control, domestic, and hydropower purposes (including the Columbia River Basin) have greatly reduced or eliminated historically accessible habitat. Studies estimate that during the last 200 years, the lower 48 states have lost approximately 53% of all wetlands and the majority of the rest are severely degraded (Gregory & Bisson 1997). Washington and Oregon's wetlands are estimated to have diminished by one-third, while California has experienced a 91% loss of its wetland habitat (NRCC 1996).

Loss of habitat complexity has also contributed to range-wide decline of steelhead. In portions of some national forests in Washington, there has been a 58% reduction in large deep pools resulting from sedimentation and loss of pool-forming structures such as boulders and large wood (McIntosh et al. 1994). Sedimentation from land use activities is recognized as a primary cause of habitat degradation in the range of west coast steelhead (62 Fed. Reg. 43942; August 18, 1997).

UCR steelhead occupy the Columbia River Basin upstream from the confluence with the Yakima River, Washington, to the United States-Canada border. The geographic area occupied by this ESU forms part of the larger Columbia Basin Ecoregion (Omernik 1987). The climate in this area includes extremes in temperatures and precipitation, with most precipitation falling in the mountains as snow. Streamflow in this area is provided by melting snowpack, groundwater, and runoff from alpine glaciers.

Estimates of historical (pre-1960s) steelhead abundance specific to this ESU are available from fish counts at dams. Counts at Rock Island Dam from 1933 to 1959 averaged 2,600 to 3,700, suggesting a pre-fishery run size in excess of 5,000 adults for tributaries above Rock Island Dam (Chapman et al. 1994). Recent average total escapement for this stock was 2,400 (62 Fed. Reg. 43949; August 18, 1997). Steelhead in the Upper Columbia River ESU continue to exhibit low abundances, both in absolute numbers and in relation to numbers of hatchery fish throughout the region. Review of the most recent data indicates that natural steelhead abundance has declined or remained low and relatively constant in the major river basins in this ESU (Wenatchee,

Methow, Okanogan) since the early 1990s (Busby et al. 1996). Estimates of natural production of steelhead in the ESU are well below replacement (approximately 0.3:1 adult replacement ratios estimated in the Wenatchee and Entiat rivers) (62 Fed. Reg. 43949; August 18, 1997). These data indicate that natural steelhead populations in the Upper Columbia River Basin are not self-sustaining at the present time. There is also anecdotal evidence that resident rainbow trout contribute to anadromous run abundance. This phenomenon would reduce estimates of the natural steelhead replacement ratio (62 Fed. Reg. 43949; August 18, 1997). The primary cause for concern for UCR steelhead is the extremely low estimate of adult replacement rate. The dramatic declines in natural run sizes and inability of naturally spawning steelhead adults to replace themselves suggest that if present trends continue, this ESU will not be viable (62 Fed. Reg. 43950; August 18, 1997).

Based upon observations and adult steelhead collected at a picket-weir, summer steelhead return to Omak Creek from the last week of March through April, with the peak occurring during the first full week of April. Redd surveys were conducted at two reaches within the project area during May of 2002. A total of 40 redds were identified, of which two were located within the lower reach of the project (~ RM 0.5) and the remaining redds were located within the upper reach of the project (RM 2.9 to RM 4.6). Fry begin emerging from redds during the last week in May. Omak Creek is most unfavorable to fry survival during the summer months when high water temperatures occur (C. Fisher, pers. comm.).

The Okanogan River and its tributaries are thought to support both anadromous and resident forms of *O. mykiss*. Resident forms are usually called rainbow or redband trout. NOAA Fisheries believes that resident fish can help buffer extinction risks to an anadromous population by mitigating depensatory effects in spawning populations, by providing offspring that migrate to the ocean and enter the breeding population of steelhead, and by providing a "reserve" gene pool in freshwater that may persist through times of unfavorable conditions for anadromous fish. A particular concern is isolation of resident populations by human-caused barriers to migration. This interrupts normal population dynamics and population genetic processes and can lead to loss of a genetically based trait (e.g., anadromy).

For the UCR steelhead ESU as a whole, NOAA Fisheries estimates that the median population growth rate (lambda) over the base period (1980-1996) ranges from 0.94 to 0.66, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin (Tables B-2a and B-2b in McClure et al. 2000). NOAA Fisheries has also estimated the risk of absolute extinction for the aggregate UCR steelhead population, using the same range of assumptions about the relative effectiveness of hatchery fish. At the low end, assuming that hatchery fish spawning in the wild have not reproduced (i.e., hatchery effectiveness = 0), the risk of absolute extinction within 100 years is 0.25 (Table B-5 in McClure et al. 2000). Assuming that the hatchery fish spawning in the wild have been as productive as wild-origin fish (hatchery effectiveness = 100%), the risk of absolute extinction within 100 years is 1.00 (Table B-6 in McClure et al. 2000).

Because of data limitations, the Quantitative Analysis Report (QAR) steelhead assessments in Cooney (2000) were limited to two aggregate spawning groups, the Wenatchee/Entiat composite and the above-Wells populations. Wild production of steelhead above Wells Dam was assumed to be limited to the Methow system. Assuming a relative effectiveness of hatchery spawners of 1.0, the risk of absolute extinction within 100 years for UCR steelhead is 100%. The QAR also assumed hatchery effectiveness values of 0.25 and 0.75. A hatchery effectiveness of 0.25 resulted in projected risks of extinction of 35% for the Wenatchee/Entiat and 28% for the Methow populations. At a hatchery effectiveness of 0.75, risks of 100% were projected for both populations.

2.1.2 Evaluating the Proposed Actions

The standards for determining jeopardy are set forth in Section 7(a)(2) of the ESA as defined by 50 C.F.R. 402, et. seq. NOAA Fisheries must determine whether the action is likely to jeopardize the listed species. This analysis involves the initial steps of (1) defining the biological requirements of the listed species, and (2) evaluating the relevance of the environmental baseline to the species' current status.

Subsequently, NOAA Fisheries evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NOAA Fisheries considers estimated level of mortality attributed to: (1) collective effects of the proposed or continuing action, (2) the environmental baseline, and (3) any cumulative effects. As a surrogate for estimating fish mortality for this Opinion, NOAA Fisheries has considered the extent of project effects on habitat listed salmon need to express certain essential behavior patterns. This evaluation must take into account measures for survival and recovery specific to the listed salmon's life stages that occur beyond the Action Area. NOAA Fisheries must identify any reasonable and prudent alternatives available for the action if it is determined that the action will jeopardize the listed species.

2.1.2.1 Biological Requirements

The first step in the methods NOAA Fisheries uses for applying ESA section 7(a)(2) to listed salmon is to define the species' biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species; taking into account population size, trends, distribution, and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its original decision to list the species for protection under the ESA. Additionally, the assessment will consider any new information or data that are relevant to the determination.

The relevant biological requirements are those necessary for the listed species to survive and recover to naturally reproducing population levels at which time protection under the ESA would be unnecessary. Species or ESUs not requiring ESA protection have the following attributes: population sizes large enough to maintain genetic diversity and heterogeneity, the ability to adapt to and survive environmental variation, and are self-sustaining in the natural

environment.

The biological requirements for UCR steelhead include food (energy) source, flow regime, water quality, habitat structure, passage conditions (migratory access to and from potential spawning and rearing areas), and biotic interactions (Spence et al. 1996).

NOAA Fisheries has related the biological requirements for listed salmonids to a number of habitat attributes, or pathways, in the Matrix of Pathways and Indicators (MPI). These pathways (Water Quality, Habitat Access, Habitat Elements, Channel Condition and Dynamics, Flow/Hydrology, Watershed Conditions, Disturbance History, and Riparian Reserves) indirectly measure the baseline biological health of listed salmon populations through the health of their habitat. Specifically, each pathway is made up of a series of individual indicators (e.g. indicators for Water Quality include Temperature, Sediment, and Chemical Contamination) that are measured or described directly (see NMFS 1996). Based on measurement or description, each indicator is classified within a category of the properly functioning condition (PFC) framework: (1) properly functioning, (2) at risk, or (3) not properly functioning. Properly functioning condition is defined as "the sustained presence of natural habitat forming processes in a watershed that are necessary for the long-term survival of the species through the full range of environmental variation."

Based on the best available information, NOAA Fisheries concludes that not all of the biological requirements of UCR steelhead are being met under the environmental baseline in this watershed. The specific biological requirements affected by the proposed action include water quality, sediment, riparian vegetation, and streambank condition.

2.1.2.2 Environmental Baseline

The environmental baseline represents the current basal set of conditions to which the effects of the proposed action would be added. The term "environmental baseline" means "the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the Action Area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process" (50 C.F.R. 402.02).

Omak Creek is a fourth order tributary of the Okanogan River that flows into the mainstem at RM 31. Of the 90,683 acres in this watershed, 73,029 acres are owned and managed by the Colville Confederated Tribes (CCT) (NRCS 1995). Elevations within the sub-basin range from 860 feet above sea level at the Omak confluence with the Okanogan River to 6,774 feet at Moses Mountain.

The climate of the sub-watershed varies from arid to montane, with an average annual precipitation of 12 inches in the lower elevations to over 45 inches at Moses Mountain. Average daily temperatures range from 23-degrees Fahrenheit in winter to 70-degrees Fahrenheit in the summer (Talayco 2001).

The Omak Creek watershed has 63,565 acres of commercial forest managed by the CCT (NRCS 1995). Past logging practices, and fire suppression have changed the forest species composition, structure and density. These practices have led to over-stocked forest stands throughout the watershed that are susceptible to disease, insects and fire. Current logging practices include prescribed burning, pre-commercial thinning, and harvest of disease-stricken trees. Livestock graze most of the forest and range areas in the watershed. Sixty percent of the rangeland in the watershed currently supports a heavy concentration of livestock, and excessive grazing along riparian areas has significantly degraded riparian conditions in some areas. Fifteen percent of the rangeland is in fair condition and only 25 percent is in either good or excellent condition (NRCS 1995). Water distribution in the uplands is inadequate to meet most agricultural and rangeland needs (NRCS 1995).

The environmental baseline indicators are either functioning at risk or not properly functioning. Of particular concern are water quality (e.g. temperature and sediment), road density, and riparian function. Water temperatures within this lower reach have been measured since 1997. Peak water temperatures have exceeded 75 degrees Farhenheit, lethal for steelhead (Bell 1986), for the past five years with the highest water temperature recorded in 1997 at 79.9 degrees Fahrenheit (CCT, unpublished data). Accelerated sediment yield from uplands and streambanks was identified as one of the main factors affecting water quality in Omak Creek (NRCS 1995). Roads were also identified as a significant source of sediment to Omak Creek and connected tributaries (NRCS 1995). Surveys conducted by CCT during 1995, also identified excessive sediment deposition (embeddedness, 56.8 to 79.8%) in Trail Creek, a tributary of Omak Creek. Further analysis of data collected during 1995 indicated sediment yield was substantial enough to reduce the available rearing habitat, as width/depth ratios in the lower reach exceeded NMFS width/depth ratio guidelines by nearly two-fold. Riparian area vegetation in the watershed is estimated to be 54% deciduous and 46% coniferous. Riparian vegetation along the lower five- point-one miles of Omak Creek is fragmented. Lack of spring developments and inadequate fencing allows livestock access to stream corridors. This results in severe over-use of riparian vegetation and streambank failure (NRCS 1995). During 2000, canopy closure was randomly-measured throughout this reach with the greatest percentage of canopy closure measuring 36%. More recently canopy closure measurements ranged from 0 to 50% and averaged 30%. Over-wintering livestock were the causal mechanism affecting canopy closure in this area.

2.1.3 Effect of the Proposed Action

The proposed stream channel reconfiguration, bank stabilization and all related construction activities are likely to adversely affect UCR steelhead. NOAA Fisheries' ESA implementing regulations define "effects of the action" as "the direct and indirect effects of an action on the species together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline" (50 C.F.R. 402.02). "Indirect effects" are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

2.1.3.1 Direct Effects

Direct effects are the immediate effects of the project on the species or its habitat. Direct effects result from the agency action and include the effects of interrelated and interdependent actions. Future Federal actions that are not a direct effect of the action under consideration (and not included in the environmental baseline or treated as indirect effects) are not evaluated (USFWS and NMFS 1998).

2.1.3.1.1 Turbidity

Reconstruction of the stream channel and bank stabilization projects associated with this project would mobilize sediments and temporarily increase downstream turbidity levels. In the immediate vicinity of the construction activities (several hundred feet), the level of turbidity would likely exceed ambient levels by a substantial margin and potentially affect UCR steelhead.

For salmonids, turbidity has been linked to a number of behavioral and physiological responses (e.g., gill flaring, coughing, avoidance, increase in blood sugar levels) which indicate some level of stress (Bisson and Bilby 1982, Sigler et al. 1984, Berg and Northcote 1985, Servizi and Martens 1987). The magnitude of the stress responses is generally higher when turbidity is increased and particle size is decreased (Bisson and Bilby 1982, Servizi and Martens 1987, Gregory and Northcote 1993). Although turbidity may cause stress, Gregory and Northcote (1993) have shown that moderate levels of turbidity accelerate foraging rates among juvenile chinook salmon, likely because of reduced vulnerability to predators due to camouflaging.

When the particles causing turbidity settle out of the water column, they contribute to sediment on the riverbed (sedimentation). When sedimentation occurs, salmonids may be negatively impacted in the following ways: (1) salmonid eggs may be buried and suffocated, (2) prey habitat may be displaced, and (3) future spawning habitat may be displaced (Spence et al. 1996).

The proposed stream channel reconfiguration and bank stabilization projects would cause elevated turbidity levels during the instream construction period and when the stream is returned to the channel for several days afterwards. However, the effects of this turbidity on UCR steelhead would be minimized by isolating the work area from the stream as described in section 1.2 above. Additionally, the BMPs in section 1.2 and the Terms and Conditions in section 2.2.3 of this Opinion should minimize the deleterious effects of sedimentation and turbidity. It is also expected that all UCR steelhead would be removed from the project area for the duration of the project. Additionally, the project work window will capitalize on a time of year when neither spawning fish nor redds are present.

NOAA Fisheries expects that turbidity and sedimentation caused by this action would be short lived, returning to baseline levels soon after construction is over. Furthermore, NOAA Fisheries expects that long term impacts would not occur. Other than the short term impacts mentioned above, this project should improve existing baseline turbidity and sedimentation levels within Omak Creek.

2.1.3.1.2 Streambed and Bank Disturbance

The stream channel reconfiguration would disturb approximately 2,800 feet of Omak Creek and the bank stabilization would disturb 17 sites in a 1.7-mile reach. The excavation of bedload and floodplain material, construction of instream structures, and installation of large boulders and large woody debris (LWD) in the active stream channel and floodplain will disturb existing substrates (fines, gravel, and cobble). The direct effect on UCR steelhead will be minor in the short-term and beneficial in the long-term. In-channel excavation work would disturb/disrupt habitat for invertebrate assemblages that provide a food source for juvenile steelhead. That impact is expected to be short-term as recolonization of available habitat would occur from adjacent upstream sources. Nevertheless, most, if not all work, will be done in the dry, avoiding work while fish are present. Furthermore, instream structures, boulder placement, and LWD installation should create a series of pools, refugia habitat and in-stream habitat complexity that is presently lacking in the Action Area. Finally, post-project conditions will provide higher quality native cobble and gravel substrates that would be immediately available for fish use.

2.1.3.1.3 Diversion of Stream and Removal of Fish

The diversion of each stream may result in the stranding of fry and juvenile salmonids. Additionally, the diversion of water from the channel will impede salmonid movements. The effects of dewatering will be reduced by removing the fish to an upstream location through passive and active removal techniques as well as gradual dewatering, enabling fish to move with the receding water.

Diverting water will also cause the temporary loss (burial, dessication, and displacement) of macroinvertebrate habitat. Aquatic invertebrates serve as an important source of prey for salmonids, and the loss of their habitat through burial, dessication, or displacement may reduce foraging opportunities for listed salmonids. Effects associated with the disruption of the streambed likely would be short-lived as new invertebrates tend to recolonize disturbed areas (Allan 1995). In the Action Area, recolonization rates are expected to be rapid due to the small size of the disturbance and relatively short time period of construction activities.

Fish will be removed from the construction area in the following manner (developed from NMFS 2000). A block net will be installed at the upstream terminus of the project area. A crew will then drag a seine through the entire project area, beginning at the upstream block net. A second block net will then be installed at the downstream terminus of the project area. If listed fish are stranded between the block nets, they will be removed by hand, dip nets, or electro fishing then placed in a tank truck and released upstream of the project area. If electrofishing is employed, the contractor will follow the *Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act* (NMFS June 2000). These guidelines reduce the adverse impacts of electrofishing on fish and increase electro fishing efficiency.

2.1.3.2 Indirect Effects

Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. Indirect effects may occur outside of the area directly affected by the action. Indirect effects may include other Federal actions that have not undergone section 7 consultation but will result from the action under consideration. These actions must be reasonably certain to occur, or they are a logical extension of the proposed action.

2.1.3.2.1 Riparian and Fisheries Habitat

The stream channel reconfiguration and bank stabilization projects call for removal of riparian vegetation. This vegetation presently provides riparian habitat functions such as shading and organic matter inputs to the stream. However, few large trees will need to be removed for either the channel reconfiguration or bank stabilization projects. In addition, the proposed action calls for the affected areas to be seeded with native plant stock and riparian plantings, which should improve riparian function over time. The effects of the projects activities on UCR steelhead and aquatic habitat indicators will be minimized by these measures.

2.1.3.2.2 Failure of Instream Structures

The proposed action may include lateral channel shifts, channel head cutting, and bank erosion as a result of bank stabilization projects; or readjustment or complete failure of the J-hook vanes or cross vanes. Artificial instream structures have a limited life span. The indirect effects of structure readjustment and/or failure are likely to occur much later in time, particularly as the structures reach the end of their design life. The design life could be reduced in time by changes in land use activities upstream of the Action Area. These likely changes include increased impervious surface and resulting changes in the winter peak flows and summer low flows. When the structures ultimately fail, eggs and intra-gravel fry of listed salmonids that may have spawned in the gravel immediately upstream of the structures are likely to be displaced as a result of streambed head-cutting and scour. This displacement will likely result in mortality of eggs and alevins. This could occur as a result of incremental shifting of the structures or during a catastrophic failure of one or more of the structures. However given the design life of the structures, the loss of production near the end of their design life would be significantly off-set by the potential for increased spawning production of listed fish over the life of the structures.

2.1.3.3 Population Level Effects

Construction activities will result in short term effects on listed salmonids. Conservation measures and BMP's are expected to reduce the potential for harm to listed fish that would result from increased turbidity, streambed and bank disturbance, and riparian habitat removal. Therefore, the proposed action is not likely to adversely influence existing population trends or risks.

2.1.4 Cumulative Effects

Cumulative effects are defined as "those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the Action Area of the Federal action subject to consultation" (50 C.F.R. 402.2). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Land uses in the Omak Watershed consist of commercial forestry, livestock grazing ,and some agriculture. These activities with their associated adverse impacts on salmonid habitat will likely continue. However, the CCT is currently addressing these issues in the Omak Watershed through decommissioning roads and removing cattle grazing from riparian areas. These improvements should reduce or minimize adverse effects from these activities in the future.

2.1.5 Conclusion

NOAA Fisheries has reviewed the direct, indirect, and cumulative effects of the proposed action on UCR steelhead and its habitat. NOAA Fisheries evaluated these effects in light of existing conditions in the Action Area and the measures included in the action to minimize the risk of effects. The proposed action is likely to cause short-term adverse effects on UCR steelhead by modifying habitat, removing and transporting fish, and through removing riparian vegetation. These effects are reasonably certain to result in incidental take, but the extent of harm is likely to be minimized by specific measures included in the action. As a result, the effects of the action are unlikely to adversely influence the existing population trends or risks for UCR steelhead. Consequently, the proposed action is not likely to jeopardize the continued existence of UCR steelhead.

2.1.6 Reinitiation of Consultation

This concludes formal consultation for the Omak Creek Stream Channel Reconfiguration and Bank Stabilization Projects. Consultation must be reinitiated if: (1) the amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; (2) new information reveals effects of the action may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on listed species that was not previously considered; or (4) a new species is designated that may be affected by the action (50 C.F.R. 402.16). To reinitiate consultation, the BIA should contact the Habitat Conservation Division (Washington Branch Office) of NOAA Fisheries. Upon reinitiation, the protection provided by this incidental take statement, section 7(o)(2), becomes invalid.

2.2 Incidental Take Statement

Section 9 of the ESA and Federal regulation pursuant to section 4 (d) of the Act prohibit the take of endangered and threatened species without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any

such conduct. Harm is further defined as significant habitat modification or degradation that results in death or injury to listed species by "significantly impairing behavioral patterns such as breeding, spawning, rearing, migrating, feeding, and sheltering" (50 C.F.R. 222.102). Incidental take is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such takings is in compliance with the terms and conditions of this incidental take statement.

An incidental take statement specifies the effects of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize take and sets forth terms and conditions with which the action agency must comply to implement the reasonable and prudent measures.

2.2.1 Amount or Extent of the Take

NOAA Fisheries anticipates that the proposed action is reasonably certain to cause incidental take of UCR steelhead. Despite the use of the best scientific and commercial data available, NOAA Fisheries cannot estimate a specific amount of incidental take of individual fish. However, NOAA Fisheries believes take will occur in the form temporary habitat modification through sedimentation that will occur at the construction site and extend several hundred feet downstream. In addition, habitat modification will occur within the entire stretch of the stream rehabilitation and at each of the 17 bank stabilization sites (although the extent of these effects will be moderated over time as the reconfiguration is intended to contribute to restoring habitat forming processes that are presently absent). Finally, habitat modification would occur in the form of vegetation removal and related loss of riparian function for a number of years after the projects is completed (although lost vegetation will be replanted and will return over time to an improved state relative to current conditions).

2.2.2 Reasonable and Prudent Measures

The following reasonable and prudent measures (RPM's) are necessary and appropriate to minimize take of UCR steelhead. These RPM's are partially integrated into the BA and proposed project. NOAA Fisheries has included them here to provide further detail as to their implementation.

1. The BIA will minimize the incidental take from construction activities in Omak Creek, by limiting the duration, timing and extent of in-water work.

2. The BIA will minimize incidental take from construction activities in or near the creek by protecting water quality.

3. The BIA will minimize incidental take by taking measures to minimize impacts to riparian and instream habitat or by replacing or restoring lost riparian and instream function.

4. The BIA will minimize incidental take by requiring monitoring of all erosion control measures and plantings for site restoration during and following construction to meet criteria as described below in the terms and conditions.

2.2.3 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the BIA must comply with the following terms and conditions, which implement the RPM's described above. Implementation of the terms and conditions within this Opinion will further reduce the risk of impacts to fish and their habitat. These terms and conditions are non-discretionary.

1. To implement RPM No. 1 (in-water work) above, the BIA shall ensure that:

1.1 All work within the active channel of Omak Creek will be completed between October 1, 2002 and January 31, 2003. Staging plans for temporary waterway diversions will be submitted and approved by BIA Environmental Staff prior to proceeding with associated in-water activities. Any extension of the in-water work period will first be approved by, and coordinated with, NOAA Fisheries.

1.2 All in-water work will be isolated by a cofferdam (sand bags), or the stream shall be routed through a culvert, to minimize the potential for sediment entrainment. If a cofferdam is used, any fish trapped in the isolation pool will be removed prior to dewatering, using NOAA Fisheries approved methods.

1.2.1 If seining is possible, fish will be captured under the supervision of a fishery biologist experienced in such efforts and all staff working with the seining operation must have the necessary knowledge, skills, and abilities to ensure the safe handling of all ESA-listed fish.

1.2.2 If seining is not possible, fish may be captured using electrofishing gear as described in NOAA Fisheries guidelines (NMFS 2000). No electrofishing may occur if water temperatures exceed 18 degrees Centigrade, or are expected to rise above this temperature before concluding the capture.

1.2.3 ESA-listed fish must be handled with extreme care and kept in water to the maximum extent possible during capture and transfer procedures. The transfer of ESA-listed fish must be conducted using a sanctuary net that holds water during transfer, whenever necessary to prevent the added stress of an out-of-water transfer.

1.2.4 No fin clipping or use of anaesthetics is authorized for UCR steelhead.

1.2.5 Captured fish must be released in appropriate habitat, as near as possible to the capture site.

1.3 Alteration or disturbance of stream banks and existing riparian vegetation will be minimized. Where bank work is necessary, bank protection material shall be placed to maintain normal waterway configuration.

1.4 During excavation, native streambed materials will be stockpiled out of the two-year floodplain for later use.

2. To implement RPM No. 2 (construction activities), the BIA shall ensure that all erosion and pollution control measures included in the BA are included as special provisions in the Omak Creek Stream Channel Reconfiguration and Bank Stabilization contract. BIA will prepare an erosion control plan (ECP). The ECP will outline how and to what specifications various erosion control devices will be installed to meet water quality standards, and will provide a specific inspection protocol and time response. Erosion control measures shall be sufficient to ensure compliance with applicable water quality standards and this Opinion. The ECP shall be maintained on site and shall be available for review upon request.

2.1 Effective erosion control measures shall be in-place at all times during the contract. Construction within the project vicinity will not begin until all temporary erosion controls (e.g., sediment barriers and containment curtains) are in place.

2.2 All exposed areas will be replanted with a native seed mix. Erosion control planting will be completed on all areas of bare soil within 14 days of completion of construction.

2.3 All equipment that is used for instream work will be cleaned prior to entering the two year floodplain. External oil and grease will be removed, along with dirt and mud. Untreated wash and rinse water will not be discharged into streams and rivers without adequate treatment.

2.4 Material removed during excavation shall only be placed in the 10 acre pits located downstream of the project site and 200-300 feet from Omak Creek. Conservation of topsoil (removal, storage and reuse) will be employed.

2.5 Measures will be taken to prevent construction debris from falling into any aquatic habitat. Any material that falls into a stream during construction operations will be removed in a manner that has a minimum impact on the streambed and water quality.

2.6 Project actions will follow all provisions of the Clean Water Act (40 C.F.R. Subchapter D).

2.7 The Contractor will develop an adequate, site-specific Spill Prevention and Countermeasure or Pollution Control Plan (PCP), and is responsible for containment and

removal of any toxicants released. The Contractor will be monitored by the BIA to ensure compliance with this PCP. The PCP shall include the following:

2.7.1 A site plan and narrative describing the methods of erosion/sediment control to be used to prevent erosion and sediment for contractor's operations related to disposal sites, borrow pit operations, haul roads, equipment storage sites, fueling operations, and staging areas.

2.7.2 Methods for confining and removing and disposing of excess construction materials, and measures for equipment washout facilities.

2.7.3 A spill containment and control plan that includes: Notification procedures; specific containment and clean up measures which will be available on site; proposed methods for disposal of spilled materials; and employee training for spill containment.

2.7.4 Measures to be used to reduce and recycle hazardous and non-hazardous waste generated from the project, including the following: Types of materials, estimated quantity, storage methods, and disposal methods.

2.7.5 The person identified as the Erosion and Pollutant Control Manager shall also be responsible for the management of the contractor's PCP.

2.8 Areas for fuel storage, refueling, and servicing of construction equipment and vehicles will be at least 150 feet from the stream channel and all machinery fueling and maintenance will occur within a contained area. Overnight storage of vehicles and equipment must also occur in designated staging areas.

2.9 Equipment refueling and storage areas will have hydrologic function restored (e.g., ripping or subsoiling) in areas where it has been degraded.

2.10 No surface application of nitrogen fertilizer will be used within 50 feet of any water body.

3. To implement RPM No. 3 (riparian habitat protection), the BIA shall ensure that:

3.1 Alteration of native vegetation will be minimized. Where native vegetation will be altered, measures will be taken to ensure that roots are left intact. This will reduce erosion while still allowing room to work. No protection will be made of invasive exotic species (e.g. Himalayan blackberry), although no chemical treatment of invasive species will be used.

3.2 Riparian vegetation removed will be replaced with a native seed mix, shrubs, and trees according to the re-vegetation plan in section 1.2.

4. To implement RPM No. 4 (monitoring), the BIA shall ensure that:

4.1 Erosion control measures as described above in RPM No. 2 shall be monitored.

4.2 All riparian planting areas will be monitored to ensure that finished grade slopes are at stable angles of repose and plantings are surviving satisfactorily (80 percent survival over three years).

4.3 Failed plantings will be replaced for a period of three years. If successive plantings have failed the BIA will replant an equally sized area in the project vicinity.

3.0 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

3.1 Background

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2));

- NOAA Fisheries must provide conservation recommendations for any Federal or State action that would adversely affect EFH (§305(b)(4)(A));

- Federal agencies must provide a detailed response in writing to NOAA Fisheries within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NOAA Fisheries EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 C.F.R. 600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species

fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 C.F.R. 600.810).

EFH consultation with NOAA Fisheries is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH.

3.2 Identification of EFH

Pursuant to the MSA the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of federally-managed Pacific salmon: chinook; coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*)(PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (i.e., natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based, in part, on this information.

3.3 Proposed Actions

The proposed action and Action Area are detailed above in Section 1.2 and 1.3 of this document. The Action Area includes habitats that have been designated as EFH for various life-history stages of chinook salmon.

3.4 Effects of Proposed Action

As described in detail in Section 2.1.3 of this document, the proposed action may result in short- and long-term adverse effects to a variety of habitat parameters.

1. Temporary increases in suspended sediment as a result of instream excavation.

2. Temporary loss of aquatic insects (a prey base for chinook) due to physical loss of existing habitat at the structure placement sites and sedimentation of downstream instream habitat.

3. Temporary risk of contamination of waters through the accidental spill or leakage of petroleum products from heavy equipment.

4. Habitat alteration in the form of streambed "head cutting" and bedload sediment transport when the instream structures fail on or before their design life.

3.5 Conclusion

NOAA Fisheries concludes that the proposed action would adversely affect designated EFH for chinook salmon.

3.6 EFH Conservation Recommendations

Pursuant to Section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations to Federal agencies regarding actions which may adversely affect EFH. While NOAA Fisheries understands that the conservation measures described in the BA will be implemented by the BIA, it does not believe that these measures are sufficient to address the adverse impacts to EFH described above. NOAA Fisheries believes that the temporary loss of prey organisms, head cutting and bedload transport after structure failure is already minimized, to the maximum extent practicable, by the conservation measures described in the BA and therefore has no additional conservation recommendations to reduce the loss of prey. To minimize the remaining adverse effects to designated EFH for Pacific salmon (suspended sediment, contamination of waters and habitat alteration), NOAA Fisheries recommends that the BIA implement Terms and Conditions 1, 2.1, and 4 as described in Section 2.2.3 of this document.

3.7 Statutory Response Requirement

Pursuant to the MSA (§305(b)(4)(B)) and 50 C.F.R. 600.920(j), Federal agencies are required to provide a detailed written response to NOAA Fisheries' EFH conservation recommendations within 30 days of receipt of these recommendations. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on EFH. In the case of a response that is inconsistent with the EFH conservation recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

3.8 Supplemental Consultation

The BIA must reinitiate EFH consultation with NOAA Fisheries if the proposed action is substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 C.F.R. 600.920(k)).

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