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 31, 2001

Thomas F. Mueller
Regulatory Branch Chief
U.S. Army Corps of Engineers
Seattle District, Corps of Engineers
P.O. Box 3755
Seattle, Washington 98124-3755

Re: Biological Opinion for McCormick Levee Stabilization and Fish Enhancement Project (USACOE Ref No. 2001-4-00845; NMFS No. WSB-01-387)

Dear Mr. Mueller:

In accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq*.) and the Magnuson Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996, the attached document transmits the National Marine Fisheries Service's (NMFS) Biological Opinion (BO) and MSA consultation on levee stabilization and fisheries habitat enhancement measures along the McCormick levee, near the town of Gleed in Yakima County, WA. The US Army Corps of Engineers (USACOE) determined that the proposed action may affect, but was not likely to adversely affect the Middle Columbia River steelhead (*Oncorhynchus mykiss*) Evolutionarily Significant Unit (ESU). The NMFS was unable to concur with this determination, and recommended formal consultation.

This BO reflects the results of a formal ESA consultation and contains an analysis of effects covering the Middle Columbia River steelhead in the Naches River, Washington. The BO is based on information provided in the Biological Assessment (BA) sent to NMFS by the USACOE, and additional information transmitted via telephone conversations and e-mail. A complete administrative record of this consultation is on file at the Washington Habitat Branch Office.

The NMFS concludes that implementation of the proposed project is not likely to jeopardize the continued existence of Middle Columbia River steelhead or result in destruction or adverse modification of their Critical Habitat. In your review, please note that the incidental take statement, which includes Reasonable and Prudent Measures and Terms and Conditions, was designed to minimize take.

The MSA consultation concluded that the proposed project may adversely impact designated Essential Fish Habitat (EFH) for chinook and coho salmon. The Reasonable and Prudent

Measures of the ESA consultation, and Terms and Conditions identified therein, would address the negative effects resulting from the proposed USACOE actions. Therefore, NMFS recommends that they be adopted as EFH conservation measures.

If you have any questions, please contact Kale Gullett of the Washington Habitat Branch Ellensburg Field Office at (509) 925-2638.

Sincerely,

F.r Michael R Course

D. Robert Lohn
Regional Administrator

Enclosure

Endangered Species Act - Section 7
Consultation
and
Essential Fish Habitat Consultation

Biological Opinion

McCormick Levee Stabilization
and
Fish Enhancement Project

WSB-01-387

Action Agency: U.S. Army Corps of Engineers

Consultation Conducted by: National Marine Fisheries Service, Northwest Region, Washington Habitat Branch

Approved: for Michael R Course
D. Robert Lohn
Regional Administrator

Date Issued: 11/06/2001

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I. BACKGROUND AND DESCRIPTION OF THE PROPOSED ACTION

A. Background/Consultation History

This Biological Opinion (BO) is the product of an Endangered Species Act (ESA) Section 7 formal consultation between the National Marine Fisheries Service (NMFS) and the US Army Corps of Engineers (USACOE) for levee stabilization and fisheries habitat enhancement activities in the Naches River, Washington. The Yakima County Public Works Department (YCPWD) is responsible for carrying out maintenance of local levees previously built by the USACOE, and will execute proposed construction activities. Because of permitting requirements, the USACOE requested ESA consultation on behalf of the YCPWD.

The goal of this project is to stabilize the McCormick levee on the Naches River in an ordered and systematic fashion using structures that provide geomorphic stability to the levee as well as ancillary fish habitat benefits. An alternative to completion of this project is traditional riprap armoring applied under a flood emergency situation that will inevitably propagate the same problem at some point later in time.

The USACOE requested informal consultation on August 29, 2001, through submission of a Biological Assessment (BA) with an effect determination of "may affect, not likely to adversely affect" for ESA listed (Threatened) Middle Columbia River (MCR) steelhead (*Oncorhychus mykiss*). After analysis and review of the proposed action as amended and presented, NMFS was unable to concur with this determination and recommended that formal consultation be undertaken for the McCormick levee project. Both the informal and formal consultation process involved reviewing information contained in the BA and correspondence and communication between the Washington Department of Fisheries and Wildlife (WDFW), NMFS, the USACOE and YCPWD (phone calls and electronic mail (e-mail)).

The objective of this BO is to determine whether the proposed project is likely to jeopardize the continued existence of the MCR steelhead Evolutionarily Significant Unit (ESU), or result in the destruction or adverse modification of their designated Critical Habitat.

The NMFS reviewed the following information and engaged in the following steps to reach its determination and prepare this BO:

- February 14, 2001 site visit with WDFW, YCPWD, and Consultant to discuss levee stabilization measures.

- July 25, 2001 early receipt of draft Biological Assessment (BA) from YCPWD for review and comment.

- August 9, 2001 site visit to review proposed construction actions as presented in BA.

- August 29, 2001 receipt of letter and final BA dated June 2001 from USACOE requesting informal consultation (WSB-01-387).

- September 6, 2001 e-mail sent to YCPWD outlining problems, data gaps and further requirements relative to informal consultation processes.

- September 14, 2001 receipt of e-mail with attached BA Addendum outlining Naches River Control, Diversion and Worksite Isolation techniques.

- September 18, 2001 e-mail sent to YCPWD containing comments on BA Addendum.

- September 21, 2001 receipt of e-mail with second BA Addendum attached changing Effect Determination for bull trout from "no effect" to "may affect, not likely to adversely affect".

- September 27, 2001 e-mail sent to YCPWD stating that BA and Addendum did not meet NMFS standards for concurrence under Section 7 informal consultation.

- October 5, 2001 nonconcurrence letter sent to USACOE recommending initiation of formal consultation.

In addition to the key events listed above, other information was informally transferred via email and phone calls between the NMFS, YCPWD, the WDFW, and the USACOE during the preparation of this BO. These documents and a record of communications are part of the consultation history on file at NMFS.

B. Description of the Proposed Action

The USACOE proposes to issue one or more federal permits covering construction activities to repair damage done to the McCormick levee on the Naches River, a major tributary to the Yakima River, near the city of Gleed, Washington, Yakima County (Lat. 45.33, Long. -120.5). Flood events in 1996 and 1997 and attendant scour along the levee caused the Naches River to downcut, attacking the toe of the emplacement. As such, there are numerous sections of the levee that are now in danger of failing. The specific goals of this project are to (1) stabilize the levee, (2) enhance salmonid habitats, (3) stabilize the bank of the Naches River, and (4) stabilize the Chapman Nelson irrigation diversion to reduce the need for in-water work by local irrigators. Controlling the vertical and lateral geomorphology of the Naches River in the vicinity of the diversion will help decrease the frequency and magnitude of in-channel work (push-up dams, gravel removal etc.) done to provide water to the diversion headworks.

The proposed project incorporates several conservation measures and best management practices (BMPs) to minimize project effects on the species under review. These are described within the

BA or have been agreed upon in the consultation process. In conducting the analysis presented in this BO, NMFS assumes that these measures will be implemented in the project design, staging, construction, and operation.

Construction is planned for mid-October and will last no longer than two weeks. Timing guidelines and restrictions will be set forth by the WDFW in their Hydraulic Project Approval (HPA), and are subject to revision based on receipt of permitting requirements. The NMFS anticipates that work will occur between mid-October, and November 15, 2001.

Construction activities associated with this project can be divided into two major elements, (1) levee stabilization, and (2) fisheries habitat enhancement. The specifics of each construction element are described in greater detail below.

1. Levee Stabilization

The main component of this activity is to install four rock barbs into the existing levee and bed of the Naches River to disrupt flow paths and velocities that allow scour to occur at high flows. The barbs will act to turn flow away from the levee, and will promote deposition along the bank of the river by creating a velocity shadow both upstream and downstream of each barb. This depositional area will foster and protect the growth of riparian vegetation which will, in turn, contribute to the structural integrity of the levee.

Because of the hydrograph of the Naches River during the proposed work window, two of the four barbs will be constructed in the dry. To minimize adverse impacts during construction in that reach of the channel where work will be performed in the wet, a ring of large boulders will be placed in the river around the work site with a clean track-hoe prior to barb installation. This ring dike will divert flowing water around the work site preventing erosion during channel excavation. A sediment barrier (a "curtain" of fabric or impermeable sheet) will be suspended from this ring dike and anchored to the bed of the river, creating an isolated, slack water environment in which work can be performed. Prior to in-channel construction, fish trapped in the slack water area will be salvaged using methods specified by the WDFW. These methods will include walking nets (seine, fyke or dipnet) through the isolated area, and, if necessary, electrofishing to remove any fish not captured by netting activities (Richard Visser, WDFW, Pers. Comm. 10/15/01). Prior to in-channel construction and after fish are removed from the isolated work area, sediment-laden water will be pumped from the worksite onto an adjacent upland area where it will not be allowed to re-enter the Naches River. After barb construction and rehabilitation work is complete, the sediment "curtain" and large rock used to divert the thalweg of the Naches River around the worksite will be removed and transported off-site.

Construction of the rock barbs will require instream work and significant excavation along the bed and banks of the Yakima River. Principal work elements will include "key" excavation at the insertion points of the barbs into the McCormick levee, and into the bed of the Naches River.

A total of 1335 yd^3 of fill material in the form of large, angular basalt is required for the four barbs and bank stabilization, and 280 yd^3 of excavation is necessary for installation of said barbs.

2. Fisheries Habitat Enhancement

Fisheries habitat elements in the form of large (4' by 12') basaltic rock slabs will be randomly placed a minimum of 10 feet downstream of each barb or bank key. These slabs will be configured to provide rearing habitat and cover for juvenile salmonids, as well as substrate for aquatic insects. Approximately 60 yd^3 of basalt will be used for these habitat features, and no excavation of bank or bed is required. If the target-sized basalt slabs cannot be obtained, suitably sized large woody debris (LWD) will be used in their place. This LWD is intended to perform the same functions previously outlined in this paragraph.

A minor amount of herbaceous and woody vegetation will be removed during project construction. To restore the area disturbed by construction activities, prevent future erosion, and provide fish habitat, on-site woody plant species [cottonwood (*Populus trichocarpa*), willow (*Salix spp*.), red-osier dogwood (*Cornus stolonifera*)] will be salvaged or harvested and stored for replanting after construction is completed. Additional woody pole cuttings will be harvested from the work area and from adjacent private land, whose owner has granted access and permission to do so (Eco-Northwest, 2001). These plantings and cuttings will be incorporated throughout the work area, on all disturbed sites. Riparian vegetation of this type provides cover for juvenile fish, anchors the river bank/levee thus contributing to erosion prevention. In addition, this vegetation will contribute woody debris to the aquatic ecosystem, provide shade that moderates water temperature increases due to solar radiation, and perform other ecologically beneficial functions.

C. Action Area

Under the ESA, the "Action Area" is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area of the action (50 C.F.R.§ 402.02 and 402.14(h)(2)). For the purposes of this BO, the Action Area includes all aquatic and riparian habitat along the Naches River extending approximately 1000 feet upstream from the Chapman Nelson Irrigation Diversion located at River Mile (RM) 6.0, downstream to the Naches-Cowiche Creek confluence at RM 2.7.

II. STATUS OF THE SPECIES AND CRITICAL HABITAT

The listing status, biological information, and critical habitat elements or potential critical habitat for the indicated species are described in Table 1.

Species (Biological Reference)	**Listing Status Reference**	**Critical Habitat Reference**
Steelhead from Washington, Idaho, Oregon and California, (Busby, *et al.* 1996).	The MCR ESU is listed as Threatened under the ESA by the NMFS, (64 Fed. Reg. 14517, March 25, 1999).	Critical Habitat for MCR ESU, (65 Fed. Reg. 7764, Feb. 16, 2000).

Table 1. References to Federal Register Notices containing additional information concerning listing status, biological information, and critical habitat designations for listed and proposed species considered in this biological opinion.

The proposed action will occur within the designated critical habitat of MCR steelhead. Essential features of this critical habitat include substrate, water quality/quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, space, and safe passage conditions (65 Fed. Reg.7764, February 16, 2000).

Middle Columbia River steelhead have been negatively affected by a combination of habitat alteration and hatchery management practices. The four downstream, mainstem dams on the Columbia are perhaps the most significant source of habitat degradation for this ESU. The dams act as a partial barrier to passage, kill out-migrating smolts in their turbines, raise temperatures throughout the river system, and have created lentic refugia for salmonid predators. In addition to dams, irrigation systems have had a major negative impact by diverting large quantities of water, stranding fish, and acting as barriers to passage. Other major habitat degradation has occurred through urbanization and livestock grazing practices (WDF *et al.* 1993; Busby *et al.* 1996; NMFS 1996; 63 Fed. Reg. 11798, March 10, 1998).

Habitat alterations and subsequent availability, on the other hand, are clearly understood to impose an upper limit on the production of naturally spawning populations of salmon. The National Research Council Committee on Protection and Management of Pacific Northwest Anadromous Salmonids identified habitat problems as a primary cause of declines in wild salmon runs (NRCC 1996). Some of the habitat impacts identified were the fragmentation and loss of available spawning and rearing habitat, migration delays, degradation of water quality, removal of riparian vegetation, decline of habitat complexity, alteration of streamflows and streambank and channel morphology, alteration of ambient stream water temperatures, sedimentation, and loss of spawning gravel, pool habitat and large woody debris (NMFS 1998, NRCC 1996, Bishop and Morgan 1996).

Hatchery management practices are suspected to be a major factor in the decline of this ESU. The genetic contribution of non-indigenous, hatchery stocks may have reduced the fitness of the locally adapted native fish through hybridization and associated reductions in genetic variation or introduction of deleterious (non-adapted) genes. Hatchery fish can also directly displace natural spawning populations, compete for food resources, or engage in agonistic interactions (Campton and Johnston 1985; Waples 1991; Hilborn 1992; NMFS 1996; 63 Fed. Reg. 11798, March 10, 1998).

Middle Columbia River steelhead population sizes are substantially lower than historic levels, and at least two extinctions are known to have occurred in the ESU. In larger rivers (John Day, Deschutes, and Yakima), steelhead abundance has been severely reduced: it is estimated that the Yakima River had annual run sizes of 100,000 fish prior to the 1960's; more recently (early 1990's), natural escapement has been about 1,200 fish (WDF *et al.* 1993). Across the entire ESU, the wild fish escapement has averaged 39,000 and total escapement 142,000 (includes hatchery fish). The large proportion of hatchery fish, concurrent with the decline of wild fish, is a major risk to the MCR ESU (WDF *et al.* 1993; Busby *et al.* 1996; 63 Fed. Reg. 11798, March 10, 1998).

Within the Yakima River Basin, steelhead spawning varies across temporal and spatial scales. The NMFS has identified the following spawning populations within the Yakima Basin: upper Yakima River above Ellensburg, Teanaway River, Swauk Creek, Taneum Creek, Roza Canyon, mainstem Yakima River between the Naches River and Roza Dam, Little Naches River, Bumping River, Naches River, Rattlesnake Creek, Toppenish Creek, Marion Drain, and Satus Creek. Typically, steelhead spawn earlier at lower, warmer elevations than higher, colder waters. Overall, most spawning is completed within the months of January through May (Hockersmith *et al.* 1995).

Four genetically distinct spawning populations of wild steelhead have been identified in the Yakima basin, one of which in the Naches River and its tributaries (Phelps *et al*. 2000). Hockersmith *et al.* (1995) found that 13% of radio-tagged steelhead from 1990 to 1992 utilized the mainstem Naches River and its tributaries for spawning, beginning in early March and extending into mid May. The largest proportion of steelhead spawning in the mainstem Naches River occurs in just two reaches, the Naches between Cowiche Creek (River Mile (RM) 2.7 and the Tieton River Confluence (RM 17.5), and the Naches between Rattlesnake Creek (RM 27.8) and the Little Naches River (RM 44.6, Hockersmith *et al.* 1995). Busack *et al.* (1991), analyzed scale samples from smolts and adult steelhead and found that smoltification occurs after two years in the Naches system, with a few fish maturing after one and an even smaller proportion reaching the smolt stage after three years. Within the Yakima River basin, the Naches subpopulation of steelhead contributes appreciably to the run as a whole, both in terms of absolute numbers, and genetic diversity.

III. EVALUATING THE PROPOSED ACTION

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA and 50 C.F.R. Part 402 (the consultation regulations). The NMFS must determine whether the action is likely to jeopardize the listed species and/or whether the action is likely to destroy or adversely modify critical habitat. This analysis involves the initial steps of (1) defining the biological requirements and current status of the listed species, and (2) evaluating the relevance of the environmental baseline to the species' current status.

From that, NMFS 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, NMFS must consider the estimated level of injury or mortality attributable to: (1) collective effects of the proposed or continuing action, (2) the environmental baseline, and (3) any cumulative effects. 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. If NMFS finds that the action is likely to jeopardize, NMFS must identify reasonable and prudent alternatives for the action.

In addition, NMFS evaluates whether the action, directly or indirectly, is likely to destroy or adversely modify the listed species' designated critical habitat. The NMFS must determine whether habitat modifications appreciably diminish the value of critical habitat for both survival and recovery of the listed species. The NMFS identifies those effects of the action that impair the function of any essential element of critical habitat. The NMFS then considers whether such impairment appreciably diminishes the habitat's value for the species' survival and recovery. If NMFS concludes that the action will adversely modify critical habitat it must identify any reasonable and prudent alternatives available.

Guidance for making determinations on the issue of jeopardy and adverse modification of habitat are contained in *The Habitat Approach, Implementation of Section 7 of the Endangered Species Act for Actions Affecting the Habitat of Pacific Anadromous Salmonids*, August 1999.

For the proposed action, NMFS' jeopardy analysis considers direct or indirect mortality of fish attributable to the action. The NMFS' critical habitat analysis considers the extent to which the proposed action impairs the function of essential elements necessary for migration and spawning of the listed salmon under the existing environmental baseline.

A. Biological Requirements

The first step in the methods NMFS uses for applying the ESA Section 7(a)(2) to listed salmon is to define the species' biological requirements that are most relevant to each consultation. The NMFS 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,

NMFS starts with the determinations made in its original decision to list the species (i.e., MCR steelhead) for protection under the ESA. Additionally, the assessment will consider any new information or data that are relevant to the determination (see Table 1 for references).

The relevant biological requirements are those necessary for salmon in each ESU to survive and recover to naturally reproducing population levels at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment.

Middle Columbia River steelhead have basic biological requirements. These requirements include food, flowing water (quantity), high quality water (cool, free of pollutants, high dissolved oxygen concentrations, low sediment content), clean spawning substrate, and unimpeded migratory access to and from spawning and rearing areas (adapted from Spence *et al.* 1996).

The NMFS 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 the 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."

B. Factors Affecting the Species within the Action Area

Section 4(a)(1) of the ESA and NMFS listing regulations (50 C.F.R. § 424) set forth procedures for listing species. The Secretary of Commerce must determine, through the regulatory process, if a species is endangered or threatened based upon any one or a combination of the following factors; (1) the present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; or (5) other natural or human-made factors affecting its continued existence.

The proposed action includes activities that would have some level of effects with short-term impacts from the first category and the potential for long-term impacts from the fifth category. The characterization of these effects and a conclusion relating the effects to the continued

existence of MCR steelhead is provided below, in section IV.

The major factors affecting steelhead within the action area include instream flows, channel conditions and dynamics, and riparian habitat. The NMFS uses the MPI to analyze and describe the effects of these factors on listed steelhead. As described above, the MPI relates the biological requirements of listed species to a suite of habitat variables. In the MPI analysis presented here, each factor is considered in terms of its effect on relevant pathways and associated indicators (*properly functioning, at risk, or not properly functioning*).

1. Instream Flows

Instream flows in the Naches River are controlled by natural watershed processes (snowmelt runoff and rain-on-snow events), and more significantly by reservoir releases in the upper watershed from Rimrock and Bumping Reservoirs, operated by the Bureau of Reclamation's (BOR) Yakima Project. The storage capacities of these reservoirs are not sizeable enough to capture a large proportion of spring runoff, so most tributaries (except for the Tieton River) and the Naches River mainstem experience a somewhat natural runoff regime where discharge peaks in June and reaches baseflow by mid July. When snowmelt ceases, upstream reservoir operations and diversions leave the Naches in a dewatered state, and habitat availability is greatly reduced. However, through a process known as "flip-flop" the Naches River becomes the primary delivery conduit for late-season irrigation demands beginning in the first week of September. Large volumes of water (on the order of 2800 cubic feet per second (cfs)) are released, primarily from Rimrock Reservoir, down the Tieton River and into the Naches River until the end of the irrigation season (usually the third week of October).

The storage or release of water at these reservoirs is synchronized with the needs of seasonal irrigators. Large volumes of water are released during late summer months (irrigation season), and then storage occurs (flows are greatly reduced) when the season is over (spring, winter and fall). The operation of BOR reservoirs produces a river that is out of phase with its natural hydrograph, and the biota of the Naches River have suffered accordingly. This storage-and-release pattern is at best suboptimal for adult and juvenile steelhead (BPA 1991).

In the MPI analysis, instream flows fall under the Flow/Hydrology pathway, and Change in Peak/Base flow indicator. Currently, for the reasons described above, this indicator is not properly functioning. In this instance, *not properly functioning* is defined as "pronounced changes in peak flow, base flow and/or flow timing relative to an undisturbed watershed of similar size, geology and geography."

2. Riparian Habitat

Forest practices, agriculture, urbanization and flood control have adversely affected riparian habitat in the Naches River watershed. In the action area of this project, numerous man-made

features *(i.e.* levees, US Highway 12, local roads, railroads, irrigation canals, homesites and irrigated croplands) have become permanent fixtures on the landscape and have displaced and precluded significant riparian habitat. Consequently, the potential for normal riparian processes (e.g., shading, bank stabilization and LWD recruitment) to occur is diminished, and aquatic habitat becomes simplified (Dykaar and Wigington 2000; Ralph *et al.* 1994; Young *et al.* 1994; Fausch *et al.* 1994).

In the MPI analysis, the lack of riparian vegetation affects several pathways and indicators. The Watershed Conditions pathway and Riparian Reserves indicator is *not properly functioning*: the riparian reserve system is fragmented, poorly connected, or provides inadequate protection of habitats and refugia for sensitive aquatic species. In addition, the Temperature and Large Woody Debris indicators, from the Water Quality and Habitat Elements pathways, are also *at risk* due to the lack of riparian function.

3. Channel Conditions and Dynamics

The action area of this project is in a braided and anastomosing floodplain reach of the Naches River. Alluvial channel patterns adjust by lateral channel migration and longitudinal profile changes through aggradation and degradation (Leopold *et al.* 1964; Alabyan and Chalov 1998). As such, the river has a natural tendency to respond to flood events by occupying distributary channels in an effort to dissipate excessive erosive energy, rebuild floodplain habitats, and recharge the shallow alluvial aquifer.

As human development progressed, numerous emplacements on the landscape (*i.e.* levees, railroad grades, roads, armored banks) became features that either intentionally or unintentionally restricted interaction between the Naches River and its floodplain. Floodplain development of these types was undertaken to protect the local infrastructure. However, these floodplain revetments also had a negative impact on fish through simplification and homogenization of littoral habitat, disconnecting the Naches River from its floodplain, and reducing channel complexity (Dykaar and Wigington 2000). As a result, the Floodplain Connectivity and Width/Depth Ratio indicators (Channel Condition and Dynamics pathway) are *not properly functioning*.

C. 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). As described above, the action area for this consultation extends along the Naches River from approximately

RM 6.0 downstream to RM 2.7.

The Naches River is the largest tributary to the Yakima River, extending 44.6 miles from its mouth at Yakima RM 116.3 to the point at which the Bumping River and the Little Naches River converge to form the Naches River. It has a moderate gradient averaging 0.58% (0.28-0.71% range) and contains a large, relatively unconfined alluvial section extending from Wapatox Dam (RM 17.1) to the Cowiche Creek confluence (RM 2.7). Significant tributaries, from the mouth upstream, include Cowiche Creek, the Tieton River, Rattlesnake Creek, Nile Creek, the Bumping River and the Little Naches River.

Threatened MCR steelhead are currently affected by a number of habitat modifications within the Action Area. The most prominent and deleterious modifications are the result of irrigation activities and general development. Specifically, irrigation and development have had the following effects on the environmental baseline: (1) adversely affected instream flows, (2) degraded streambank morphology and function, and (3) detached portions of the Naches River and its tributaries from their historical floodplains creating impaired floodplain function.

Instream flow related BOR Yakima Project operations, pursuant to delivery of irrigation demands, have greatly impacted biotic and abiotic conditions in the Naches River. Generally speaking, instream flow problems stem from chronically low discharge levels during reservoir refill periods, to inordinately high, temporally incompatible flows when downstream demands are being met. In essence, the Naches River now experiences two periods of high discharge, one in the spring commensurate with snowmelt runoff and on in the late summer as discharge is ramped up to meet irrigation demands. Under natural conditions, only one freshet (snowmelt driven) would have coursed through the mainstem Naches, with greater magnitude and longer duration.

Floodplain development and revetments have altered natural processes that served to (1) promote exchange of water and sediments between the Naches River and its overbank habitats, (2) provide lateral habitat heterogeneity for MCR steelhead, and (3) maintain riparian habitat communities dependent on natural streamflow dynamics. As described in the preceding paragraph, flow management scenarios have served to exacerbate floodplain function problems.

Throughout the lower Naches River, riparian habitat has been degraded through a variety of activities. Among them, roading, diking, farming, grazing, urban development, and flood control have had the greatest effect. These activities have degraded riparian habitat by covering the ground with materials that preclude plant growth, reducing the widths of riparian zones, and altering the riparian species composition in favor of nonnative plants. For listed steelhead, the lack of properly functioning riparian habitat contributes to instream temperatures that exceed physiological tolerances and streambank erosion that increases sedimentation of spawning habitat. Additionally, degraded riparian zones contribute an inadequate amount of LWD, and subsequently prevent or inhibit habitat forming processes such as pool formation and

establishment of instream cover.

Based on the above information, NMFS concludes that not all of the biological requirements of listed steelhead for freshwater habitat in general are being met under the environmental baseline in this watershed. The status of the species is such that there must be significant improvement in the environmental conditions they experience over those presently available under the environmental baseline to meet the biological requirements for survival and recovery of this species. Further degradation of these conditions could significantly reduce the likelihood of survival and recovery of this species due to the amount of risk listed steelhead already face under the current environmental baseline.

IV. EFFECTS OF THE PROPOSED ACTION

The NMFS' ESA implementing regulations define "effects of the action" as "the direct and indirect effects of an action on the species or critical habitat together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline." Direct effects are immediate effects of the project on the species or its habitat, and indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur (50 C.F.R.§ 402.02).

A. Direct Effects

Direct effects are the immediate effects of the project on the species or its habitats. Direct effects result from the agency action and may 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.

1. Water Diversion and Control

Turbidity. Instream excavation, placing rocks, and other activities associated with installing rock barbs in the Naches River would mobilize sediments and, consequently, temporarily increase downstream turbidity levels. In the immediate vicinity of the construction activities (several hundred feet), the level of turbidity would likely exceed the natural background levels by a significant margin and potentially affect listed MCR steelhead.

For salmonids, turbidity has been linked to a number of behavioral and physiological responses (i.e., 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 1992). The magnitude of these stress responses is generally higher when turbidity is increased and particle size 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 (camouflaging effect).

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 affected: (1) buried salmonid eggs may be smothered and suffocated, (2) prey habitat may be displaced, and (3) future spawning habitat may be displaced (Spence *et al.* 1996)

The YCPWD project would cause elevated turbidity levels during the instream construction period and for several days afterwards. However, the effects of this turbidity on listed fish would be minimized by working within an area isolated as previously described. The initial placement of large boulders forming a ring dike around the work area could cause a temporary spike of sediment influx only moderate in magnitude. Additionally, instream turbidity would be minimized if not totally removed because construction activities in the active channel will be carried out in an isolated environment after fish have been removed, and turbid water will be pumped onto adjacent upland areas. It is also expected that listed fish present during the initial phases of construction would temporarily move to refuges where turbidity can be avoided, thus preventing injury or death. Additionally, the project work window (mid-October to mid-November) will capitalize on a time of the year when spawning fish or redds are not present, and adult fish are most likely migrating in small numbers. Because the proposed barbs are designed to stabilize the streambank and levee, and retain sediments, it is unlikely that they would cause long-term sedimentation problems in the Action Area. Instead, the barbs are likely to reduce baseline erosion rates and decrease associated turbidity and sedimentation in the future.

It is expected that turbidity and sedimentation caused by this action would be short lived, returning to baseline levels soon after construction is over, long term impacts (i.e., adverse modification of critical habitat) would not occur. Other than the short term inputs mentioned above, this project would not change or add to the existing baseline turbidity or sedimentation levels within the Naches River.

Streambed and Bank Disturbance. The installation of rock barbs in the Naches River would disturb the existing substrate present in the river, and require a small amount of bank disturbance. The primary mechanisms of disturbance would be rock placement, instream excavation, and bank excavation to key in the rock barbs.

As previously stated, a small amount of herbaceous and woody material will be removed to facilitate construction of the rock barbs. To the extent possible, existing large woody debris and riparian vegetation will be left intact during construction. Post-construction revegetation work will provide an overall net gain in riparian vegetation within the project area. The creation of a depositional environment along the base of the levee will further promote and maintain the establishment of riparian vegetation.

The direct effect on MCR steelhead is expected to be minor. Because of the project work window, MCR steelhead life stages in the project area include juvenile and young-of-the-year (YOY) fish that are resident in the water column and are able to evacuate the area when disturbance is initiated. The most significant impact would be the temporary loss (burial or displacement) of some potential prey species (invertebrates) and their habitat.

Invertebrates (e.g., larval insects, obligate aquatic insects, molluscs, crustaceans etc.) recolonize disturbed areas by drifting, crawling, swimming, or flying in from adjacent areas (Mackay 1992). The time required for new invertebrates to reach pre-disturbance abundance levels and equilibrium would be related to the spatial scale of their initial habitat loss, the persistence of the excluding or disturbing mechanism, the size of adjacent or remnant invertebrate populations (potential colonizers), the season in which the disturbance is taking place, and the life history characteristics of the invertebrate species (Mackay 1992).

Lost foraging opportunities resulting from the disturbance of Naches River bedforms would likely be short-lived as invertebrates would recolonize the disturbed substrate (Allan 1995). Long-term impacts to prey abundance and habitat are not predicted because (1) the initial disturbance would be relatively small in scale (1,964 ft^2 of riverbed), (2) the fall work window coincides with high levels of invertebrate activity (and therefore recolonization potential), and (3) following construction, new riverbed materials would resemble pre-disturbance habitat (i.e., benthic habitat would not be permanently displaced). The rock structures should not reduce the long-term functional quality of juvenile foraging habitat in the Action Area.

2. Geomorphic Floodplain Alteration

The four rock barbs proposed for installation into the McCormick levee on the Naches River are intended to turn the river away from the streambank, and promote a depositional environment that will protect the integrity of the streambank and levee, promoting the reestablishment of riparian vegetation. Over time, as the barbs experience a range of higher discharge, the thalweg of the Naches River will move away from the levee. Scour pools will develop at the toe of each respective barb, providing holding cover for adult and rearing cover for juvenile salmonids.

The Naches River in the vicinity of the McCormick levee project is relatively unconfined, especially when compared to other reaches of the Naches River and the mainstem Yakima River. As such, there is room across the opposite side of the floodplain for lateral channel migration. This geomorphic process is expected to continue over time, until a new equilibrium channel position is attained. The driving factor in this process is found in the form of competent discharge events that will mobilize bed sediments (cobbles and gravels). In the Naches system, these competent discharges usually coincide with spring runoff, or short duration, high magnitude flow events (rain-on-snow or rain-on-melting snow).

The installation of four rock barbs in the Naches River is intended to promote natural physical

processes; therefore the biological impacts are expected to be minimal in nature. At the time of the year when bed mobility is highest (high magnitude flow events), MCR steelhead would seek refuge in areas where velocities and sediment movement are not hazardous, or, depending on life stage, they will be either migrating into or outmigrating the system. The slackwater habitat that will be created by the construction of these barbs will provide refugia for MCR steelhead during times of elevated discharge. In addition, since these barbs will encourage the Naches River to occupy more of its floodplain, the river will assume a more natural condition, and MCR steelhead can rely on refuge mechanisms under which they naturally evolved. Finally, promoting a more natural interaction between the Naches River and its floodplain will promote ecosystem processes vital to salmonids and the food webs they rely upon for survival (Stanford *et al.* 1996)

B. Indirect Effects

Indirect effects are caused by the proposed action, are later in time, and are reasonably certain to occur (50 C.F.R. § 402.02). Indirect effects may occur outside of the area directly affected by the action. Indirect effects may include the effects of other Federal actions that have not undergone section 7 consultation, but will result from the action under consultation. These actions must be reasonably certain to occur, or be a logical extension of the proposed action. The indirect effects resulting from the proposed McCormick Levee project include (1) improving floodplain function and (2) improving fisheries and riparian habitat.

1. Floodplain Function

The McCormick levee has produced hydraulic conditions under which the Naches River has downcut and taken residence. High flows have created local turbulence amongst the large basalt boulders of the levee, and created a long scour pool along its toe. This is a textbook response to extensive riprap application in conjunction with levee construction (Simons and Richardson 1966; Heede 1986). As such, this reach of the Naches has become the defining hydrologic feature in the immediate area, and baseflow is concentrated along the foundation of the levee, pulling the water table down in a braided and anastomosing reach that would, under natural conditions, exhibit a number of shallow, narrow flow paths. This characteristic is deleterious to the Naches River floodplain and its inhabitants, most notably MCR steelhead.

Installing four rock barbs along the levee will serve to turn the thalweg of the Naches River away from this revetment, and will promote a situation where the Naches can inhabit more of its floodplain over a wider range of flows. This will promote more natural floodplain processes by spreading discharge (requiring smaller amounts than under the current baseline) across the floodplain such that the shallow alluvial aquifer will recharge, sediments and chemical constituents will be delivered to floodplain habitats, and the floodplain ecosystem will receive elements vital to the overall aquatic foodweb (Stanford and Ward 1993). The NMFS believes that as the Naches River migrates laterally from the McCormick levee, the promotion of more

natural floodplain processes will, over time, produce positive foodweb-based effects to MCR steelhead.

2. Riparian and Fisheries Habitat

After the rock barbs are installed, the lateral migration of the Naches River will promote the creation of scour pools at the toe of each barb, while fluvial sediments will deposit in the velocity shadow downstream along the base of the McCormick levee. These sediments will cover the previously scoured levee footing and help to eliminate future erosion. The recruitment of sediments to an area that has been subject to unnatural scour conditions is viewed as a beneficial effect, however, there will also be some cost in terms of habitat loss: the area accumulating sediment includes a scour pool that is currently used, potentially, by MCR steelhead. However, the existing pool along the toe of the levee will be replaced by four new pools, and the addition of basalt slabs or LWD will produce a net benefit by adding habitat heterogeneity, and providing holding cover and rearing habitat for adult and juvenile MCR steelhead. In addition, the barbs may serve to produce a tailout area below that could provide future spawning habitat for MCR steelhead.

The depositional environment created at the base of the levee will foster the growth of riparian vegetation that is (1) introduced as a function of project revegetation and rehabilitation measures, and (2) naturally established pursuant to fluvial floodplain processes. This riparian vegetation will serve to enhance fisheries habitat by reducing instream temperatures by creating shade, adding a LWD component to the system over time, and interacting with and contributing to the aquatic foodweb (Gregory *et al.* 1991). Overall, the proposed action could serve as a net improvement to the Riparian Reserves and LWD indicators as compared to the baseline.

C. Effects on Critical Habitat

The NMFS designates critical habitat for a listed species based upon physical and biological features that are essential to that species. Essential features of critical habitat for the MCR steelhead ESU include substrate, water quality/quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, space, and safe passage conditions (65 Fed. Reg.7764, February 16, 2000).

The direct and indirect effects previously discussed include effects on critical habitat to a limited extent. The avenues in which critical habitat may be affected are apparent in the MPI analysis: specifically, in the Flow/Hydrology, Water Quality, Habitat Elements, Channel Condition and Dynamics, and Watershed Condition pathways. Within these pathways, the functional quality of most indicators will be maintained. The exceptions are the temporary effects of turbidity and sediment alteration which will briefly degrade the Turbidity and Substrate indicators (Water Quality pathway). Relating these indicators back to essential habitat elements, the primary impact of this action will be a short-term decline in water quality, and substrate conditions.

The long-term effects of the project are likely to benefit a listed MCR steelhead critical habitat. The NMFS believes that the loss of the existing scour pool and riparian habitat along the levee during construction of this project will be outweighed by the benefits of increased Instream habitat heterogeneity, new scour pools created downstream of the rock barbs, and by riparian plantings. In addition, the project is likely to increase interaction between the Naches River and its floodplain by encouraging more natural physical processes, as previously described. These mechanisms will serve to locally improve the Habitat Elements and Channel Condition and Dynamics pathways. Accordingly, the proposed action is unlikely to diminish the value of the affected habitat elements to the survival and recovery of MCR steelhead.

V. CUMULATIVE EFFECTS

Cumulative Effects are defined in 50 C.F.R. § 402.02 as "those effects of future state or private activities, not Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." For this analysis, cumulative effects for the general action area are considered. Future Federal actions, including the ongoing operation of hatcheries, fisheries, and land management activities have been or will be reviewed through separate Section 7 consultation processes.

It is expected that a range of non-Federal activities would occur within the Naches River Basin for the purposes of restoring and enhancing fish habitat. These activities would likely include installing fish screens, improving flow management, restoring instream and riparian habitat, and removing barriers to passage. Although the specific details of individual projects are lacking, it is assumed that non-Federal conservation efforts would continue or increase in the near future.

In addition to potential beneficial projects, it is also likely that much of the private land management and water regulation will continue under existing conditions. Specific activities such as farming in or adjacent to sensitive riparian areas, allowing livestock to access critical habitat, and withdrawing large volumes of water for irrigation will continue to adversely affect listed MCR steelhead.

VI. CONCLUSION/OPINION

The NMFS has determined that the effects of the proposed action will not jeopardize the continued existence of MCR steelhead or result in the adverse modification or destruction of critical habitat. The determination of no jeopardy is based upon the current status of the species, the environmental baseline for the action area, and the effects of the proposed action.

The installation of four rock barbs will create short term direct effects with a more than negligible chance of causing incidental take. The most significant risks are posed by (1) the

temporary increase in turbidity that will occur during instream excavation and rock placement, and (2) the entrapment of MCR steelhead behind the ring dike and sediment curtain as the work site is isolated from the active channel. The risk of take will be minimized by the implementation of conservation measures, WDFW HPA provisions, and construction timing. At no time, and without contingencies, will the activities described in this BO have levels of take or destroy habitat that would appreciably reduce the likelihood of survival and recovery of MCR steelhead.

VII. REINITIATION OF CONSULTATION

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; or (3) a new species is listed or critical habitat is designated that may be affected by the action (50 C.F.R.§ 402.16). The NMFS will be monitoring the listed reasonable and prudent measures and terms and conditions of the incidental take statement. The NMFS may reinitiate consultation if the above measures are not adequately completed, resulting in increased probability of take to listed species. To reinitiate consultation, the USACOE must contact the Habitat Conservation Division (Washington Branch Office) of NMFS.

VIII. INCIDENTAL TAKE STATEMENT

Sections 9 of the ESA prohibits any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. Section 4(d) enables the extension of this prohibition to animals listed as "Threatened" under the ESA. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as spawning, rearing, feeding, and migrating (50 C.F.R. § 222.106; 64 Fed. Reg. 60727; November 8, 1999). Incidental take is take of listed animal species that results from, but is not the purpose of, the Federal agency or 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 is not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary; in order for the exemption in section 7(o)(2) to apply, they must be implemented by the action agency so that they become binding conditions of any grant or permit issued to the applicant as appropriate. The USACOE has a continuing duty to regulate the activity covered in this incidental take statement. If the USACOE fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

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

A. Amount or Extent of Take

The NMFS anticipates that incidental take of MCR steelhead could result from project activities as described in the BO. Despite the use of the best scientific and commercial data available, NMFS cannot estimate a specific amount of incidental take of individual fish. However, the mechanisms of expected effects are explained below.

The NMFS believes that there are several mechanisms by which take could occur. Direct harm or injury may result from in-water construction (turbidity), displacing listed fish from their habitat (worksite isolation activities), and the temporary disturbance of prey habitat. The extent to which these mechanisms can result in effects on listed steelhead, or their habitat, can be described qualitatively, enabling reinitiation of consultation if such effects are exceeded during the project: (1) turbidity increases will not extend further than the downstream confluence of the Naches River and Cowiche Creek, (2) the riverbed disturbance will not continue past the in-water work window ending November 15, 2001 (i.e., in-water work will be completed on time). The NMFS does not expect any additional take through indirect impacts of the proposed activities.

B. Reasonable and Prudent Measures

The NMFS believes that the following reasonable and prudent measures (RPMs) are necessary and appropriate to minimizing take of MCR steelhead. These RPMs are integrated into the BA and proposed project, and NMFS has included them here to provide further detail as to their implementation.

1. The USACOE will minimize take by incorporating BMPs to reduce potential impacts of staging and onshore construction activities.

2. The USACOE will minimize take by incorporating BMPs to reduce potential impacts of instream construction activities

3. The USACOE will minimize take by incorporating appropriate construction timing restrictions.

C. Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the USACOE must ensure comply

with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary and apply to both action agencies.

1. Implement RPM #1 by conducting the following

    a. A temporary erosion and sediment control (TESC) plan will be implemented.
    b. A spill prevention, control, and containment (SPCC) plan will be implemented.
    c. All heavy equipment will be clean and free of external oil, fuel, or other potential pollutants.
    d. Disturbed riparian areas will be replanted.
    e. All planting will use native species appropriate for riparian use.

2. Implement RPM #2 by conducting the following

    a. Heavy equipment will work from on-shore (or constructed) staging areas, with the exception of an excavator arm or bucket.
    b. Placement of ring dike and barb rocks will be performed by a qualified heavy equipment operator.
    c. Worksite isolation from the active channel of the Naches River will be achieved per BA Addendum 1 "Naches River Control, Diversion and Worksite Isolation Techniques".
    c. Any fill material entering the Naches River will be clean and free of fines.

3. Implement RPM #3 by conducting the following

    a. Instream construction will take place between October 15 through October 31, 2001, or possibly into November 15, 2001 if prevailing conditions dictate.

IX. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop additional information.

To encourage greater habitat diversity near the project area, NMFS recommends increasing riparian planting in the upstream and downstream vicinity of the project, and placing LWD along

the riverbanks. Placing LWD may encourage higher densities of juvenile MCR steelhead (Peters *et al.* 1998). The current river channel lacks the habitat heterogeneity essential for reaching PFC.

The NMFS must be kept informed of actions minimizing or avoiding adverse effects, or those that benefit listed species or their habitat. Accordingly, NMFS requests notification of the implementation of any conservation recommendations.

X. ESSENTIAL FISH HABITAT

A. 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 NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2));
- NMFS shall provide conservation recommendations for any Federal or State activity that may adversely affect EFH (§305(b)(4)(A));
- Federal agencies shall within 30 days after receiving conservation recommendations from NMFS provide a detailed response in writing to NMFS regarding the conservation recommendations. The response shall 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 the conservation recommendations of NMFS, the Federal agency shall 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 CFR 600.110). 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 CFR 600.810).

Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NMFS is required by Federal agencies regarding any activity that may adversely affect EFH, regardless of its location.

The objective of this Essential Fish Habitat (EFH) consultation is to determine whether the proposed action may adversely affect designated EFH, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse impacts to EFH resulting from the proposed action.

B. Identification of EFH

Pursuant to the MSA, the Pacific Fisheries Management Council (PFMC) has designated EFH for federally-managed fisheries within the waters of Washington, Oregon, and California. The designated EFH for groundfish and coastal pelagic species encompasses all waters from the mean high water line, and upriver extent of saltwater intrusion in river mouths, along the coasts of Washington, Oregon and California, seaward to the boundary of the U.S. exclusive economic zone (370.4 km)(PFMC 1998a, 1998b). 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), 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 the impacts to these species' EFH from the proposed action is based, in part, on this information.

C. Proposed Actions

The proposed action and action areas are detailed above in Section I of this BO. These action areas contain habitats that have been designated as EFH for various life stages of chinook and coho salmon.

D. Effects of Proposed Action

As described in detail in Section IV of this BO, the proposed activities may result in detrimental short-term impacts to designated EFH. These impacts include increased turbidity and some disturbance to prey habitat.

E. Conclusion

NMFS believes that the proposed action may adversely affect designated EFH for chinook and coho salmon.

F. EFH Conservation Recommendations

Pursuant to Section 305(b)(4)(A) of the MSA, NMFS is required to provide EFH conservation recommendations to Federal agencies regarding actions which may adversely affect EFH. While NMFS understands that the conservation measures described in the BO will be implemented by the USACOE, it does not believe that these measures are sufficient to address the adverse impacts to EFH described above. However, the Terms and Conditions outlined in Section VII are generally applicable to designated EFH for Pacific salmon and address these adverse effects. Consequently, NMFS recommends that they be adopted as EFH conservation measures. If implemented by the USACOE, these measures will minimize the potential adverse impacts of the proposed project and conserve EFH.

G. Statutory Response Requirement

Please note that the Magnuson-Stevens Act and 50 CFR 600.920(j) require the Federal agency to provide a written response to NMFS' EFH conservation recommendations within 30 days of its receipt of this letter. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity. 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.

H. Supplemental Consultation

The USACOE must reinitiate EFH consultation with NMFS 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 NMFS' EFH conservation recommendations (50 CFR 600.920(k)).

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