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

January 19, 2001

John Pell, Project Manager
Department of the Army
Seattle District, Corps of Engineers
P.O. Box 3755
Seattle, Washington 98124-3755

Re: Biological Opinion and Essential Fish Habitat Consultation for the Replacement of Culverts in Seven Streams in Clark County, Washington (NMFS WSB Nos. 00-003; 00-004; 00-005; 00-006; 00-007; 00-008; and 00-009)

Dear Mr. Pell:

The attached document transmits the National Marine Fisheries Service's (NMFS) Biological Opinion (BO) based on our review of the proposal to replace culverts in seven streams in Clark County, Washington. The Department of Army, Corps of Engineers determined that the proposed project was likely to adversely affect LCR chinook salmon (*Oncorhynchus tshawytscha*), LCR steelhead trout (*O. mykiss*), and CR chum salmon (*O. keta*). The enclosed document represents NMFS' BO related to the effects of the actions on federally listed salmonids in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.).

This BO is based on information provided in seven Biological Assessments that were received on September 18, 2000. A complete administrative record of this consultation is on file at the Washington Habitat Branch Office. Formal consultation for this project was initiated on September 18, 2000.

This BO also serves as consultation on Essential Fish Habitat pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and its implementing regulations (50 CFR part 600).

The NMFS concludes that implementation of the proposed project is not likely to jeopardize the continued existence of LCR chinook, LCR steelhead, CR chum or result in destruction or adverse modification of 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 and avoid jeopardy.

If you have any questions, please contact Sam Brenkman of the Washington State Habitat Branch Office at (360) 534-9338.

Sincerely,

Michael R Crouse

for

Donna Darm
Acting Regional Administrator

Enclosure

ENDANGERED SPECIES ACT-SECTION 7
AND
ESSENTIAL FISH HABITAT CONSULTATION

BIOLOGICAL OPINION

Replacement of Culverts to Improve Fish Passage Conditions in Clark County, Washington
(WSB 00-003; 00-004; 00-005; 00-006; 00-007; 00-008; 00-009)

Agency: United States Department of Army, Corps of Engineers

Consultation Conducted By: National Marine Fisheries Service
Northwest Region
Washington State Habitat Branch

Approved _____ Date January 19, 2001

Donna Darm
Acting Regional Administrator

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I. BACKGROUND INFORMATION

A. Background and Consultation History

This document transmits the National Marine Fisheries Service's (NMFS) Biological Opinion (BO) for the proposal to replace culverts in seven creeks in Clark County, Washington. The U.S. Department of Army, Corps of Engineers (COE) is the lead agency that concluded that the proposed actions are likely to adversely affect Lower Columbia River (LCR) steelhead (*Oncorhynchus mykiss*), LCR chinook (*O. tshawytscha),* and Columbia River (CR) chum salmon (*O. keta*). Additionally, the COE determined that the proposed actions would not adversely modify designated critical habitat for the above listed species. This document also serves to meet the requirements for consultation related to Essential Fish Habitat under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

The Clark County Department of Public Works is the applicant that proposes to conduct construction activities. Funds for this project were provided by the Washington Department of Transportation.

This BO was completed pursuant to the Endangered Species Act (ESA) and its implementing regulations (50 C.F.R. 402). The objective of this BO is to determine whether the proposed actions are likely to jeopardize the continued existence of LCR chinook, LCR steelhead, and CR chum or result in the destruction or adverse modification of designated critical habitat. The BO addresses adverse effects of construction activities associated with the installation of seven culverts. The projects were evaluated together based on similar construction activities and similar impacts to listed salmonids and their habitats. Effects determinations were made using the methods described in the Habitat Approach (NMFS 1996).

NMFS intends to use this BO to facilitate future consultations with the COE for projects designed specifically to improve fish passage conditions at culverts. NMFS believes that these projects are necessary for the survival and recovery of each ESU. This BO may be referenced by NMFS in future consultations that involve actions and effects that are consistent with those analyzed in this document. This BO was not intended to accommodate projects that involve the effects of indirect and interrelated actions such as road widening, road construction, or housing developments.

On January 4, 2000, NMFS received seven Biological Assessments (BA) and a request for informal consultation from the COE. On January 10, 2000, NMFS requested additional information related to the proposed projects. On September 18, 2000, NMFS received seven amended BA's and a request for formal consultation from the COE. On January 10, 2001, NMFS received additional information necessary to complete the consultation. This BO is based on information provided in the amended BA's and the letter received on January 10, 2001. Telephone conversations related to the consultation occurred among NMFS staff, Clark County staff, and Shapiro and Associates, Inc. on December 21,

2000, January 8, 2001, and January 10, 2001.

B. Description of Proposed Action

The Clark County proposes to replace a total of seven culverts in tributaries to the Lewis River, East Fork Lewis River, and Washougal River (Table 1). The goal of each project is to eliminate barriers that impede migration of salmonids. At each culvert, migration of salmonids is impeded by high water velocities, inadequate water depths in the culvert, or vertical barriers at the culvert outlet.

To improve passage conditions for salmonids, Clark County will replace culverts in Brickie, Cedar, Coyote, John, Lockwood, Riley, and Winkler Creeks (Table 1). The action area for each creek includes an area that extends upstream to the farthest extent of salmonid migration and extends two miles downstream from each culvert (Table 1).

Project activities that will occur in each stream include removal of vegetation, excavation of roadway fill, diversion of the stream, removal of fish from the work area, installation of new culverts and rock weirs, and implementation of measures designed to minimize impacts to salmonids. Trackhoes, a small bulldozer, a grader, dump trucks, and front-end loaders will be used in close proximity to each stream. Construction in each stream will occur from June 15 to October 15, 2001 depending on conditions specified in Hydraulic Project Approvals (HPA's) issued by Washington Department of Fish and Wildlife (WDFW).

Specifically, the removal and replacement of culverts will require the following activities:

1. Removal of Riparian Vegetation

Removal of riparian vegetation may be necessary to access each site. The applicant proposes to remove the following amounts of vegetation from each riparian area: 0.06 ha from Brickie Creek; 0.14 ha (or 12 trees) from Cedar Creek; 0.06 ha from Coyote Creek; three conifers and nine hardwoods from John Creek; 0.05 ha from Lockwood Creek; 0.10 ha from Riley Creek; and 0.04 ha from Winkler Creek. Vegetation typically consists of conifer, willow, horsetail, Western sword fern, big leaf maple, Himalayan blackberry, red alder, bracken fern, vine maple, oceanspray, and various grass species (Shapiro and Associates, Inc., 2000).

The applicant will replant the following trees and plants in the riparian area of each creek: five ash, five big leaf maple, 16 Douglar-fir, ten western red cedar, and native shrub species in Brickie Creek (replacement ratio of 18:1); six western red cedar in Cedar Creek (replacement ratio of 1:2); native woody shrubs, four western red cedar, and two Douglas fir in Coyote Creek; five big leaf maple, eight ash, and 12 western red cedar in John Creek (replacement ratio of 2:1); four big leaf maple trees and five western red cedar in Lockwood Creek (replacement ratio of 3:1); five western red cedar, 16 Douglas fir, five red alder, and 11 big leaf maple in Riley Creek (replacement ratio of 3:1); and four

western red cedar, native shrubs, and two big leaf maple in Winkler Creek. Vegetation will be maintained for three years to ensure 80 percent survival based on conditions outlined in the HPA.

2. Excavation of Roadway Fill

Removal of the existing culverts will require excavation of the following amounts of roadway fill material from each riparian area: 382 m^3 from Brickie Creek; 13 m^3 from Cedar Creek; 460 m^3 from Coyote Creek; 1,463 m^3 John Creek; 2.5 m^3 from Lockwood Creek; 5 m^3 from Riley Creek; and 2,878 m^3 from Winkler Creek. Excavated materials will be hauled off-site and safely secured.

Table 1. Project location, listed salmonid species that may occur in the action area, and physical attributes of culverts for seven streams in Clark County, Washington.

Stream	**Major Basin**	**Location of Project Site and Action Area**	**ESU's and Designated Critical Habitat**	**Factors That Impede Fish Passage**	**Dimensions of Existing/New Culverts**
Winkler Creek	Washougal River	-T 2 N, R 4 E, NW 1/4 Section 25 -Action area is creek mile 0 to 1.3 and 1.2 miles of Washougal River below creek mouth.	LCR Chinook, LCR Steelhead, and CR chum	0.6 m drop, high water velocities	0.9 m diameter, 13.7 m long/4.2 m span, 2.6 m rise, 50 m long
Coyote Creek	Washougal River	-T 2N, R 4 E, NE 1/4 S 36 -Action area is 0.5 miles upstream and 2.0 miles downstream of above location	LCR Chinook, LCR Steelhead, and CR chum	Two ft. vertical drop and high water velocities in culvert	1.5 m diameter by 11 m long/3.6 m span x 2.3 m rise, 17 m long
Cedar Creek	Lewis River	-T 5 N, R 3 E, SE 1/4, S 35 -Action area is creek mile 12.0 to 14.8	LCR Chinook, LCR Steelhead, and CR chum	High water velocities, inadequate depth in culvert, and turbulence	??/9 m span by 3 m rise, 18 m long

John Creek (Tributary to Cedar Creek)	Lewis River	-River Mile 0.25 -Action area is creek mile 0 to 0.75 and 1.75 miles of Cedar Creek below mouth of John Creek.	LCR Chinook, LCR Steelhead, and CR chum	High water velocities and inadequate depth in culvert	1.5 m diameter by 24 m long/5.7 m by 3.7 m rise, 27 m long
Lockwood Creek	East Fork Lewis River	-T 5 N, R 2 E, N ½ S 36 -Action area is 0.5 miles downstream and 2.0 miles upstream from above location.	LCR Chinook, LCR Steelhead, and CR chum	0.45 m drop at outlet, high water velocities, and inadequate depth in culvert.	1.2 m diameter, 14 m long concrete culvert/3.6 m span by 2.3 m rise, 13.4 m long
Riley Creek (Tributary to Lockwood Creek)	East Fork Lewis River	-T 5 N, R 1 E, SE 1/4 Section 36 -Action area is creek mile 0.0 to 2.0 and includes 0.5 miles of Lockwood Creek below mouth of Riley Creek.	LCR Chinook, LCR Steelhead, and CR chum	1.2 m drop at outlet, high water velocities	1 m diameter, 18 m long concrete culvert/4.4 m span by 3 m rise, 18 m long
Brickie Creek	East Fork Lewis River	-T 4 N, R 3 E, NE 1/4 Section 18 -Action area is from creek mile 0.0 to 0.5.	LCR Chinook, LCR Steelhead, and CR chum	0.6 m drop at outlet, high water velocities	1 m concrete culvert

3. Diversion of Stream and Removal of Fish

The portion of stream in each construction area will be temporarily isolated and diverted (from two to five weeks) using coffer dams located upstream and downstream of the project site. In each creek, 100 percent of the stream flow will be diverted around the construction area in a pipe following specifications outlined under the Washington State Hydraulic Code RCW 75.20.100. A WDFW biologist will be onsite during the dewatering phase of the project. The stream will be diverted upstream from the culvert and water will slowly recede out of the work area. This method should enable fish to move downstream with the receding water. Electrofishing will be employed to remove any remaining fish. Any captured fish will be transported and released into flowing water (Shapiro and Associates, Inc. 2001).

The temporary bypass pipe will be large enough to pass flows and debris throughout the duration of the project (Shapiro and Associates, Inc. 2000). The following sized diversion pipes will be used: 26 m long and 0.9 m diameter pipe in Brickie Creek; 61 m long and 0.8 m diameter pipe in Cedar Creek; 34

m long and 0.9 m diameter in Coyote Creek; 46 m long and 0.9 m diameter pipe in John Creek; 26 m long and 0.9 m diameter pipe in Lockwood Creek; 44 m long and 0.6 m diameter pipe in Riley Creek; and 37 m long and 0.9 m diameter pipe in Winkler Creek. The bypass pipes will be removed upon completion of the project.

4. Installation of Culverts

In each stream, undersized culverts will be replaced with larger culverts that are designed to accommodate 100 year flow events (Table 1). The design and installation of each culvert is based on guidelines outlined by WDFW (1999) (Shapiro and Associates, Inc. 2001). To increase hydraulic diversity within the culvert, large rocks will be placed in each culvert barrel.

5. Installation of Rock Weirs

The proposed actions may involve in-water construction and the placement of boulders or logs in the stream channel. Generally, construction of rock weirs will occur upstream from the new culvert to control stream gradient (Shapiro and Associates, Inc. 2000). The following types of grade controls will be constructed in each stream: Brickie Creek-five rock weirs will be placed downstream and one rock weir placed upstream from the culvert; Cedar Creek-one rock weir will be placed downstream from the culvert; Coyote Creek-two vortex rock weirs will be placed upstream of the culvert; John Creek-one rock weir will be placed downstream from the culvert and would form an artificial cascade; Lockwood Creek-no placement of grade control structures was reported; Riley Creek-three rock weirs will be placed downstream and one rock weir will be placed upstream from the culvert; and Winkler Creek-four rock weirs will be placed upstream from the culvert. Each structure will incorporate boulders ~0.75 m in diameter

6. Erosion and Silt Control

Clark County and the construction contractor will follow an Erosion and Sediment Control Plan that conforms with the Clark County Erosion Control Ordinance CCC 13.27 (Shapiro and Associates, Inc. 2000). The intent of the plan is to reduce erosion and prevent stormwater from entering the stormwater management facilities. The contractor is responsible for installation and maintenance of temporary silt fences, jute matting, and a temporary sediment barrier. Additionally, overburden materials will be stored off-site.

II. STATUS OF SPECIES AND CRITICAL HABITAT

A. Lower Columbia River Chinook Salmon

Lower Columbia River chinook salmon were listed as a threatened species under the ESA on March

24, 1999 (64 Fed. Reg. 14309). Critical habitat for LCR chinook was designated on February 16, 2000 (65 Fed. Reg. 7774). In Washington State, the LCR chinook ESU includes all naturally spawned chinook populations from the mouth of the Columbia River to the Cascade Crest. Critical habitat in Washington includes all river reaches accessible to chinook salmon in Columbia River tributaries between the Grays River and White Salmon River.

Factors for decline of the LCR chinook were attributed to habitat degradation associated with forest practices, urbanization, hydroelectric dams, and agricultural practices. The LCR chinook also have been negatively influenced by genetic introgression from artificial propagation (63 Fed. Reg. 11495; March 9, 1998).

B. Columbia River Chum Salmon

Columbia River chum salmon were listed as threatened under the ESA on March 25, 1999 (64 Fed. Reg. 14507). Critical habitat was designated on February 16, 2000 and includes accessible reaches of the Columbia River (including estuaries and tributaries) downstream from Bonneville Dam to the river mouth. Critical habitat includes all river reaches accessible to listed chum salmon (including estuarine areas and tributaries) in the Columbia River downstream from Bonneville Dam, excluding Oregon tributaries upstream of Milton Creek at river km 144 near the town of St. Helens. Also included are adjacent riparian zones. Excluded are tribal lands and areas above specific dams or above longstanding, naturally impassable barriers (i.e., natural waterfalls in existence for at least several hundred years). Major river basins containing spawning and rearing habitat for this ESU comprise approximately 4,426 square miles in Oregon and Washington. In Washington, the following counties are partially or entirely within these basins: Clark, Cowlitz, Lewis, Pacific, Skamania, and Wahkiakum.

The factors for decline in naturally reproducing chum salmon populations are primarily attributed to habitat degradation, water diversions, harvest, dams, loss of estuarine habitats, and artificial propagation. Presently, there are no recreational or commercial fisheries for chum salmon in the Columbia River although some fish are incidentally taken in the gill-net fisheries for coho and chinook salmon.

C. Lower Columbia River Steelhead

Lower Columbia River steelhead trout were listed as threatened under the ESA on March 19, 1998 (63 Fed. Reg. 13347). Critical habitat for steelhead was designated on February 16, 2000 (65 Fed. Reg. 7775). In Washington, the LCR steelhead ESU includes winter and summer steelhead in tributaries to the Columbia River between the Cowlitz River and Wind River, inclusive (Busby et al. 1996).

Critical habitat includes all river reaches accessible to listed steelhead in Columbia River tributaries between the Cowlitz and Wind Rivers in Washington and the Willamette and Hood Rivers in Oregon,

inclusive. Also included are adjacent riparian zones, as well as river reaches and estuarine areas in the Columbia River from a straight line connecting the west end of the Clatsop jetty (south jetty, Oregon side) and the west end of the Peacock jetty (north jetty, Washington side) upstream to the Hood River in Oregon. Excluded are tribal lands and areas above specific dams or above longstanding, naturally impassable barriers (i.e., natural waterfalls in existence for at least several hundred years). Major river basins containing spawning and rearing habitat for this ESU comprise approximately 5,017 square miles in Oregon and Washington. In Washington, the following counties are partially or entirely within these basins (or contain migration habitat for the species): Clark, Cowlitz, Lewis, Pacific, Skamania, and Wahkiakum.

Nineteen stocks of steelhead within the LCR ESU were identified as at risk of extinction or of special concern (Nehlsen et al. 1991). There are several factors for decline of LCR steelhead including habitat degradation, overharvest, predation, hydroelectric dams, hatchery introgression, the eruption of Mount Saint Helens, and other natural or human-induced factors. Urbanization, forestry, water diversions, and mining also greatly reduced habitat complexity or eliminated habitat. There is no tribal or direct commercial fishery on steelhead although incidental catch of wild steelhead may occur in lower Columbia River fall gill-net fishery (WDFW 1992).

Recent and historical information related to life histories and factors for decline of steelhead, chinook, and chum are summarized in Busby et al. (1996), Myers et al. (1998), and Johnson et al. (1997).

Table 2. Information related to the listing status, life histories, and critical habitats for listed salmonids in Washington State.

Fish Species and ESU	**Threatened or Endangered**	**Listing Status**	**Critical Habitat**	**Citations for Biological Information**
Lower Columbia River Chinook Salmon	Threatened	64 Fed. Reg. 14308; 3/24/99	65 Fed. Reg. 7774; 2/16/00	Myers et al. 1998; Healey 1991
Lower Columbia River Steelhead	Threatened	63 Fed. Reg. 13347; 3/19/98	65 Fed. Reg. 7775; 2/16/00	Busby et al. 1996; NMFS 1996
Columbia River Chum Salmon	Threatened	64 Fed. Reg. 14507; 3/25/99	65 Fed. Reg. 7774; 2/16/00	Johnson et al. 1997

III. 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 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 defining the biological requirements of the listed species, and evaluating the relevance of the environmental baseline to the species' current status.

Subsequently, 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 mortality attributed 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 result in jeopardy, NMFS must identify reasonable and prudent alternatives for the action.

Furthermore, NMFS evaluates whether the action, directly or indirectly, is likely to destroy or adversely modify the listed species' 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.

For the proposed action, NMFS's 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 habitat elements including spawning, rearing, feeding, sheltering, or migration within the action area, when viewed in relation to the status of habitat throughout the ESU.

A. Biological Requirements

The relevant biological requirements are those necessary for 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.

Essential features of critical habitat for steelhead, chinook, and chum include clean spawning substrate, high water quality, appropriate water quantity, adequate water temperatures, water velocity, cover/shelter, food, riparian vegetation, and safe passage conditions to and from spawning and rearing areas.

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. Status of the Species within Action Area

The paucity of data for specific streams makes it difficult to determine the status of each species within each action area. Consequently, NMFS addressed the relative status of each ESU by major drainage and included site specific information when data were available.

1. Summer and Winter Steelhead

Wild summer steelhead in the East Fork Lewis, Lewis, and Washougal River Basins are distinct stocks. The upstream migration of summer steelhead is from May through November and spawning occurs from early March to June. Populations of summer steelhead from the Lewis River Basin and Washougal River Basin are considered depressed and in low abundance. The escapement goal for the East Fork Lewis River summer steelhead is 814 adults. Few, if any, wild summer steelhead remain in the Washougal River (Nehlsen et al. 1991).

Winter steelhead inhabit the East Fork Lewis River, Lewis River, and Washougal River. The upstream migration of winter steelhead is from December through April, and spawning generally occurs from early March to early June. In the East Fork Lewis River, spawning escapements ranged from 72 to 282 adults from 1986 to 1992, below the escapement goal of 204 wild winter steelhead. The spawner escapement goal in the Washougal River is 841 wild winter steelhead (WDFW 1992). Summer and winter steelhead likely inhabit Brickie, Cedar, Coyote, John, Lockwood, Riley, and Winkler Creeks (Shapiro and Associates, Inc. 2000).

Steelhead eggs may incubate for 1.5 to 4 months before hatching depending on water temperature (61 Fed. Reg. 41542; August 9, 1996). Bjornn and Reiser (1991) noted that steelhead eggs incubate about 85 days at 4˚C and 26 days at 12˚C to reach 50% hatch. Nickelson et al. (1992) stated that steelhead eggs hatch in 35 to 50 days depending upon water temperature.

2. Fall and Spring Chinook

In the East Fork Lewis River, two distinct stocks of fall chinook inhabit the river. The early portion of the run spawns in October and the later portion spawns from November through January. Natural spawner escapements averaged 598 fish from 1967 to 1991 (WDFW 1992). It is unknown as to whether chinook inhabit Brickie Creek, Lockwood Creek, and Riley Creek (Shapiro and Associates, Inc. 2000).

Fall chinook typically enter the Washougal River from August through September and spawning occurs from October to November. In the Washougal River, escapements of chinook averaged 1,842 fish from 1967 to 1991 (ranged from 70 to 4,578). Chinook likely occur in the Washougal River immediately downstream from Coyote and Winkler Creeks although it is unlikely that they inhabit those creeks (Shapiro and Associates, Inc. 2000).

Historically, native spring chinook occurred in the Lewis River Basin. Adult chinook migrate through the Columbia River from late January through May, and migration into the Lewis River and its tributaries occurs from March to June. Chinook spawn from late August to early October between the Merwin Dam and the Lewis River hatchery. From 1980 to 1991, natural spawner escapement averaged 2,194 adults (ranged from 345 to 6,939). At present, few if any spring chinook return to the East Fork Lewis River (WDFW 1992). Chinook may occur in Cedar Creek although it is unlikely that they inhabit John Creek.

3. Chum

The location of each project occurs within areas designated as critical habitat for CR chum salmon. Chum salmon may enter the Columbia River in September. In the Columbia River Basin, chum salmon production primarily occurs in the Grays River Basin, Hardy Creek, and Hamilton Creek (WDFW 1994) although fry were observed in the lower portion of the East Fork Lewis River in May 2000 (personal communication on 8/17/00, Dan Rawding, WDFW). Current incidental catch of chum salmon in the lower Columbia River commercial fishery has been less than 100 fish since 1993 (WDFW 2000). It is unlikely that chum salmon inhabit any of the creeks in this project.

C. Factors Affecting the Species Environment Within the Action Area

The biological requirements of the listed species are not being met under current environmental baseline conditions throughout each ESU. To improve the status of LCR steelhead, LCR chinook, and CR chum, significant improvements in the conditions of critical habitat are necessary.

The major factors affecting listed salmonids in the action area are barriers to fish passage and degraded water quality. To analyze and describe the effects of these factors on listed species, NMFS uses the MPI. 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. Barriers to Fish Passage

In the seven streams, fish passage is impeded by inadequate water depths, velocity barriers, or barriers at the culvert outlet. Consequently, habitat availability is reduced in each stream. At present, Cedar Creek supports most of the remaining spawning and rearing habitat in the Lewis River Basin system for steelhead and coho. Seasonal flow barriers in the culvert of Cedar Creek prevent migration and eliminate access to spawning habitat. The culverts in Brickie Creek, John Creek, Lockwood Creek, Riley Creek, and Winkler Creek are complete barriers to fish passage that prevent salmonids from using the upper portions of each watershed. Fish passage through the culvert on Coyote Creek is only passable during high flow conditions (Shapiro and Associates, Inc. 2000).

2. Degraded Water Quality

Current factors that are attributed to degraded habitat quality in Cedar Creek include elevated water temperatures and the presence of fine sediments in spawning areas (Washington Conservation Commission 2000). There are no water quality concerns in the Washougal River or Coyote Creek based on Washington Department of Ecology's (WDOE) 303(d) list (Shapiro and Associates, Inc. 2000). Lockwood Creek and the East Fork Lewis River are currently identified on the WDOE 303(d) list for elevated water temperatures and fecal coliforms. The other streams in this project were not included in WDOE's 303(d) list.

D. Environmental Baseline

The environmental baseline represents the current set of basal conditions to which the effects of the proposed action are then added. Environmental baseline is defined as "the past and present impacts of all Federal, State, and 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 informal ESA section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation process" (50 C.F.R 402.02). The term "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".

The NMFS is informed of a myriad of factors that negatively influence current baseline conditions in the Lewis River, East Fork Lewis River, Washougal River, and their tributaries. Generally, factors for decline of listed salmonids include urbanization, forest practices, agricultural practices, water diversions, mining, hydroelectric dams, and artificial propagation.

The primary factor limiting habitat in the Lewis River is the presence of dams that now prevent access to 80% of anadromous habitat. Most of the lower floodplain has been diked and disconnected from the river (Washington Conservation Commission 2000). Additionally, riparian conditions and the abundance of woody debris have been reduced in most portions of the basin. Extensive hatchery production has occurred in the Lewis River. Releases of spring chinook are made from the Speelyai and the Lewis River hatcheries. Spring chinook eggs were collected from the river as early as 1926 (WDFW 1992). The North Fork Lewis River has been planted with winter steelhead since 1954 and with summer steelhead since 1964.

In the East Fork Lewis River, construction of dikes and development within the floodplain have largely disconnected the river from its floodplain (Washington State Conservation Commission 2000). The presence of a gravel mine in the lower portion of river has negatively influenced habitat conditions in the river. Overall, the Commission recommends that continued efforts be made to reduce water temperatures, improve water quality, and enhance limited off-channel and floodplain habitats in the river. No salmon hatcheries exist on the East Fork Lewis River although hatchery steelhead have been planted in the river since 1954 (WDFW 1992). In 1986, release of wild steelhead was required by WDFW (WDFW 1992).

In upper portions of the East Fork Lewis River, road construction, mining, and commercial thinning of forests have negatively influenced habitat conditions. Additionally, past forest fires dramatically altered the landscape in the upper East Fork Lewis River (Babb et al. 1995).

There is a paucity of information related to the environmental baseline in the Washougal River. There is concern that genetic introgression of wild and hatchery summer steelhead has occurred. The Skamania hatchery has been releasing steelhead into the river since 1950 (WDFW 1992). There have been angling restrictions that require the release of all wild steelhead in the Washougal River since 1991.

IV. EFFECTS OF THE PROPOSED ACTION

The proposed actions are likely to adversely affect LCR chinook, LCR steelhead, and CR chum as determined by the COE in a letter to NMFS that was received on September 18, 2000. The 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”. “Indirect effects” are defined as those that are caused by the proposed action at a later time, but still are reasonably certain to occur (50 C.F.R 402.02).

To evaluate direct and indirect effects associated with replacement of culverts, it is useful to describe elements of the life history of each species. The timing of construction activities (June to October) may

overlap with the upstream migration of steelhead, chinook, and chum. Additionally, instream construction may overlap with the onset of chinook spawning and may overlap with the incubation, emergence, and rearing of steelhead and chinook.

A. 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 interrelated to or interdependent on the action under consideration (and not included in the environmental baseline or treated as indirect effects) are not evaluated.

The magnitude of effects associated with this project are influenced by the duration of construction activities (up to five weeks) and whether salmonids or redds are present. For each proposed project, there will be long term beneficial effects and short term negative effects. Any negative effects in the action area typically will be limited to areas downstream of the construction area.

1. Fish Passage

The replacement of culverts in Clark County streams will result in improved conditions when added to the environmental baseline. Installation of new culverts will provide fish passage and increased access to aquatic habitats. The increased lineal length of accessible habitat in each stream will be: 3.4 miles in Brickie Creek, 8.0 miles in Cedar Creek, 1.6 miles in Coyote Creek, 2.0 miles in John Creek, 2.0 miles in Lockwood Creek, 2.0 miles in Riley Creek, and 1.0 mile in Winkler Creek.

2. Water Quality

The expected negative impacts associated with installation of rock weirs, grading, excavation, and installation of culverts include temporary increases in turbidity and sediment levels during construction. Increased turbidity and sediment levels are likely to exceed natural background levels in each stream throughout the period of construction. Short-term negative effects include: the deposition of fine sediment that may significantly degrade spawning habitat and reduce survival of steelhead from egg to emergence (Phillips et al. 1975); sublethal effects from suspended sediments (e.g., elevated blood sugars and cough rates) (Servizi and Martens 1992); physiological stress and reduced growth; loss of intergravel cover for fish from increased sediment levels (Spence et al. 1996); avoidance of suspended sediments by juvenile salmonids (Bisson and Bilby 1982; Servizi and Martens 1992); and elevated turbidity levels that can reduce the ability of salmonids to detect prey and may cause gill damage (Sigler 1980; Lloyd et al. 1987). Moderate turbidity levels (11 to 49 NTU's) also may cause juvenile steelhead and coho to leave rearing areas (Sigler et al. 1984). Additionally, short-term pulses of suspended sediment have been shown to influence territorial, gill-flaring, and feeding behavior of salmon under laboratory conditions (Berg and Northcote 1985).

The negative effects of construction activities on water quality will be minimized through recommended restrictions in timing of construction (e.g.-summer low-flow conditions) and the use of erosion control measures (e.g. silt fences and stream diversions) as outlined in the HPA, BA, and terms and conditions of this BO. It is expected that listed species present during construction will seek refugia or will avoid portions of stream with high turbidity and sediment levels. Overall, the increased turbidity and sediment are not expected to influence the environmental baseline over the long term.

3. Disturbance of Streambed

The proposed actions that will disturb the substrate of each creek include excavation, removal of existing culverts, placement of rock weirs, and back-filling. It is unlikely that the instream work will affect spawning habitat although equipment driven in the stream may harm fish or eggs. For instance, workers or equipment in the stream channel may result in trampling of eggs when the eggs are in the gravel (Roberts and White 1992). Additionally, the use of heavy equipment in riparian areas may cause compaction of soils resulting in reduced infiltration at the project site.

4. Diversion of Stream and Removal of Fish

The diversion of each stream may result in the stranding of eggs, fry, and juvenile salmonids. Additionally, the diversion of water in the channel will impede movements of salmonids. The impacts associated with dewatering are expected to be reduced through the use of sequential dewatering that will enable 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 of each stream, recolonization rates are expected to be rapid due to the small size of the disturbance and relatively short time period of construction activities.

Electrofishing may result in direct mortality of young-of-the-year or juvenile salmonids. Physical injuries from electrofishing include internal hemorrhaging, spinal misalignment, or fracture of vertebrae. The likelihood of injury or mortality will be reduced by using a qualified WDFW biologist that ensures safe capture, handling, and release of fish.

B. 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 the effects of 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 be a logical extension of the proposed action.

The indirect effects that are caused by or result from the replacement of culverts include: improved passage conditions for salmonids; the removal of vegetation; the opportunity for the re-establishment of locally adapted populations of steelhead and chinook; and changes in fluvial transport and channel morphology.

1. Fish Passage

The improvement of fish passage conditions through the installation of larger culverts will contribute to the recovery of listed fish and should not further degrade environmental baseline conditions in the action area. Significant benefits associated with improved fish passage conditions include increased access to diverse habitats, free movement of juvenile salmonids, and increased foraging opportunities. The installation of culverts that are passable to salmonids will greatly improve biotic linkages and increase genetic exchange. Additionally, the removal of impassable barriers will enable the movement of other fishes and drift of aquatic insects (WDFW 1999).

2. Removal of Riparian Vegetation

The indirect effects associated with the removal of vegetation from riparian areas are expected to be localized and minimal. Ultimately, replanting of vegetation will maintain the environmental baseline over the long term.

Riparian vegetation links terrestrial and aquatic ecosystems, influences channel processes, contributes organic debris to streams, stabilizes streambanks, and modifies water temperatures (Gregory 1991). Removal of vegetation may result in increased water temperatures that would further degrade already impaired water temperatures in some action areas. Elevated water temperatures may influence numerous attributes of salmonids including physiology, growth and development, life history patterns, disease, and competitive predator-prey interactions (Spence et al. 1996). Loss of vegetation also may reduce allochthonous inputs to the stream. Woody debris provides essential functions in streams including the formation of habitats. Additionally, the removal of vegetation decreases streambank stability and resistance to erosion.

To replace lost function of riparian areas, all disturbed areas will be revegetated with native conifers, native deciduous trees, and shrubs. Replanting native conifers in the riparian area may result in a net benefit to the action area despite the temporal loss of more mature trees at the site.

3. Changes in Fluvial Transport and Channel Morphology

The installation of larger sized culverts will increase the fluvial transport of sediment important in the

formation of diverse habitats. Larger culverts also will enable additional recruitment of debris to downstream reaches when compared to current conditions. Additionally, the use of larger culverts will reduce the probability of catastrophic damage to aquatic habitats that is often associated with undersized culverts (e.g.-during extreme natural evenings, debris accumulation, beaver dams, etc.). The installation of larger culverts also should increase the stability of the streambed. The effects described above are considered to be beneficial to listed salmonids and critical habitat.

Construction of rock weirs may cause significant modifications of the stream channel and may eliminate natural meanders thereby reducing habitat diversity. Rock weirs are expected to backfill with natural stream substrate.

4. Influence on Locally Adapted Populations

In the seven streams in Clark County, NMFS believes that the culvert replacements and subsequent increase in upstream habitat serves to re-establish the presence of locally adapted salmonid populations. Overall, the improvement in baseline passage conditions will contribute to increased survival and recovery of listed species.

The improvement in passage conditions for salmonids provides an immediate benefit that is likely to increase the numbers of fish moving upstream and downstream from portions of stream that previously were inaccessible. The replacement of culverts likely will enhance genetic diversity and increase the capability of salmonids to adapt to various environmental conditions.

When sufficient freshwater habitat diversity exists, single species of salmonids may exhibit wide variation in life history and morphometric traits (e.g., Blair et al. 1993). These traits are often unique to a specific geographic location and are referred to as locally adapted traits. Locally adapted subpopulations maintain reserves of genetic information that allow salmonids to recolonize disturbed areas and adapt to environmental changes (Milner and Baily 1989). The loss of locally adapted populations through habitat degradation (e.g. barriers at culverts) may significantly reduce a species ability to respond to extinction mechanisms (Waples 1991). The increased accessibility to diverse habitats fosters the development and maintenance of locally adapted subpopulations, and may reduce the likelihood of extinction for endangered species.

C. Effects on Critical Habitat

The proposed actions will not adversely modify designated critical habitat for LCR chinook, LCR steelhead, and CR chum. The NMFS designates critical habitat based on physical and biological features that are essential to each listed species. Essential features for designated critical habitat include stream substrate, water quality, water quantity, water temperature, water velocity, food, riparian vegetation, access, and safe passage conditions for fish.

The proposed projects will maintain or improve the functional quality of most habitat indicators. Improvements in baseline habitat conditions will result from the removal of barriers to fish passage and the subsequent increase in habitat diversity. The short-term negative effects associated with changes in water quality and macroinvertebrate communities are not expected to have a lasting effect on baseline conditions.

In terms of essential habitat features, the primary direct effect of this action will be a permanent improvement in passage conditions at each culvert. NMFS believes that the increase in critical habitat will assist in the survival and recovery of LCR chinook, LCR steelhead, and CR chum.

D. 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 402.02). 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. Future federal actions related to hydroelectric systems, hatcheries, fisheries, and land management activities will be reviewed through separate section 7 consultations.

NMFS assumes that future private and State actions will occur at similar intensities as in recent years. At present, extensive development in Clark County may influence future watershed conditions in each stream. Future impacts include, but are not limited to altered stream hydrology, degraded water quality, increased impervious surface, and loss of riparian vegetation. Based on the listing of LCR chinook, LCR steelhead, and CR chum, NMFS expects that project proponents will curtail or avoid actions that would result in take of listed species.

V. CONCLUSION

The NMFS concludes that the proposed actions are not likely to jeopardize the continued existence of LCR chinook, LCR steelhead, and CR chum or result in destruction or adverse modification of designated critical habitat. The determination of no jeopardy was based on the current status of the listed species, the environmental baseline for the proposed action area, and the effects of the proposed action.

Overall, the installation of the seven culverts will benefit LCR chinook, LCR steelhead, and possibly CR chum. The new culverts will greatly increase habitat accessibility and natural habitat forming processes throughout the lower and upper reaches of each creek. The project also will contribute to the re-establishment of locally adapted salmon and steelhead subpopulations. NMFS believes that the proposed activities will move towards the attainment of properly functioning conditions in the action area of each stream.

The NMFS anticipates that there is a more than a negligible chance that incidental take of LCR chinook, CR chum, and LCR steelhead will occur during construction. The risk of incidental take will be minimized by the implementation of conservation measures, Terms and Conditions, and Best Management Practices. Overall, the long-term benefits of this project will outweigh the temporary degradation of water quality and disturbance of the streambed.

VI. REINITIATION OF CONSULTATION

Consultation must be reinitiated if: the amount or extent of take specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; new information reveals effects of the action may affect listed species in a way not previously considered; the action is modified in a way that causes an effect on listed species that was not previously considered; or, a new species is listed or critical habitat is designated that may be affected by the action (50 C.F.R 402.16).

VII. 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 of listed species without a specific permit or exemption (50 C.F.R 217.12). "Harm" is further defined by the NMFS Final Rule to include 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". "Harass" is defined as actions that created the likelihood of injuring listed species to such an extent as to significantly alter normal behavior patterns which include, but are not limited to breeding, feeding, and sheltering. 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 impact of any incidental taking of endangered or threatened species. It 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 Anticipated

The NMFS anticipates that the proposed actions will result in incidental take of juvenile and/or adult

salmonids and their habitat. The numerical amount of take that is expected to occur is difficult to determine, and therefore has not been quantified. NMFS believes that take may occur through harm, injury, or mortality associated with in-water construction (increased turbidity and sediment), removal of fish (electrofishing), and stranding of fish (dewatering). The extent of take is limited to a distance of 0.5 miles upstream and two miles downstream from each culvert. Reasonable and Prudent Measures were developed to address and minimize the extent of take.

B. Reasonable and Prudent Measures

The NMFS believes that the following reasonable and prudent measures (RPM's) are necessary and appropriate to minimize take of LCR chinook, LCR steelhead, and CR chum:

1. To minimize negative impacts in the riparian area and stream channel, the applicant shall implement Best Management Practices as outlined in the BA and adhere to the conditions in the HPA.

2. In each stream, the applicant shall safely remove fish from each construction area and shall conduct redds surveys in the action area.

3. The applicant shall maintain each culvert over the long term to ensure the safe passage of fish. The applicant also shall monitor the amount of woody debris located at each culvert.

C. Terms and Conditions

To be exempt from the prohibitions of ESA section 9, the COE must comply with the terms and conditions that implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

RPM #1 will be implemented using the following terms and conditions:

a. The applicant shall adhere to all conditions outlined in the HPA's issued by WDFW (HPA Log Numbers 00-E2406-01; 00-E2407-01; 00-E2408-01; 00-D5665-01; 00-E2442-01; 00-E2405-01; and 00-D5664-01).
b. The applicant shall ensure that all culverts were designed according to WDFW (1999).
c. The applicant shall follow a temporary erosion and sediment control plan. All erosion control measures shall be in place and functional prior to the onset of construction. All disturbed slopes shall be stabilized. All erosion control measures shall be inspected daily by the contractor. In the event of high water or failure of control measures, all work shall cease.
d. The applicant shall follow a spill prevention, control, and containment plan. Work shall immediately cease in the event of a spill.

e. The applicant shall ensure that all heavy equipment will be clean and free of external oil, fuel, and other pollutants.
f. Placement of rocks or components of the culvert will be conducted by a qualified heavy equipment operator.
g. No fertilizer shall be used within 61 m of a stream.
h. No machinery shall operate in the wetted channel.
i. Use of heavy equipment shall be avoided in the stream and riparian zones to minimize soil compaction and disturbance. Existing paths and roadways will be used for access to project sites.
j. The applicant shall notify NMFS by telephone regarding the start date of construction.
k. Any device used for diverting water from a fish-bearing stream shall be equipped with a fish guard to prevent passage of fish into the diversion device. The pump intake shall be screened to prevent fish from entering the system (See HPA).
l. The applicant will ensure that trees removed during construction will be placed adjacent to, or in the stream channel.
m. The applicant shall monitor newly planted trees on an annual basis for three years. All failed plantings will be replanted.

RPM #2 will be implemented using the following terms and conditions:

a. A biologist shall conduct visual surveys to ensure that there are no redds or adult fish in the vicinity of the action area. Surveys shall be conducted on a weekly basis beginning one week prior to the onset of construction and continuing through the end of construction. Work shall cease if redds are detected.
b. The applicant will capture fish using electrofishers. Fish shall be safely transported from the construction area to a point located immediately downstream.

RPM #3 will be implemented using the following terms and conditions:

a. On an annual basis, Clark County shall inspect each culvert once during low-flow and once during high-flow conditions. Each culvert also will be inspected after major high water events. Each culvert shall be able be able to pass all life history stages of salmonids. Any debris accumulated at the inlet of a culvert shall be removed and placed within the stream channel immediately downstream of the culvert. If more significant repairs are required, reinitiation of consultation will occur and a HPA will be obtained.

VIII. ESSENTIAL FISH HABITAT CONSULTATION

A. Background

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

B. Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires the inclusion of EFH descriptions in Federal fishery management plans. In addition, the MSA requires Federal agencies to consult with NMFS on activities that may adversely affect EFH.

EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (MSA §3). The Pacific Fisheries Management Council (PFMC) has designated EFH for federally-managed Pacific salmon fisheries (PFMC 1999).

The requirements of section 305(b) of the MSA (16 U.S.C. 1855(b)) provide that:

- Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;
- NMFS shall provide conservation recommendations for any Federal or State activity that may adversely affect EFH;
- 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.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. 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 undertaking, permitting or funding activities that may adversely affect EFH, regardless of its location.

C. Identification of Essential Fish Habitat

A description and identification of EFH for salmon is found in Appendix A of Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Salmon EFH includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to chinook *(Oncorhynchus tshawytsch*a), coho (*O. kisutch*), and Puget Sound pink salmon (*O. gorbuscha*) in Washington, Oregon, Idaho, and California, except above the impassable barriers identified by the Council (PFMC 1999). Chief Joseph Dam, Dworshak Dam, and the Hells Canyon Complex (Hells Canyon, Oxbow, and Brownlee Dams) are among the listed man-made barriers that represent the upstream extent of the Pacific salmon fishery EFH. Salmon EFH also excludes areas upstream of longstanding naturally impassable barriers (i.e., natural waterfalls in existence for several hundred years).

D. Proposed Actions

The proposed actions are detailed above in Section I. The action area for each creek includes an area that extends upstream to the farthest extent of salmonid migration and extends two miles downstream from each culvert (Table 1).

E. Effects of the Proposed Actions

As described in Section IV, these activities may result in short-term impacts and long-term benefits to listed species and their habitats. The project occurs within the area designated as EFH for various life stages of chinook and coho salmon.

F. Conclusion

Information submitted by the COE in seven BA's and supplemental correspondence is sufficient to conclude that this project, as proposed, is likely to adversely affect designated EFH for Pacific salmon.

G. EFH Conservation Recommendations

The Reasonable and Prudent Measures and the Terms and Conditions outlined above in Section VII are applicable to Pacific salmon EFH. Therefore, NMFS recommends that they be adopted as EFH conservation measures. Should the COE adopt and implement these recommendations, potential adverse impacts to EFH would be minimized.

H. Statutory Response Requirements

The MSA and Federal regulation (50 C.F.R Section 600.920) require Federal action agencies to provide a written response to EFH Conservation Recommendations within 30 days of receipt. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse

impacts of the activity. If the response is inconsistent with NMFS' conservation recommendations, the reasons for not implementing them must be included.

I. Consultation Renewal

The COE must reinitiate EFH consultation with NMFS if either action is substantially revised or new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 C.F.R 600.920).

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