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

Refer to:
2004/00352

July 21, 2004

Mr. Fred Patron
U.S. Department of Transportation
Federal Highway Administration
The Equitable Center, Suite 100
530 Center Street NE
Salem, Oregon 97301

Re: Endangered Species Act Section 7 Formal Conference and Magnuson-Stevens Fishery and Conservation Management Act Essential Fish Habitat Consultation for the Pioneer Mountain to Eddyville Highway Construction Project, Yaquina River Basin, Lincoln County, Oregon (6th Field HUC - 171002040104)

Dear Mr. Patron:

Enclosed is a conference opinion (Opinion) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act (ESA) on the effects of the proposed Pioneer Mountain to Eddyville Highway Construction Project in Lincoln County, Oregon. In this Opinion, NOAA Fisheries concludes that the proposed action is not likely to jeopardize the continued existence of Oregon Coast (OC) coho salmon (*Oncorhynchus kisutch*), which are proposed for listing as threatened under the ESA. As required by section 7 of the ESA, NOAA Fisheries included reasonable and prudent measures with nondiscretionary terms and conditions that are necessary to minimize the impact of incidental take associated with this action. However, the incidental take statement does not become effective until NOAA Fisheries adopts this conference opinion as a biological opinion, after the listing is final. Until the time that the species is listed, the prohibitions of the ESA do not apply.

This document also serves as consultation on essential fish habitat pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and implementing regulations (50 CFR Part 600). NOAA Fisheries concludes that the proposed action may adversely affect designated EFH for Pacific salmon, groundfish and coastal pelagic species. As required by section 305(b)(4)(A) of the MSA, included are conservation recommendations that NOAA Fisheries believes will avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from the proposed action. As described in the enclosed consultation, 305(b)(4)(B) of the MSA requires that a Federal action agency must provide a detailed response in writing within 30 days after receiving an EFH conservation recommendation.

Please direct any questions regarding this consultation to Tom Loynes, fisheries biologist, in the Oregon State Habitat Office at 503.231.6892.

Sincerely,

Russell M Strach for

D. Robert Lohn
Regional Administrator

cc: Tom Arnold, CH2MHILL
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Endangered Species Act - Section 7 Consultation
Biological Opinion

&

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Pioneer Mountain to Eddyville Highway Construction Project
Yaquina River Basin, Lincoln County, Oregon
6th Field HUC - 171002040104

Agency:	Federal Highway Administration
Consultation Conducted By:	NOAA's National Marine Fisheries Service, Northwest Region
Date Issued:	July 21, 2004
Issued by:	Russell M Strach for _____ D. Robert Lohn Regional Administrator
Refer to:	**2004/00352**

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1. INTRODUCTION

The Endangered Species Act (ESA) of 1973 (16 USC 1531-1544), as amended, establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with U.S. Fish and Wildlife Service and NOAA's National Marine Fisheries Service (NOAA Fisheries), as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their designated critical habitats. This conference opinion (Opinion) is the product of an interagency conference pursuant to section 7(a)(2) of the ESA and implementing regulations found at 50 CFR 402.

The analysis also fulfills the essential fish habitat (EFH) requirements under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan. Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2)).

1.1 Background

On March 18, 2004, NOAA Fisheries received a letter from the Federal Highway Administration (FHWA) requesting formal consultation pursuant to section 7(a)(2) of the ESA, and EFH consultation pursuant to section 305(b)(2) of the MSA for the Pioneer Mountain to Eddyville Highway Construction Project in Lincoln County, Oregon (Project). Weekly meetings have been held between NOAA Fisheries, Oregon Department of Transportation (ODOT), and the consultant to assure that all of the information needed would be provided with the biological assessment (BA). A BA describing the proposed action and its potential effects was submitted with the letter on March 18, 2004. NOAA Fisheries considered the information sufficient to initiate formal consultation. In the BA, the FHWA determined the proposed action was likely to adversely affect the Oregon Coast (OC) coho salmon, a species proposed for listing as threatened under the ESA. The FHWA also found the proposed project may adversely affect designated EFH.

1.2 Proposed Action

The proposed action is the funding of a highway realignment project by the FHWA. The footprint of this Project exists in the upper Yaquina River basin. Construction activities will include bridge removal and replacement, culvert removal and replacement, riparian and vegetation removal, placement of fill material, bank modification, cofferdam (dams that isolate elements of a construction project from the wetted channel) installation and removal, new impervious highway surface, reforestation and vegetation plantings. Specific elements of the proposed Project are described below.

The Project is a realignment of a portion of U.S. Highway 20, which connects the cities of Newport and Corvallis, Oregon. The Project begins at the eastern base of Pioneer Mountain (MP 14.68) and extends approximately 16 kilometers (km) east to MP 24.75 near Eddyville, Oregon.

The proposed Project will be contracted as a design/build with performance standards. Designs presented in this document are to determine feasibility and impacts associated with varying potential designs. The final contractor will be able to alter the designs within certain agreed-to limitations and performance expectations. New designs during the final design process are expected to trigger additional consultation.

The Project was further divided into segments contained within seven subbasins. The original two units are as follows:

Unit 1

Unit 1 starts at the eastern base of Pioneer Mountain, Station 638+50 (MP 14.68) and extends to the east side of the Yaquina River at Station 748+00, roughly 3.2 km from the westerly end of the Project. Unit 1 will generally follow the alignment of the existing roadway. Deviations from the existing roadbed are large enough that much of the existing roadway will be obliterated. The Simpson Creek and Yaquina River subbasins fall within this unit.

Structures

Four bridges are planned for Unit 1 (Simpson Creek Bridge, Simpson Creek Bridge at Elk City Road, Railroad Overcrossing, and Yaquina River Bridge). Several culverts conveying tributaries and small drainages are incorporated in the plans. Several retaining walls of various types are proposed. These are described later in this section, with information grouped by subbasin. Some features may change as a result of the design/build process, but will be subject to performance standards in the contract.

The proposed Project requires a substantial volume of earthwork. During the construction of Unit 1, 1,211,819 cubic meters (m^3) of material will be cut, of which 366,986 m^3 subsequently will be used as fill, leaving 844,833 m^3 as excess. Selective fill sites are used to dispose of the excess material, the largest of which is the Yaquina Meadow area. Table 2-2 in the BA summarizes the total earthwork for Unit 1.

There will be several major cuts and fills on this Project as a result of the steep and varied topography of the area. Figure 2-2 in the BA displays the Unit 1 vertical alignment profile. Cuts and fills are described by subbasin later in this section.

The most significant site is Yaquina Meadow, which will receive 802,018 m^3 of excess material.

Virtually all of the existing roadway will be obliterated from Sams Creek Road to the intersection of the old highway with the new highway (Station 727). Obliteration means removal of the asphalt or concrete and rehabilitation of the abandoned roadway.

A salmon viewing and educational area is planned on Simpson Creek between Stations 670+00 and 672+00.

Unit 2

Unit 2 begins at the terminus of Unit 1, Station 748+00, and extends to east of Eddyville at Station 1016+00 (MP 24.75). Unit 2 will create a new alignment for nearly its entire length, until it rejoins the existing highway on its eastern end at Station 1016+00. The Trapp Creek, Cougar Creek, Crystal Creek, Eddy Creek, and Little Elk Creek subbasins fall within Unit 2. Approximately 91 m of roadway within the Yaquina River subbasin are included in Unit 2. The existing roadway is approximately 16 km long. Construction of the Build Alternative, Units 1 and 2, will result in a roadway with a straighter alignment and fewer curves. Consequently, the length of the rebuilt roadway between Project termini will be shortened to 11.7 km.

Table 1. Yaquina River Basin Impervious Surface Area Increase By Subbasin

Subbasin	Increase In Impervious Surface Area in Acres (%)
Simpson Creek	8.89 (0.27)
Yaquina River	7.08 (0.15)
Trapp Creek	1.78 (0.16)
Cougar Creek	5.43 (1.75)
Crystal Creek	4.04 (0.88)
Eddy Creek	14.47 (1.70)
Little Elk Creek	10.65 (0.09)
Total Increase In Yaquina River Basin:	**52.34 (0.03)**

As planned, Unit 2 includes three bridges (Trapp Creek Bridge, Crystal Creek Bridge, and Little Elk Creek Bridge), some mechanically stabilized earth (MSE) or other retaining walls, and several culverts that convey tributaries and drainages. Some features may change as a result of the design/build process, but will be subject to performance standards in the contract.

Preliminary estimates of the total earthwork for Unit 2 are as follows: General excavation = 3,827,862 m^3, and embankment = 3,739,438 m^3, for a near balance of earthwork. The excess of 87,924 m^3 will likely be added to planned fills or the alignment may be adjusted during final design to balance the cut and fill quantities.

Unit 2 follows an upland route that runs along Cougar Creek's southern ridgetop. Although the overall elevation along Unit 2 increases then decreases, significant variations in topography occur along the alignment. Consequently, there will be several major cuts and fills on this Project. Figure 2-3 in the BA displays the Unit 2 vertical alignment profile. There are no selective fills in Unit 2.

Existing roadway obliteration will be minimal. For most of Unit 2, the existing roadway will need to be retained to provide local access. Some obliteration is expected at Station 984+00 where the new highway alignment diverges from the existing highway alignment.

Stormwater will be treated according to NOAA Fisheries' Stormwater Management Guidelines. Table 1 shows the total amount of impervious surface separated by subbasin within the project. FHWA has set up performance measures and standards to ensure that the guidelines are met.

1.3 Description of the Action Area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area (project area) involved in the proposed action (50 CFR 402.02). For this consultation, NOAA Fisheries defines the action area as all riverine habitats accessible to the subject species in the Yaquina River and its tributaries within the project area from milepost (MP) 14.68 extending 10 miles to the east to MP 24.75.

2. ENDANGERED SPECIES ACT

2.1 Conference Opinion

2.1.1 Biological Information

NOAA Fisheries initially listed OC coho salmon as threatened under the ESA on August 10, 1998 (63 FR 42587), and issued protective regulations under section 4(d) of the ESA on July 10, 2000 (65 FR 42422). Critical habitat is not designated or proposed for this species.

In September 2001, in the case *Alsea Valley Alliance v. Evans*, U.S. District Court Judge Michael Hogan struck down the 1998 ESA listing of OC coho salmon and remanded the listing decision to NOAA Fisheries for further consideration. In November 2001, the Oregon Natural Resources Council appealed the District Court's ruling. Pending resolution of the appeal, in December 2001, the Ninth Circuit Court of Appeals stayed the District Court's order that voided the OC coho listing. While the stay was in place, the OC coho evolutionarily significant unit (ESU) was again afforded the protections of the ESA.

On February 24, 2004, the Ninth Circuit dismissed the appeal in *Alsea*. On June 15, 2004, the Ninth Circuit returned the case to Judge Hogan and ended its stay. Judge Hogan's order invalidating the OC coho listing is back in force. Accordingly, OC coho are now not listed, and

ESA provisions for listed species, such as the consultation requirement and take prohibitions, do not apply to OC coho.

In response to the *Alsea* ruling, NOAA Fisheries released its revised policy for considering hatchery stocks when making listing decisions on June 3, 2004 (69 FR 31354). NOAA Fisheries completed a new review of the biological status of OC coho salmon, and applying the new hatchery listing policy, proposed to list OC coho salmon as a threatened species on June 14, 2004 (69 FR 33102). NOAA Fisheries must make a final decision on the proposed OC coho salmon listing by June 14, 2005.

This consultation considers the potential effects of the proposed action on OC coho salmon. The objective of this consultation is to determine whether the proposed action is likely to jeopardize the continued existence of OC coho. This consultation is conducted pursuant to section 7(a)(2) of the ESA and its implementing regulations, 50 CFR 402.

Based on migratory timing, OC coho salmon likely will be present in the action area during the proposed construction period. The action area serves as rearing, spawning and migration habitat for juvenile and adult OC coho salmon.

Spawning, incubation, rearing, and migration occur throughout accessible reaches of the Yaquina watershed (Table 2).

Table 2. OC Coho Salmon Life History Timing in the Yaquina River Basin (Weitkamp 1995, Oregon Department of Fish and Wildlife, [ODFW] 2003). Light shading represents low-level abundance, dark shading represents peak abundance.

	J	F	M	A	M	J	J	A	S	O	N	D
River Entry												
Spawning												
Incubation-Intragravel Development												
Juvenile Freshwater Rearing												
Juvenile Migration												
Juvenile Residence in Estuary												

Estimated escapement of coho salmon in coastal Oregon was about 1.4 million fish in the early 1900s, with harvest of nearly 400,000 fish (Weitkamp *et al.* 1995). Abundance of wild OC coho salmon declined during the period from about 1965 to 1975 (Nickelson *et al.* 1992). Lichatowich (1989) concluded that production potential (based on stock recruit models) for OC coho salmon in coastal Oregon rivers was only about 800,000 fish, and associated this decline with a reduction in habitat capacity of nearly 50%. Wild spawner abundance in this ESU has

ranged from 16, 510 adults in 1990, to 59,453 adults in 1996, to nearly 239,000 adult coho in 2002 (ODFW 2003).

Estimated spawning populations for naturally-produced coho salmon in the Yaquina River basin averaged 3805 adults from 1990 through 2003 (Table 3).

Survey data collected by ODFW in the Yaquina River basin estimated densities of juvenile OC coho salmon ranging from 0.02 fish m^{-2} to 0.41 fish m^{-2} (Rodgers 2001).

Table 3. Estimated Spawning Populations for Naturally-Produced Coho Salmon in the Yaquina River Basin (Jacobs *et al.* 2003, ODFW 2003)

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
OC coho	381	380	633	549	2,448	5,668	5,127	384	365	2,588	647	3,039	24,414	13,074

2.1.2 Evaluating Proposed Actions

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR 402.02 (the consultation regulations). In conducting analyses of habitat-altering actions under section 7 of the ESA, NOAA Fisheries uses the following steps of the consultation regulations: (1) Consider the biological requirements of the listed species; (2) evaluate the relevance of the environmental baseline in the action area to the species' current status; (3) determine the effects of the proposed or continuing action on the species; and (4) determine whether the species can be expected to survive with an adequate potential for recovery under the effects of the proposed or continuing action, the effects of the environmental baseline, and any cumulative effects, and considering measures for survival and recovery specific to other life stages. In completing this step of the analysis, NOAA Fisheries determines whether the action under consultation, together with cumulative effects when added to the environmental baseline, is likely to jeopardize the ESA-listed species. If so, NOAA Fisheries may identify reasonable and prudent alternatives for the action that avoid jeopardy, if any exist.

The next step above requires a two-part analysis. The first part focuses on the action area and defines the proposed action's effects in terms of the species' biological requirements in that area (*i.e.*, effects on essential habitat features). The second part focuses on the species itself. It describes the action's effects on individual fish–or populations, or both–and places these effects in the context of the ESU as a whole. Ultimately, the analysis seeks to answer the question of whether the proposed action is likely to jeopardize a listed species' continued existence.

2.1.3 Biological Requirements

The first step in the methods NOAA Fisheries 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. NOAA Fisheries also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess to the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list the species for ESA protection and also considers new data available that is relevant to the determination.

The biological requirements are population characteristics necessary for the subject species 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 its capacity to adapt to various environmental conditions, and allow it to become self-sustaining in the natural environment.

For actions that affect freshwater habitat, NOAA Fisheries usually describes the habitat portion of a species' biological requirements in terms of a concept called properly functioning condition (PFC). PFC 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 (NOAA Fisheries 1999). PFC, then, constitutes the habitat component of a species' biological requirements. Pacific salmon and steelhead survival in the wild depends on the proper functioning of ecosystem processes, including habitat formation and maintenance. Restoring functional habitats depends largely on allowing natural processes to increase their ecological function, while at the same time removing adverse effects of current practices. For this consultation, the biological requirements are habitat characteristics that would function to support successful adult migration, juvenile rearing and migration, and smoltification.

2.1.4 Environmental Baseline

In step two of NOAA Fisheries' analysis, it evaluates the relevance of the environmental baseline in the action area. Regulations implementing section 7 of the ESA (50 CFR 402.02) define the environmental baseline as the past and present effects of all Federal, state, or private actions and other human activities in the action area. The environmental baseline also includes the anticipated effects of all proposed Federal projects in the action area that have undergone section 7 consultation, and the effects of state and private actions that are contemporaneous with the consultation in progress.

Land uses in the action area include rural-residential, commercial-industrial, agricultural, recreation, and commercial forestry. Riparian areas and stream channels in the action area have been damaged by activities related to these land uses throughout the watershed (FEMAT 1993, Botkin *et al.* 1995, OCSRI 1997). Habitat changes that have contributed to the decline of OC coho in the action area include: (1) Reduced biological, chemical, and physical connectivity between streams, riparian areas, floodplains, and uplands; (2) elevated fine sediment yields; (3) reduced instream large woody debris; (4) loss or degradation of riparian vegetation; (5) altered stream channel morphology; (6) altered base and peak stream flows; and (7) fish passage impediments. Estuarine habitats in the Yaquina River basin have been significantly degraded and reduced in size due to land use practices and development. An estimated 202.1

acres of intertidal habitat have been lost, 257 acres of tidal marsh have been filled, and 1240 acres of tidal marsh have been diked (Seliskar and Gallagher 1983, Boule and Bierly 1987). This is a significant loss of habitat for rearing and smoltification of OC coho salmon in the Yaquina River basin. NOAA Fisheries (1995) identified habitat degradation as a factor for decline in listing OC coho salmon as a threatened species under the ESA.

NOAA Fisheries concludes that not all of the biological requirements of OC coho within the action area are being met under present conditions. Based on the best available information on the status of OC coho salmon, including population status, trends, and genetics, and the environmental baseline conditions within the action area, significant improvement in habitat conditions is needed to meet the biological requirements of OC coho salmon for survival and recovery.

2.1.5 Analysis of Effects

2.1.5.1 Effects of Proposed Action

There are a number of direct and indirect effects associated with many elements of this project. FHWA has outlined numerous performance and conservation measures in the BA (pages 6-1 to 6-35) to deal with these effects.

Construction Activities

In-water construction activities will occur within cofferdams. The effects of cofferdam installation and removal, fish removal and handling, and ground disturbance are discussed below.

Fish may be killed, or more likely temporarily displaced, by in-water work activities. Aspects of the proposed action most likely to injure or kill OC coho are the isolation of the in-water work area, and fish removal and handling. Although in-water work area isolation is a conservation measure intended to minimize adverse effects from instream construction activities to fish present in the work isolation area, some fish may be captured, handled, and released. Capturing and handling fish causes physiological stress, though overall effects of the procedure are generally short-term if appropriate precautions are exercised. The primary factors controlling the likelihood of stress and death from handling are differences in water temperatures (between the river and transfer containers), dissolved oxygen concentrations, the amount of time that fish are held out of the water, and the extent of physical trauma. Stress on salmonids increases rapidly from handling if the water temperature exceeds 18°C or if dissolved oxygen concentration is below saturation.

The in-water work period recommended by the Oregon Department of Fish and Wildlife (ODFW) is July 1 to September 15 of a given year, and the proposed fish removal methods are likely to minimize the adverse effects from work area isolation and fish handling as abundance of juvenile salmon is likely to be low at this time of year.

Ground Disturbance

Excavation required to remove and install new culverts and bridges will remove existing vegetation that provides effective ground cover and minimize erosion from rainfall, increasing suspended sediment in Yaquina River system. Effects of increased suspended sediment are likely to lead to effects similar to those described below in "Water Quality - Total Suspended Solids."

Water Quality - Stormwater

This project will add approximately 3% of new impervious surface to the Yaquina River basin site by relocating and widening the highway and therefore increasing stormwater runoff. The construction of the project will increase the amount of impervious surface in each drainage by a small increment, ranging from 1.78 acres in the Trapp Creek subbasin to 14.47 acres in the Eddy Creek subbasin (Table 1). However, the increase in overall impervious surface area as a proportion of the total Yaquina River basin will be small (0.03 %). Most of the added impervious surface area will be in areas isolated from streams, reducing direct impacts associated with increased impervious surfaces. In addition, the slight increase in impervious surface area is not likely to cause noticeably elevated peak flows, flashiness, or scouring flows that would not otherwise occur. The effects of stormwater include changes in hydrologic processes, increasing the magnitude, frequency and duration of peak discharges and reducing summer base flows (Booth 1991). These changes occur because of a loss of forest cover, an increase in the impervious surface, and a replacement of the natural drainage system with an artificial network of storm pipes, drainage ditches and roads (Lucchetti and Fuerstenberg 1993, Booth and Jackson 1997). Roads provide a direct drainage pathway for runoff into the stream system and storm sewer outfalls. Reductions in the natural drainage network and increases in artificial drainage systems shrink the lag time between a rainfall event and the point of peak discharge of stormwater into a stream (Booth and Jackson 1997). This reduction often equates to heightened stormwater peak discharges which cause streambed and streambank scour, mobilize and remove large wood, and extend durations of channel forming flows. This change to the natural hydrology of the stream can have adverse effects on all life stages of salmonids, however, rearing juveniles are particularly vulnerable to being swept downstream during high flows and flows of extended durations.

The increased impervious cover of watersheds also alters the pathway of water to streams. As functional vegetation is removed, evapotranspiration (evaporation of water from plant surfaces and transpiration of water from the soil by plants) can be decreased by 50% or more, resulting in increased runoff volume. Infiltration is reduced as soils are stripped of vegetation, compacted and/or paved, and impervious cover increases. This decrease in infiltration often results in a decrease of stream base flows, adversely affecting salmonids who utilize streams during the summer.

Imperviousness is a very useful indicator with which to measure effects of land development on aquatic systems. Total impervious area is a physically-defined unit which is the sum of roads, parking lots, sidewalks, rooftops, and other impermeable surfaces of the lowland streams landscape. Several studies have provided significant scientific evidence that relates

imperviousness to specific changes in hydrology, habitat structure, water quality and biodiversity of aquatic systems. The body of research, conducted in many geographic areas, concentrating on many different variables, and employing widely different methods, has yielded similar conclusions: Significant stream degradation can occur at relatively low levels of imperviousness (Paul and Meyer 2001). The hydrology of urban streams changes as sites are cleared and natural vegetation is replaced by impervious cover. One of the consequences is that more of a stream's annual flow is delivered as stormwater runoff rather than baseflow. Depending on the degree of a subwatershed's impervious cover, the annual volume of stormwater runoff can increase up to 16 times that for natural areas (Schueler 1994). Increased stream flows can have significant effects on channel morphology. In addition, since impervious cover prevents rainfall from infiltrating into the soil, less flow is available to recharge ground water. Therefore, during extended periods without rainfall, baseflow levels are often reduced in urban streams.

Water Quality - Total Suspended Solids (TSS)

In-water construction activities (*i.e.*, cofferdam installation and removal, culvert removal and installation, placement of rock, bank excavation, bent construction and channel excavation) are likely to temporarily increase concentrations of total suspended solids (TSS) and turbidity. Potential effects from project-related increases in turbidity on salmonid fishes include, but are not limited to: (1) Reduction in feeding rates and growth, (2) increased mortality, (3) physiological stress, (4) behavioral avoidance, (5) reduction in macroinvertebrate populations, and (6) temporary beneficial effects. Potential beneficial effects include a reduction in piscivorous fish/bird predation rates, enhanced cover conditions, and improved survival conditions.

Increases in TSS can adversely affect filter-feeding macroinvertebrates and fish feeding. At concentrations of 53 to 92 ppm (24 hours) macroinvertebrate populations were reduced (Gammon 1970). Concentrations of 250 ppm (1 hour) caused a 95% reduction in feeding rates in juvenile coho salmon (Noggle 1978). Concentrations of 1200 ppm (96 hours) killed juvenile coho salmon (Noggle 1978). Concentrations of 53.5 ppm (12 hours) caused physiological stress and changes in behavior in coho salmon (Berg 1983).

The proposed in-water work is likely to increase turbidity downstream of the work area. These increases in turbidity are likely to increase physiological stress, physical injury (*e.g.*, gill abrasion), and potentially displace rearing juvenile salmon. Restricting in-water work to July 1 through September 15, and the use of cofferdams is likely to minimize the above effects on rearing juvenile salmon and steelhead.

The first phase of in-water work will be short-lived; occurring when the culverts are installed and water enters the new channel creating an initial pulse of sediment. Ground cover will likely be long-term, until plantings are well-established, as the new culvert construction will be exposed earth with no effective ground cover to minimize erosion. These increases in turbidity are likely to increase physiological stress and physical injury.

Water Quality - Chemical Contamination

Operation of excavation equipment requires the use of fuel, lubricants, coolants, *etc.*, which if spilled into a waterbody could injure or kill aquatic organisms. The proposed action includes a spill containment and control plan, however, the FHWA provided no details of the plan, therefore its potential effectiveness cannot be evaluated.

Juvenile salmon exposed to constant water temperatures greater than 18°C are highly susceptible to disease, such as *Chondrococcus columnaris.* Susceptibility to disease is a function of concentration of *C. columnaris* organisms, length of exposure, and temperature (EPA 2001) as well as age of individual (increased age, increased resistance). Contagion of *C. columanaris* has been suspected during passage of salmon through fish ladders (Pacha 1961), and increased incidence may be a result of the creation of slow-moving waters (Snieszko 1964). Increases in water temperature likely will reduce dissolved oxygen, thereby compounding adverse effects on rearing juveniles. In addition to physiological and disease effects, exposure of juvenile salmonid fishes to increased water temperature and decreases in dissolved oxygen for an estimated period of 5 to 7 hours per high tide (*i.e.*, twice per 24-hour tidal cycle) may cause disorientation, possibly subjecting juvenile fish to increased predation.

Effects of diminished water quality are likely to primarily affect juvenile salmonid fishes, although effects to adult salmonids, such as depletion of energy reserves (Idler and Clemens 1959, Gilhousen 1980), pre-spawning mortality, and reduced viability of gametes (McCullough 1999) may occur if adults are trapped in the Blind Slough complex for extended periods of time.

Direct Harm or Harassment

Bridge bent construction, removal, and culvert installation will likely require work area isolation from the flowing water. Fish removal activities will be in accordance with NOAA Fisheries fish handling guidelines (NOAA Fisheries 2000). Any OC coho fish removed from the isolated work areas will experience high stress, with the possibility of up to a 5% delayed mortality rate depending on rescue method. Work area isolation can result in a loss of aquatic invertebrates due to dewatering areas within the wetted channel. In addition, sediment-laden water created within isolated work areas could escape, resulting in impacts to the aquatic environment downstream from the project site.

Direct Harm Due to Steel Pile Driving

The project will require the installation of piles for support on the work bridges. These piles will be wood or hollow steel and will be installed via a vibratory hammer or an impact hammer. It is anticipated that the majority of the piles will be hollow steel and installed with an impact hammer.

Biological effects to OC coho may result from the high sound pressures produced when driving piles with an impact hammer. Impact driving of steel piles can produce intense sound pressure waves that can injure and kill fishes (Stadler, pers. comm. 2003; Desjardin, pers. comm. 2003). The injuries caused by such pressure waves are known as barotraumas, and include hemorrhage and rupture of internal organs, including the swimbladder and kidneys in fish, and damage to the

auditory system. Death can be instantaneous, can occur within minutes after exposure, or can occur several days later. Fishes with swimbladders (which include salmonids) are sensitive to underwater impulsive sounds (*i.e.*, sounds with a sharp sound pressure peak occurring in a short interval of time) because of swimbladder resonance, which is believed to occur in the frequency band of most sensitive hearing (usually 200 to 800 Hz) (Caltrans 2002). As the pressure wave passes through a fish, the swimbladder is rapidly squeezed due to the high pressure and then rapidly expanded as the underpressure component of the wave passes through the fish. The pneumatic pounding may result in the rupture of capillaries in the internal organs as indicated by observed blood in the abdominal cavity, and maceration of the kidney tissues (Caltrans 2002).

Another mechanism of injury and death is "rectified diffusion," which is the formation and growth of bubbles in tissue caused by regions of high sound pressure levels. Hastings (2002) expects little to no physical damage to aquatic animals for peak sound pressures below 190 decibels (dB) (re: 1 Pascal), the threshold for rectified diffusion. However, much uncertainty exists as to the level of adverse effects to fish exposed to sound between 180 and 190 dB_{peak} due to species-specific variables. Based on this information, NOAA Fisheries has established the threshold for physical harm at 180 dB_{peak} for this project.

Sound pressure levels expressed as "root-mean-squared" (rms) values are commonly used in behavioral studies. Sound pressure levels in excess of 150 dB_{rms} are expected to cause temporary behavioral changes such as elicitation of a startle response or behavior associated with stress. These sound pressure levels are not expected to cause direct permanent injury, but, as discussed above, may decrease a fish's ability to avoid predators. Observations by Feist, *et al.* (1992) suggest that sound levels in this range may disrupt normal migratory behavior of juvenile salmon. They also noted that when exposed to the sounds from pile driving, juvenile pink and chum salmon were less likely to startle and flee when approached by an observer than were those that were shielded from the sounds. Based on this information, NOAA Fisheries has established the threshold for behavioral disruption at 150 dB_{rms} for this project.

Driving hollow steel piles of the size proposed for this project can produce sound pressure levels measured at 10m from the pile, over 180 dB_{peak} and 150 rms (Stadler 2003, pers. comm.). Clearly, these sound pressure levels are sufficiently high to present a lethal threat to fishes, as evidenced by the number of species, including salmonids, killed during impact driving of 24, 36-inch diameter steel piles (Stadler, pers. obs. 2002; Desjardin, pers. comm. 2003). Vibratory hammers produce peak pressures that are approximately 17 dB lower than those from impact hammers (Nedwell and Edwards 2002) yielding an estimated peak sound pressure level of 193 dB for the piles used in this project. While this is above the threshold for physical injury (180 dB), no fish kills have been linked to the use of vibratory hammers. The lack of evidence does not mean that vibratory hammers are harmless, but they are likely, less harmful than impact hammers.

The sounds from the two types of hammer differ not only in intensity, but also in frequency and impulse energy (the rate at which the pressure rises) as well. Most of the sound energy of impact

hammers is concentrated between 100 and 800 Hz, the frequencies thought to be most harmful to fishes, while the sound energy from the vibratory hammer is concentrated around 20 to 30 Hz.

Just as these two sounds are different, so are the behavioral responses of fishes to them. Most of the energy in the sounds produced by vibratory hammers is at the frequency of vibration, around 20 to 30 Hz, very near the range of infrasound (less than 20 Hz). The response to impact hammers is, however, quite different. Fishes may react to the first few strikes of an impact hammer with a "startle" response. After these initial strikes, the startle response wanes and the fishes may remain within the field of a potentially harmful sound (NOAA Fisheries 2001). Thus, impact hammers may be more harmful than vibratory hammers for two reasons: First, they produce pressure waves with greater potential to harm fishes and second, the sounds produced do not elicit an avoidance response in fishes, which will expose them for longer periods to those harmful pressures.

Most reports of fish kills associated with pile driving are limited to those fishes that were immediately killed and floated to the surface. However, physical harm to juvenile salmonids is not always expected to result in immediate, mortal injury – death may occur several hours or days later, while other injuries may be sublethal.

Small fishes that are subjected to high sound pressure levels may also be more vulnerable to predation, and the predators, themselves, may be drawn into the potentially harmful field of sound by following injured prey. The California Department of Transportation (cited in NOAA Fisheries 2003) reported that the stomach of a striped bass killed by pile driving contained several freshly consumed juvenile herring. It appears this striped bass was feeding heavily on killed, injured, or stunned herring as it, too, swam into the zone of lethal sound pressure. Due to their piscivorous nature, adult salmonids may be drawn to an area of dangerously high sound pressure level by the smaller fishes that are injured or killed.

Not all fishes killed by pile driving float to the surface. With few exceptions, fish kills are reported only when dead and injured fishes are observed at the surface. Thus, the frequency and magnitude of such kills may be underestimated.

The effects to fishes of the high sound pressure levels produced by impact driving of steel piles depend on several factors, including the size and species of fish. At Bremerton, Washington, approximately 100 surf perches (*Cymatogaster aggregata* and *Embiotoca lateralis*) were killed during impact driving of 30-inch diameter steel pilings (Stadler, pers. obs. 2003). The size of these fish ranged from 70-mm to 175-mm fork length. Dissections revealed that the swimbladders of the smallest of the fishes (80mm fork length) were completely destroyed, while those of the largest individual (170mm fork length) were nearly intact. Damage to the swimbladder of *C. aggregata* was more was more severe than to similar sized *E. lateralis*. These results indicate size and species-specific differences.

The potential for injury to fishes from pile driving depends on the type and intensity of the sounds produced. These are greatly influenced by a variety of factors, including the type of

hammer, the type of substrate and the depth of the water. Firmer substrates require more energy to drive piles into, and produce more intense sound pressures.

To minimize the potential risk to juvenile OC coho and adults, the FHWA will need to implement a program of acoustic attenuation using a bubble curtain. Hydroacoustic monitoring will not be required if bubble curtain systems are automatically deployed during pile driving. The efficacy of a bubble curtain is dependent on the current regime where they are used. Currents above 1.6 miles per hour can disperse the bubbles downstream, away from the pile. Stream currents are likely to be below 1.6 miles per hour, however, if they are above that threshold a confined bubble curtain will be used. Deployment of a bubble curtain is expected to attenuate the peak sound pressure levels by approximately 20 dB (a 90% reduction in sound energy). However, a bubble curtain may not bring the peak and rms sound pressure levels below the established thresholds, and some low level of take may still occur.

Any fish in the area that are not buffered by the sound attenuation devices will be affected. Based on discussions with ODFW, the expected low numbers of the smallest OC coho at the time of pile driving and the assumption that larger juvenile and adult OC coho are less affected by the behavioral changes brought by pile driving, leads NOAA Fisheries to believe that this activity is not reasonably certain to adversely affect OC coho with sound attenuation devices in place.

2.1.5.2 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 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."

NOAA Fisheries is not aware of any specific future non-federal activities within the action area that would cause greater effects to OC coho than presently occurs. The action area includes significant tracts of private lands. Land use on these non-federal lands includes rural development, agricultural, and commercial forestry. Chemical fertilizers or pesticides are used on many of these lands, but no specific information is available regarding their use. Furthermore, NOAA Fisheries generally does not consider the rules governing timber harvests, agricultural practices, and rural development on non-federal lands within Oregon to be sufficiently protective of watershed, riparian, and stream habitat functions to support the survival and recovery of listed species. Therefore, these habitat functions likely are at risk due to future activities on non-federal forest lands within the basin.

Non-federal activities within the action area are expected to increase due to a projected 36% increase in human population by the year 2024 in Lincoln County (EPA 2004). Thus, NOAA Fisheries assumes that future private and state actions will continue within the action area, increasing as population density rises. Each subsequent action may have only a small incremental effect, but taken together they may have a significant effect that would further

degrade the watershed's environmental baseline and undermine the improvements in habitat conditions necessary for listed species to survive and recover.

2.1.6 Conclusion

The next step in NOAA Fisheries' approach to determine jeopardy is to determine whether the proposed action, in light of the above factors, is likely to appreciably reduce the likelihood of the species' survival and recovery in the wild. After reviewing the best available scientific and commercial information available regarding the current status of OC coho salmon, the environmental baseline for the action area, the effects of the proposed action, and cumulative effects, NOAA Fisheries concludes that the action, as proposed, is not likely to jeopardize the continued existence of OC coho.

Our conclusion is based on the following considerations: (1) In-water construction and its potential effects will occur at a time of year when abundance of adult and juvenile salmon is likely to be low; (2) conservation and performance measures are in place to ensure impacts are minimized on all aspects of the project; (3) work area isolation and fish removal will occur; and (4) the effects of this action are not likely to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward proper functioning condition essential to the long-term survival and recovery at the population or ESU scale.

2.1.7 Reinitiation of Consultation

This concludes formal consultation on these actions in accordance with 50 CFR 402.14(b)(1). Reinitiation of consultation is required: (1) If the amount or extent of incidental take is exceeded; (2) the action is modified in a way that causes an effect on the listed species that was not previously considered in the BA and this Opinion; (3) new information or project monitoring reveals effects of the action that may affect the listed species in a way not previously considered; or (4) a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16).

2.1.8 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on listed species, to minimize or avoid adverse modification of critical habitats, or to develop additional information.

2.2 Incidental Take Statement

The ESA at section 9 [16 USC 1538] prohibits take of endangered species. The prohibition of take is extended to threatened anadromous salmonid fishes by section 4(d) rule [50 CFR

223.203]. Take is defined by the statute as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." [16 USC 1532(19)] Harm is defined by regulation as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering." [50 CFR 17.3] Incidental take is defined as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant." [50 CFR 402.02] The ESA at section 7(o)(2) removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement [16 USC 1536]. However, the incidental take statement included in this conference opinion does not become effective until NOAA Fisheries adopts the conference opinion as a biological opinion, after the listing is final. Until the time that the species is listed, the prohibitions of the ESA do not apply.

2.2.1 Amount or Extent of Take

The proposed action covered by this Opinion is reasonably certain to result in incidental take of listed species due to changes in physical habitat, fish harassment, suspension of sediments, temporary changes in water quality, and reduction in benthic prey resources. Effects of actions such as these are unquantifiable in the short term, but are likely to be largely limited to harm. Therefore, even though NOAA Fisheries expects some low level of incidental take to occur due to the action covered by this Opinion, the best scientific and commercial data available are not sufficient to enable it to estimate a specific amount of incidental take. In instances such as this, NOAA Fisheries designates the expected level of take in terms of the extent of take allowed. Therefore, the extent of incidental take for this opinion is limited to the combined effects of 8.5 hectares of riparian disturbance causing increases in sediment, turbidity and reductions in stream productivity associated with the construction activities and 12 road-stream crossings within the action area, as described on page 5. Although these effects will be associated with areas where OC coho are not present or are in low numbers, the effects could be attenuated up to one kilometer downstream of the project on the Yaquina River. NOAA Fisheries also expects that incidental take of up to 200 juvenile OC coho salmon may be caused by work area isolation and handling of fish. Any take resulting from actions not described in the biological assessment and analyzed in this Opinion, or that extends beyond the action area, is not part of the amount or extent of incidental taking specified in this incidental take statement.

This incidental take statement does not become effective for OC coho salmon until NOAA Fisheries adopts the conference opinion as a biological opinion, after the listing is final. Until the time that OC coho salmon is listed, the prohibitions of the ESA do not apply.

2.2.2 Reasonable and Prudent Measures

The measures described below are non-discretionary. They must be implemented so that they become binding conditions in order for the exemption in section 7(a)(2) to apply. The FHWA has the continuing duty to regulate the activities covered in this incidental take statement. If the

FHWA fails to adhere to the terms and conditions of the incidental take statement through enforceable terms added to the document authorizing this action, or fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

NOAA Fisheries believes that the following reasonable and prudent measures along with conservation measures described in the BA are necessary and appropriate to minimize the likelihood of take of OC coho fish resulting from implementation of this Opinion.

The FHWA shall:

1. Minimize incidental take from general construction by applying conditions to the proposed action that avoid or minimize adverse effects to water quality, riparian, and aquatic systems.

2. Ensure completion of a comprehensive monitoring and reporting program to confirm this Opinion is meeting its objective of minimizing take from the proposed action.

2.2.3 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, FHWA must comply with the following terms and conditions, which implement the reasonable and prudent measures described above for each category of activity. These measures should be incorporated into construction contracts and subcontracts to ensure that the work is carried out in the manner prescribed. These terms and conditions are non-discretionary.

1. To implement reasonable and prudent measure #1 (general conditions for construction, operation and maintenance), the FHWA shall ensure that:

    a. Timing of in-water work. Work within the active channel of the Yaquina River and its tributaries will be completed during the period of July 1 to September 15. All work must be completed within these dates unless otherwise approved in writing by NOAA Fisheries.
    b. Minimum Area. Confine construction impacts to the minimum area necessary to complete the project.
    c. Cessation of work. Project operations will cease under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.

d. Fish screens. All water intakes used for a project, including pumps used to isolate an in-water work area, will have a fish screen installed, operated and maintained according to NOAA Fisheries' fish screen criteria.[1]

e. Fish passage. Passage will be provided for any adult or juvenile salmonid species present in the project area during construction, and after construction for the life of the project. Upstream passage is not required during construction if it did not previously exist.

f. Pollution and Erosion Control Plan. A pollution and erosion control plan will be prepared and carried out to prevent pollution related to construction operations. The plan must be available for inspection on request by FHWA or NOAA Fisheries.

   i. Plan Contents. The pollution and erosion control plan must contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.

      (1) Practices to prevent erosion and sedimentation associated with access roads, stream crossings, construction sites, borrow pit operations, haul roads, equipment and material storage sites, fueling operations and staging areas.

      (2) Practices to confine, remove and dispose of excess concrete, cement and other mortars or bonding agents, including measures for washout facilities.

      (3) A description of any hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.

      (4) A spill containment and control plan with notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

      (5) Practices to prevent construction debris from dropping into any stream or waterbody, and to remove any material that does drop with a minimum disturbance to the streambed and water quality.

   ii. Inspection of erosion controls. During construction, all erosion controls must be inspected daily during the rainy season and weekly during the dry season to ensure they are working adequately.[2]

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[1] National Marine Fisheries Service, *Juvenile Fish Screen Criteria* (revised February 16, 1995) and *Addendum: Juvenile Fish Screen Criteria for Pump Intakes* (May 9, 1996) (guidelines and criteria for migrant fish passage facilities, and new pump intakes and existing inadequate pump intake screens) (http://www.nwr.noaa.gov/1hydrop/hydroweb/ferc.htm).

[2] "Working adequately" means no turbidity plumes are evident during any part of the year.

(1) If inspection shows that the erosion controls are ineffective, work crews must be mobilized immediately to make repairs, install replacements, or install additional controls as necessary.

(2) Sediment must be removed from erosion controls once it has reached 1/3 of the exposed height of the control.

g. Construction discharge water. All discharge water created by construction (*e.g.*, concrete washout, pumping for work area isolation, vehicle wash water) will be treated as follows.

i. Water quality. Facilities must be designed, built and maintained to collect and treat all construction discharge water using the best available technology applicable to site conditions. The treatment must remove debris, nutrients, sediment, petroleum hydrocarbons, metals and other pollutants likely to be present.

ii. Discharge velocity. If construction discharge water is released using an outfall or diffuser port, velocities must not exceed 4 feet per second.

iii. Spawning areas, marine submerged vegetation. No construction discharge water may be released within 300 feet upstream of active spawning areas.

h. Preconstruction activity. Before significant[3] alteration of the project area, the following actions must be completed:

i. Marking. Flag the boundaries of clearing limits associated with site access and construction to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary.

ii. Emergency erosion controls. Ensure that the following materials for emergency erosion control are onsite:

(1) A supply of sediment control materials (*e.g.*, silt fence, straw bales[4]).

(2) An oil-absorbing, floating boom whenever surface water is present.

iii. Temporary erosion controls. All temporary erosion controls must be in-place and appropriately installed downslope of project activity within the riparian area until site restoration is complete.

i. Temporary access roads.

i. Existing ways. Existing roadways or travel paths must be used whenever possible, unless construction of a new way would result in less habitat take.

ii. Steep slopes. Temporary roads built mid-slope or on slopes steeper than 30% are not authorized.

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[3] "Significant" means an effect can be meaningfully measured, detected or evaluated.

[4] When available, certified weed-free straw or hay bales must be used to prevent introduction of noxious weeds.

iii. Minimizing soil disturbance and compaction. When a new temporary road is necessary within 150 feet[5] of a stream, waterbody or wetland, soil disturbance and compaction must be minimized by clearing vegetation to ground level and placing clean gravel over geotextile fabric (Geotextile fabric is a woven material that reduces surface erosion and sometimes allows vegetative growth), unless otherwise approved in writing by NOAA Fisheries.

iv. Temporary stream crossings.

(1) The number of temporary stream crossings must be minimized.

(2) Temporary road crossings must be designed as follows:

(a) A survey must identify and map any potential spawning habitat within 300 feet downstream of a proposed crossing.

(b) No stream crossing may occur at known or suspected spawning areas, or within 300 feet upstream of such areas if spawning areas may be affected.

(c) The crossing design must provide for foreseeable risks (*e.g.*, flooding and associated bedload and debris) to prevent the diversion of streamflow out of the channel and down the road if the crossing fails.

(d) Vehicles and machinery must cross riparian areas and streams at right angles to the main channel wherever possible.

v. Obliteration. When the project is completed, all temporary access roads and work bridges must be obliterated, the soil must be stabilized, and the site must be revegetated. Temporary roads in wet or flooded areas must be abandoned and restored as necessary by the end of the in-water work period.

j. Heavy Equipment. Use of heavy equipment will be restricted as follows.

i. Choice of equipment. When heavy equipment must be used, the equipment selected must have the least adverse effects on the environment (*e.g.*, minimally-sized, rubber-tired).

ii. Vehicle staging. Vehicles must be fueled, operated, maintained, and stored as follows.

(1) Vehicle staging, cleaning, maintenance, refueling, and fuel storage must take place in a vehicle staging area placed 150 feet or more from any stream, waterbody or wetland.

(2) All vehicles operated within 150 feet of any stream, waterbody or wetland must be inspected daily for fluid leaks before leaving the

[5] Distances from a stream or waterbody are measured horizontally from, and perpendicular to, the bankfull elevation, the edge of the channel migration zone, or the edge of any associated wetland, whichever is greater. "Channel migration zone" means the area defined by the lateral extent of likely movement along a stream reach as shown by evidence of active stream channel movement over the past 100 years, *e.g.*, alluvial fans or floodplains formed where the channel gradient decreases, the valley abruptly widens, or at the confluence of larger streams.

vehicle staging area. Any leaks detected must be repaired in the vehicle staging area before the vehicle resumes operation. Inspections must be documented in a record that is available for review on request by FHWA or NOAA Fisheries.

(3) All equipment operated instream must be cleaned before beginning operations below the bankfull elevation to remove all external oil, grease, dirt, and mud.

(4) The temporary work bridges shall be constructed to ensure full containment of any spills and/or leaks.

iii. Stationary power equipment. Stationary power equipment (*e.g.*, generators, cranes) operated within 150 feet of any stream, waterbody or wetland must be diapered to prevent leaks, unless otherwise approved in writing by NOAA Fisheries.

k. Site preparation. Native materials will be conserved for site restoration.

i. If possible, native materials must be left where they are found.

ii. Materials that are moved, damaged or destroyed must be replaced with a functional equivalent during site restoration.

iii. Any large wood,[6] native vegetation, weed-free topsoil, and native channel material displaced by construction must be stockpiled for use during site restoration.

l. Isolation of in-water work area. If adult or juvenile fish are reasonably certain to be present, the work area will be well isolated from the active flowing stream using inflatable bags, sandbags, sheet pilings, or similar materials. The work area will also be isolated if in-water work may occur within 300 feet upstream from spawning habitats.

m. Capture and release. Before and intermittently during pumping to isolate an in-water work area, an attempt must be made to capture and release fish from the isolated area using trapping, seining, electrofishing, or other methods as are prudent to minimize risk of injury.

i. A fishery biologist experienced with work area isolation and competent to ensure the safe handling of all ESA-listed fish must conduct or supervise the entire capture and release operation.

ii. If electrofishing equipment is used to capture fish, the capture team must comply with NOAA Fisheries' electrofishing guidelines.[7]

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[6] For purposes of this Opinion only, "large wood" means a tree, log, or rootwad big enough to dissipate stream energy associated with high flows, capture bedload, stabilize streambanks, influence channel characteristics, and otherwise support aquatic habitat function, given the slope and bankfull width of the stream in which the wood occurs. See, Oregon Department of Forestry and Oregon Department of Fish and Wildlife, *A Guide to Placing Large Wood in Streams*, May 1995 (www.odf.state.or.us/FP/RefLibrary/LargeWoodPlacemntGuide5-95.doc).

[7] National Marine Fisheries Service, *Backpack Electrofishing Guidelines* (December 1998) (http://www.nwr.noaa.gov/1salmon/salmesa/pubs/electrog.pdf).

iii. The capture team must handle ESA-listed fish with extreme care, keeping fish in water to the maximum extent possible during seining and transfer procedures to prevent the added stress of out-of-water handling.

iv. Captured fish must be released as near as possible to capture sites.

v. ESA-listed fish may not be transferred to anyone except NOAA Fisheries personnel, unless otherwise approved in writing by NOAA Fisheries.

vi. Other Federal, state, and local permits necessary to conduct the capture and release activity must be obtained.

vii. NOAA Fisheries or its designated representative must be allowed to accompany the capture team during the capture and release activity, and must be allowed to inspect the team's capture and release records and facilities.

n. Earthwork. Earthwork (including drilling, excavation, dredging, filling and compacting) will be completed as quickly as possible.

i. Site stabilization. All disturbed areas must be stabilized, including obliteration of temporary roads, within 12 hours of any break in work unless construction will resume work within 7 days between June 1 and September 30, or within 2 days between October 1 and May 31.

ii. Source of materials. Boulders, rock, woody materials and other natural construction materials used for the project must be obtained outside the riparian area.

o. Site restoration. All streambanks, soils and vegetation disturbed by the project are cleaned up and restored as follows.

i. Restoration goal. The goal of site restoration is renewal of habitat access, water quality, production of habitat elements (such as large woody debris), channel conditions, flows, watershed conditions and other ecosystem processes that form and maintain productive fish habitats.

ii. Streambank shaping. Damaged streambanks must be restored to a natural slope, pattern and profile suitable for establishment of permanent native woody vegetation.

iii. Revegetation. Areas requiring revegetation must be replanted before the first April 15 following construction with a diverse assemblage of species that are native to the project area or region, including grasses, forbs, shrubs, and trees.

iv. Pesticides. No pesticide application is allowed, although mechanical or other methods may be used to control weeds and unwanted vegetation.

v. Fertilizer. No surface application of fertilizer may occur within 50 feet of any stream channel.

vi. Fencing. Fencing must be installed as necessary to prevent access to revegetated sites by livestock or unauthorized persons.

p. Pile Driving.

i. The number and diameter of the pilings are minimized, as appropriate, without reducing the structural integrity.

ii. The FHWA shall ensure that, providing substrate conditions are appropriate, vibratory hammers are used to drive piles when possible. If substrate conditions are not appropriate, impact hammers may be used. Impact hammers will require the use of a bubble curtain.

iii. Drive each piling as follows to minimize the use of force and resulting sound pressure.

(1) When impact drivers will be used to install a pile, use the smallest driver and the minimum force necessary to complete the job. Use a drop hammer or a hydraulic impact hammer, whenever feasible and set the drop height to the minimum necessary to drive the piling.

(2) When using an impact hammer to drive or proof steel piles, one of the following sound attenuation devices will be used to reduce sound pressure levels by 20 dB.

(3) Place a block of wood or other sound dampening material between the hammer and the piling being driven.

(4) If currents are 1.7 miles per hour or less, surround the piling being driven by an unconfined bubble curtain that will distribute small air bubbles around 100% of the piling perimeter for the full depth of the water column.[8]

(5) If currents greater than 1.7 miles per hour, surround the piling being driven by a confined bubble curtain (*e.g.*, a bubble ring surrounded by a fabric or metal sleeve) that will distribute air bubbles around 100% of the piling perimeter for the full depth of the water column.

(6) Other sound attenuation devices as approved in writing by NOAA Fisheries.

iv. Piling removal. If a temporary or permanent piling will be removed, the following conditions apply:

(1) Dislodge the piling with a vibratory hammer.

(2) Once loose, place the piling onto the construction barge or other appropriate dry storage site.

(3) If a treated wood piling breaks during removal, either remove the stump by breaking or cutting 3 feet below the sediment surface or push the stump in to that depth, then cover it with a cap of clean substrate appropriate for the site, filling the holes left by each piling with clean, native sediments, whenever feasible.

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[8] For guidance on how to deploy an effective, economical bubble curtain, see, Longmuir, C. and T. Lively, *Bubble Curtain Systems for Use During Marine Pile Driving*, Fraser River Pile and Dredge LTD, 1830 River Drive, New Westminster, British Columbia, V3M 2A8, Canada. Recommended components include a high volume air compressor that can supply more than 100 pounds per square inch at 150 cubic feet per minute to a distribution manifold with 1/16 inch diameter air release holes spaced every 3/4 inch along its length. An additional distribution manifold is needed for each 35 feet of water depth.

q. Stormwater management. Prepare and carry out a written stormwater management plan for any project that will produce a new impervious surface or a land cover conversion that slows the entry of water into the soil. Submit a copy of the written plan to the FHWA and to the Oregon State Habitat Office of NOAA Fisheries, at the address below, before beginning work below bankfull elevation.

i. Plan contents. The goal is to avoid and minimize adverse effects due to the quantity and quality of stormwater runoff for the life of the project by maintaining or restoring natural runoff conditions. The plan will meet the following criteria and contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.

(1) A system of management practices and, if necessary, structural facilities, designed to complete the following functions.

(a) Minimize, disperse and infiltrate stormwater runoff onsite using sheet flow across permeable vegetated areas to the maximum extent possible without causing flooding, erosion impacts, or long-term adverse effects to groundwater.

(b) Pretreat stormwater from pollution generating surfaces, including bridge decks, before infiltration or discharge into a freshwater system, as necessary to minimize any nonpoint source pollutant (*e.g.*, debris, sediment, nutrients, petroleum hydrocarbons, metals) likely to be present in the volume of runoff predicted from a 6-month, 24-hour storm.[9]

(c) Ensure that the duration of post project discharge matches the pre-developed discharge rates from 50% of the 2-year peak flow up to the 50-year peak flow.

(2) Install structural facilities outside wetlands or the riparian buffer area[10] whenever feasible, otherwise, provide compensatory mitigation to offset any long-term adverse effects.

(3) Document completion of the following activities according to a regular schedule for the operation, inspection and maintenance of

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[9] A 6-month, 24-hour storm may be assumed to be 72% of the 2-year, 24-hour amount. See, Washington State Department of Ecology (2001), Appendix I-B-1.

[10] For purposes of this Opinion only, 'riparian buffer area' means land: (1) Within 150 feet of any natural water occupied by listed salmonids during any part of the year or designated as critical habitat; (2) within 100 feet of any natural water within 1/4 mile upstream of areas occupied by listed salmonids or designated as critical habitat and that is physically connected by an above-ground channel system such that water, sediment, or woody material delivered to such waters will eventually be delivered to water occupied by listed salmon or designated as critical habitat; and (3) within 50 feet of any natural water upstream of areas occupied by listed salmonids or designated as critical habitat and that is physically connected by an above-ground channel system such that water, sediment, or woody material delivered to such waters will eventually be delivered to water occupied by listed salmon or designated as critical habitat. 'Natural water' means all perennial or seasonal waters except water conveyance systems that are artificially constructed and actively maintained for irrigation.

all structural facilities and conveyance systems, in a log available for inspection on request by the FHWA and NOAA Fisheries.

(a) Inspect and clean each facility as necessary to ensure that the design capacity is not exceeded, heavy sediment discharges are prevented, and whether improvements in operation and maintenance are needed.

(b) Promptly repair any deterioration threatening the effectiveness of any facility.

(c) Post and maintain a warning sign on or next to any storm drain inlet that says, as appropriate for the receiving water, 'Dump No Waste - Drains to Ground Water, Streams, or Lakes.'

(d) Only dispose of sediment and liquid from any catch basin in an approved facility.

(6) As agreed to in project meetings, provide elevations and calculations for each stormwater treatment facility to NOAA Fisheries for approval before implementation. These calculations should demonstrate the effeciency of these facilities.

ii. Runoffs/discharge into a freshwater system. When stormwater runoff will be discharged directly into fresh surface water or a wetland, or indirectly through a conveyance system, the following requirements apply.

(1) Maintain natural drainage patterns and, whenever possible, ensure that discharges from the project site occur at the natural location.

(2) Use a conveyance system comprised entirely of manufactured elements (*e.g.*, pipes, ditches, outfall protection) that extends to the ordinary high water line of the receiving water.

(3) Stabilize any erodible elements of this system as necessary to prevent erosion.

(4) Do not divert surface water from, or increase discharge to, an existing wetland if that will cause a significant adverse effect to wetland hydrology, soils or vegetation.

(5) The velocity of discharge water released from an outfall or diffuser port may not exceed 4 feet per second, and the maximum size of any aperture may not exceed one inch.

2. To implement reasonable and prudent measure #2 (monitoring), the FHWA shall:

a. Implementation monitoring. Ensure that the permittee submits a monitoring report to the FHWA within 120 days of project completion describing the permittee's success meeting permit conditions. The monitoring report will include the following information.

i. Project identification.

(1) Permittee name, permit number, and project name.

(2) Project location, including any compensatory mitigation site(s), by 5th field HUC and by latitude and longitude as determined from the appropriate USGS 7-minute quadrangle map.
(3) FHWA contact person.
(4) Starting and ending dates for work completed.
(a) Photo documentation. Photo of habitat conditions at the project and any compensation site(s), before, during, and after project completion.[11]
(b) Include general views and close-ups showing details of the project and project area, including pre and post construction.
(c) Label each photo with date, time, project name, photographer's name, and a comment about the subject.

ii. Other data. Additional project-specific data, as appropriate for individual projects.
(1) Work cessation. Dates work cessation was required due to high flows.
(2) Fish screen. Compliance with NOAA Fisheries' fish screen criteria.
(3) A summary of pollution and erosion control inspections, including any erosion control failure, hazardous material spill, and correction effort.
(4) Site preparation.
(a) Total cleared area – riparian and upland.
(b) Total new impervious area.
(5) Isolation of in-water work area, capture and release.
(a) Supervisory fish biologist – name and address.
(b) Methods of work area isolation and take minimization.
(c) Stream conditions before, during and within one week after completion of work area isolation.
(d) Means of fish capture.
(e) Number of fish captured by species.
(f) Location and condition of all fish released.
(g) Any incidence of observed injury or mortality.
(6) Site restoration.
(a) Finished grade slopes and elevations.
(b) Log and rock structure elevations, orientation, and anchoring (if any).
(c) Planting composition and density.
(d) A 5-year plan to:

[11] Relevant habitat conditions may include characteristics of channels, eroding and stable streambanks in the project area, riparian vegetation, water quality, flows at base, bankfull and over-bankfull stages, and other visually discernable environmental conditions at the project area, and upstream and downstream of the project.

(i) Inspect and, if necessary, replace failed plantings to achieve 100% survival at the end of the first year, and 80% survival or 80% coverage after five years (including both plantings and natural recruitment).
(ii) Control invasive non-native vegetation.
(iii) Protect plantings from wildlife damage and other harm.

b. Reporting. On an annual basis for 5 years after completing the project, the FHWA shall ensure submital of a monitoring report to NOAA Fisheries describing the applicant's success in meeting their habitat restoration goals of any riparian plantings. This report will consist of the following information.

i. Project identification.
   a. Project name.
   b. Starting and ending dates of work completed for this project.
   c. The FHWA contact person.

ii. Riparian restoration. Documentation of the following conditions:
   a. Any changes in planting composition and density.
   b. A plan to inspect and, if necessary, replace failed plantings and structures.

iii. Monitoring reports will be submitted to:

NOAA Fisheries
Oregon State Habitat Office
Attn: 2004/00352
525 NE Oregon Street, Suite 500
Portland, OR 97232-2778

c. NOTICE. If a sick, injured or dead specimen of a threatened or endangered species is found, the finder must notify the Vancouver Field Office of NOAA Fisheries Law Enforcement at 360.418.4246. The finder must take care in handling of sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

3.1 Background

Pursuant to the MSA:

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

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

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). "Adverse effect" means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). EFH consultation with NOAA Fisheries is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

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

3.2 Identification of EFH

Pursuant to the MSA, the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of federally-managed Pacific salmon: Chinook (*O. tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC

1999), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). EEH also has been designated for groundfish species and coastal pelagic species. The estuarine EFH composite includes those waters, substrates and associated biological communities within bays and estuaries of the EEZ, from mean higher high water level (MHHW) or extent of upriver saltwater intrusion to the respective outer boundaries for each bay or estuary as defined in 33 CFR 80.1 (Coast Guard lines of demarcation). Detailed descriptions and identifications of EFH are contained in the fishery management plans for groundfish (PFMC 1999), coastal pelagic species (PFMC 1999a), and Pacific salmon (PFMC 1999b).

3.3 Proposed Action

The proposed action is detailed above in section 1.2 of this document. For this consultation, NOAA Fisheries defines the action area as all marine and riverine habitats accessible to the OC coho salmon in the Yaquina River and the tributaries within the project area. This area has been designated as EFH for various life stages of Chinook and coho salmon.

3.4 Effects of Proposed Action

The proposed action will adversely affect water quality for Chinook and coho salmon due to increased concentrations of suspended sediment and turbidity, potential spills of toxic materials, and reduced water quality due to riparian impacts and stormwater.

3.5 Conclusion

The proposed action may adversely affect the EFH for Chinook and coho salmon.

3.6 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. The conservation measures proposed for the project by the applicant and the terms and conditions described in the incidental take statement that is attached to the ESA Conference Opinion for this project are all applicable to salmon EFH, except those relating to work timing, isolation of the in-water work area, fish salvage (capture and release), and the disposition of any individual fish killed or injured during completion of the project. With those exceptions, NOAA Fisheries incorporates those conservation measures and terms and conditions here as EFH conservation recommendations.

3.7 Statutory Response Requirement

Please note that the MSA (section 305(b)) and 50 CFR 600.920G) requires the Federal agency to provide a written response to NOAA Fisheries after receiving EFH conservation recommendations within 30 days of its receipt of this letter. This response must include a description of measures proposed by the agency to avoid, minimize, mitigate or offset the

adverse effects of the activity on EFH. If the response is inconsistent with a conservation recommendation from NOAA Fisheries, the agency must explain its reasons for not following the recommendation.

3.8 Supplemental Consultation

The FHWA must reinitiate EFH consultation with NOAA Fisheries if the action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920).

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