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:
2003/01285

April 30, 2004

Mr. Fred P. Patron
Senior Transportation Planning Engineer
Federal Highway Administration, Oregon Division
530 Center Street NE
Salem, OR 97301

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation on the Effects of the Grave Creek (Beecher Road) Bridge Replacement Project, Josephine County, Oregon

Dear Mr. Patron:

Enclosed is a biological opinion (Opinion) pursuant to section 7 of the Endangered Species Act (ESA) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries), on the effects of the proposed Grave Creek (Beecher Road) Bridge Replacement Project, Josephine County, Oregon. In this Opinion, NOAA Fisheries concludes that the proposed action is not likely to jeopardize the continued existence of ESA-listed Southern Oregon/Northern California Coast coho salmon, or destroy or adversely modify their designated critical habitat. As required by section 7 of the ESA, NOAA Fisheries includes reasonable and prudent measures with nondiscretionary terms and conditions that NOAA Fisheries believes are necessary to minimize the potential for incidental take associated with this action.

This document also serves as consultation on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and includes conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects to EFH. Section 305(b)(4)(B) of the MSA requires Federal agencies to provide a detailed written response to NOAA Fisheries within 30 days after receiving these recommendations. If the response is inconsistent with the recommendations, the action agency must explain why the recommendations will not be followed, including the justification for any disagreements over the effects of the action and the recommendations.

If you have any questions regarding this consultation, please contact Jim Collins of my staff in the Oregon State Habitat Office at 541.957.3389.

Sincerely,

for Michael R Crouse

D. Robert Lohn
Regional Administrator

cc: Molly Cary, ODOT
Ken Cannon, ODOT
Ken Norton, ODOT

Endangered Species Act - Section 7 Consultation
Biological Opinion

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

Grave Creek (Beecher Road) Bridge Replacement Project,
Josephine County, Oregon

Agency:	Federal Highway Administration
Consultation Conducted By:	NOAA's National Marine Fisheries Service, Northwest Region
Date Issued:	April 30, 2004
Issued by:	for Michael R Crouse _____ D. Robert Lohn Regional Administrator
Refer to:	**2003/01285**

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1. INTRODUCTION

1.1 Consultation History

On October 8, 2003, the National Marine Fisheries Service (NOAA Fisheries) received a biological assessment (BA) and a request from the Federal Highway Administration (FHWA) for Endangered Species Act (ESA) section 7 formal consultation for the Grave Creek (Beecher Road) Bridge Replacement Project. This biological opinion (Opinion) is based on the information presented in the BA, site visits, and discussions with the applicant. The project area is near the city of Grants Pass, Oregon, two miles east of Interstate 5 (I-5) at road mile 65.

The FHWA determined that Southern Oregon/Northern California Coast (SONC) coho salmon (*Oncorhynchus kisutch*) is likely to occur within the project area. The SONC coho salmon were listed as threatened under the ESA on May 6, 1997 (62 FR 24588), critical habitat was designated on May 5,1999 (64 FR 24049), and interim protective regulations were issued under section 4(d) of the ESA on July 18, 1997 (62 FR 38479). Critical habitat is designated to include all river reaches accessible to listed coho salmon between Cape Blanco, Oregon, and Punta Gorda, California. Excluded are areas above specific dams or above longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for at least several hundred years). The FHWA, using methods described in *Making ESA Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFS 1996), determined that the proposed action is likely to adversely affect SONC coho salmon.

This Opinion is based on the information presented in the BA and developed through correspondence to obtain additional information and clarity. The objective of this Opinion is to determine whether FHWA's decision to fund Oregon Department of Transportation's (ODOT) proposed action to replace the Grave Creek (Beecher Road) Bridge is likely to jeopardize the continued existence of the SONC coho salmon, or destroy or adversely modify critical habitat. This consultation is undertaken under section 7(a)(2) of the ESA, and its implementing regulations, 50 CFR Part 402.

1.2 Proposed Action

1.2.1 Project Purpose

This project is designed to replace the Grave Creek (Beecher Road) Bridge, which carries residential, recreational, and commercial traffic over Grave Creek via Beecher Road. Beecher Road connects residential and forest lands to I-5.

The existing Grave Creek (Beecher Road) Bridge has received minor and major maintenance since its construction in 1957. There are numerous identified problems including rot, insect damage, and section loss in some chord members. The structure has exceeded its useful life and is a major maintenance problem. In addition, the structure consistently releases creosote to the Grave Creek stream channel, potentially impacting water quality. The proposed project would

include construction of a wider and stronger bridge beside the existing structure to improve the safety of the Beecher Road crossing of Grave Creek. In addition, the proposed project includes the realignment of Beecher Road at the bridge site and at its intersection with Placer Road. The two roads intersect at a hazardous angle that does not provide motorists proper site distance when accelerating onto Placer Road from Beecher Road. Furthermore, the intersection alignment does not meet current American Association of State Highway and Transportation Officials (AASHTO) and ODOT standards. The proposed realignment of the intersection will meet current AASHTO and ODOT standards by providing a 90-degree turning radius.

1.2.1.1 Proposed Bridge

The proposed bridge consists of a single-span, reinforced pre-cast, pre-stressed concrete structure approximately 115 feet long and 25 feet wide. The bridge deck will consist of a cast-in-place surface. The bridge will be supported on a total of 12 steel pipe piles at each end of the bridge, within the ordinary high water mark (OHWM), but outside of the low-flow wetted channel. The piles will be approximately 30 feet in length. In order to accommodate the structure's 115 foot span length, vertical abutments between 5 to 10 feet of exposed height below the beams are anticipated. This abutment height will require a double row of pilings at each abutment to resist seismic design loads. The bridge roadway typical section will be consistent with the proposed, realigned portion of Beecher Road.

The proposed steel pipe piles for the bridge piers will be driven after the bridge approaches are constructed. Some of the piles will be within the creek's OHWM, resulting in approximately 300 feet^2 of impact within the OHWM. However, the piles will not be within Grave Creek's wetted channel. After the piles are driven to their designed depth of approximately 30 feet, concrete pile caps will be poured and cured. After the bridge support structures are in place, the PCPS bridge beams will be placed on the pile caps. After the bridge beams have been placed, the bridge deck will be placed on the beams. The final step will be to install the rails on the deck.

A small irrigation ditch, approximately 125 feet north of the creek, crosses Beecher Road near its intersection with Placer Road. The ditch is conveyed under Beecher Road via an existing corrugated metal culvert. The proposed intersection of Beecher Road and Placer Road will be relocated approximately 375 feet east of the existing intersection. Therefore, a new culvert will be constructed near the intersection to accommodate the irrigation ditch.

The proposed culvert would be approximately 50 feet long and 18 inches in diameter. A total area of approximately 200 feet^2 will be covered with gravel at the culvert inlet and outlet to provide flow control and limit scour at the intersection. The irrigation ditch will likely contain irrigation water during the proposed construction of the new culvert at the realigned portion of Beecher Road, therefore, to meet irrigation demand, a bypass system will be developed to dry the work area while maintaining irrigation flows.

1.2.1.2 Roadway Realignment

The proposed new bridge approaches on Beecher Road will be east of the existing bridge approaches to match the proposed alignment of the new bridge and to optimize the horizontal alignment of the intersection of Beecher Road with Placer Road. The proposed roadway is a two-lane road with a 2% crowned pavement section of 5-inch asphalt concrete over a 10-inch aggregate rock base. The roadway will consist of two 9-foot travel lanes with 2-foot shoulders, for a total roadway width of 22 feet.

Traveling from the west, the proposed alignment begins at the new intersection of Beecher Road and Placer Road, approximately 375 feet east of the existing intersection. The proposed realignment of the intersection will improve existing safety conditions for motorists by providing a 90-degree turning radius. The proposed alignment for Beecher Road will cause the new bridge to be approximately 30 feet east of the existing bridge. The new roadway and bridge approaches will constitute approximately 0.34 acres of impervious surface within the project action area; a decrease of approximately 3,138 feet^2 from the existing roadway and bridge approaches.

The portion of Beecher Road north of the existing bridge and outside of the proposed realigned portion of this road, will remain in place after the completion of the proposed project to serve as an access road to the relocated gravel stockyard. The southern portion of Beecher Road outside of the proposed realignment will remain to provide driveway access to the realigned road for a residence south of the bridge.

1.2.1.3 Bridge Demolition

After the proposed bridge is constructed, the existing bridge will be removed. The first stage will consist of removing the bridge rails, deck, and beams by cutting them into smaller, manageable sections and lifted out. Once the superstructure is removed, the existing abutments will be removed approximately 2 feet below the existing ground surface. Sediment containment structures will be placed between the existing bridge abutments and the wetted channel to minimize the potential for construction-related sediment to enter the creek.

It is anticipated that all bridge removal activities can be performed from the existing roadway, above the OHWM, so there is no in-water work associated with this phase of the project. All debris will be contained and prevented from entering the waterway below.

1.2.1.4 New Impervious Surfaces and Stormwater Management

The proposed project will result in a net reduction of impervious surface within the action area of approximately 3,138 feet^2, primarily from the realignment of Beecher Road. The proposed roadway between the bridge and Placer Road will be shorter than the existing road. The proposed bridge will constitute approximately 2,900 feet^2 of impervious surface; a decrease of approximately 138 feet^2 from the existing structure. The proposed roadway will result in approximately 15,000 feet^2 of impervious surface.

Stormwater runoff originating from the roadway discharges via sheet flow into adjacent vegetated roadside ditches before entering the riparian area of Grave Creek. Stormwater runoff associated with the existing bridge is discharged directly from the bridge deck to the creek without prior treatment.

The project has been designed to collect, convey, and treat stormwater runoff from the impervious surfaces constructed within the project area. Stormwater runoff from the proposed roadway will be conveyed to four engineered bioswales beside the proposed bridge. The proposed bridge will be fully curbed so that stormwater generated on its surface will be conveyed to the bridge ends and into the bioswales. The bioswales will be within each quadrant of the proposed bridge, approximately 50 feet from the bridge ends. The bioswales will be approximately one foot deep and 100 feet long with 2:1 side slopes. Due to the pervious nature of the existing soils, it is anticipated that stormwater will infiltrate entirely before entering Grave Creek.

2. ENDANGERED SPECIES ACT

2.1 Biological Opinion

2.1.1 Biological Information

The action area is defined by NOAA Fisheries regulations (50 CFR 402) as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The action area is Grave Creek, from the work area downstream approximately 1,500 feet and upstream 500 feet from the existing bridge.

Essential habitat features for salmonids are: Substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food (juvenile only), riparian vegetation, space, and safe passage conditions. The proposed action may affect the essential habitat features of water quality, riparian vegetation and substrate. Grave Creek, within the action area, serves as a migration, rearing, and, potentially, spawning area for SONC coho salmon.

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 Part 402. NOAA Fisheries must determine whether the action is likely to jeopardize the listed species and/or whether the action is likely to destroy or adversely modify critical habitat. This analysis involves the initial steps of: (1) Defining the biological requirements and current status of the listed species; and (2) evaluating the relevance of the environmental baseline to the species' current status.

Subsequently, NOAA Fisheries evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for

recovery. In making this determination, NOAA Fisheries must consider the estimated level of mortality attributable to: (1) Collective effects of the proposed or continuing action; (2) the environmental baseline; and (3) any cumulative effects. If NOAA Fisheries finds that the action is likely to jeopardize the listed species, NOAA Fisheries must identify reasonable and prudent alternatives for the action.

For the proposed action, NOAA Fisheries' jeopardy analysis considers direct or indirect mortality of fish attributable to the action. NOAA Fisheries' analysis considers the extent to which the proposed action impairs the function of essential elements necessary for migration, spawning, and rearing of SONC coho salmon under the existing environmental baseline.

2.1.2.1 Biological Requirements

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

The relevant biological requirements are those necessary for the listed species to survive and recover to a naturally-reproducing population level, 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 this consultation, the biological requirements are improved habitat characteristics that function to support successful rearing and migration. The current status of the listed species, based on their risk of extinction, has not significantly improved since the species were listed.

2.1.2.2 Environmental Baseline

In step two of NOAA Fisheries' analysis, we evaluate 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, mining, and forestry. Riparian areas and stream channels within the action area have been damaged by development activities related to these land uses. The current range-wide status of the identified evolutionarily significant unit

(ESU) may be found in Nickelson *et al.* (1992) and Weitkamp *et al.* (1995). The identified action will occur within the range of SONC coho salmon. The action area is the area that is directly and indirectly affected by the action. The direct effects occur at the project site and may extend upstream or downstream based on the potential for impairing fish passage, hydraulics, sediment and pollutant discharge, and the extent of riparian habitat modifications. Indirect effects may occur throughout the watershed where actions described in this Opinion lead to additional activities or affect ecological functions contributing to stream degradation. For the purposes of this Opinion, the action area is the channel and adjacent riparian area 500 feet upstream from the project site, and approximately 1,500 feet downstream. Temporary indirect effects, such as disruption of primary productivity and food resources, and potential direct effects, such as sediment, pollutant discharge, and hydraulics, to Grave Creek will be caused by the in-water work and general riparian and bank disturbance within the project area.

Stream channel widths in Grave Creek are predominately narrow enough for stream-side vegetation to provide adequate shade. However, canopy closure over many fish-bearing streams is inadequate to maintain water temperatures below 64° F. Naturally low summer flows quickly result in elevated water temperature when streams are subjected to timber harvest, land clearing, and water diversion. Water diversion in Grave Creek limits the amount of habitat available for fish and other aquatic species. The floodplain in the Grave Creek watershed has been altered from its original state by hydraulic mining. Road construction and mining activities have altered stream channel configurations within the watershed by reducing sinuosity and channel complexity. The continued disturbance from various activities restricts the input of large wood and natural channel migration.

Placer gold mining has occurred on most of the streams in the Grave Creek watershed and is ongoing in some locations. Placer mining involves washing stream gravels for gold and, as a result, riparian vegetation in some areas has been destroyed from the historic mining practices. The largest dredging operation for placer gold in Josephine County was conducted between 1935 and 1938 on the south side of Grave Creek, east of Leland. Mining activities within the watershed excavated large quantities of stream substrate to the extent that stream channels were stripped to bedrock. Placer mining has removed large conifers from riparian areas, added large quantities of sediment to streams, and has simplified stream habitat within the Grave Creek watershed.

Roads are a chronic sediment source to streams within the Grave Creek watershed. There are approximately 808 miles of roads in the watershed, representing approximately 4,848 acres of roadway surface. There is an average road density of 5 miles of road per square mile of watershed. Most of these roads are on private timber industry lands and the vast majority are likely unpaved. Unpaved roads are generally the largest sediment sources for Grave Creek and its tributaries.

Water quality is a limiting factor within the watershed. Grave Creek is listed on the Oregon Department of Environmental Quality (ODEQ) 303(d) list for temperature violations from its headwaters to the confluence with the Rogue River.

Based on the best available information regarding the current status of SONC coho salmon range-wide, the population status, trends, genetics, and the poor environmental baseline conditions within the action area, NOAA Fisheries concludes that the biological requirements of SONC coho salmon are not currently being met. Degraded habitat, resulting from mining, forestry practices, road building, and residential construction, indicate many aquatic habitat indicators are not properly functioning within Grave Creek. Actions that do not maintain or restore properly functioning aquatic habitat conditions would be likely to jeopardize the continued existence of SONC coho salmon.

2.1.3 Analysis of Effects

Analysis of effects includes assessing direct, indirect, beneficial, and cumulative effects. Temporary indirect effects, such as disruption of primary productivity and food resources, and potential direct effects, such as sediment, pollutant discharge, and changes in hydraulics to Grave Creek will be caused by the in-water work and general riparian and bank disturbance within the project area. An additional direct effect to SONC coho salmon juveniles may occur from the capture, handling, and relocation of individuals during the in-water work. Beneficial effects may include the removal of treated wood from above the stream.

2.1.3.1 Effects of the Proposed Action

Creeks and rivers are dynamic systems that naturally alter their courses in response to many physical processes. Roadways and other structures constructed along waterways are subject to flooding and undercutting as a result of these natural changes in the stream course. Structural hardening of embankments is the traditional means of protecting these structures along waterways. Hardened embankments simplify stream channels, alter hydraulic processes, and prevent natural channel adjustments (Spence *et al.* 1996). Moreover, embankment hardening may shift the erosion point either upstream or downstream of the project and accelerate stream velocity. As amplified erosive forces attack different locations and landowners respond with more bank hardening, the river eventually attains a continuous fixed alignment lacking habitat complexity (COE 1977).

Fish habitats are enhanced by diversity of habitats at the land-water interface and adjacent bank (COE 1977). Streamside vegetation provides shade that reduces water temperature and stabilizes streambanks. Overhanging branches provide cover from predators. Insects and other invertebrates that fall from overhanging branches may be preyed on by fish, or provide food sources for other prey organisms. Immersed vegetation, logs, and root wads provide points of attachment for aquatic prey organisms, shelter from swift currents during high flows, retain bed load sediment, create pools, and reduce flow velocity.

The combination of channel confinement, ground water alteration, riparian degradation and the legacy of large woody material removal within the system and specifically at roadway crossings has simplified the habitat within the action area and retarded the formation and maintenance of complex fish habitat within the project reach.

Sedimentation

Potential impacts to listed salmonids from the proposed action include both direct and indirect effects. Potential direct effects include mortality from exposure to suspended sediments (turbidity) and contaminants resulting from ground disturbance and general construction activities. Potential indirect effects include behavioral changes resulting from elevated turbidity level (Berg and Northcote 1985), during riverbank habitat alterations.

Suspended sediment and turbidity influences on fish reported in the literature range from beneficial to detrimental. Elevated total suspended solids (TSS) levels have been reported to enhance cover conditions, reduce piscivorous bird predation rates, and improve survival. Elevated TSS conditions have also been reported to cause physiological stress, reduce growth, and adversely affect survival. Of key importance in considering the detrimental effects of TSS on fish is the frequency and the duration of the exposure, not just the TSS concentration.

Behavioral avoidance of turbid waters may be one of the most important effects of suspended sediments (DeVore *et al.* 1980, Scannell 1988). Salmonids have been observed to move laterally and downstream to avoid turbid plumes (Lloyd 1987, Scannell 1988, Servizi and Martens 1991). Juvenile salmonids tend to avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, unless the fish need to traverse these streams along migration routes (Lloyd *et al.* 1987). In addition, a potentially positive reported effect is providing refuge and cover from predation (Gregory and Levings 1998).

Fish that remain in turbid waters (elevated TSS concentration), experience a reduction in predation from piscivorous fish and birds (Gregory and Levings 1998). In systems with intense predation pressure, this provides a beneficial trade off (*e.g.*, enhanced survival) to the cost of potential physical effects (*e.g.*, reduced growth). Turbidity levels of about 23 Nephalometric Turbidity Units (NTU) have been found to minimize bird and fish predation risks (Gregory 1993). Exposure duration is a critical determinant of the occurrence and importance of physical or behavioral effects. Salmonids have evolved in systems that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with flood events, and are adapted to such high pulse exposures. Adult and larger juvenile salmonids may be little affected by the high concentrations of suspended sediments that occur during storm and snowmelt runoff episodes (Bjornn and Reiser 1991). However, research shows that chronic exposure can cause physiological stress responses that can increase maintenance energy and reduce feeding and growth (Redding *et al.* 1987, Lloyd 1987, Servizi and Martens 1991).

Turbidity, at moderate levels, has the potential to adversely affect primary and secondary productivity, and at high levels, has the potential to injure and kill adult and juvenile fish, and may also interfere with feeding (Spence *et al.* 1996). Newly-emerged salmonid fry may be vulnerable to even moderate amounts of turbidity (Bjornn and Reiser 1991). Other behavioral effects on fish, such as gill flaring and feeding changes, have been observed in response to pulses of suspended sediment (Berg and Northcote 1985). Fine, redeposited sediments also have the potential to adversely affect primary and secondary productivity (Spence *et al.* 1996), and to reduce incubation success (Bell 1991) and cover for juvenile salmonids (Bjornn and Reiser

1991). Because the potential for turbidity should be localized and brief, the probability of direct mortality is negligible.

To minimize the potential for increased turbidity and disturbance of fish, in-water work will occur during the preferred in-water work timing guideline. During this window, streamflows are typically low, fish presence is reduced, and rainfall is minimal. Erosion and sediment control devices will be deployed within 100 feet of all waterways and will stay in place until the project area is stabilized.

Chemical Contamination

As with all construction activities, accidental release of fuel, oil, and other contaminants may occur. Operation of back-hoes, excavators, and other equipment requires the use of fuel, lubricants, *etc.*, which, if spilled into the channel of a waterbody or into the adjacent riparian zone, can injure or kill aquatic organisms. Petroleum-based contaminants, such as fuel, oil, and some hydraulic fluids, contain poly-cyclic aromatic hydrocarbons (PAHs), which can be acutely toxic to salmonids at high levels of exposure and can also cause chronic lethal and acute and chronic sublethal effects to aquatic organisms (Neff 1985). Similarly, exposure to herbicides can have lethal and sublethal effects on salmonids, aquatic invertebrates, aquatic vegetation, and target and non-target riparian vegetation (Spence *et al.* 1996). Exposure to water contaminated with runoff contacting green concrete and the associated changes in water chemistry also can have lethal and sublethal effects on salmonids, aquatic invertebrates, aquatic vegetation, and target and non-target riparian vegetation.

To minimize the potential for chemical contamination and disturbance of fish, in-water work would be completed during the recommended in-water work period. During this window, streamflow is typically low, fish presence is reduced, and rainfall is minimal. In-water work area isolation would allow the work to occur in the dry, thereby reducing indirect (chemical contaminants) from entering the actively flowing water and direct impacts to fish. Staging areas would be in areas that have already been previously disturbed. Equipment and vehicle staging and storage will be at least 150 feet from the regulated work area. Fuels and other hazardous materials will be at least 300 feet away from the regulated work area.

Stream Hydraulics

The proposed placement of driven-pile bridge piers below the OHWM of Grave Creek will typically result in simplification of habitat and increased stream velocities under and along the structure and hard points. Due to the decreased footprint from existing conditions, there will be an increase of approximately 240 feet^2 of habitat within the OHWM. Since an increase in habitat bankline functions are expected, no long-term adverse effect is likely to occur to stream hydraulics as a result of the proposed action.

Riparian Vegetation

The proposed project will result in approximately 36 trees, all less than 20 inches in diameter at breast height (dbh), being removed. Since the trees are predominately immature, the removal of riparian vegetation will result in a short-term potential for exposed soils and increased sediment

transport to Grave Creek. Riparian plantings, at a 2:1 replacement ratio, will provide erosion control, bank stabilization, shading, allochthonous inputs, and will increase the potential for insect production. In addition, extensive erosion control measures and the proposed riparian plantings, will result in long-term beneficial effects to the Grave Creek riparian corridor.

Hydrologic Stormwater Effects

New impervious surface increases the potential for reduced evapotransporation and infiltration opportunities, resulting in an increase in magnitude and duration of peak discharge as well as decreased summer base flow (Booth and Jackson 1997). The Grave Creek (Beecher Road) Bridge Replacement Project will result in a net decrease of 3,138 $feet^2$ of impervious surface. In addition, the proposed vegetated swales and riparian plantings will help to attenuate peak flows through filtration, infiltration, and evapotransporation of stormwater runoff from impervious surfaces. Compared to existing conditions, the proposed stormwater runoff treatment measures will reduce potential adverse effects to Grave Creek's annual hydrograph.

Direct Harm or Harassment

The proposed project will likely only require work area isolation from the flowing water within the irrigation canal. Although salmonids have been observed within the canal, fish removal activities would be in accordance with NOAA Fisheries fish handling guidelines (NOAA Fisheries 2000). Any listed fish removed from the isolated work areas would 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 of the project site.

2.1.3.2 Effects on Critical Habitat

NOAA Fisheries designates critical habitat based on physical and biological features that are essential to the listed species. Essential features for designated critical habitat include substrate, water quality, water quantity, water temperature, food, riparian vegetation, access, water velocity, space and safe passage. Effects on critical habitat from the proposed action are included in the effects description above in section 2.1.3.1 of this Opinion.

2.1.3.3 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". The action area has been defined as the streambed and streambanks of Grave Creek, extending approximately 500 feet upstream and 1500 feet downstream.

Non-federal activities within the action area are expected to increase with a projected 20% increase in human population over the next 25 years in Josephine County (U.S. Census Bureau, 2002). Thus, NOAA Fisheries assumes that future private and state actions will continue within

the action area, but at increasingly higher levels as population density increases. NOAA Fisheries assumes that future FHWA transportation projects in the Grave Creek watershed will be reviewed through separate section 7 consultation processes and therefore are not considered cumulative effects.

2.1.4 Conclusion

NOAA Fisheries has determined that, when the effects of the FHWA's proposed actions are added to the environmental baseline and cumulative effects occurring in the action area, they are not likely to jeopardize the continued existence of SONC coho salmon, or cause adverse modification or destruction of designated critical habitat. These conclusions were based on the following considerations: (1) All in-water work and other construction activities within the OHWM of Grave Creek will take place according to recommended in-water work time lines or during approved exceptions, to protect fish and wildlife resources; (2) to the greatest extent possible, all sediment-laden water and water contaminated by contact with green concrete or other construction-related contaminants will be contained and treated before contact with flowing waters; (3) any riparian trees removed as a result of the proposed action will be retained within the riparian area, and, where feasible, the rootwads will remain attached and the trees will be placed partially into the channel of Grave Creek; (4) work area isolation, where necessary, will include use of NOAA Fisheries' guidelines for proper fish handling (NMFS 2000) and other conservation measures to avoid or minimize adverse effects to water quality; (5) riparian vegetation cleared for access and construction and scour protection measures will be more than offset by the native riparian plantings; (6) stormwater generated from new impervious surfaces will not result in long-term adverse effects to Grave Creek, and with the reduction of total impervious surface and vegetated swale, construction will meet NOAA Fisheries, Northwest Region, Habitat Conservation Division Stormwater Guidelines; and (7) bridge piers will not result in long-term adverse effects to Grave Creek hydraulics. Therefore, the proposed action is not expected to prevent or delay the achievement of properly functioning habitat conditions in the action area.

2.1.5 Reinitiation of Consultation

Consultation must be reinitiated if: (1) The amount or extent of taking specified in the incidental take statement is exceeded, or is expected to be exceeded; (2) new information reveals that effects of the action may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on listed species that was not previously considered; or (4) a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16). In instances where the amount or extent of authorized incidental take is exceeded, any operations causing such take must cease pending reinitiation of consultation.

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 salmonids 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 222.102] Harass is defined as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, 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].

An incidental take statement specifies the impact of any incidental taking of 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 to implement the reasonable and prudent measures.

2.2.1 Amount or Extent of the Take

NOAA Fisheries anticipates that the actions covered by this Opinion are reasonably certain to result in incidental take of SONC coho salmon because of potential adverse effects from increased sediment levels, chemical contamination, and the potential for direct incidental take during in-water work. Handling of juvenile coho salmon during the work isolation process may result in incidental take of individuals if adequate water quality allows juvenile salmonids to be present during the construction period. NOAA Fisheries anticipates non-lethal incidental take of up to 50 individuals, of which, lethal take of 3 juvenile coho salmon could occur as a result of the fish rescue, salvage, and relocation activities covered by this Opinion. The potential adverse effects of the other project components on population levels are largely unquantifiable, and NOAA Fisheries does not expect them to be measurable in the long term. The extent of authorized take is limited to SONC coho salmon in Grave Creek and is limited to that caused by the proposed action within the action area.

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 require ODOT 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.

The Grave Creek (Beecher Road) Bridge Replacement Project includes a set of "conservation measures" designed to minimize take of ESA-listed species. These are described on pages 27 to 30 of the September, 2003, BA. Specific measures for in-water and bank work, clearing and grubbing, bridge construction, stormwater management, erosion control, hazardous materials, and site-specific conservation and habitat remediation measures are also included.

NOAA Fisheries believes that the following reasonable and prudent measures, along with the conservation measures described in the BA, are necessary and appropriate to minimize the likelihood of take of ESA-listed fish resulting from implementation of this Opinion. These reasonable and prudent measures would also minimize adverse effects to designated critical habitat.

The FHWA shall:

1. Ensure completion of a comprehensive monitoring and reporting program to confirm that this Opinion is meeting its objective of minimizing take from permitted activities.

2. Avoid or minimize incidental take from construction-related activities by applying conditions that require construction, operation, and maintenance actions with minimum harm to aquatic and riparian systems.

3. Minimize the likelihood of incidental take from in-water work by ensuring that in-water work areas are isolated from flowing water.

4. Minimize the amount and extent of take from loss of instream habitat by implementing measures to minimize impacts to riparian and instream habitat, or where impacts are unavoidable, to replace or restore lost riparian and instream functions.

5. Minimize the amount and extent of take from stormwater impacts and altered stream hydraulics by implementing measures to treat and detain water and limit fill within the 100-year floodplain.

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.

1. To implement reasonable and prudent measure #1 (monitoring), the FHWA shall ensure that:

    a. Salvage notice. The following notice is included as a permit condition.

NOTICE. If a sick, injured or dead specimen of a threatened or endangered species is found, the finder must notify the Roseburg Field Office of NOAA Fisheries Law Enforcement at 541.957.3388. 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.

b. Written planning requirements. Before beginning any work below bankfull elevation,[1] the permittee will provide a copy of the written plans for site restoration, compensatory mitigation, pollution and erosion control, bridge demolition and stormwater management, to the Oregon State Habitat Office of NOAA Fisheries at the following address. Plan requirements are described below.

Director, Oregon State Habitat Office
Habitat Conservation Division
National Marine Fisheries Service
Attn: 2003/01285
525 NE Oregon Street
Portland, OR 97232

c. Implementation monitoring report required. The permittee submits an implementation monitoring report to the FHWA and to NOAA Fisheries, at the address below, within 120 days of completing all in-water work. The monitoring report will describe the permittee's success meeting his or her permit conditions.

d. Implementation monitoring report contents. Each 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 6th 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.

[1] 'Bankfull elevation' means the bank height inundated by a 1.5 to 2-year average recurrence interval and may be estimated by morphological features such average bank height, scour lines and vegetation limits.

ii. Habitat conditions. Photos of habitat conditions at the project and any compensation site or sites, before, during, and after project completion.[2]
   (1) Include general views and close-ups showing details of the project and project area, including pre and post construction.
   (2) Label each photo with date, time, project name, photographer's name, and a comment about the subject.

iii. Site restoration.
   (1) The name and address of the party(s) responsible for meeting each component of the site restoration.
   (2) Performance standards for determining compliance.
   (3) Any other pertinent requirements such as financial assurances, real estate assurances, monitoring programs, and the provisions for short and long-term maintenance of the restoration.
   (4) Planting composition and density.
   (5) A plan to inspect and, if necessary, replace failed plantings for five years.
   (6) A provision for FHWA certification that all action necessary to carry out each component of the restoration is completed, and that the performance standards are achieved.

iv. Project data.
   (1) Work cessation. Dates work ceased due to high flows, if any.
   (2) Fish screen. Evidence of compliance with NOAA Fisheries' fish screen criteria.
   (3) Pollution control. A summary of pollution and erosion control inspections, including any erosion control failure, contaminant release, and correction effort.
   (4) Pilings.
      (a) Number and type of pilings removed, including the number of pilings (if any) that broke during removal.
      (b) Number, type, and diameter of any pilings installed (e.g., untreated wood, treated wood, hollow steel).
      (c) Description of how pilings were installed and any sound attenuation measures used.
   (5) Site preparation.
      (a) Total cleared area – riparian and upland.
      (b) Total new impervious area.
   (6) 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.

[2] 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.

(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) Release site and condition of all fish released.
(g) Any incidence of observed injury or mortality of listed species.

(7) Road construction, repairs and improvements. The justification for any new permanent road crossing design (i.e., road realignment, full span bridge, streambed simulation, or no-slope design culvert).

(8) Site restoration. Photo or other documentation that site restoration performance standards were met.

e. Annual report on site restoration and compensatory mitigation monitoring. In addition to the 120-day implementation report, the permittee will submit an annual report to the FHWA and NOAA Fisheries by December 31 that includes the date of each visit to a restoration site, site conditions on that date, and any corrective action taken as a result of that visit. Reporting will continue from year to year until the FHWA certifies that site restoration or compensatory mitigation performance standards have been met.

f. Post construction impacts. The FHWA/ODOT shall assess the project's impacts, temporary and permanent, and compare them to the impacts assessed in the 2003 BA. This written assessment will be provided to NOAA Fisheries for review. If the actual impacts exceed those outlined in the BA then the FHWA/ODOT will provide additional mitigation to offset those impacts.

g. Reinitiation contact. To reinitiate consultation, contact the Oregon State Habitat Office of NOAA Fisheries, at the address above.

2. To implement reasonable and prudent measure #2 (construction-related activities), the FHWA shall require the following:

a. Minimum area. Confine construction impacts to the minimum area necessary to complete the project.

b. Preconstruction meeting. ODOT will arrange a pre-construction meeting with NOAA Fisheries and the contractor before commencement of project activities.

c. Preconstruction activity. Complete the following actions before significant[3] alteration of the project area.

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. Survey and mark the OHWM at the project site before commencement of work.

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

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 will be in-place and appropriately installed downslope of project activity within the riparian area until site restoration is complete.

d. Site preparation. Conserve native materials for site restoration.
i. If possible, leave native materials where they are found.
ii. If materials are moved, damaged, or destroyed, replace them with a functional equivalent during site restoration.
iii. Stockpile any large wood,[5] native vegetation, weed-free topsoil, and native channel material displaced by construction for use during site restoration.

e. Earthwork. Complete earthwork (including drilling, excavation, dredging, filling, and compacting) as quickly as possible.
i. Site stabilization. Stabilize all disturbed areas, including obliteration of temporary roads, following any break in work unless construction will resume within four days.
ii. Source of materials. Obtain boulders, rock, woody materials and other natural construction materials used for the project outside the riparian area.

f. Cessation of work. Cease project operations under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.

g. Timing of in-water work. Complete all work below the OHWM between June 15 and September 15, unless otherwise approved in writing by NOAA Fisheries. ODOT shall notify NOAA Fisheries at least one week before the start of work below the OHWM.

h. Fish screens. Install, operate and maintain a fish screen according to NOAA Fisheries' fish screen criteria[6] on each water intake used for project construction,

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

[5] 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 channel 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).

[6] 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).

including pumps used to isolate an in-water work area. Screens for water diversions or intakes that will be used for irrigation, municipal or industrial purposes, or any use besides project construction are not authorized.

i. Fish passage. Provide passage for any adult or juvenile salmonid species present in the project area during construction, unless otherwise approved in writing by NOAA Fisheries, and after construction for the life of the project. Upstream passage is not required during construction if it did not previously exist.

j. Pollution and Erosion Control Plan. Prepare and carry out a written pollution and erosion control plan to prevent pollution caused by surveying or construction operations. Submit a copy of the written plan to the FHWA and to the Oregon State Habitat Office of NOAA Fisheries, at the address above, before beginning work below bankfull elevation.

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

      (1) The name and address of the party(s) responsible for accomplishment of the pollution and erosion control plan.

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

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

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

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

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

   ii. Inspection of erosion controls. During construction, monitor instream turbidity and inspect all erosion controls daily during the rainy season and weekly during the dry season, or more often as necessary, to ensure the erosion controls are working adequately.[7]

[7] 'Working adequately' means that project activities do not increase ambient stream turbidity by more than 10% above background 100 feet below the discharge, when measured relative to a control point immediately upstream of the turbidity causing activity.

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

(2) Remove sediment from erosion controls once it has reached 1/3 of the exposed height of the control.

k. Construction discharge water. Treat all discharge water created by construction (*e.g.*, concrete washout, pumping for work area isolation, vehicle wash water, drilling fluids) as follows.

i. Water quality. Design, build and maintain facilities to collect and treat all construction discharge water, including any contaminated water produced by drilling, using the best available technology applicable to site conditions. Provide treatment to 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 may not exceed 4 feet per second, and the maximum size of any aperture may not exceed one inch.

iii. Pollutants. Do not allow pollutants including green concrete, contaminated water, silt, welding slag, sandblasting abrasive, or grout cured less than 24 hours to contact any wetland or the OHWM.

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

i. Dislodge the piling with a vibratory hammer.

ii. Once loose, place the piling onto an appropriate dry storage site.

iii. Fill the holes left by each piling with clean, native sediments.

m. Temporary access roads. All temporary access roads will be constructed as follows.

i. Existing ways. Use existing roadways and travel paths 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.

iii. Minimizing soil disturbance and compaction. Minimize soil disturbance and compaction whenever a new temporary road is necessary within 150 feet[8] of a stream, waterbody or wetland by clearing vegetation to ground level and placing clean gravel over geotextile fabric, unless otherwise approved in writing by NOAA Fisheries.

iv. Temporary stream crossings.

[8] 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).

(1) Minimize the number of temporary stream crossings.
(2) Design temporary road crossings as follows.
(a) Survey and map any potential spawning habitat within 300 feet downstream of a proposed crossing.
(b) Do not place a stream crossing at known or suspected spawning areas, or within 300 feet upstream of such areas if spawning areas may be affected.
(c) Design the crossing to 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 will cross riparian areas and streams at right angles to the main channel wherever possible.

v. Obliteration. When the project is complete, obliterate all temporary access roads that will not be in footprint of a new bridge or other permanent structure, stabilize the soil, and revegetate the site. Abandon and restore temporary roads in wet or flooded areas by the end of the in-water work period.

n. Bridge Demolition. A bridge demolition plan must be approved by NOAA Fisheries before removal of the existing structures.

o. Heavy Equipment. Restrict use of heavy equipment as follows:

i. Choice of equipment. When heavy equipment will be used, the equipment selected will have the least adverse effects on the environment (*e.g.*, minimally-sized, low ground pressure equipment).

ii. Vehicle and material staging. Store construction materials, and fuel, operate, maintain and store vehicles as follows:

(1) To reduce the staging area and potential for contamination, ensure that only enough supplies and equipment to complete a specific job will be stored on site.
(2) Complete vehicle staging, cleaning, maintenance, refueling, and fuel storage in a vehicle staging area placed 150 feet or more from any stream, waterbody or wetland, unless otherwise approved in writing by NOAA Fisheries, except as stated below.
(a) Fuel storage locations within 150 feet of the OHWM shall have containment measures in place that meets or exceeds 100% containment.
(b) No auxiliary fuel tanks are stored within 150 feet of the OHWM.
(3) Hazardous materials stored within 150 feet of the OHWM shall have containment measures in place that meets or exceeds 100% containment.
(4) Inspect all vehicles operated within 150 feet of any stream, waterbody or wetland daily for fluid leaks before leaving the

vehicle staging area. Repair any leaks detected in the vehicle staging area before the vehicle resumes operation. Document inspections in a record that is available for review on request by FHWA or NOAA Fisheries.

(5) Before operations begin and as often as necessary during operation, steam clean all equipment that will be used below bankfull elevation until all visible external oil, grease, mud, and other visible contaminates are removed.

(6) Diaper all stationary power equipment (*e.g.*, generators, cranes, stationary drilling equipment) operated within 150 feet of any stream, waterbody or wetland to prevent leaks, unless suitable containment is provided to prevent potential spills from entering any stream or waterbody.

p. Site restoration. Prepare and carry out a written site restoration plan as necessary to ensure that all streambanks, soils and vegetation disturbed by the project are cleaned up and restored as follows. Submit a copy of the written site restoration plan to the FHWA and to the Oregon State Habitat Office of NOAA Fisheries, at the address above, before beginning work below bankfull elevation.

i. General considerations.

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

(2) Streambank shaping. Restore damaged streambanks to a natural slope, pattern and profile suitable for establishment of permanent woody vegetation, unless precluded by pre-project conditions (*e.g.*, a natural rock wall).

(3) Revegetation. Replant area requiring revegetation before the first April 15 following construction. Use a diverse assemblage of species native to the project area or region, including grasses, forbs, shrubs and trees. Noxious or invasive species may not be used.

(4) Pesticides. Take of ESA-listed species caused by any aspect of pesticide use is not included in the exemption to the ESA take prohibitions provided by this incidental take statement. Pesticide use must be evaluated in an individual consultation, although mechanical or other methods may be used to control weeds and unwanted vegetation.

(5) Fertilizer. Do not apply surface fertilizer within 50 feet of any stream channel.

(6) Fencing. Install fencing as necessary to prevent access to revegetated sites by livestock or unauthorized persons.

ii. Plan contents. Include each of the following elements.

(1) Baseline information. This information may be obtained from existing sources (*e.g.*, land use plans, watershed analyses, subbasin plans), where available.
   (a) A functional assessment of adverse effects, *i.e.*, the location, extent and function of the riparian and aquatic resources that will be adversely affected by construction and operation of the project.
   (b) The location and extent of resources surrounding the restoration site, including historic and existing conditions.

(2) Goals and objectives. Restoration goals and objectives that describe the extent of site restoration necessary to offset adverse effects of the project, by aquatic resource type.

(3) Performance standards. Use these standards to help design the site restoration plan and to assess whether the restoration goal is met. While no single criterion is sufficient to measure success, the intent is that these features should be present within reasonable limits of natural and management variation.
   (a) Bare soil spaces are small and well dispersed.
   (b) Soil movement, such as active rills or gullies and soil deposition around plants or in small basins, is absent or slight and local.
   (c) If areas with past erosion are present, they are completely stabilized and healed.
   (d) Plant litter is well distributed and effective in protecting the soil with few or no litter dams present.
   (e) Native woody and herbaceous vegetation, and germination microsites, are present and well distributed across the site.
   (f) Vegetation structure is resulting in rooting throughout the available soil profile.
   (g) Plants have normal, vigorous growth form, and a high probability of remaining vigorous, healthy and dominant over undesired competing vegetation.
   (h) High impact conditions confined to small areas necessary access or other special management situations.
   (i) Streambanks have less than 5% exposed soils with margins anchored by deeply rooted vegetation or coarse-grained alluvial debris.
   (j) Few upland plants are in valley bottom locations, and a continuous corridor of shrubs and trees provide shade for the entire streambank.

(4) Work plan. Include a written work plan as part of the site restoration plan with sufficient detail to include a description of the following elements, as applicable.
   (a) Boundaries for the restoration area.

(b) Restoration methods, timing, and sequence.
(c) Water supply source, if necessary.
(d) Woody native vegetation appropriate to the restoration site.[9] This must be a diverse assemblage of species that are native to the project area or region, including grasses, forbs, shrubs and trees. This may include allowances for natural regeneration from an existing seed bank or planting.
(e) A plan to control exotic invasive vegetation.
(f) Elevation(s) and slope(s) of the restoration area to ensure they conform with required elevation and hydrologic requirements of target plant species.
(g) Geomorphology and habitat features of stream or other open water.
(h) Site management and maintenance requirements.

(5) Five-year monitoring and maintenance plan.
(a) A written schedule to visit the restoration site annually for 5 years or longer as necessary to confirm that the performance standards are achieved. Despite the initial 5-year planning period, site visits and monitoring will continue from year-to-year until the FHWA certifies that site restoration performance standards have been met.
(b) During each visit, inspect for and correct any factors that may prevent attainment of performance standards (*e.g.*, low plant survival, invasive species, wildlife damage, drought).
(c) Keep a written record to document the date of each visit, site conditions and any corrective actions taken.

3. To implement reasonable and prudent measure #3 (isolation of in-water work area) the FHWA shall ensure that:

a. Work area isolation. During in-water work (work within the OHWM), if the project involves either significant channel disturbance or use of equipment within the wetted channel, ensure that the work area is well isolated from the active flowing stream within a coffer dam (constructed of sand bags, sheet pilings, inflatable bags, *etc.*) or similar structure, to minimize the potential for sediment entrainment. Furthermore, no ground- or substrate-disturbing action will occur within the OHWM 150 feet upstream of potential spawning habitat as measured at the thalweg without isolation of the work area from flowing waters. After the coffer dam is in place, any fish trapped in the isolation pool will be removed by a permitted ODOT and/or Oregon Department of Fish and Wildlife (ODFW) biologist before de-watering, using ODFW-approved methods.

[9] Use references sites to select vegetation for the mitigation site whenever feasible. Historic reconstruction, vegetation models, or other ecologically-based methods may also be used as appropriate.

i. Coffer dams. All coffer dams will be of sufficient height to not be inundated during high flows.

ii. Water intake structures. Any water intake structure authorized under this Opinion must have a fish screen installed, and operated and maintained in accordance with NOAA Fisheries' fish screen criteria.
   (1) Water pumped from the work isolation area will be discharged into an upland area providing over-ground flow before returning to the creek. Discharge will occur so that it does not cause erosion.
   (2) Discharges into potential fish spawning areas or areas with submerged vegetation are prohibited.

iii. Work Area Isolation. A work area isolation plan must be approved by NOAA Fisheries before in-water work.

iv. Fish Salvage. Before and intermittently during pumping to isolate an in-water work area, attempt to capture and release fish from the isolated area using trapping, seining, electrofishing, or other methods as are prudent to minimize risk of injury.
   (1) The entire capture and release operation must be conducted or supervised by a fishery biologist experienced with work area isolation and competent to ensure the safe handling of all ESA-listed fish.
   (2) Do not use electrofishing if water temperatures exceed 18°C.
   (3) If electrofishing equipment is used to capture fish, comply with NOAA Fisheries' electrofishing guidelines.[10]
   (4) 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.
   (5) Transport fish in aerated buckets or tanks.
   (6) Release fish into a safe release site as quickly as possible, and as near as possible to capture sites.
   (7) Do not transfer ESA-listed fish to anyone except NOAA Fisheries personnel, unless otherwise approved in writing by NOAA Fisheries.
   (8) Obtain all other Federal, state, and local permits necessary to conduct the capture and release activity.
   (9) Allow NOAA Fisheries or its designated representative to accompany the capture team during the capture and release activity, and to inspect the team's capture and release records and facilities.

4. To implement reasonable and prudent measure #4 (minimize loss of instream habitat), FHWA shall ensure that:

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

a. The amount of fill within the floodplain will be minimized.
b. Boundaries of the clearing limits associated with site access and construction will be flagged to prevent ground disturbance of riparian vegetation, wetlands, and other sensitive sites beyond the flagged boundary.
c. During excavation, native streambed material will be stockpiled out of the two-year floodplain for later use in back-filling the trenches used to construct coffer dams.
d. Alteration or disturbance of streambanks and existing riparian vegetation will be minimized. Where bank work is necessary, bank protection material shall be placed to maintain normal waterway configuration whenever possible.
e. Measures will be taken to prevent any debris from falling within the boundaries of the OHWM. Any material that falls within this area will be removed in a manner that has a minimum impact to the riparian area, streambed and water quality.

5. To implement reasonable and prudent measure # 5 (new impervious surface and stormwater management), the FHWA shall ensure that:

a. All stormwater runoff from any road or bridge built pursuant to a permit issued under this Opinion must be managed to ensure that it will not result in a change in the existing hydraulic conditions or an increase of pollutants to the receiving water.
b. Any project that will produce new surfaces or land use conversions that retard the entry of water into the soil must control the quantity and quality of the resulting stormwater runoff for the life of the project.
c. Stormwater must be infiltrated or dispersed onsite to the maximum extent possible without causing flooding or erosion impacts.
d. When stormwater runoff must be discharged into a freshwater system, the following requirements apply.
    i. The area must be drained by a conveyance system comprised entirely of manufactured elements (*e.g.*, pipes, ditches, outfall protection) that extends to the OHWM of the receiving water.
    ii. Any erodible elements of this system must be adequately stabilized to prevent erosion.
    iii. Surface water from the area must not be diverted from or increased to an existing wetland, stream or near-shore habitat sufficient to cause a significant adverse effect.
    iv. Runoff treatment facilities must be designed, built and maintained to collect runoff from the project site using the best available technology applicable to the site conditions. Treatment must be provided to remove debris, nutrients, sediment, petroleum hydrocarbons, metals and other pollutants likely to be present.

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

3.1 Background

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance essential fish habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

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

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

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

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 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 to EFH.

3.2 Identification of EFH

Pursuant to the MSA the Pacific Fisheries Management Council (PFMC) has designated EFH for federally-managed fisheries within the waters of Washington, Oregon, and California. Designated EFH for groundfish and coastal pelagic species encompasses all waters from the mean high water line, and upriver extent of saltwater intrusion in river mouths, along the coasts of Washington, Oregon and California, seaward to the boundary of the U.S. exclusive economic zone (370.4 km) (PFMC 1998a, 1998b). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other waterbodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable artificial barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years) (PFMC 1999). In estuarine and marine areas, designated salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (370.4 km) offshore of Washington, Oregon, and California north of Point Conception to the Canadian border (PFMC 1999).

Detailed descriptions and identifications of EFH are contained in the fishery management plans for groundfish (PFMC 1998a), coastal pelagic species (PFMC 1998b), and Pacific salmon (PFMC 1999). Casillas *et al.* (1998) provides additional detail on the groundfish EFH habitat complexes. Assessment of the potential adverse effects to these species' EFH from the proposed action is based, in part, on these descriptions and on information provided by the Corps.

3.3 Proposed Action

The proposed action is detailed above in section 1.2 of this document. For the purposes of this EFH consultation, the action area is defined as the streambed, streambank and riparian corridor of Grave Creek, extending to upstream 500 feet and downstream approximately 1,500 feet. This area has been designated as EFH for various life stages of chinook salmon and coho salmon.

3.4 Effects of Proposed Action

As described in detail in section 2.1.3 of this document, the proposed activities may result in short-term adverse effects to water quality (sediment, chemical contamination, riparian vegetation removal). NOAA Fisheries expects short-term adverse effects from increases in turbidity and the potential for chemical contamination within the action area. NOAA Fisheries expects long-term beneficial effects from decreased constriction, improved hydraulic conditions and riparian function of Grave Creek as a result of the proposed project.

3.5 Conclusion

The proposed action will 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 FHWA, all of the reasonable and prudent measures and the terms and conditions contained in sections 2.2.2 and 2.2.3, respectively, are applicable to salmon EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH conservation recommendations.

3.7 Statutory Response Requirement

Please note that the MSA (section 305(b)) and 50 CFR 600.920(j) 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 impacts 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 either 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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