



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:
2002/01294

October 7, 2003

Mr. Lawrence C. Evans
Portland District
Corps of Engineers
CENWP-OP-GP (Ms. Kathryn Harris)
P.O. Box 2946
Portland, OR 97208-2946

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery and Conservation Management Act Essential Fish Habitat Consultation on D River Dredging, D River Basin, Lincoln County, Oregon (Corps No. 200100963)

Dear Mr. Evans:

Enclosed is a biological opinion (Opinion) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act (ESA) on the issuance of Department of the Army permits to the city of Lincoln City for dredging in the D River Basin, Lincoln County, Oregon. NOAA Fisheries concludes in this Opinion that the proposed action is not likely to jeopardize Oregon Coast coho salmon (*Oncorhynchus kisutch*). As required by section 7 of the ESA, NOAA Fisheries included reasonable and prudent measures with non-discretionary terms and conditions that NOAA Fisheries believes are necessary to avoid or minimize the effects of incidental take associated with this action.

This document also serves as consultation on essential fish habitat pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and its implementing regulations (50 CFR 600).

Please direct any questions regarding this letter to Robert Anderson of my staff in the Oregon Habitat Branch at 503.231.2226.

Sincerely,

Michael R. Crouse

D. Robert Lohn
Regional Administrator



Endangered Species Act - Section 7 Consultation Biological Opinion

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

D River Dredging
D River Basin
Lincoln County, Oregon
(Corps No. 200100963)

Agency: U.S. Army Corps of Engineers

Consultation
Conducted By: NOAA's National Marine Fisheries Service,
Northwest Region

Date Issued: October 7, 2003

Issued by: *for* 
D. Robert Lohn
Regional Administrator

Refer to: 2002/01294

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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 biological opinion (Opinion) is the product of an interagency consultation 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)).

The proposed action is issuance of permits to the City of Lincoln City (City) by the U.S. Army Corps of Engineers (Corps) under section 404 of the Clean Water Act and section 10 of the Rivers and Harbors Act to dredge the mouth of the D River, a tributary to the Pacific Ocean. The administrative record for this consultation is on file at the Oregon Habitat Branch office of NOAA Fisheries.

1.1 Background and Consultation History

On October 31, 2002, NOAA Fisheries received a letter from the Corps requesting consultation pursuant to section 7(a)(2) of the ESA and EFH consultation pursuant to section 305(b)(2) of the MSA for issuance of permits to the city of Lincoln City (City) by the Corps under section 404 of the Clean Water Act and section 10 of the Rivers and Harbors Act to authorize dredging the mouth of the D River. In the letter, the Corps determined that the proposed action was "not likely to adversely effect" Oregon Coast (OC) coho salmon (*Oncorhynchus kisutch*). NOAA Fisheries responded to the Corps with a letter of nonconcurrence on December 18, 2002, indicating that NOAA Fisheries did not concur with the "not likely to adversely affect" determination and that the consultation could not be completed until additional information was provided.

On May 5, 2003, NOAA Fisheries received a letter from the Corps providing most of the information requested in the December 18, 2002, letter. The Corps determined that the proposed action was "likely to adversely effect" OC coho salmon and requested formal consultation. OC coho salmon were listed as threatened under the ESA on August 10, 1998 (63 FR 42587), and protective regulations were issued on July 10, 2000 (65 FR 42422).

1.2 Proposed Action

The proposed action is issuance of permits to the City of Lincoln City (City) by the U.S. Army Corps of Engineers (Corps) under section 404 of the Clean Water Act and section 10 of the Rivers and Harbors Act to excavate the mouth of the D River, a tributary to the Pacific Ocean. The City proposes to remove only enough materials from the mouth of the D River deposited during winter storms to “open” the mouth to prevent back-flow of the D River. Approximately 50 to 150 cubic yards (cy) of sand, cobbles, and driftwood would be removed during each of up to four dredging events during the in-water work period of November 1 through February 15. The City proposes to use a small to medium-sized excavator operated within the river channel, and to place excavated materials on the banks of the D River.

1.3 Conservation Measures

Conservation measures in the following categories are proposed by the City (see consultation proposal for details): Timing of in-water work, fish passage, pollution and erosion control, pre-construction activity, and heavy equipment use. NOAA Fisheries regards the conservation measures included in the consultation request as intended to minimize adverse effects to OC coho salmon and their habitats, and considers them to be part of the proposed action.

1.4 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 marine and riverine habitats accessible to OC coho salmon from 300 feet offshore of the confluence of the D River and the Pacific Ocean up to 300 feet upstream of the mouth of the D River, including the 100-year floodplain.

2. ENDANGERED SPECIES ACT

2.1 Biological Opinion

This Opinion considers the potential effects of the proposed action on OC coho salmon, which occur in the action area.

2.1.1 Biological Information

Life history of OC coho salmon are represented in Table 1. Spawning, incubation, rearing, and migration occur throughout accessible reaches of the Devil’s Lake and Beaver Creek watersheds.

Table 1. OC Coho Salmon Life History Timing in the Devil’s Lake and Beaver Creek watersheds (Weitkamp 1995, Steelquist 1992, ODFW 2002). 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	Dark								Light	Light	Dark	Dark
Spawning	Dark	Light								Light	Dark	Dark
Incubation-Intragravel Development	Dark	Dark	Dark	Dark	Light					Light	Dark	Dark
Juvenile Freshwater Rearing	Dark	Dark	Dark	Dark	Dark	Dark	Dark	Dark	Dark	Dark	Dark	Dark
Juvenile Migration	Light	Light	Dark	Dark	Dark	Dark	Light	Light	Light	Light	Light	Light
Juvenile Residence in Devil’s Lake	Dark	Dark	Dark	Dark	Dark	Dark	Dark	Dark	Dark	Dark	Dark	Dark

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%. Recent estimates of wild spawner abundance in this evolutionarily significant unit (ESU) has ranged from 16,500 adults in 1990, to nearly 60,000 adults in 1996, and 238,700 adult coho in 2002 (ODFW 2003).

Estimated spawning populations for naturally-produced coho salmon in the Devil’s Lake and Beaver Creek watersheds averaged 1790 adults from 1990 through 2002. These results are summarized in Table 2.

Table 2. Estimated Spawning Populations for Naturally-Produced Coho Salmon in the Devil’s Lake and Beaver Creek watersheds (Jacobs *et al.* 2001, ODFW 2002)

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Estimated Devil’s Lake and Beaver Creek Basins Population	23	NA	756	500	1259	NA	1340	425	1041	3366	738	5274	8547

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 and when appropriate combines them with the Habitat Approach (NOAA Fisheries 1999): (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, step 5 occurs. In step 5, NOAA Fisheries may identify reasonable and prudent alternatives for the action that avoid jeopardy, if any exist.

The fourth 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 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 OC coho salmon 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. OC coho salmon survival in the wild depends upon 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 improved habitat characteristics that would function to support successful adult migration, holding, and spawning; and juvenile rearing, upstream and downstream migration, and smoltification.

Essential habitat features for juvenile rearing (growth and development) areas include adequate water quality, water quantity, water velocity, cover and shelter, dietary and spatial resources, riparian vegetation, and safe passage to upstream and downstream habitats. Essential habitat features for juvenile migration corridors include adequate water quality, water quantity, water velocity, cover and shelter, dietary resources, riparian vegetation and space. Essential habitat features for adult migration corridors include adequate water quality, water quantity, water velocity, cover and shelter, riparian vegetation and space.

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 residential, commercial-industrial, and recreational. 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 in-stream 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.

NOAA Fisheries concludes that not all of the biological requirements of the listed species within the action area are being met under current 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

In step three of NOAA Fisheries' jeopardy analysis, it evaluates the effects of proposed actions on listed species and seeks to answer the question of whether the species can be expected to survive with an adequate potential for recovery if those actions go forward.

2.1.5.1 Effects of the Proposed Action

Physical Habitat Alteration

The effects of dredging on physical habitat features include modification of bottom topography with resultant changes in water circulation patterns, changes to near-shore habitat structure, and a shift to coarser substrate within the dredged area. The significance of the effects is a function of the ratio of the size of the dredged area to the size of the bottom area and water volume (Morton 1977). Dredging may convert intertidal habitats to subtidal, or shallow subtidal habitats to deeper subtidal. Such conversions may affect plant and animal assemblages uniquely adapted to the particular site conditions these habitats offer. The Corps provided no information on the presence of vegetation in the D River, however, based on the mapped characteristics at the site, NOAA Fisheries does not expect that extensive areas of submerged vegetation exist in the action area. The intent of the dredging is to only remove enough materials from the mouth of the D River to “open” the mouth to prevent back-flow of the river.

Since dredging would be limited to 50 to 150 cy of sediment for each of a maximum of four dredging events, it is unlikely that this area would be converted to deep subtidal habitat, or that the action area would prevent recovery of any submerged vegetation in the long term.

Water Quality – Turbidity

Increased suspended sediments from dredging can adversely affect salmonid fishes. The size of the sediment particles and tidal current velocities typically affect the duration of sediment suspension in the water column. Larger particles, such as sand and gravel, settle rapidly, but silt and very fine sediment may be suspended for several hours. Suspended sediments can adversely affect migratory and social behavior and foraging opportunities (Bisson and Bilby 1982; Sigler *et al.* 1984; Berg and Northcote 1985).

Turbidity is defined as a measurement of relative clarity due to an increase in dissolved or suspended, undissolved particles (measured as total suspended sediment as TSS). At moderate levels, turbidity can reduce primary and secondary productivity and, at high levels, has the potential to interfere with feeding and to injure and kill adult and juvenile fish (Spence *et al.* 1996, Bjornn and Reiser 1991). Servizi (1988) observed an increase in sensitive biochemical stress indicators and an increase in gill flaring when salmonids were exposed to highly turbid water (gill flaring allows the fish to create sudden changes in buccal cavity pressure, which acts similar to a cough). Salmonid fishes may move laterally and downstream to avoid turbid plumes (Sigler *et al.* 1984, Lloyd 1987, Servizi and Martens 1991). Juvenile salmonid fishes tend to avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, except when the fish must traverse these streams along migration routes (Lloyd *et al.* 1987). A potential positive effect of increased turbidity is providing refuge and cover from predation. Fish that remain in turbid waters experience a reduction in predation from piscivorous fish and birds (Gregory and Levings 1998). In habitats with intense predation pressure, this provides a beneficial trade-off of enhanced survival in exchange for physical effects such as reduced growth.

Exposure duration is a critical determinant of the occurrence and magnitude of physical or behavioral effects (Newcombe and MacDonald 1991). Salmonid fishes have evolved in systems that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with floods, and are adapted to such exposures. Adult and larger juvenile salmonid fishes appear to be little affected by the high concentrations of suspended sediments that occur during storm and snowmelt runoff episodes (Bjornn and Reiser 1991). However, chronic exposure can cause physiological stress that can increase maintenance energy and reduce feeding and growth (Redding *et al.* 1987, Lloyd 1987, Servizi and Martens 1991).

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 dredging is likely to temporarily increase turbidity upstream (due to incoming tides) and downstream of the work area during and after dredging for a total of approximately 7 to 10 hours per dredging event, with a maximum of four events in 2003-2004. These temporary increases in turbidity are likely to physiologically stress and displace immigrating adults and rearing juvenile salmon. Dredging is proposed to occur only during the November 1 through February 15 in-water work window, when juvenile abundance is likely low. Due to the limited number of proposed dredging events, NOAA Fisheries does not expect long-term effects to adults in the action area.

Placement of dredged materials on the banks of the D River without containment measures is likely to increase sediment delivery to the river, especially during storm surges and high tides. This increase in sedimentation likely would increase turbidity, potentially delaying adult coho salmon from immigrating into the D River and displacing rearing juvenile salmon. The Corps provided no details of the proposed erosion control plan, therefore its potential effectiveness cannot be evaluated.

Water Quality – Dissolved Oxygen

Dredging fine sediments would likely create a sediment plume that may not disperse rapidly, especially during incoming tides. This could decrease dissolved oxygen due to higher biological oxygen demand (BOD) in the re-suspended sediments. During dredging in Grays Harbor, Smith *et al.* (1976) measured dissolved oxygen at 2.9 mg/l. LaSalle (1990) found a decrease in dissolved oxygen to 16-83% in the mid-to-upper water column from nearly 100% close to the bottom. Decreases in dissolved oxygen have been shown to adversely affect swimming performance in salmonid fishes (Bjornn and Reiser 1991). Reductions in dissolved oxygen due to the proposed dredging could delay or slow immigration of adult coho salmon into the D River to gain access to spawning grounds, and could displace rearing juvenile salmon. NOAA Fisheries expects only minor effects on dissolved oxygen concentrations due to the limited

number and size of dredging events, and to the seasonal restriction that will limit dredging to the time of year that BOD is likely to be low.

Effects to Benthic Prey Resources

Dredging physically disturbs channel bottoms, eliminating or displacing established benthic communities, and reducing prey availability to coho salmon. Dredging may also suppress the ability of some benthic species to re-colonize the dredged area, thus creating a loss of benthic diversity and food sources for the prey species of coho salmon. This may increase OC coho salmon intraspecific aggression, displace them from preferred rearing habitat, and reduce production of juveniles to the smolt stage. Due to the limited number of proposed dredging events, NOAA Fisheries does not expect long-term effects on benthic invertebrates.

Dredging Equipment

Operation of heavy equipment requires the use of fuel, lubricants, coolants, and other petroleum products, which if spilled into a waterbody could injure or kill aquatic organisms. Petroleum-based contaminants, such as fuel, oil, and some hydraulic fluids, contain harmful polycyclic aromatic hydrocarbons. The proposed action includes a spill containment and control plan; however, the Corps provided no details of the plan and therefore its potential effectiveness cannot be evaluated.

2.1.5.3 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”.

NOAA Fisheries is not aware of any specific future non-federal activities within the action area that would cause greater effects to listed species than presently occurs. The action area includes private and state lands. Land use on these non-federal lands include residential, commercial-industrial, and recreational. NOAA Fisheries 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 likely to increase due to a projected 34% increase in human population between 2000 and 2025 in Oregon (Oregon Department of Administrative Services 1999). Thus, NOAA Fisheries assumes that future private and state actions will continue within the action area, increasing as population density rises. As the human population in the state continues to grow, demand for actions similar to the subject project likely will continue to increase as well. 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

After reviewing the best available scientific and commercial information available regarding the current status of the OC coho salmon ESU, 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 salmon.

Our conclusion is based on the following considerations: (1) All in-water work will occur at a time of year when abundance of juvenile OC coho salmon is low; (2) all in-water work would occur for no more than approximately 7 to 10 hours per dredging event with a maximum of four events in the permitted period; (3) potential increases in turbidity and reductions in dissolved oxygen will be short-lived; 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

As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) The amount or extent of taking specified in the incidental take statement is exceeded, or is expected to be exceeded; (2) new information reveals effects of the action may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on listed species that was not previously considered; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending conclusion of the reinitiated 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].

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 dredging changes in water quality, and reduction in benthic prey resources. Effects of actions such as these are largely unquantifiable in the short term, but are likely to be largely limited to harm in the form of injury and behavior modification.

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 take for this opinion is limited to take resulting from activities undertaken as described in this Opinion that occur in the action area, which includes all riverine habitats accessible to OC coho salmon from 300 feet offshore of the confluence of the D River and the Pacific Ocean up to 300 feet upstream of the mouth of the D River, including the 100-year floodplain. Incidental take occurring due to modifications to the proposed action or beyond the area described is not authorized by this consultation.

2.2.2 Reasonable and Prudent Measures

Reasonable and prudent measures are non-discretionary measures to minimize take, that may or may not already be part of the description of the proposed action. They must be implemented as binding conditions for the exemption in section 7(a)(2) to apply. The Corps has the continuing duty to regulate the activities covered in this incidental take statement. If the Corps fails to require the applicants to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, 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 following reasonable and prudent measures are necessary and appropriate to minimize take of listed fish resulting from implementation of the proposed action. The Corps shall ensure that:

1. The amount and extent of incidental take from the proposed dredging operations (timing of in-water work, fish passage, pollution and erosion control, preconstruction activity, and heavy equipment use) are minimized by ensuring that the proposed conservation measures are fully implemented.
2. The disturbance to river channel morphology, river banks, submerged vegetation, and riparian habitat features is minimized, or where effects are unavoidable, that the City restore these habitat features.

3. The reasonable and prudent measures and conservation measures are monitored and evaluated.

2.2.3. Terms and Conditions

These measures should be incorporated into construction contracts and subcontracts to ensure that the work is carried out in the manner prescribed.

1. To implement reasonable and prudent measure #1 (conservation measures), the Corps shall ensure that conservation measures proposed as part of the project are fully implemented, with the exception of conservation measure 1, timing of in-water work.
2. To implement reasonable and prudent measure #2 (habitat disturbance), the Corps shall ensure that:
 - a. All work below top-of-bank and below the elevation of mean higher high tide is restricted to December 1, 2003 through February 15, 2004. Any adjustments to the in-water work period must be approved in writing by NOAA Fisheries.
 - b. Dredging frequency is limited to a maximum of four times within the in-water work period. Any adjustments to dredging frequency must be approved in writing by NOAA Fisheries.
 - c. Dredged materials are disposed of in a manner and location that would not permit dredged materials to re-enter the D River.
 - d. Alteration or disturbance of river morphology, streambanks, existing riparian vegetation, and submergent vegetation is minimized.
 - i. River depth shall not be increased by more than 2 to 5 feet deeper than the depth measured from the reference station 100 feet upstream of the dredged area.
 - ii. No fish passage barriers are created as a result of dredging.
 - iii. River channel width shall not be increased.
 - iv. Where submerged vegetation currently exists and is altered or disturbed by dredging, it shall be replaced by planting native, submerged vegetation (*e.g.*, *Zostera marina*, eelgrass).
 - e. 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. To implement reasonable and prudent measure #3 (monitoring), the Corps shall ensure that the applicant monitor and record:

- a. The implementation of conservation measures proposed by the Corps, including the success or failure of conservation measures, and actions taken to correct any problems.
- b. The extent, duration, and frequency of any turbidity plumes related to project activities, and efforts made to control it.
- c. The success of any submerged vegetation plantings. Vegetation plantings shall be self-sustaining with a required survival rate or plant cover of 80%. Once vegetation plantings are self-established, no monitoring is required.
- d. Starting and ending dates for each dredging event completed under the permit.
- e. Actual volume of dredged material removed and disposed of, and the locations of disposal sites.
- f. River discharge and tide elevation during each dredging event.
- g. Depths in pre- and post-dredging cross-sections of the dredged area for each dredging event.
 - i. A minimum of three stations shall be established including one station 100 feet upstream of the dredged area (reference site) that include measurements of river channel widths and river channel depths taken at low tide.
 - ii. Cross-sections shall include a minimum of 10 measurements per station.
- h. Any observed injury and/or mortality of fish resulting from project implementation.
- i. Condition of the river banks and river channel, upstream and downstream, of the area to be dredged before and following each dredging event using photo-documentation.

Monitoring reports shall be submitted within 90 days of completion of dredging to:

National Marine Fisheries Service
 Oregon Habitat Branch, Habitat Conservation Division
Attn: 2002/01294
 525 NE Oregon Street, Suite 500
 Portland, OR 97232-2778

3. MAGNUSON-STEVENSON 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 waterbodies 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). Casillas *et al.* (1998) provides additional detail on the groundfish EFH habitat complexes.

3.3 Proposed Action

The proposed action is detailed above in section 1.2 of this document. For this consultation, the action area includes all riverine habitats accessible to OC coho salmon from 300 feet offshore of the confluence of the D River and the Pacific Ocean up to 300 feet upstream of the mouth of the D River, including the 100-year floodplain. This area has been designated as EFH for various life stages of coastal pelagic species, groundfish species, and chinook and coho salmon (Table 3).

3.4 Effects of Proposed Action

The proposed action will adversely affect migration habitat of adult salmon, rearing and migration habitat for juvenile salmon, benthic prey resources, and water quality for coastal pelagic species, groundfish species, and chinook and coho salmon.

3.5 Conclusion

The proposed action will adversely affect the EFH for coastal pelagic species, ground fish species, and chinook and coho salmon in the action area.

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. NOAA Fisheries recommends the Corps implement the conservation recommendations and terms and conditions in the ESA consultation.

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 Corps 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).

Table 3. Species with designated EFH in the estuarine EFH composite in the state of Oregon.

Groundfish Species	
Leopard Shark (southern OR only)	<i>Triakis semifasciata</i>
Southern Shark	<i>Galeorhinus zyopterus</i>
Spiny Dogfish	<i>Squalus acanthias</i>
California Skate	<i>Raja inornata</i>
Spotted Ratfish	<i>Hydrolagus colliei</i>
Lingcod	<i>Ophiodon elongatus</i>
Cabezon	<i>Scorpaenichthys marmoratus</i>
Kelp Greenling	<i>Hexagrammos decagrammus</i>
Pacific Cod	<i>Gadus macrocephalus</i>
Pacific Whiting (Hake)	<i>Merluccius productus</i>
Black Rockfish	<i>Sebastes maliger</i>
Bocaccio	<i>Sebastes paucispinis</i>
Brown Rockfish	<i>Sebastes auriculatus</i>
Copper Rockfish	<i>Sebastes caurinus</i>
Quillback Rockfish	<i>Sebastes maliger</i>
English Sole	<i>Pleuronectes vetulus</i>
Pacific Sanddab	<i>Citharichthys sordidus</i>
Rex Sole	<i>Glyptocephalus zachirus</i>
Rock Sole	<i>Lepidopsetta bilineata</i>
Starry Flounder	<i>Platichthys stellatus</i>
Coastal Pelagic Species	
Pacific Sardine	<i>Sardinops sagax</i>
Pacific (Chub) Mackerel	<i>Scomber japonicus</i>
Northern Anchovy	<i>Engraulis mordax</i>
Jack Mackerel	<i>Trachurus symmetricus</i>
California Market Squid	<i>Loligo opalescens</i>
Pacific Salmon Species	
Chinook Salmon	<i>Oncorhynchus tshawytscha</i>
Coho Salmon	<i>Oncorhynchus kisutch</i>

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