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:
2002/00392

April 1, 2003

Mr. Lawrence C. Evans
U.S. Army Corps of Engineers
Regulatory Branch, CENWP-CO-GP
PO Box 2946
Portland, OR 97208-2946

Re: Endangered Species Act Formal Section 7 and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation Request for the Taylor Water Treatment Intake Project, Upper Willamette River Basin, City of Corvallis, Benton County, Oregon (Corps No. 199900172).

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 effects of the proposed Taylor Water Treatment Intake Project, in Benton County, Oregon. In this Opinion, NOAA Fisheries concludes that the proposed action is not likely to jeopardize the continued existence of ESA-listed Upper Willamette River (UWR) chinook salmon (*Oncorhynchus tshawytscha*). As required by section 7 of the ESA, NOAA Fisheries also includes reasonable and prudent measures with nondiscretionary terms and conditions that NOAA Fisheries believes are necessary to minimize the impact 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 implementing regulations at 50 CFR Part 600.

If you have any questions regarding this consultation, please contact Anne Mullan of my staff in the Oregon Habitat Branch at 503.231.6267.

Sincerely,

For Michael R Crouse

D. Robert Lohn
Regional Administrator

cc: Mark Zinniker, West Yost
Tom Penpraze, City of Corvallis
Steve Mamoyac, ODFW
Bob Hair, ODFW

Endangered Species Act - Section 7 Consultation
Biological Opinion
&
Magnuson-Stevens Act
Essential Fish Habitat Consultation

Taylor Water Treatment Intake Project, Upper Willamette River Basin,
City of Corvallis, Benton County, Oregon
(Corps No. 199900172)

Agency: U.S. Army Corps of Engineers

Consultation Conducted By: NOAA Fisheries, Northwest Region

Date Issued: April 1, 2003

for Michael R Crouse

Issued by: _________________
D. Robert Lohn
Regional Administrator

Refer to: **2002/00392**

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1. INTRODUCTION

1.1 Consultation History

On April 16, 2002, NOAA's National Marine Fisheries Service (NOAA Fisheries) received a request for Endangered Species Act (ESA) section 7 consultation and Magnuson-Stevens Fishery Conservation and Management Act section 3 consultation from the U.S. Army Corps of Engineers (COE) for the proposed issuance of a permit under section 10 of the Rivers and Harbors Act and section 404 of the Clean Water Act for the Taylor Water Treatment Intake Project in Benton County, Oregon. The proposed permit is for building sheet pilings around the water intake plant to allow replacement of existing screens. The biological assessment (BA) provided by the applicant to the COE determined that the proposed activities covered would be "not likely to adversely affect" (NLAA) anadromous fish species listed under the ESA, but the COE did not concur with that determination and requested formal consultation. The objective of this biological opinion (Opinion) is to determine whether the proposed action is likely to jeopardize the continued existence of Upper Willamette River (UWR) chinook salmon.

The Willamette River supports UWR chinook salmon (*Oncorhynchus tshawytscha*). UWR chinook salmon were listed as threatened under the ESA by NOAA Fisheries on March 24, 1999 (64 FR 14308). Protective regulations for UWR chinook salmon were issued under section 4(d) of the ESA on July 10, 2000 (65 FR 42422).

The June 2001 BA did not address the proposed project to place pilings for work on the intake screens, but instead discussed gravel relocation at the site. Subsequent emails, fax exchanges and meetings provided a better understanding of the existing problem, proposed actions, and possible effects. Through this process, it was determined that gravel encroaches primarily from the downstream direction (north), where there is a large gravel bar, although during large flow events, material deposits in front of the screen from upstream. The trash rack immediately in front of the existing screens did not protect them from damage in the large flows of 1996, because the 6-foot spacing could not block the buildup of smaller rock. The existing screens, and the initial proposed replacement, did not meet NOAA Fisheries sweeping velocity and bypass criteria.[1] NOAA Fisheries sent a letter on June 21, 2002, requesting further information on the project design to address these problems.

After further meetings, on September 11, 2002, a letter from West Yost and Associates, the engineering firm consulting for the City of Corvallis (City) provided an early design for screens meeting NOAA Fisheries' criteria. This design would leave some sheet pilings to protect the new screen structure, and to potentially reduce the buildup of gravel adjacent to the screens. On February 19, 2003, questions regarding the 90% design were resolved by phone and email.

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

1.2 Proposed Action

1.2.1 Fish Screens

The existing recessed traveling screen will be replaced with a tee screen design that extends into the river in front of the intake structure. This allows flows across the screens to provide sufficient sweeping velocity to meet NOAA Fisheries criteria (NMFS 1995). The Corvallis-Taylor Water Treatment Plant pumping rate averages between 5.0 and 6.3 cubic feet per second (cfs) from November to April, and from 8.3 to 13.7 cfs between May and October. The current daily maximum is 18.4 cfs, with a peak instantaneous rate of 30.9 cfs (McCullough 2002). The new screen design capacity is 65 cfs, to meet the full water right.

Four 30-inch stainless steel cylindrical tee screens will be installed. The screen face will consist of continuous wedge wire material with 1.75 mm bar spacing. The screens will be configured to provide an average approach velocity of 0.28 feet per second (fps) at the design capacity of 65 cfs. Internal baffles will be installed to ensure that the approach velocity at any point on the screen will be within ±10 percent of the mean screen approach velocity. All four screens will connect to a single suction manifold. The manifold connects the screens to the wet well of the pump station. The manifold will include a valve to isolate the screens from the pump station.

The screens will be inspected frequently to ensure that the screen surfaces are intact and that the cleaning system is functioning properly. If structural damage occurs that could result in the entrainment of fish into the suction manifold, the City will either patch the damaged section or remove the damage screen and install a blind flange on the suction manifold. The City will attempt to use the tee-screens as the primary screening device. The existing traveling belt screen will be used only if it is determined that using the traveling screen will present less risk to juvenile fish than the damaged tee screens.

The tee screens are equipped with an air burst cleaning system. This backwash system includes an air compressor, controls and automatic valves to thoroughly clean each screen's entire surface with an air burst. It is designed to backwash at 0.1 ft headloss above nominal screen loss, with a backup timer. The cleaning sequence of the screens is from upstream to downstream, ensuring no debris remains after completion of the cleaning cycle.

Sheet piling will be placed in front of the intake structure to dewater the area for construction. Upon completion, the piling will remain but will be cut down to 193 feet, one foot above the historic elevation of the river bed. The center line of the cylindrical tee screens is at elevation 194.5 feet, with 1.25 feet radius extending below the center line to clear 193.25 feet elevation. Minimum water elevation is not expected to drop below 197 feet.

The sheet pilings will have I-beams supporting H-piles. The sheet piling that is upstream and west of the screens will extend above the level of the top of the frame to reduce debris accumulation. Additionally, a removable steel frame will extend along the river side of the structure to protect the tee screens.

1.2.2 Gravel Relocation

The intake structure was originally constructed in 1949, and was in a backwater channel. The channel was subsequently deepened to approximately 182 feet elevation. The channel shifted over time to bring the intake site into the main channel, leaving a depression which fills with river bed material. Large flow events deposit gravel in the screen area, and a gravel bar downstream adds to the velocity pattern that results in deposition. Gravel dredging near the screens was required in 1973 and 1996, and twice after the 1996 floods, in 1999 and 2000. Past work required the contractor to excavate the river bed to limits designated based on the pre-dredging survey, from approximately 100 feet upstream of the intake structure to 600 feet downstream of the intake structure. In 2000, 7,500 cubic yards of material were redeposited downstream and toward the middle of the river channel by a barge-mounted excavator.

Ongoing operations are expected to lead to dredging whenever deposits in the immediate vicinity are greater than 191 feet elevation, to maintain the functionality of the new screens. Flows exceeding 60,000 cfs at this reach are capable of transporting gravel, and depending on peak flows, may move sufficient material to require relocation. The permanent sheet piling at 193 feet elevation will reduce the frequency of gravel relocation.

The material has a low concentration of fines, so suspended sediments are expected to be minimal. The dredging and relocation work was described as follows in the June 2001, Long Term Maintenance Strategy:

1. Excavation work shall be performed from a barge, and material shall be redeposited in the river a minimum of 800 feet downstream of the downstream edge of the intake structure within the main river current.

2. A minimum of 2 feet of water shall be maintained above any gravel placed in the river at the time of deposit.

3. Work methods which minimize turbidity in the river shall be used.

4. Excavation shall be performed to tolerances of plus 0 feet to minus 1 foot in elevation, and plus 5 feet to minus 0 feet horizontal.

1.2.3 Construction Sequence

The proposed work will take place during the preferred in-water work window of June 1 - September 30. The following general work sequence is anticipated for the project. The selected contractor shall develop a detailed work sequence for the project.

1. Place sheet piling and H-piles in front of intake structure and between the north and south existing screens with top elevation of 193 feet

2. Remove fish, and dewater the area behind the sheet piling.
3. Remove debris and rock within the piling to elevation 181 feet.
4. Remove the existing gates and bar racks, and install the new roller gate.
5. Place precast concrete walls at the entrance to the north and south screen chambers. The precast concrete wall for the north screen chamber will include a pipe with blind flanges on either side.
6. Construct cofferdam at the south screen from elevation 193 feet to above the water surface. Close existing screen chamber isolation gate separating north and south screen chambers.
7. Remove any fish and partially dewater south screen chamber.
8. Install new roller gate and bar racks.
9. Open south roller gate and remove cofferdam allowing water to flow into south screen chamber.
10. Construct cofferdam at the north screen from elevation 193 feet to above the water surface.
11. Remove any fish and partially dewater north screen chamber.
12. Install new north roller gate and bar racks.
13. Remove existing north screen and install interior portions of the new intake screening system.
14. Close north roller gate and remove any temporary sheet piling and cofferdam.
15. Install tee screens and protective steel framing.
16. Place rock fill around new intake piping as required.
17. Close south roller gate and open new intake screen system butterfly valves.

2. ENDANGERED SPECIES ACT

2.1 Biological Opinion

2.1.1 Biological Information

UWR spring chinook salmon migrate through, and rear in the Willamette River in the project vicinity. The UWR chinook salmon ESU includes native spring-run populations above Willamette Falls and in the Clackamas River. In the past, it included sizable numbers of spawning salmon in the Santiam River, the middle fork of the Willamette River, and the McKenzie River, as well as smaller numbers in the Molalla River, Calapooia River, and Albiqua Creek.

The total run sizes reported for UWR spring chinook since 1970 have ranged from 30,000 to 130,000, with the 2000-2002 runs in the range of 60,000 to 80,000. In 2002, fishery counts showed a rate of 77% for marked fish through June. Hence, approximately 23% of the 2002 forecasted run size of 74,000 results in approximately 17,000 natural spawners in the Willamette basin (ODFW 2002). Marking of hatchery releases with an adipose fin clip reached 100%, beginning with those released in 1998 (S. King, ODFW, personal communication with A. Mullan, NOAA Fisheries, 28 October 2002, email).

Fish in this ESU are distinct from those of adjacent ESUs in life history and marine distribution. The life history of chinook salmon in the UWR ESU includes traits from both ocean- and stream-type development strategies. Coded wire tag (CWT) recoveries indicate that the fish travel to the marine waters off British Columbia and Alaska. More Willamette fish are recovered in Alaskan waters than fish from the Lower Columbia River ESU. UWR chinook salmon mature in their fourth or fifth years. Historically, 5-year-old fish dominated the spawning migration runs, but recently, most fish have matured at age 4. The timing of the spawning migration is limited by Willamette Falls. High flows in the spring allow access to the upper Willamette basin, whereas low flows in the summer and autumn prevent later-migrating fish from ascending the falls. The low flows may serve as an isolating mechanism, separating this ESU from others nearby.

Human activities have had vast effects on the salmonid populations in the Willamette River drainage. First, the Willamette River, once a highly braided river system, has been dramatically simplified through channelization, dredging, and other activities that have reduced rearing habitat by as much as 75%. In addition, the construction of 37 dams in the basin has blocked access to over 700 kilometers (km) of stream and river spawning habitat. The dams also alter the temperature regime of the Willamette and its tributaries, affecting the timing and development of naturally-spawned eggs and fry. Water quality is also affected by development and other economic activities. Agricultural and urban land uses on the valley floor, as well as timber harvesting in the Cascade and Coast ranges, contribute to increased erosion and sediment load in Willamette River Basin streams and rivers. Finally, since at least the 1920s, the lower Willamette River has suffered municipal and industrial pollution.

Hatchery production in the basin began in the late nineteenth century. Eggs were transported throughout the basin, resulting in current populations that are relatively homogeneous genetically, although still distinct from those of surrounding ESUs. Hatchery production continues in the Willamette River, with an average of 8.4 million smolts and fingerlings released each year into the main river or its tributaries between 1975 and 1994. Hatcheries are currently responsible for most production (90% of escapement) in the basin.

Harvest on this ESU is high, both in the ocean and in river. The total in river harvest below the falls from 1991 through 1995 averaged 33%, and was much higher before then. Ocean harvest was estimated as between 19-33% since 1982. ODFW (1998) indicates that total (marine and freshwater) harvest rates on UWR spring-run stocks were reduced considerably for the 1991 through 1993 brood years, to an average of 21%. Prior to full marking of hatchery fish with an adipose fin clip, harvest occurred on both wild and hatchery fish. Current regulations allow only marked fish to be retained.

For the UWR chinook salmon ESU as a whole, NOAA Fisheries estimates that the median population growth rate (lambda) over the base period ranges from 1.01 to 0.63, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin (Tables B-2a and B-2b in McClure *et al.* 2000).

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 (the consultation regulations). NOAA Fisheries must determine whether the action is likely to jeopardize the listed species. In conducting analyses of habitat-altering actions under section 7 of the ESA, NOAA Fisheries uses the following steps: (1) Consider the status and biological requirements of the 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; (4) consider cumulative effects; and (5) determine whether the proposed action, in light of the above factors, is likely to appreciably reduce the likelihood of species survival in the wild. In completing this step of the analysis, NOAA Fisheries determines whether the action under consultation, together with all cumulative effects when added to the environmental baseline, is likely to jeopardize the continued existence of the listed species. 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.

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 salmon is to define the species' biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species, taking into account population size, trends, distribution and genetic diversity. To assess to the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list the species for ESA protection and also considers new data available that is relevant to the determination.

The relevant biological requirements are those necessary for the subject 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.

Essential elements for salmonids are: Substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food (juvenile only), riparian vegetation, space, and safe passage conditions. Based on migratory and other life history timing, it is likely that juvenile life stages are present in the action area when activities would be carried out. Actions authorized by the proposed project may affect water quality, water quantity, and water velocity.

In larger rivers, chinook fry are expected to migrate at the edges of the river, rather than in the high velocity water near the center of the channel. At night chinook have been found to move inshore to quiet water over sandy substrates or into pools and settle to the bottom, but returning to occupy the same riffle and glide areas that they had occupied on the previous day (Healey, in Groot and Margolis 1991). Possible affected behavior are fish movements back and forth when dredging takes place.

Actions suggested by the Federal Caucus in the 2000 Salmon Recovery Strategy included protecting productive habitat and fixing flow, passage and diversion problems by restoring flows to depleted streams, screening and combining water diversions, and reducing passage obstructions (Federal Caucus 2000).

For this consultation, the biological requirements are improved habitat characteristics that function to support successful rearing and migration. The current status of the indicated fish species, based upon their risk of extinction, has not significantly improved since the species were listed.

2.1.2.2 Environmental Baseline

The environmental baseline is an analysis of the effects of past and ongoing human and natural factors leading to the current status of the species or its habitat and ecosystem within the action area. 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 habitat degradation. For this consultation, 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 project site, at river mile (RM) 134.5 is midway between the confluences of the Calapooia River at RM 120 and the Long Tom River at RM 146. This reach is listed by ODEQ for mercury, bacteria, and temperature during summer months (ODEQ 2002).

Adult spring chinook migration upstream past Willamette Falls peaks between late April and early June. Radio-tagging studies in the project area showed the timing from Willamette Falls to the project area varied from 40 days to later migrants taking as few as 5 days. Adults are expected to pass this area from early April to late July with the peak around early June (Ellis 2001).

2.1.3 Analysis of Effects

2.1.3.1 Effects of Proposed Action

With the installment of the new screens, juveniles traveling past this area will not risk entrainment or impingement against the screens, as was possible before. The cleaning system will provide the necessary surface openings to ensure the approach and sweeping velocities are not modified to compromise the effectiveness of the screens. These actions will improve passage past the structure.

Both the construction placement and removal of sheet pilings and ongoing gravel relocation have the potential to increase turbidity. The gravel relocation will disturb the area surrounding the intake structure, and the area where the gravel is placed. Construction actions that add fine sediment to channels, or disturb shallow-water habitats, can adversely affect the ability of salmon and steelhead to obtain food necessary for growth and maintenance. Salmon and steelhead are generally able to avoid the adverse conditions created by construction if those conditions are limited to areas that are small or local compared to the total habitat area, and if the system can recover before the next disturbance. This means juvenile and adult salmon and steelhead will, to the maximum extent possible, readily move out of a construction area to obtain a more favorable position within their range of tolerance along a complex gradient of temperature, turbidity, flow, noise, contaminants, and other environmental features.

The degree and effectiveness of the avoidance response varies with life stage, season and the frequency and duration of exposure to the unfavorable condition, and the ability of the individual to balance other behavioral needs for feeding, growth, migration, and territory. Chronic or unavoidable exposure heightens physiological stress thus increasing maintenance energy demands (Redding *et al*. 1987, Servizi and Martens 1991). This reduces the feeding and growth rates of juveniles and can interfere with juvenile migration, growth to maturity, and adult migration. Due to the expected low numbers of fish in the area during the limited time period that the placement of pilings requires, the environmental changes caused should be negligible.

At moderate levels, turbidity 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. Turbidity might also interfere with feeding (Spence *et al*. 1996). 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). Localized increases of turbidity during in-water work will likely displace fish in the project area and disrupt normal behavior. There is a low probability of direct mortality from turbidity associated with proposed activities because the turbidity should be infrequent, localized, and take place when fish are least likely to be present.

The high fines content for the Willamette River substrate was described as not properly functioning in the Biological Assessment (Ellis 2001). Comparing the sediment load pre- and post-reservoir construction in the Willamette River, Laenen (1995) noted that samples post-reservoir were composed of finer material, with an increase in average suspended sediment percent finer than 62-micrometers from 62% to 85% for the Willamette River at Salem. He also noted that annual sediment loads are likely to have decreased along with the reduced peak streamflows post-reservoir and dam construction. The gravel relocated downstream to the adjacent bar potentially reduces armoring and increases suspension of fines, affecting macroinvertebrate habitat and hence, salmonid food sources (OWRRI 1995, Power *et al.* 1996). Macroinvertebrates will recover from the dredging disturbances, but only after some time period during which their availability will be reduced. The new sheet pilings should minimize the frequency of dredging and reduce the disturbance, as will placement of the gravel on the downstream, less armored half of the gravel bar. While rearing habitat is limited in the vicinity of the water treatment plant and sampling during years of low chinook returns found few fish in the area (Ellis 2001), the gravel bar area provides habitat needed for recovery to greater population densities, particularly as temperature and other water quality problems are addressed.

As the sheet pilings are installed to dewater the work areas, some salmonids may be present. Fish removal will need to occur prior to de-watering. During fish removal there is an increased chance for handling and direct mortality. Direct harm to fish species may occur during pilings removal and construction activities. Rescue, salvage and relocation of fish will result in the potential capture and handling of up to 100 juvenile and adult salmonids. Assuming a 5% direct or delayed mortality rate from capture and relocation stress, up to 5 juvenile or adult salmonids may be killed. The probability of harm is reduced because these activities would be conducted during the ODFW defined in-water work period, when fish presence is less likely.

2.1.3.2 Interrelated and Interdependent Effects

The improved screens will allow the water treatment plant to ultimately operate at the design flows of 65 cfs, a more than three-fold increase over existing peak withdrawals of 18 cfs. This should not substantially change the river wetted usable area or floodplain connectivity since the lowest summer flows are approximately 4000 cfs.

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." Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities are being (or have been) reviewed through separate section 7 consultation processes. Therefore, these actions are not considered cumulative to the proposed action.

NOAA Fisheries expects that other currently unused water rights could allow additional diversion demands, some of which are consumptive. Consumptive uses such as irrigation will further reduce flows downstream of the project.

Non-Federal activities within the action area are expected to increase with a projected 34% increase in human population over the next 25 years in Oregon (Oregon Department of Administrative Services 1999). Thus, NOAA Fisheries assumes that future private and State actions will continue within the action area, but at increasingly higher levels as population density climbs.

2.1.4 Conclusion

NOAA Fisheries has determined, based on the available information, that the proposed action covered in this Opinion is not likely to jeopardize the continued existence of listed salmonids. NOAA Fisheries used the best available scientific and commercial data to apply its jeopardy analysis, analyzing the effects of the proposed action on the biological requirements of the species relative to the environmental baseline, together with cumulative effects.

NOAA Fisheries believes that the proposed action will provide safer passage past the Corvallis-Taylor Water Treatment Plant, although turbidity from project construction and ongoing gravel relocation will also cause some short-term adverse effects. Furthermore, NOAA Fisheries expects that construction related effects and work isolation activities could alter normal feeding and sheltering behavior of juvenile chinook salmon should any be present in the action area during the proposed action. NOAA Fisheries expects some direct or delayed mortality of chinook salmon as a result of fish rescue, salvage and relocation activities for any fish present but very few are expected to be present. NOAA Fisheries expects long-term beneficial effects of improved fish passage as a result of improved screening and reduced dredging from the placement of sheet piling.

2.1.5 Reinitiation of Consultation

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

If the applicant fails to provide specified monitoring information by the required date, NOAA Fisheries will consider that a modification of the action that causes an effect on listed species not previously considered, and causes the Incidental Take Statement of the Opinion to expire.

2.2 Incidental Take Statement

Section 9 and rules promulgated under section 4(d) of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. “Harm” is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. “Harass” is defined as actions that create the likelihood of injuring listed species by annoying it to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. Incidental take is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

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

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 ESA-listed salmonids because of potential adverse effects from construction of sheet pilings and ongoing gravel relocation activities. Handling of chinook salmon during the work isolation process may result in incidental take of individuals if salmonids are present during the construction period.

NOAA Fisheries anticipates non-lethal incidental take of up to 100 juvenile and adult salmonids, of which, lethal take of up to 5 juvenile chinook could occur as a result of 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 UWR chinook salmon in the vicinity of the Taylor Water Treatment Plant project area and is limited to that caused by the proposed action within the action area.

2.2.2 Reasonable and Prudent Measures

NOAA Fisheries believes that the following reasonable and prudent measures are necessary and appropriate to avoid or minimize take of listed salmonid species resulting from the action covered by this Opinion. The COE shall include measures that will:

1. Avoid or minimize take associated with loss of passage past the intake by ensuring that conditions for juvenile fish passage downstream and adult fish passage upstream exist at facilities during and after construction of this project.

2. Minimize the likelihood of incidental take from gravel dredging activities by moving gravel to new location downstream only as necessary.

3. Minimize the likelihood of incidental take from activities involving screen construction, temporary access roads, use of heavy equipment, earthwork, site restoration, or that may otherwise involve in-water work or affect fish passage by directing the contractor to avoid or minimize disturbance to riparian and aquatic systems.

4. Ensure effective application of the reasonable and prudent measures, all erosion control measures, and plantings for site restoration by evaluating and monitoring success.

2.2.3 Terms and Conditions

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

1. To implement reasonable and prudent measure #1 (fish passage), the COE will ensure that the applicant installs and operates the fish screen as follows.
    a. The four 30-inch-square holes at elevation 205 of the existing structure shall be screened to meet the following components of NOAA Fisheries' juvenile screening criteria:
        i. Maximum bar spacing of 1.75 mm or perforated plate maximum hole diameters of 3/32 inch
        ii. Maximum approach velocity through screen of 0.4 fps at all river levels up to 210 feet elevation.
        iii. A manual screen cleaning system may be used as long as it proves to be effective. An automatic mechanical cleaning system must be installed if experience shows that the manual system is not effective.
    b. The roller gates shall provide a water-tight seal whenever they are in the closed position.
    c. The screen design must ensure even velocity distribution when in the screening mode, and even air distribution when in the cleaning mode.
        i. The supplier must be able to provide test data showing their system can meet these requirements.
        ii. The system shall be able to clean each screen with a 7-8 second burst every 15 minutes. This airburst time is exclusive of any time required to blow the water out of the air distribution piping. The system should be designed to be capable of future expansion to provide additional compressed air energy if the above parameters prove to be insufficient.
        iii. The system shall be capable of initiating backwashing based on a timer and based on a differential head of 0.10 feet.
    d. The sheet pile cofferdam walls shall be cut down to elevation 193.0 feet except for the portion of the wall south and west of the upstream end of the screens. The objective is to permit sweeping flow past the screens and to minimize sediment deposition near the screens.

2. To implement reasonable and prudent measure #2 (gravel dredging), the COE will ensure that
    a. Gravel removed from the vicinity of the facility will be placed on the downstream half of the adjacent gravel bar.

b. If dredging more frequently than intervals of once every three years is required, the City shall contact the Corps of Engineers and NOAA Fisheries to initiate additional analysis of the effects of the project.

3. To implement reasonable and prudent measure #3 (general conditions for construction, operation and restoration), the COE shall ensure that:
   a. Timing of in-water work. Work within the active channel, including future dredging, will be completed during the ODFW (2000) preferred in-water work period June 1 - September 30, unless otherwise approved in writing by NOAA Fisheries.
   b. Fish passage. Passage will be provided for any adult or juvenile salmonid species present in the project area during construction.
   c. Fish screens. All water intakes used for a project, including pumps used to isolate an in-water work area, will have a fish screen installed, operated and maintained according to NOAA Fisheries' fish screen criteria.[2]
   d. Pollution and Erosion Control Plan. A pollution and erosion control plan will be prepared and carried out to prevent pollution related to construction operations. The plan must be available for inspection on request by COE or NOAA Fisheries.
      i. Plan Contents. The pollution and erosion control plan must contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.
         (1) Practices to prevent erosion and sedimentation associated with access roads, stream crossings, construction sites, borrow pit operations, haul roads, equipment and material storage sites, fueling operations and staging areas.
         (2) Practices to confine, remove and dispose of excess concrete, cement and other mortars or bonding agents, including measures for washout facilities.
         (3) A description of any hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.
         (4) A spill containment and control plan with notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.
         (5) Practices to prevent construction debris from dropping into any stream or water body, and to remove any material that does drop with a minimum disturbance to the streambed and water quality.

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[2] 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).

ii. Inspection of erosion controls. During construction, all erosion controls must be inspected daily during the rainy season and weekly during the dry season to ensure they are working adequately.[3]

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

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

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

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

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

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

f. Preconstruction activity. Before significant [4] alteration of the project area, the following actions must be completed:

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

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

(1) A supply of sediment control materials (*e.g.*, silt fence, straw bales[5]).

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

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

g. Temporary access roads.

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

ii. Minimizing soil disturbance and compaction. When a new temporary road

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

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

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

is necessary within 150 feet [6] of a stream, water body or wetland, soil disturbance and compaction must be minimized by clearing vegetation to ground level and placing clean gravel over geotextile fabric, unless otherwise approved in writing by NOAA Fisheries.

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

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

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

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

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

(2) All vehicles operated within 150 feet of any stream, water body or wetland must be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected must be repaired in the vehicle staging area before the vehicle resumes operation. Inspections must be documented in a record that is available for review on request by COE or NOAA Fisheries.

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

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

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

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

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

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[6] Distances from a stream or water body 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.

iii. Any large wood [7], native vegetation, weed-free topsoil, and native channel material displaced by construction must be stockpiled for use during site restoration.

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

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

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

ii. If electrofishing equipment is used to capture fish, the capture team must comply with NOAA Fisheries' electrofishing guidelines.[8]

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

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

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

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

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

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

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

ii. Source of materials. Boulders, rock, woody materials and other natural

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

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

construction materials used for the project must be obtained outside the riparian area.

(1) Any erodible elements of this system must be adequately stabilized to prevent erosion.

(2) 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 to wetland hydrology, soils or vegetation.

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

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

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

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

n. Long-term adverse effects. Long-term adverse effects will be avoided or offset after taking all appropriate steps to avoid or minimize short-term adverse effects.

i. Actions of concern. Activities that prevent development of properly functioning condition of natural habitat processes.

ii. Design review. The COE must review and approve designs to avoid or offset long-term adverse effects by applying the following considerations:

(1) Use of an ecosystem approach;

(2) habitat requirements of the affected species;

(3) productive capacity of the proposed construction and dredging site(s);

(4) timing of the construction and dredging actions;

(5) length of time necessary to achieve full functionality; and

(6) the likelihood of success

4. To implement reasonable and prudent measure #4 (monitoring and reporting), the COE will ensure that the applicant completes the following tasks.

a. Fish passage.

i. During construction and for the following first two years, visually verify the passage conditions are met, by checking during upstream and downstream fish migration.

ii. Note whether there are predators and juvenile salmonids present in the pilings area at lower stream flow levels.

b. Implementation monitoring. Ensure that the applicant submits a monitoring report to NOAA Fisheries within 120 days of project completion describing success meeting these terms and conditions. The monitoring report will include the following information:

i. Project identification
   (1) Permittee name, consultation number, and project name,
   (2) type of activity,
   (3) project location,
   (4) contact person, and
   (5) starting and ending dates for work completed

ii. Photo documentation. Photo of habitat conditions at the project and any compensation site(s), before, during, and after project completion.[9] Include general views and close-ups showing details of the project and project area, including pre and post construction. Label each photo with date, time, project name, photographer's name, and a comment about the subject.

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

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[9] 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.

(g) Location and condition of all fish released.
(h) Any incidence of observed injury or mortality.

i. If a dead, injured, or sick endangered or threatened species specimen is located, initial notification must be made to the NOAA Fisheries Law Enforcement Office, located at Vancouver Field Office, 600 Maritime, Suite 130, Vancouver, Washington 98661; phone: 360.418.4246. Care will be taken in handling sick or injured specimens to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered and threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

Oregon Habitat Branch Chief - Portland
NOAA Fisheries
Attn: 2002/00856
525 NE Oregon Street
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3. MAGNUSON-STEVENS ACT

3.1 Magnuson-Stevens Fishery Conservation and Management Act

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

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

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting the definition of essential fish habitat: “Waters” include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; “substrate” includes sediment, hard bottom, structures underlying the waters, and associated biological communities; “necessary” means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species' full life cycle (50 CFR 600.110).

Section 305(b) of the MSA (16 U.S.C. 1855(b)) requires that:

- 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;
- NOAA Fisheries shall provide conservation recommendations for any Federal or state activity that may adversely affect EFH;
- Federal agencies shall within 30 days after receiving conservation recommendations from NOAA Fisheries provide a detailed response in writing to NOAA Fisheries regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NOAA Fisheries, the Federal agency shall explain its reasons for not following the recommendations.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NOAA Fisheries is required by Federal agencies undertaking, permitting or funding activities that may adversely affect EFH, regardless of its location.

3.2 Identification of EFH

The Pacific Fisheries Management Council (PFMC) has designated EFH for Federally-managed fisheries within the waters of Washington, Oregon, and California.

Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the *Pacific Coast Salmon Plan* (PFMC 1999). Assessment of the potential adverse effects to these species' EFH from the proposed action is based on this information.

The Pacific Fisheries Management Council (PFMC) has designated EFH for three species of Pacific salmon: Chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the *Pacific Coast Salmon Plan* (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based on this information.

3.3 Proposed Action

The proposed action is detailed above in section 1.2. The action area for this consultation begins at Willamette River Mile (RM) 134.5, the barge entry location, and extends to RM 134 downstream to approximately the downstream effects of the gravel relocation on river flow levels. This area has been designated as EFH for chinook and coho salmon.

3.4 Effects of Proposed Action

Chinook salmon spawn upstream of Corvallis in the McKenzie, and Coast Fork. As described in detail in section 2.1.3 of this Opinion, the proposed action may result in adverse effects to water quality. NOAA Fisheries believes the implementation of the fish screen and dredging project is likely to adversely affect EFH for chinook and coho salmon. NOAA Fisheries also believes that providing screening and reducing the dredging frequency would avoid, minimize, or otherwise offset potential adverse impacts to designated EFH.

3.5 Conclusion

NOAA Fisheries believes that implementation of the fish screen and dredging project in the Willamette River will adversely affect designated EFH for chinook and coho salmon.

3.6 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the Magnuson-Stevens Act, NOAA Fisheries is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. The conservation measures proposed for the project by the applicant, all of the reasonable and prudent measures and the terms and conditions contained in section 2.2.3 are applicable to chinook salmon EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH recommendations.

3.7 Statutory Response Requirement

Please note that the Magnuson-Stevens Act (§ 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.

3.9 Consultation Renewal

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

4. LITERATURE CITED

Section 7(a)(2) of the ESA requires biological opinions to be based on "the best scientific and commercial data available." This section identifies the data used in developing this Opinion.

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