UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2004/00079

March 19, 2004

Mr. Lawrence C. Evans
Chief, Regulatory Branch
Portland District, U.S. Army Corps of Engineers
Attn: CENWP-OP-GP (Mr. John Barco)
P.O. Box 2946
Portland, OR 97208-2946

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation on the City of Portland Kelley Creek Confluence Restoration Project, Johnson Creek Watershed, Multnomah County, Oregon (Corps No. 200400022)

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) for the issuance of a permit under section 404 of the Clean Water Act to authorize construction of a stream restoration project on Johnson and Kelley Creeks in Multnomah County, Oregon. The Corps of Engineers (COE) requested formal consultation on this action, and determined that the action may adversely affect Lower Columbia River (LCR) steelhead (*Oncorhynchus mykiss*), and may affect but is not likely to adversely affect LCR chinook salmon (*O. tshawytscha*).

NOAA Fisheries concludes in this Opinion that the proposed action is not likely to jeopardize the continued existence of LCR steelhead and not likely to adversely affect LCR chinook salmon. As required by section 7 of the ESA, this Opinion includes reasonable and prudent measures with terms and conditions that are necessary to minimize the potential for incidental take associated with this action.

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

If you have any questions regarding this consultation, please contact Dr. Nancy Munn of my staff in the Oregon State Habitat Office at 503.231.6269.

Sincerely,

for Michael R Crouse

D. Robert Lohn
Regional Administrator

cc: Mike Reed, City of Portland
Greg Smith, U.S. Fish and Wildlife Service

Endangered Species Act - Section 7 Consultation
Biological Opinion

&

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

City of Portland Kelley Creek Confluence Restoration Project,
Johnson Creek Watershed,
Multnomah County, Oregon
(Corps No. 200400022)

Agency: U.S. Army Corps of Engineers

Consultation Conducted By: National Marine Fisheries Service, Northwest Region

Date Issued: March 19, 2004

F.r Michael R Course

Issued by: _____
D. Robert Lohn
Regional Administrator

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1. INTRODUCTION

1.1 Consultation History

On January 29, 2004, NOAA's National Marine Fisheries Service (NOAA Fisheries) received a letter and a biological assessment (BA) from the U.S. Army Corps of Engineers (COE) requesting formal consultation pursuant to the Endangered Species Act (ESA) for the issuance of a permit under section 404 of the Clean Water Act to the City of Portland to allow the construction of a stream restoration project at the confluence of Kelley Creek and Johnson Creek, in Multnomah County, Oregon. Kelley Creek flows into Johnson Creek, which is a tributary to the Willamette River. The COE determined the proposed action was likely to adversely affect Lower Columbia River (LCR) steelhead (*Oncorhynchus mykiss*), and may affect, but is not likely to adversely affect LCR chinook salmon (*O. tshawytscha*).

The purpose of the proposed project is to improve habitat for fish and improve floodplain function. The project is one of several restoration project sites along Johnson Creek identified as part of the City of Portland's (City) Johnson Creek Restoration Plan. The proposed project would entail creation of a new Kelley Creek channel and abandonment the old channel, creation of floodplain and wetland habitats, restoration for fish and wildlife habitat, and creation of backwater channels. The project would also realign approximately 268 linear feet of Kelley Creek at the confluence of Kelley Creek and Johnson Creek, effectively increasing the overall length of Kelley Creek to 573 feet in this reach.

References for listing status and dates, and ESA section 4(d) take prohibitions are provided in Table 1. This biological opinion (Opinion) is based on the information presented in the BA and information provided during discussions with the COE, the City, the U.S. Fish and Wildlife Service, and the project consulting firms, CH2M Hill and InterFluve. The objective of this Opinion is to determine whether issuance of the section 404 permit is likely to jeopardize the continued existence of the ESA-listed species described in Table 1. This consultation is conducted pursuant to section 7(a)(2) of the ESA and its implementing regulations, 50 CFR 402.

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

Table 1. Additional Background on Listing Status, Biological Information, Protective Regulations for the ESA-Listed Species Considered in this Consultation.

Species ESU	Status	Protective Regulations	Biological Information, Historical Population Trends
Chinook salmon (*O. tshawytscha*)			
Lower Columbia River	Threatened 3/24/99; 64 FR 14308	7/10/00; 65 FR 42422	Myers *et al.*1998; Healey 1991
Steelhead (*O. mykiss*)			
Lower Columbia River	Threatened 3/19/98; 63 FR 13347	7/10/00; 65 FR 42422	Busby *et al.* 1995; 1996

1.2 Proposed Action

The COE proposes to issue a permit enabling the City to construct a stream restoration project at the confluence of Kelley Creek with Johnson Creek. The site is near SE 159th and SE Foster Road, on the south side of Powell Butte in the City of Portland, Multnomah County, Oregon. Kelley Creek is a tributary of Johnson Creek in the Johnson Creek watershed. Johnson Creek flows into the Willamette River at river mile (RM) 18.5.

The proposed project has been identified as a project in the Johnson Creek Restoration Plan (the Plan). The Plan was developed by a number of local agencies to help resolve a long history of flooding, water quality problems and endangered species listings. It emphasizes reconnecting floodplains for floodwater storage and creation of wetland habitat and high flow refugia for fish. The proposed project is desirable for restoration because fill was placed in the floodplain historically, and removing that fill to provide additional backwater channels with cool summer water temperatures in Kelley Creek is likely to significantly improve salmon rearing.

The Kelley Creek Project includes channel realignment, floodplain excavation, and creation of backwater areas. The Kelley Creek floodplain will be excavated to approximately the 9-month water surface elevation to provide approximately 13.6 acre-feet of floodwater storage (up to a 10-year event). The project design and landscape plan are provided in Figures 1 and 2, respectively. Construction will occur during 2004, with all work within the wetted channel to occur during the low flow period of summer.

Figure 1. Design Plan.

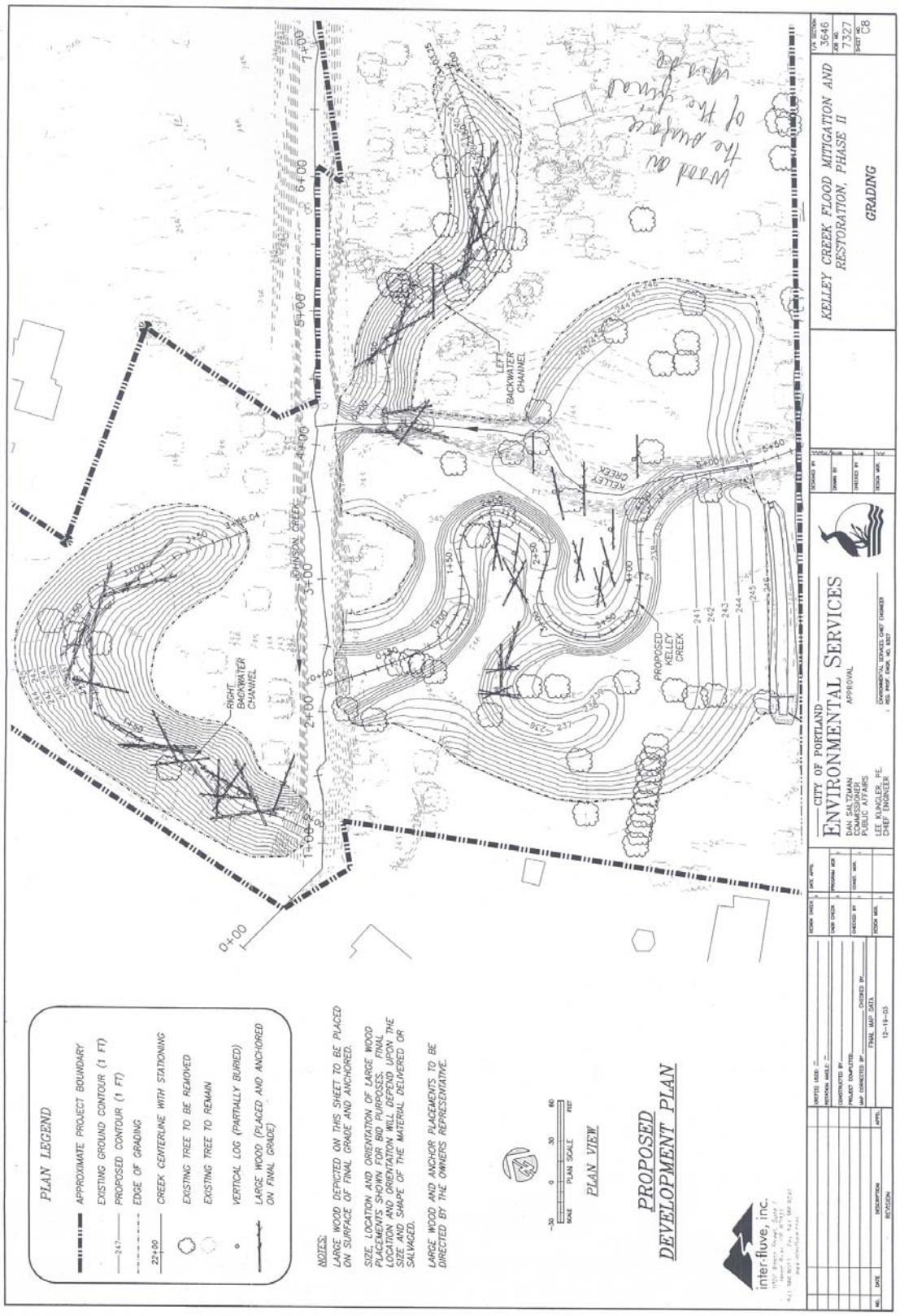
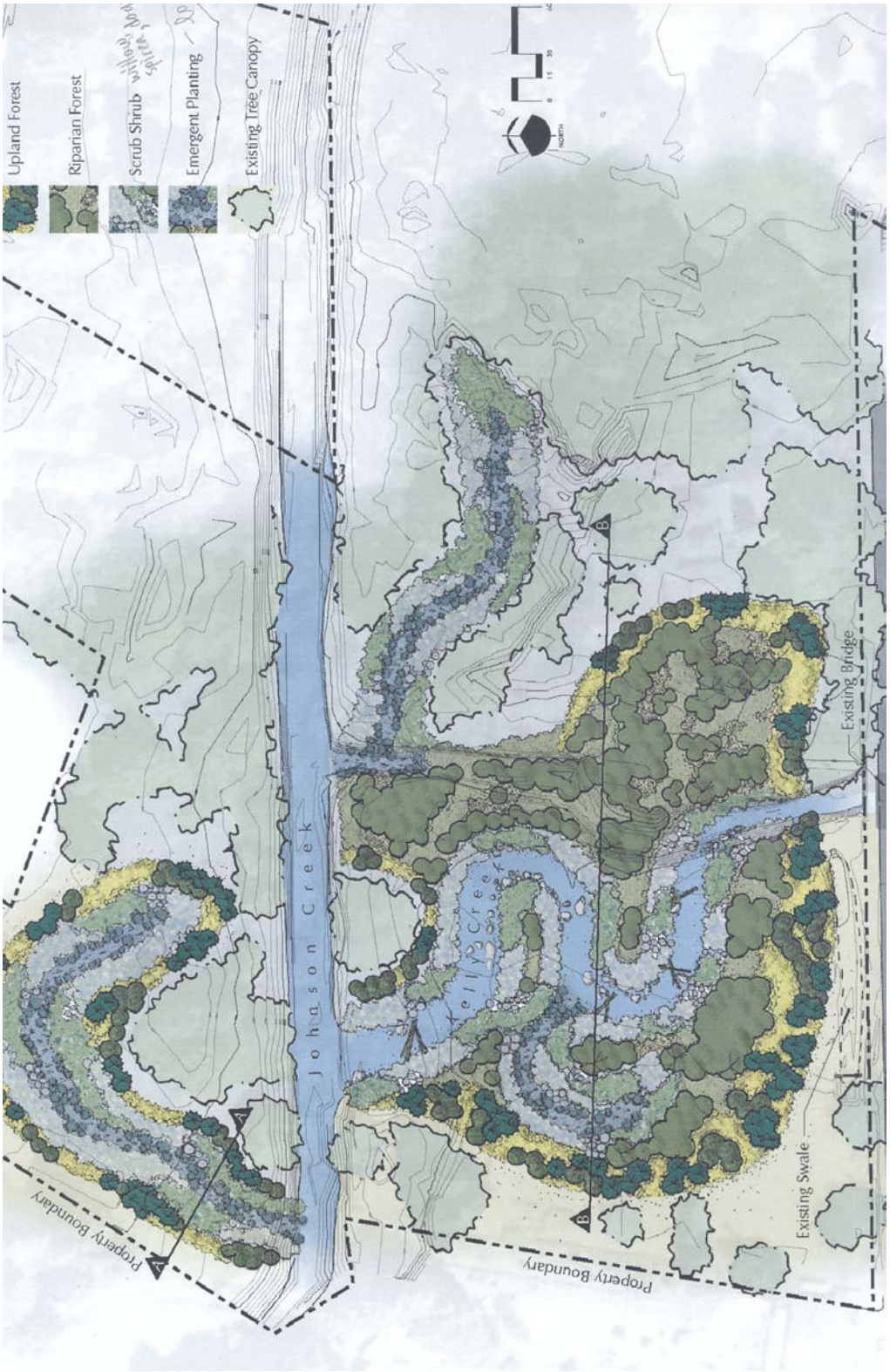


Figure 2. Proposed Landscape Plan.



Construction activities will be sequenced as follows:

1. Excavate the new Kelley Creek channel and associated floodplain.
2. Excavate the two backwater areas beside Johnson Creek.
3. Plant vegetation in the channel, floodplain, riparian area, upland, and two backwater areas, where appropriate based on the time of year.
4. Remove the berm structure on the upstream end of the newly-constructed channel to allow the flow of Kelley Creek to enter the new channel.
5. Restrict the entrance of the old channel, and then fill in and regrade the old channel.
6. Plant appropriate native species during the fall and winter.

The new elevation will be lower than the current ground contours to allow addition storage of floodwaters and support the new wetland vegetation. Approximately 25,000 cubic yards of material will be removed to create approximately 530 feet of meandering channel length and floodplain. A berm will be constructed between the existing Kelley Creek and the new channel to prevent water from flowing through the new channel until it is stabilized. During construction the new channel will be connected to Johnson Creek at the downstream end to prevent pooling of stormwater or springwater. After the new channel is created and stabilized, the berm between the old and new channels of Kelley Creek will be removed. Excavated soils will not be stored on-site permanently with the exception of soil used to fill in the old Kelley Creek channel. Excavated soils will be hauled to an off-site disposal site.

Instream habitat structures will be incorporated into the new channel to allow for the development of alternating pool and riffle bed forms. Large wood will be used to construct the new channel, and will be strategically placed and anchored on grade or partially buried to prevent channel avulsion, on the outside of meander bends to provide channel stability, and ongrade in pools to provide cover and to scour and maintain pool habitat. By adjusting the stream length, the project designers were able to optimize the channel slope for spawning. The new channel slope in the project reach will be 0.8%, which is within the desired range of 0.1 to 1% for salmonids (Bell 1986).

The project also includes creating two backwater areas beside Johnson Creek. The backwater areas will emulate meander scars and will provide wetland habitat, high-flow refugia for fish, and floodwater storage. The backwater channels will be constructed leaving a plug of undisturbed oil and a vegetated buffer beside the bank of Johnson Creek.

The newly-constructed channel, floodplain, and backwater areas will be revegetated soon after construction. The exposed soil will be hydroseeded for immediate erosion control. The area will then be planted with emergent, scrub shrub, riparian forest, and upland forest plants. After revegetation, the City's monitoring and documentation protocol will be followed as described in the City's Watershed Revegetation Program. Part of ongoing maintenance of the site will involve the control of invasive plant species. The site has a large patch of Japanese knotweed, which has the potential to affect the success of site restoration with native plants. The project

applicant proposes to use Rodeo (glyphosate) with the surfactant LI-700 within 25 feet of the creeks using the conservation measures listed below.

1. Solutions would be low in herbicide concentration (between 0.5% and 1.5% herbicide mixed with water). The actual amount of herbicide to be used is not expected to exceed 0.75 gallons per acre before dilution.
2. All contractors applying the herbicide would be licensed and would be required to provide their records to City staff.
3. Rodeo would be applied using a spot-spray method with a hand wand from a low pressure backpack sprayer (single nozzle) to minimize drift.
4. Plants would be sprayed at the optimum height (approximately 18-24 inches) to allow for adequate leaf surface, ease of application, minimization of drift and minimization of drip.
5. No spraying would occur during rain or high wind (over 6 miles per hour), or if precipitation has been forecasted within 24 hours of spraying.
6. Disturbed open areas will be seeded with native species to compete against noxious weeds.
7. All equipment used for transportation, storage or application of chemicals will be maintained in an areas that is constructed to fully contain all chemicals, and not loaded or unloaded within 300 feet of any perennial or intermittent stream or waterbody. This includes chemical storage, chemical mixing, and post-application equipment cleaning.
8. Non-target plant mortality on the site will be monitored and reported.

Two stockpile and staging areas will be used within the project boundary, and construction equipment will not be parked or maneuvered outside the boundary of disturbance. Six temporary access roads will be constructed to access stockpile and stage areas, and the project area.

The project applicant is requesting an extension of the in-water work window from August 31 to September 15 to complete in-water work. Most of the work during this time will be conducted within the riparian areas of both Kelley Creek and Johnson Creek. Furthermore, steelhead would not be migrating at that time, and flows usually remain very low.

1.3 Proposed Conservation Measures

The applicant has incorporated conservation measures into the project design to avoid and minimize effects to listed steelhead. The measures address in-water work, handling of hazardous materials and disturbance to riparian vegetation.

The Oregon Department of Fish and Wildlife (ODFW) requires that all in-water work for Kelley Creek be conducted between July 15 and August 31, and all work in Johnson Creek between June 1 and August 31. The applicant has requested an extension until September 15 (refer to section 1.2). In-water work for the Kelley Creek Project will consist of connecting two

backwater areas to Johnson Creek and removing the plug to allow Kelley Creek to flow into the new channel. The following measures apply to all project activities.

Preconstruction Activity

Before any construction/restoration activities, the following actions will be completed:

1. The boundaries of clearing limits associated with site access and construction to prevent ground disturbance of critical riparian vegetation, wetlands, and other sensitive sites will be flagged.
2. The following emergency erosion control materials shall be maintained onsite:
    a. A supply of sediment control materials (*e.g.*, silt fence, straw bales).
    b. Hazardous material containment booms and spill containment booms to facilitate the cleanup of hazardous material spills.
    c. All temporary erosion controls must be in place and appropriately installed downslope of project activity within the riparian area until site restoration is complete.

Earthwork

Earthwork will be completed as quickly as possible, including the following practices:

1. All disturbed areas will be stabilized within 12 hours of any break-in work unless construction will resume within 7 days between June 1 and August 31, or within 2 days between October 1 and May 31.
2. Boulders, rock, woody materials, and other natural construction materials used for the project will be obtained outside of the riparian area.
3. Alteration or disturbance of streambanks and existing riparian vegetation will be minimized. Where bank work is necessary, bank protection material will be placed to maintain normal waterway configuration.

Erosion Control

A Erosion, Sediment and Pollution Control Plan (ESPCP) will be prepared and carried out to prevent pollution related to construction operations. The intent of the manual is to describe proactive practices that can be taken to prevent erosion, releases of sediment and other pollutants generated at a site of ground disturbance. The ESPCP shall meet requirements of all applicable laws and regulations. The ESPCP shall include the following:

1. Practices to prevent erosion and sedimentation associated with access roads, stream crossings, construction sites, burrow 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 that includes: Notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures which will be available on site, proposed methods for disposal of spilled materials, and employee training for spill containment.
5. Identifications of measures 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.
6. All discharge water from the excavated bank will be treated to reduce the probability of suspended solids directly entering the river. One or more of the following techniques will be used: Detention pond, vegetated swale, biofiltration bags, sediment fence, or straw bales.
7. During construction, all erosion controls shall be inspected weekly to ensure they are working adequately. Erosion controls will be inspected daily during the rain events.
    a. 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.
    b. Sediment must be removed from erosion controls once it has reached 1/3 of the exposed height of the control.

Fish Passage and Salvage

Adult and juvenile fish passage conditions will be maintained for the duration of the project. The stream channel will not be blocked. In the unlikely event that listed fish become stranded in the work area, they will be rescued and moved to an appropriate waterbody. The following actions will be undertaken:

1. Before and intermittently during dewatering activities, an attempt will 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.
2. A fishery biologist experienced with work area isolation and competent to ensure the safe handling of all ESA-listed fish will conduct or supervise the entire capture and release operation.
3. If electrofishing equipment is used, the capture team will comply with NOAA Fisheries' electrofishing guidelines (NOAA Fisheries 1998).
4. The capture team will handle the ESA-listed fish with extreme care, keeping fish in water to the maximum extent possible during seining and transfer procedures to prevent the added stress of out-of-water handling.
5. Captured fish will be released as near as possible to the capture sites.
6. ESA-listed fish will not be transferred to anyone except NOAA Fisheries personnel, unless otherwise approved in writing by NOAA Fisheries.

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

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

Revegetation

The following actions are proposed for revegetation:

1. Streambank revegetation in the disturbed construction area will be completed immediately following construction. Native perennials and grasses will be used to revegetate the area. All areas disturbed will be revegetated, with native plant cuttings along the bank above ordinary high water.
2. Areas requiring revegetation will 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.
3. Fencing will be installed to prevent access to revegetated sites by livestock or unauthorized persons.

Stormwater Control

Presently the stormwater conveyance swale along SE 159th Drive discharges to Kelley Creek via a culvert just north of the bridge over Kelley Creek. This outfall will be removed and storm flow will be spread onto the flood plain bench using a flow spreader system. This will allow stormwater to infiltrate into the ground instead of flowing directly into Kelley Creek.

Part of the project goal is to improve floodwater storage and as such will be a net benefit to stormwater control. The floodplain will be re-connected to Kelley Creek. This will result in decreased velocities, decreased erosion, lower local water surface elevation during high flow events, and detention of some floodwaters via depression storage and infiltration. By increasing floodwater retention and infiltration, baseflows could be increased and temperature could ultimately be decreased.

The creation of wetland habitat is another project goal. Wetlands are also beneficial for stormwater treatment because of their treatment capacity. Rain events may occur during construction of the project and stormwater would be generated. Best management practices will be used during construction including silt fences and straw bales.

1.4 Action Area

The action area is defined by NOAA Fisheries regulations (50 CFR 402.02) as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The action area is Johnson Creek and Kelley Creek including the streambed, streambank, water column and adjacent riparian zone at the confluence of the two creeks, and 100 feet downstream of the construction area and 100 feet upstream of the construction area on each creek.

2. ENDANGERED SPECIES ACT

2.1 Biological Opinion

2.1.1 Biological Information

Johnson Creek provides spawning, rearing and migration habitat for the listed chinook salmon and steelhead ESUs under consideration in this Opinion, although chinook salmon do not travel as far upstream as the project reach. The lower reaches of Johnson Creek likely provide a refuge during high winter flows for juvenile chinook salmon. Essential features of the project area for the steelhead are: (1) Substrate; (2) water quality; (3) water quantity; (4) water temperature; (5) water velocity; (6) cover/shelter; (7) food (juvenile only); (8) riparian vegetation; (9) space; and (10) safe passage conditions (see, 65 FR 7764). The essential habitat features that the proposed project may affect include all of the above-mentioned habitat features.

References for further background on listing status and biological information can be found in Table 1. According to a recent draft of "Preliminary conclusions regarding the updated status of listed ESUs of West Coast salmon and steelhead," drafted by the West Coast Salmon Biological Review Team (BRT), a number of ESUs were determined by the majority of the BRT as "likely to become endangered in the foreseeable future" including LCR chinook salmon and steelhead (NOAA Fisheries 2003). Biological information for each listed ESU considered in this Opinion are discussed below.

Lower Columbia River Chinook

LCR chinook salmon includes both fall-fun and spring-run stocks. Adults migrating to the Clackamas River may be present in the lower Willamette River starting in August and continuing through November, with peak migration occurring in September and October. Juveniles in this ESU would be expected in the lower Willamette River starting in March, continuing through July, with the peak occurring in April, May and June.

Threats to chinook spawning and rearing habitat in the Lower Columbia River ESU continue to be habitat degradation and loss due to extensive hydropower development projects, urbanization, logging and agriculture.

Lower Columbia River Steelhead

Based on the updated information provided in the BRT report (NOAA Fisheries 2003), the information contained in previous LCR status reviews, and preliminary analyses, the number of historical and currently viable populations have been tentatively identified. Like the previous BRT, the current BRT could not conclusively identify a single population that is naturally self-sustaining. Over the period of the available time series, most of the populations are in decline and are at relatively low abundance. No population has a recent mean greater than 750 spawners. In addition, many of the populations continue to have a substantial fraction of hatchery origin spawners.

LCR steelhead move through the action area throughout the year. Peak movement is expected from late April through May. According to a review by Fulton (1970), the midsection and lower portion of Johnson Creek provided good spawning habitat for steelhead in the past.

2.1.2 Evaluating Proposed Actions

The standards for determining jeopardy and destruction or adverse modification of critical habitat are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402 (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 combined with the Habitat Approach (NMFS 1999): (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 and whether the action is consistent with the available recovery strategy; (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 or destroy or adversely modify critical habitat. 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 NOAA Fisheries finds that the action is likely to jeopardize the listed species, NOAA Fisheries must identify reasonable and prudent alternatives for the action.

2.1.3 Biological Requirements

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

The relevant biological requirements are those necessary for the listed species to survive and recover to a naturally-reproducing population level, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance its capacity to adapt to various environmental conditions, and allow it to become self-sustaining in the natural environment.

For this consultation, the biological requirements are improved habitat characteristics that function to support successful adult and juvenile migration, rearing ans spawning. Listed Pacific salmonid survival in the wild depends upon the proper functioning of certain ecosystem processes, including habitat formation and maintenance. Restoring functional habitats depends largely on allowing natural processes to increase their ecological function, while removing adverse impacts of current practices. In conducting analyses of habitat-altering actions, NOAA

Fisheries defines the biological requirements in terms of a concept called Properly Functioning Condition (PFC) and applies a "habitat approach" to its analysis (NMFS 1999). The current status of the listed species covered by this Opinion, based upon their risk of extinction, has not significantly improved since they were considered for listing.

2.1.4 Environmental Baseline

In step 2 of NOAA Fisheries' analysis, we evaluate the relevance of the environmental baseline in the action area to the species' current status. The environmental baseline is an analysis of the effects of past and ongoing human-caused and natural factors leading to the current status of the species or its habitat and ecosystem within the action area.

Johnson Creek originates in the hills east of Portland and flows westward approximately 25 miles to its confluence with the Willamette River. The stream receives water from several major tributaries, including Crystal Springs Creek, Kelley Creek, Mitchell Creek, Butler Creek, Hogan Creek, Sunshine Creek, and Badger Creek. Land use in the 34,560-acre (54 square miles) Johnson Creek watershed ranges from heavily developed urban areas (the cities of Portland, Milwaukie, and Gresham) to rural farm and nursery lands in the headwaters. Johnson Creek is a low gradient stream that drops approximately 700 feet over its course. The average gradient along the mainstem is 0.5%. Remnants of predevelopment vegetation are rare, as a result of extensive logging and clearing. Generally, riparian vegetation is either in a narrow band of minimal extent, or lacking throughout much of the watershed. The Kelley Creek watershed is 3000 acres (4.69 square miles).

Water Quality

Water quality in Johnson Creek is rated as poor. Johnson Creek has been placed on the 303(d) list by the Oregon Department of Environmental Quality (DEQ) for bacteria, summer temperature, and toxics (dichlorodiphenyltrichloroethane [DDT] and dieldrin, polychlorinated biphenyls [PCBs], polynuclear aromatic hydrocarbons [PAHs], and chlordane). The 303(d) listing includes the entire stream, from the mouth to the headwaters. DEQ is currently developing a total maximum daily load (TMDL) for Johnson Creek. The TMDL is scheduled to be completed with the rest of the Willamette River TMDLs in 2004. The numerous investigations of temperature in Johnson Creek over the years have consistently indicated that elevated temperatures are a problem throughout the watershed. In addition, dissolved oxygen concentrations can be below the state standard of 8.0 mg/L during the summer.

Limited water quality data are available for Kelley Creek. The City collected and analyzed water quality samples from four locations on Kelley Creek in January, March, June, and September of 2002. Samples were analyzed for pesticides, metals, general chemistry, oil and grease, total suspended solids, bacteria, nutrients, and field measurements. A brief description of some of the sample results is provided below:

- Instream temperature ranged from 5.8°C to 15.6 °C (42.4 °F to 60.1°F).
- Instream dissolved oxygen ranged from 6.2 to 12.4 mg/L.

- Total DDT concentrations ranged from 0.0014 to 0.152 µg/L.
- Total suspended solids ranged from 3 to 161 mg/L.
- Total lead ranged from 0.15 to 5.31 µg/L.
- Bacteria ranged from 50 to 1,400 MPN/100 mL.

Temperatures in Kelley Creek are generally low and provide good cold water refugia for salmonid species. The criterion for cold-water fish spawning in the Lower Columbia and Willamette Rivers is 55°F (http://www.deq.state.or.us/wq/303dlist/TempFactSheet.htm). When comparing values with the freshwater chronic criteria in Table 20 of the Water Quality Criteria Summary (http://www.deq.state.or.us/wq/303dlist/303dpage.htm), Kelley Creek values appear to exceed the criteria in some instances for DDT and lead. Bacteria levels also appear high.

Hydrology

Flow monitoring indicates that low-flow conditions in Johnson Creek may adversely affect aquatic life. ODFW has set minimum flow targets to protect salmonids in Johnson Creek (Meross 2000). Flows in the middle and upper watershed frequently do not meet those minimum flows, particularly in spring and summer months. Minimum instream flows are typically met below Crystal Springs which has consistent and abundant groundwater flows. General hydrologic patterns in Johnson Creek are driven by patterns of rainfall and groundwater inflow. High flows normally occur in December, January, and February in response to abundant rainfall and high amounts of runoff as soils become saturated through the rainy season. Summer low flows in July, August and September reflect minimal groundwater contributions to streamflow throughout the watershed.

There is also evidence of adverse effects from excessive peak flows. The Sycamore gage provides the longest period of record with which to evaluate changes in flow over time that result from human activities. The Sycamore gage is above the City of Portland and so does not reflect impacts from the most intensely urbanized portion of the watershed. However, it does reflect impacts from Gresham and other changes within the middle and upper watershed since the 1940s. Statistical evaluation of flow since 1940 indicates some increase in the flashiness of peak flows over the period of record (Clark 1999, as cited in the BA). Significant impacts on peak flows in Johnson Creek also appear to be affected by alterations in the stream channel and floodplain that change the way high waters flow through Johnson Creek.

Johnson Creek has been altered substantially from its historical configuration. Diking, channelization, and other alterations of the natural floodplain have eliminated many of the areas that once absorbed and conveyed floods through the watershed. One of the most significant alterations occurred in the 1930s when the WPA widened, deepened, rock-lined, and channelized 15 miles of the 25-mile stream in an attempt to control flooding. These alterations have had long-lasting and marked effects on the habitat and hydrology of the watershed. Most significantly, the historical floodplain of Johnson Creek is disconnected or minimally connected through much of the stream's length. The lack of floodplain connection means that flood flows cannot spread out and attenuate on the floodplain. Instead they are directed and concentrated into the main channel, where they increase scour and degrade instream habitat. In addition to

increasing high flows, the lack of floodplain connection leads to lower low flows because the floodplain cannot augment base flows.

Habitat

ODFW has conducted habitat surveys throughout Johnson Creek (ODFW 2000, 2002). They found extremely low instream wood volumes, a high percentage of anthropogenically hardened banks, a lack of refugia in many reaches, channel incision, and high levels of fine sediment. Riparian vegetation is minimal or lacking throughout much of the watershed. Interestingly, riparian vegetation is as lacking in the upper watershed as it is in the lower watershed (ODFW 2000).

Fish access to habitat in Johnson Creek is impaired by culverts throughout the watershed. Although there are no culverts on the mainstem until high in the watershed, they are present on nearly all the tributaries of Johnson Creek. Crystal Springs, an area used by resident and migratory salmonids, has a series of partially impassable culverts along its length, and some of the least developed tributaries along the southern side of the middle watershed also have culverts at their confluence with the mainstem.

Johnson Creek at the confluence of Kelley Creek consists primarily of forested properties. Powell Butte to the north and Clatsop Butte to the south confine the floodplain area of Johnson Creek. The riparian corridor is fairly wide. Vegetation consists of native rose, bigleaf maple, red alder, Oregon ash, beaked hazelnut, red osier dogwood, willow, salmonberry, Douglas' spirea, Pacific nonebark, red alderberry, Douglas-fir, grand fir, Douglas hawthorn, and Indian plum, as well as non-native Himalayan blackberry and reed canarygrass.

The stream habitat in Johnson Creek near the Kelley Creek confluence is dominated by glides and scour pools. Average pool depth is 24.4 inches, and the stream substrate is dominated by cobble and fine sediments, with some boulders. Instream wood volume is very low. Riparian vegetation is dominated by small and medium-sized deciduous trees, including alder, dogwood, and willow, which often overhang the water. The reach contains limited multiple-channel areas or backwaters. Summer conditions are typified by slow, deep water. The banks are constrained by WPA tiles. There is, however, a good variety of deep pools, steps, and riffles.

Based on Ecosystem Diagnosis and Treatment (EDT) analysis by the City of Portland, habitat loss and degradation is a limiting factor in the success of salmonid survival and productivity in Johnson Creek. EDT outputs specifically recommend improvements to habitat quality, habitat diversity, removal of WPA channelization, and introduction of large woody debris.

Kelley Creek in the project area (near its confluence with Johnson Creek) has riparian and upland habitat mixed with forested elements and disturbed areas. Douglas fir and cedar dominate, with a scattered shrub layer, and sword fern and trailing Himalayan blackberry as the ground cover. In some reaches, manicured lawns border the creek. The streambed in Kelley Creek has a distribution of cobble to boulder-sized materials, with some surficial accumulations

of smaller-sized sands and gravels. The bankfull width of Kelley Creek is approximately 26 feet.

There are two wetlands identified within the project area. A palustrine emergent wetland is on the south side of the Johnson Creek confluence with Kelley Creek, approximately 500 feet east of Kelley Creek. This 0.028-acre wetland contains palustrine emergent vegetation, including wetland herbs and shrubs under a forested canopy. Another palustrine emergent wetland is beside a former house site on the Alsop property near the end of SE 159th Drive. This 0.059-acre wetland is in a shallow depression, partially formed by a graveled access roadway. It is dominated by reed canarygrass and is bordered by Oregon ash trees.

Fish Communities

Johnson Creek historically had large salmon populations. Numbers declined dramatically once urbanization began and particularly after the channelization work was completed (McConnaha 2003). However, adult salmonids have been observed in recent years including coho salmon, chinook salmon, cutthroat trout, and steelhead.

Winter-run steelhead return to spawn in Johnson Creek from mid-November through May. Two separate runs appear to peak in January to February and again in April to May. Eggs can be present in the gravel from December to July. Juvenile steelhead can remain in Johnson Creek for one to two years before migrating as smolts to salt water. Steelhead are likely to use the mainstem of Johnson Creek and the tributaries.

The City's Endangered Species Program has determined that Johnson Creek hold an independent population of steelhead trout. The documentation of steelhead trout juveniles in surveys between 1992 and 1999 in the Kelley Creek subwatershed to Johnson Creek and documentation of possible overwintering juveniles (Reed and Smith 2000), combined with ongoing observations of spawning adults, suggest the continued presence of a small, independent population and not just sightings of occasional strays.

Historically, coho salmon were observed in the lower reaches of Johnson Creek and Crystal Springs Creek from late September through early November. Eggs could be within the gravels between October and March. Fry attempt to establish territories and remain in streams as juveniles for one to two years before smolts migrate to salt water.

Chinook salmon probably enter Johnson Creek to spawn during mid-September through October. Fry emerge from gravels in January or February. It is likely that most chinook found in the Johnson Creek system are either strays or fish seeking refuge from high flows in the Willamette River.

Johnson and Kelley Creeks also support populations of non-salmonid native and non-native fish species, including western brook lamprey, Pacific lamprey, rainbow/steelhead trout, redside shiner, speckled dace, peamouth chub, chiselmouth, largescale sucker, yellow bullhead, largemouth bass, green sunfish, and reticulate sculpin.

Based on this information as well as information in the BA, the environmental baseline within the action area is not properly functioning and is not currently adequate to meet the needs of migrating, spawning, or rearing salmonids.

2.1.5 Effects of Proposed Action

In step 3 of the jeopardy analysis, NOAA Fisheries evaluates the effects of the proposed action on listed fish and their habitat.

Effects to chinook salmon are not expected. Chinook salmon have not been observed in the project reach, and water temperatures and low flows during the summer work period would likely preclude their presence. The greatest potential for effect is associated with the expected increased turbidity from in-water work; however, even this scenario is unlikely because turbidity would likely dissipate to background before reaching the lower reaches of Johnson Creek where chinook salmon presence is more likely.

However, effects to steelhead are expected because adult and juvenile steelhead have been observed in the project reach, and juveniles may be present during the summer work period. Potential effects of the proposed action on listed salmonids include the potential for short-term construction effects (direct take, harm or disturbance during in-water work, and an increase in turbidity during in-water work), and long-term effects (modification of instream and riparian habitat which can alter spawning, prey availability and foraging and other aspects of rearing).

Short-term Effects of Construction

Most of the earth-moving activities will occur in isolation, separated from the existing Kelley Creek channel and Johnson Creek. The new channel and off-channel depressions will be excavated in the dry. Flow will remain in the existing channel until the new channels have been created and stabilized. Toward the end of the in-water work period, fish (including any LCR steelhead present) will be salvaged from the old channel and placed into Johnson Creek and then flow will be diverted from the old channel into the new channel. Any listed fish removed from the existing channel would experience high stress with the possibility of up to 5% delayed mortality rate depending on the rescue method. Fish handling will only occur as the existing Kelley Creek channel is de-watered, and extend along the length of the de-watered section only. Because of the limited extent of the activity, the effects are not expected to be significant over the long term.

Significant amounts of soil will be moved to create new floodplain areas as well as new channels and backwater areas. Despite good erosion controls, increased turbidity is expected. The downstream extent of increased turbidity will be limited because the low flow conditions will minimize the sediment transport capacity of the stream. Furthermore, the project design was developed to minimize turbidity increases through erosion control best management practices and careful grading of streambed and bank materials. Potential effects from project-related increases in turbidity on LCR steelhead include, but are not limited to: (1) Reduction in feeding rates and growth; (2) increased mortality; (3) physiological stress; (4) behavioral

avoidance; (5) reduction in macroinvertebrate populations; and (6) temporary beneficial effects. Potential beneficial effects include a reduction in piscivorous fish/bird predation rates, enhanced cover conditions, and improved survival conditions.

At moderate levels, turbidity can reduce primary and secondary productivity and, at high levels, turbidity can interfere with feeding and can injure and kill both adult and juvenile fish (Spence *et al.* 1996, Bjornn and Reiser 1991). Other behavioral effects on fish, such as gill flaring and feeding changes, have been observed in response to pulses of suspended sediment (Berg and Northcote 1985). Fine, redeposited sediments can also reduce primary and secondary productivity (Spence *et al.* 1996), and reduce incubation success and interstitial rearing space for juvenile salmonids (Bjornn and Reiser 1991). Salmonid fishes have been observed to 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). In contrast, turbid water can provide cover and refuge from predationfrom 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 whether turbidity causes physical or behavioral effects and the extent of those effects (Newcombe and MacDonald 1991). Salmonids have evolved in waters that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with floods, and are adapted to such high pulse exposures. Adult and larger juvenile salmonids 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 suspended sediment can adversely affect filter-feeding macroinvertebrates and fish feeding. At concentrations of 53 to 92 parts per million (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).

Johnson Creek is not properly functioning for sediment and turbidity. Over the long term, the proposed action will maintain this parameter. As stated above, elevated turbidity from construction activities is expected in the work area and downstream of the work area. These increases in turbidity are likely to increase physiological stress and displace rearing juveniles. Salmon are likely to avoid waters that are chronically turbid, and therefore adverse effects are less likely after initial exposure; however, repeated pulses of turbidity that persist over a period of days or weeks may displace rearing salmon for longer periods, possibly reducing survival. Construction will occur from June through mid-September. No adult LCR steelhead will be in

the project reach during this time, although yearling and sub-yearling LCR steelhead may be present. The sub-yearling fish are more vulnerable, because yearling fish are better to tolerate turbid water. Both are vulnerable to increased physiological stress and potentially physical injury (*e.g.*, gill abrasion). Therefore, effects related to turbidity are expected for juvenile LCR steelhead. The effects would be in the form of physiological stress and displacement, with the potential for reduced survival.

As with all construction activities, accidental release of fuel, oil, and other contaminants may occur. Operation of the back-hoes, excavators, and other equipment requires the use of fuel, lubricants, and other substances which, if spilled into the channel of a waterbody or into the adjacent riparian zone, can injure or kill aquatic organisms. Petroleum-based contaminants, such as fuel, oil, and some hydraulic fluids, contain polycyclic aromatic hydrocarbons (PAHs), which can be acutely toxic to salmonids at high levels of exposure and can also cause chronic lethal and acute and chronic sublethal effects to aquatic organisms (Neff 1985).

Johnson Creek is not properly functioning for chemical contaminants. This project is expected to maintain or improve this parameter. To minimize the potential for chemical contamination and disturbance of fish, most of the project work will occur during the ODFW in-water work timing guideline. During this window, streamflow is typically low, fish presence is reduced, and rainfall is minimal. Work area isolation will allow the work to occur in the dry, thereby reducing the potential for chemical contaminants to enter the actively flowing water. Staging areas will be away from actively flowing streams and other waterbodies.

Long-term Effects of the Proposed Action

Beneficial long-term effects of the proposed action include improved spawning and rearing habitat. The new channel will have better slope and substrate for spawning, and better habitat complexity for rearing. The new Kelley Creek channel will include alternating pool and riffle bed forms that incorporate large wood as an integral part of channel construction. The riffles will provide macroinvertebrate habitat, an important food source for fish, as well as spawning habitat. Pool tail-outs also provide spawning habitat for salmonids, and pools provide important rearing habitat for juvenile salmonids. The large wood will provide refuge and cover habitat, and the resulting local hydraulics will assist in maintaining pool depths. Backwater areas will provide a flow refuge and feeding opportunities for juvenile steelhead.

The Effects of Pesticide (Rodeo) Use

The applicant proposes to selectively use herbicides to control invasive plant species along the riparian area of the property until the proposed riparian community is established.

Glyphosate is moderately persistent in soil, with an estimated average half-life of 47 days. Field half-lives range from one to 174 days. It is strongly adsorbed to most soil types, including types with low organic and clay content. Therefore, even though it is highly soluble in water, glyphosate has a low potential for runoff (except as adsorbed to colloidal matter) and leaching. One study suggested that 2% of the applied chemical was lost to runoff. However, glyphosate can enter waterbodies by other means, such as overspray, drift, or erosion of contaminated soil.

Once in water, glyphosate is strongly adsorbed to any suspended organic or mineral matter and is then broken down primarily by microbes. Sediment adsorption and/or biodegradation represents the major dissipation process in aquatic systems. Half-lives in ponds range from 12 days to 10 weeks (Extoxnet website). Furthermore, evidence from studies suggest that glyphosate levels first rise and then fall to a very low, or even undetectable level, in aquatic systems.

Given the results reported in the literature (Rashin and Graber 1993), and limitations of existing best management practices (BMPs) for the application of herbicides, it appears likely that glyphosate will enter salmon habitat as a result of the proposed action. Standard BMPs have been shown to be insufficient to completely eliminate drift and runoff, and modeling, despite their complexities, have not been sufficiently developed to be able to predict the risk of spray drift. The applicant proposes to use the herbicide within the riparian area, thus increasing the risk of spray drift or direct application to salmon habitat. However, when used according to the Environmental Protection Agency (EPA) label restrictions, it is unlikely that the herbicides or surfactant will be present in Johnson Creek at sufficient concentrations to cause direct lethal effects. The greatest risk of toxicological effects is during the summer low flow period. The risk of effect should decline over time as the herbicide degrades. Furthermore, with the implementation of BMPs, the risk can be minimized.

The indirect effects of herbicides on ecosystem structure and function are a key factor in determining a toxicant's cumulative risk to aquatic organisms (Preston 2002). Moreover, aquatic plants and macroinvertebrates are generally more sensitive than fish to the acutely toxic effects of herbicides. Therefore, chemicals can potentially impact the structure of aquatic communities at concentrations that fall below the threshold for direct biological impairment in salmon. The integrity of the aquatic food chain is an essential biological requirement for salmon, and the possibility that herbicide applications will limit the productivity of the river should be considered in an adverse affects analysis. Herbicide applications have the potential to impair autochthonous production and, by extension, undermine the trophic support for stream ecosystems. However, existing data gaps make it difficult to estimate the degree of ecological risk. The proposed herbicide use is unlikely to cause fish kills when used according to the EPA label. Therefore, for listed salmonids, the vast majority of harmful direct effects are expected to be from sublethal exposure, although glyphosate appears to carry low risk for sublethal effects. The potential for additive effects with the adjuvants or other chemicals found at the site has not been investigated. The possibility of sublethal effects leading to a significant loss of ecological function (Kruzynski *et al.* 1994) or other deleterious biological outcomes is a possibility for LCR steelhead at the site.

Non-toxicological effects are also possible when using a herbicide like glyphosate. Since glyphosate is a broad spectrum chemical, it tends to kill native grasses as well as the non-native target species. This leaves the soil vulnerable to erosion with the potential for increased turbidity in the Willamette River. Furthermore, the effectiveness of glyphosate to control blackberries at some sites has been low (NOAA Fisheries No.: 2003/01440).

2.1.6 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." This is step 4 in NOAA Fisheries' analysis process. Future Federal actions, including implementation of the Johnson Creek Restoration Plan, 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 is not aware of any specific future non-federal activities within the action area that would cause greater impacts to listed species than presently occurs. Residential, commercial and industrial development will continue in the Johnson Creek watershed and Kelley Creek watershed. Implementation of the Johnson Creek Restoration Plan will likely include activities that do not have a Federal nexus. NOAA Fisheries assumes that future private and state actions will continue at similar intensities as in recent years, and that current trends in the environmental baseline will continue to be negative. Efforts to development land using low impact development concepts and implementation of plans like the Johnson Creek Restoration Plan may slow the trend or perhaps result in improvements to the baseline.

2.1.7 Conclusion

The final step in NOAA Fisheries' approach to determine jeopardy is to determine whether the proposed action is likely to appreciably reduce the likelihood of species survival or recovery in the wild. NOAA Fisheries has determined that when the effects of the proposed action addressed in this Opinion are added to the environmental baseline and cumulative effects occurring in the action area, it is not likely to jeopardize the continued existence of listed LCR steelhead. Further, NOAA Fisheries concurs with the COE's determination that the proposed action is not likely to adversely affect LCR chinook salmon. NOAA Fisheries used the best available scientific and commercial data to apply its jeopardy analysis, when analyzing the effects of the proposed action on the biological requirements of the species relative to the environmental baseline, together with cumulative effects.

These conclusions are based on the following considerations: (1) LCR chinook salmon have not been found in the project reach and are unlikely to be immediately downstream of the project reach; (2) the proposed changes to the stream channels will result in improved habitat for spawning and rearing for LCR steelhead because of proposed changes in channel alignment, instream habitat, riparian condition, and hydrology; (3) negative effects such as increased turbidity and fish handling will be short term in both duration and extent; (4) the potential for effect from the use of glyphosate will be minimized through the use of BMPs; and (5) the proposed action is not likely to impair properly functioning habitat, or retard the long-term progress of impaired habitat toward proper functioning condition essential to the long-term survival and recovery at the population or ESU scale.

2.1.8 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on listed species, minimize or avoid adverse modification of critical habitat, and to develop additional information. NOAA Fisheries believes the following conservation recommendation is consistent with these obligations, and therefore should be carried out by the COE.

> The COE should advise the project applicant that compliance with terms and conditions in the incidental take statement issued with this biological opinion does not remove the prohibition against take that may result from fish rearing in stream water that exceeds their thermal tolerance range. By improving spawning and rearing habitat at the site, the proposed action has the potential to increase the density of listed fish in this reach. Cool water temperatures in the Kelley Creek basin make this an ideal site for habitat restoration activities. However, increased development in the basin could result in warmer water temperatures if certain development practices are not followed (*e.g.*, maintenance of riparian habitat, on-site management of stormwater that encourages infiltration, use of pervious pavements, *etc.*). Therefore, the COE should encourage the applicant to protect water temperatures in the Kelley Creek basin by: (1) Planning development at the landscape scale to incorporate concepts that will protect water temperatures such as low impact development concepts that encourage infiltration and minimize impervious surfaces; and (2) protecting riparian buffers along permanent and ephemeral streams in the Kelley Creek basin.

To keep NOAA Fisheries informed of actions minimizing or avoiding adverse effects, or those that benefit listed salmon and steelhead or their habitats, we request notification of the achievement of any conservation recommendations when the COE submits the monitoring report for this Opinion.

2.1.9 Reinitiation of Consultation

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

2.2 Incidental Take Statement

Section 9 of the ESA [16 USC 1538] prohibits take of endangered species. The prohibition of take is extended to threatened anadromous salmonids by section 4(d) rule [50 CFR 223.203].

Take is defined by the statute as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." [16 USC 1532(19)] Harm is defined by regulation as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering." [50 CFR 222.102] Harass is defined as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering." [50 CFR 17.3] Incidental take is defined as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant." [50 CFR 402.02] The ESA at section 7(o)(2) removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement [16 USC 1536].

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

2.2.1 Amount or Extent of the Take

The proposed action is reasonably certain to result in incidental take of steelhead because surveys show the listed species occur in the action area, the proposed action will result in a short-term increase in turbidity, and fish salvage is required. Anywhere from zero to ten juvenile steelhead may be present in the project reach during the in-water work. Five percent mortality is not uncommon for fish salvage activities. Consequently, one fish may die as a result of the fish salvage.

However, take associated with the habitat-related effects of actions such as increased turbidity are largely unquantifiable and are not expected to be measurable as long-term effects on populations. Therefore, NOAA Fisheries is unable to estimate a specific amount of incidental take attributable to those effects. In instances such as these, NOAA Fisheries designates the expected level of take as 'unquantifiable.' The extent of take will be limited to the action area, including the water column, streambed, streambank, and adjacent riparian zone at the confluence of Johnson Creek and Kelley Creek, including 100 downstream of the construction area and 100 feet upstream of the disturbance area on each creek.

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 ensure that the City will:

1. Avoid or minimize incidental take from in-water work associated with the new channel construction, diverting flow to the new channel, decommissioning the old channel, creation of new off-channel areas, and fish salvage activities.
2. Avoid or minimize incidental take from streambank and upland activities including grading, plantings, and staging by applying permit conditions or project specifications that provide the greatest degree of ecological function in the riparian areas.
3. Complete a comprehensive monitoring and reporting program to confirm this Opinion is meeting its objective of minimizing take from permitted activities.

2.2.4 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the COE must require that the City and/or their contractors 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 (in-water activities), the COE shall ensure that:

    a. Project Design. The design of this project must be reviewed to ensure that impacts to natural resources have been avoided, minimized and mitigated, and that the following overall project design conditions are met.
        i. Minimum area. Construction impacts will be confined to the minimum area necessary to complete the project.
        ii. In-water work. All work within Kelley Creek will be completed within the ODFW-approved in-water work period of July 15 through August 31. All work within Johnson Creek will be completed within the ODFW approved in-water work period of June 1 through August 31. An extension of the work window until September 15 is approved. Further extensions of the in-water work period, including those for work outside the wetted perimeter of the river but below the ordinary high water mark must be approved in writing by biologists from NOAA Fisheries.
    b. Water Quality Plan, Pollution and Erosion Control Plan. Increased turbidity as a result of soil-moving activities is a concern, as is operation of equipment in and beside the water. Prepare and carry out a pollution and erosion control plan to avoid or minimize the likelihood of an effect from these activities. The plan must be available for inspection on request by COE or NOAA Fisheries. The pollution and erosion control plan will contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.
        i. The names and address of the party(s) responsible for accomplishment of the water quality and pollution and erosion control plan.
        ii. Describe methods or best management practices (BMPs) that will be used to minimize turbidity increases as a result of piling removal, placement of cap materials, or resuspension of river sediment. Silt curtains and

floating booms will be deployed, as necessary, during in-water activities to maintain the water quality standards described below.

iii. Turbidity shall be monitored during active in-water work period with a turbidity meter that is calibrated daily (calibration measures must be documented and available for review upon request). Monitoring points shall be an undisturbed site 100 feet upstream of the activity and 50 feet downstream from the disturbance point.

iv. Turbidity shall be measured and recorded at least once every four hours during in-water work. The first sample of the day will be taken four hours after the initiation of the in-water activity, and once at each four-hour interval thereafter. If the turbidity criteria is exceeded, work will not proceed until the turbidity level has dropped to an acceptable level.

v. Visual monitoring must occur at least once every four hours during in-water work. If, at any time, the visual turbidity levels are estimated to be approaching the turbidity exceedance level, field-testing will be performed. If field testing confirms turbidity criteria exceedances, then the contractor will cease operations responsible for causing the elevated turbidty.

vi. The BMPs will be evaluated and modified (when applicable) throughout the construction period to assure that the water quality standards are met. BMP modifications may include deployment of addition sediment control devices. If sediment curtains are used, ESA consultation must be reinitiated to ensure appropriate fish exclusion practices are followed.

vii. A description of the hazardous products or materials that will be used, including inventory, storage, handling, and monitoring.

viii. 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 will be available on site, proposed methods for disposal of spilled materials, and employee training for spill containment.

c. If the fish salvaging aspect of this project requires the use of seine equipment to capture fish, it must be accomplished as follows:

i. Before and intermittently during pumping, attempts will be made to seine and release fish from the area to be de-watered as is prudent to minimize risk of injury.

ii. Seining will be conducted by, or under the supervision of a fishery biologist experienced in such efforts. Staff working with the seining operation must have the necessary knowledge, skills, and abilities to ensure the safe handling of all ESA-listed fish.

iii. ESA-listed fish must be handled with extreme care and kept in water to the maximum extent possible during seining and transfer procedures. The transfer of ESA-listed fish must be conducted using a sanctuary net that holds water during transfer, whenever appropriate, to prevent the added stress of an out-of-water transfer.

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

v. The COE shall ensure that the transfer of any ESA-listed fish to third parties other than NOAA Fisheries personnel receives prior approval from NOAA Fisheries.

vi. The COE shall ensure that any other Federal, state, and local permits and authorizations necessary for the conduct of the seining activities will be obtained before project seining activity.

vii. The COE must allow NOAA Fisheries or its designated representative to accompany field personnel during the seining activity, and allow such representative to inspect the seining records and facilities.

viii. A description of any seine and release effort will be included in a post-project report, including the name and address of the supervisory fishery biologist, methods used to isolate the work area and minimize disturbances to ESA-listed species, stream conditions before and following placement and removal of barriers, the means of fish removal, the number of fish removed by species, the condition of all fish released, and any incidence of observed injury or mortality.

d. If the fish salvaging aspect of this project requires the use of electrofishing equipment to capture fish, it must be accomplished as follows (NMFS 2000):

i. Electrofishing may not occur near listed adults in spawning condition or near redds containing eggs.

ii. Equipment must be in good working condition. Operators must go through the manufacturer's preseason checks, follow all provisions, and record major maintenance work in a log.

iii. A crew leader having at least 100 hours of electrofishing experience in the field using similar equipment must train the crew. The crew leader's experience must be documented and available for confirmation; such documentation may be a logbook. The training must occur before an inexperienced crew begins any electrofishing; it must also be conducted in waters that do not contain listed fish.

iv. Measure conductivity and set voltage as follows:

Conductivity (umhos/cm)	Voltage
Less than 100	900 to 1100
100 to 300	500 to 800
Greater than 300	150 to 400

v. Direct current (DC) must be used at all times.

vi. Each session must begin with pulse width and rate set to the minimum needed to capture fish. These settings should be gradually increased only to the point where fish are immobilized and captured. Start with pulse width of 500 us and do not exceed 5 milliseconds. Pulse rate should start at 30Hz and work carefully upwards. In general, pulse rate should not exceed 40 Hz, to avoid unnecessary injury to the fish.

vii. The zone of potential fish injury is 0.5 meters from the anode. Care should be taken in shallow waters, undercut banks, or where fish can be concentrated because in such areas the fish are more likely to come into close contact with the anode.

viii. The monitoring area must be worked systematically, moving the anode continuously in a herringbone pattern through the water. Do not electrofish one area for an extended period.

ix. Crew members must carefully observe the condition of the sampled fish. Dark bands on the body and longer recovery times are signs of injury or handling stress. When such signs are noted, the settings for the electrofishing unit may need adjusting. Sampling must be terminated if injuries occur or abnormally long recovery times persist.

x. Whenever possible, a block net must be placed below the area being sampled to capture stunned fish that may drift downstream.

xi. The electrofishing settings must be recorded in a logbook along with conductivity, temperature, and other variables affecting efficiency. These notes, with observations on fish condition, will improve technique and form the basis for training new operators.

e. After completion of the project the new channel should be watered in a way that will not significantly impact water quality or cause fish stranding.

2. To implement reasonable and prudent measure #2 (streambank and upland activities), the COE shall ensure that:

a. Pollution and Erosion Control Plan. Increased turbidity as a result of bank grading and upland activities is a concern. Ensure that the Pollution and Erosion Control Plan required in term and condition #1 also addresses the prevention of pollution caused by earth-moving activities in riparian and upland areas. The plan must be available for inspection on request by COE or NOAA Fisheries.

i. Plan Contents. The plan contents identified here are in addition to the contents identified under term and condition #1.

(1) Practices to prevent erosion and sedimentation associated with access roads, streambank grading, equipment and material storage sites, fueling operations, and staging areas. A sediment or silt curtain must be installed and maintained on the downslope site of the bank grading activities. Seeding outside of the growing season will not be considered adequate nor permanent stabilization.

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

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

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

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

ii. Inspection of erosion controls. During construction in upland and riparian areas, monitor stream turbidity and inspect all erosion controls daily, or more often as necessary, to ensure that erosion controls are working adequately.[1]

(1) Erosion control devices will be inspected daily during the rainy season and weekly during the dry season until the site is permanently stabilized.

(2) If monitoring and inspection shows that the erosion controls are ineffective, mobilize work crews immediately, during working and off-hours, to make repairs, install replacements, or install additional controls as necessary.

(3) Erosion control measures will be judged ineffective when turbidity plumes are evident in waters occupied by listed salmonids during any part of the year. If soil erosion and sediment resulting from construction activities is not effectively controlled, the engineer will limit the amount of disturbed area to that which can be adequately controlled.

(4) Sediment will be removed from sediment controls once it has reached 1/3 of the exposed height of the control. Whenever straw bales are used, they will be staked and dug into the ground 5 inches (12 cm). Catch basins will be maintained so that no more than 6 inches (15 cm) of sediment depth accumulates within traps or sumps.

(5) Sediment-laden water created by construction activity will be filtered before it leaves the right-of-way or enters Johnson Creek or Kelley Creek.

b. Pre-construction Activities. Before significant alteration of the action area, the following actions will be accomplished.

i. Boundaries of the clearing limits associated with site access and construction are flagged to prevent ground disturbance of critical riparian vegetation and other sensitive sites beyond the flagged boundary.

ii. The following erosion control materials are onsite.

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[1] 'Working adequately' means that project activities do not increase ambient stream turbidity by more than 10% above background 50 feet below the discharge, when measured relative to a control point immediately upstream of the turbidity causing activity.

(1) A supply of erosion control materials (*e.g.*, silt fence and straw bales) is on hand to respond to sediment emergencies. Sterile straw or hay bales will be used when available to prevent introduction of weeds.

(2) An oil-absorbing, floating boom is available on-site during all phases of construction whenever surface water is present.

iii. All temporary erosion controls (*e.g.*, straw bales, silt fences) are in-place and appropriately installed downslope of project activities within the riparian area. Effective erosion control measures will be in-place at all times during the contract, and will remain and be maintained until such time that permanent erosion control measures are effective.

c. Heavy Equipment. Heavy equipment use will be restricted as follows.

ii. When heavy equipment is required, the applicant will use equipment having the least impact (*e.g.*, minimally-sized, rubber-tired).

iii. Heavy equipment will be fueled, maintained and stored as follows.

(1) Place vehicle staging, maintenance, refueling, and fuel storage areas a minimum of 150 feet horizontal distance from Johnson Creek or Kelley Creek.

(2) All vehicles operated within 150 feet of Johnson Creek or Kelley Creek will be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected will be repaired before the vehicle resumes operation.

(3) When not in use, vehicles will be stored in the vehicle staging area.

d. Plantings. Prepare and carry out a site restoration plan as necessary to ensure that the streambank is stable and appropriately planted. Make the written plan available for inspection on request by the COE or NOAA Fisheries.

i. Goal. The goal of the bank layback and plantings is the production of habitat elements such as large wood, habitat formation, and shading.

ii. Streambank shaping. The grading shall occur consistently with the proposed grading plan to restore a natural slope and profile suitable for the establishment of vegetation.

iii. Plants. Complete the plantings before the first April 15 following construction of new channel. Use a diverse assemblage of species native to the project site, including grasses, forbs, shrubs and trees. Noxious or invasive species may not be used. However, a sterile non-native seed mix may be used for erosion control the first year, if necessary.

iv. Pesticides. Take of ESA-listed species caused by pesticide use is included in the incidental take statement. Pesticide use is limited in type and extent, as described in the proposed action.

v. Fertilizer. Do not apply fertilizer within 50 feet of Johnson Creek or Kelley Creek.

vi. Fencing. Install fencing as necessary to prevent access to revegetated sites by unauthorized persons or by equipment during future construction.

vii. Plan Contents. Include each of the following elements.

(1) Responsible party. The name and address of the party(s) responsible for meeting each component of the planting requirements, including providing and managing any financial assurances and monitoring necessary to ensure planting success.

(2) Performance standards. Use these standards to help design the plan and to assess whether the planting goals are met. While no single criterion is sufficient to measure success, the intent is that these features should be present within reasonable limits of natural and management variation.

(a) Bare soil spaces are small and well dispersed.

(b) Soil movement, such as active rills or gullies and soil deposition around plants or in small basin, is absent or slight and local.

(c) Plant litter is well distributed and effective in protecting the soil with few or no litter dams present.

(d) Native woody and herbaceous vegetation, and germination microsites, are present and well distributed across the site.

(e) Vegetation structure is resulting in rooting throughout the available soil profile.

(f) Plants have normal, vigorous growth form, and a high probability of remaining vigorous, healthy and dominant over undesired competing vegetation.

(g) Streambanks have less than 5% exposed soils with margins anchored by deeply-rooted vegetation or coarse-grained alluvial debris.

(h) A continuous corridor of shrubs and trees provide shade for the entire streambank.

viii. Long-term maintenance of the plants. The plan shall address roles and responsibilities associated with the long-term maintenance of the trees and shrubs. Because the trees and shrubs are being planted to stabilize the newly-graded soils, the plan must address maintaining the forest community in perpetuity in an undisturbed state (*i.e.*, no trails, walkways, building intrusions).

ix. Herbicide use for the proposed action will be limited to Rodeo with LI-700 surfactant. Rodeo will be diluted to 50% or less concentration of the active ingredient when applied directly to fresh-cut stems, and up to 5% when applied to foilage.

3. To implement reasonable and prudent measure #3 (monitoring and reporting), the COE shall ensure that:

a. Construction Monitoring. Provide NOAA Fisheries with a monitoring report within 30 days of project completion describing COE's success meeting these terms and conditions. This report will consist of the following information.
   i. Project identification.
   ii. Photographic documentation of environmental conditions at the project site before, during and after project completion. Each photograph will be labeled with the date, time, photo point, project name, the name of the photographer, and a comment describing the photograph's subject.
   iii. Provide a narrative that briefly discusses project implementation and consistency with the terms and conditions, with special attention to turbidity, plantings, and presence/absence of fish in the new channel.

   Submit a copy of this report to the Oregon State Habitat Office of NOAA Fisheries:

   Director, Oregon State Habitat Office
   Habitat Conservation Division
   National Marine Fisheries Service
   Attn: 2004/00079
   525 NE Oregon Street
   Portland, OR 97232

b. If a dead, injured, or sick endangered or threatened species specimen is found, initial notification must be made to the National Marine Fishery Service Law Enforcement Office, Vancouver Field Office, 600 Maritime, Suite 130, Vancouver, Washington 98661; telephone: 360.418.4246. Care should 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.

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

3.1 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), 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 substrates 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; "substrates" include 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 (50CFR600.110).

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

(370.4 km) offshore of Washington, Oregon, and California north of Point Conception to the Canadian border.

Detailed descriptions and identifications of EFH for the groundfish species are found in the Final Environmental Assessment/Regulatory Impact Review for Amendment 11 to *The Pacific Coast Groundfish Management Plan* (PFMC 1998a) and NOAA Fisheries' *Essential Fish Habitat for West Coast Groundfish Appendix* (Casillas *et al.* 1998). Detailed descriptions and identifications of EFH for the coastal pelagic species are found in Amendment 8 to the *Coastal Pelagic Species Fishery Management Plan* (PFMC 1998b). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the *Pacific Coast Salmon Plan* (PFMC 1999). The assessment of the 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 sections 1.2 and 1.3. This area has been designated as EFH for various life stages of chinook and coho salmon. However, chinook salmon have not been documented in the project reach.

3.4 Effects of Proposed Action

As described in detail in section 2.1.5, the proposed activities may result in beneficial and negative impacts to coho salmon. During project construction, increased turbidity may alter the behavior of the fish as they avoid the disturbance associated with earth-moving activities. However, the proposed habitat improvements are expected to create new spawning and rearing habitat for coho salmon. Since chinook salmon are not in the project area, effects to EFH habitat for chinook salmon are not expected.

3.5 Conclusion

NOAA Fisheries believes that the proposed action will adversely affect the EFH for coho salmon during active construction, but will provide a long-term benefit to the species through habitat improvements.

3.7 EFH Conservation Recommendations

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

3.8 Statutory Response Requirement

Please note that the MSA (section 305(b)) and 50 CFR 600.920(j) require 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 Supplemental Consultation

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

4. LITERATURE CITED

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