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

May 11, 2001

Jerry Alb
Washington State Department of Transportation
Transportation Building
P.O. Box 47331
Olympia, WA 98504-7331

Elizabeth Healy
Federal Highway Administration
Suite 501 - Evergreen Plaza Building
711 South Capitol Way
Olympia, WA 98501

Re: Endangered Species Act Section 7 Consultation Biological Opinion on the 41st Street Overcrossing Freight Mobility Project and Essential Fish Habitat Consultation

Dear Mr. Alb and Ms. Healy:

Attached is the National Marine Fisheries Service's (NMFS) biological opinion (Opinion) on the proposed 41st Street Overcrossing Freight Mobility Project in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq*.) and Public Law 104-267, Sustainable Fisheries Act of 1996, which amended the Magnuson-Stevens Fishery Conservation and Management Act (MSA). NMFS determined the proposed action is likely to adversely affect threatened Puget Sound chinook salmon (*Oncorhynchus tshawytscha)* which is under NMFS' jurisdiction. Formal consultation was initiated for this project on March 28, 2001, when NMFS received a revised BA.

This Opinion reflects formal consultation and an analysis of effects covering the threatened Puget Sound chinook salmon and their critical habitat in the Snohomish River near Everett, Washington. The Opinion is based on information provided in biological assessments (BAs) and reports sent to NMFS by the Washington Department of Transportation, additional information transmitted via telephone conversations, and direct communication with the project applicant. A complete administrative record of this consultation is on file at the Washington State Habitat Branch Office.

The NMFS concludes that implementation of the proposed project is not likely to jeopardize the continued existence of threatened Puget Sound chinook salmon or result in destruction or adverse modification of their critical habitat. In your review, please note that the incidental take statement, which includes reasonable and prudent measures and terms and conditions, was designed to minimize take.

If you have any questions, please contact DeeAnn Kirkpatrick of the Washington State Habitat Branch Office at (206) 526-4452.

Sincerely,

Donna Darm
Acting Regional Administrator

Enclosure

CC: Larry Crawford, City of Everett
Brian Hasselbach, WSDOT
Karen Schmidt, Freight Mobility Strategic Investment Board
USFWS, Lacey

ENDANGERED SPECIES ACT – SECTION 7
&
MAGNUSON-STEVENS ACT - ESSENTIAL FISH HABITAT CONSULTATION

BIOLOGICAL OPINION

41st Street Overcrossing Freight Mobility Project
Everett, Washington

WSB-00-492

Agency: U.S. Department of Transportation - Federal Highway Administration

Consultation
Conducted By: National Marine Fisheries Service
NW Region
Washington State Habitat Branch

Approved _____ Date May 11, 2001

Donna Darm
Acting Regional Administrator

TABLE OF CONTENTS

Attachment 1: The Habitat Approach
Attachment 2: Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale.

I. BACKGROUND AND CONSULTATION HISTORY

A. Consultation History

This document presents the National Marine Fisheries Service's (NMFS) biological opinion (Opinion) on the effects of the proposed 41st Street overcrossing freight mobility project on threatened Puget Sound chinook salmon (*Oncorhynchus tshawytscha*). The project is located in Everett, Washington along the lower Snohomish River basin. This consultation is in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.). The Washington Department of Transportation (WSDOT) is the designated non-Federal representative for Federal Highways Administration (FHWA) actions that are supported by funds from FHWA in Washington state. The project proponent is the City of Everett (Applicant). Federal funding to the applicant, through WSDOT, provides the basis ("Federal nexus") for this consultation.

WSDOT provided NMFS a letter containing a "no effect" determination regarding the project on October 6, 2000. On October 13, 2000, NMFS advised WSDOT and the City of Everett that the project appeared likely to adversely effect chinook salmon, and that a more rigorous evaluation of these effects was necessary before NMFS could concur with WSDOT's effects determination. WSDOT provided a revised BA on January 5, 2001. The revised BA contained additional information on possible indirect effects of the project and provided a determination "may affect, not likely to adversely affect."

On March 19, 2001, NMFS informally advised WSDOT and the Applicant that it did not concur with the effects determination and that formal consultation was necessary. NMFS identified direct effects, as well as the effects of several interrelated and interdependent actions that were not identified or analyzed in the BA. The Applicant and NMFS met on March 28, 2001, during which the Applicant provided NMFS with an addendum to the BA that further described stormwater management for the proposed project, which NMFS identified as a direct effect of the project.

On April 5, 2001 the (Washington State) Freight Mobility Strategic Investment Board (FMSIB) informed NMFS that if consultation was not concluded by May 11, 2001, the Applicant would potentially lose a portion of the project's funding on which the Applicant has asserted its dependence. To facilitate rapid preparation of this Opinion, NMFS prepared a letter dated April 6, 2001, identifying additional information needs.

On April 13, 2001, the Applicant provided NMFS with additional information on the project. On April 18, 2000, a follow-up meeting was held between the Applicant, NMFS and WSDOT to discuss remaining concerns. On April 30, 2001, NMFS and the Applicant discussed reasonable

and prudent measures while in the field.

The purpose of this Opinion is to determine whether the 41st Street overcrossing project is likely to jeopardize the continued existence of Puget Sound chinook salmon, or destroy or adversely modify designated critical habitat. This Opinion is based on the following information: the BA (received October 6, 2000; amended December 28, 2000, and March 28, 2001), site visits by NMFS personnel on September 13, October 27, 2000, April 5 and 12, 2001; conversations with personnel from various State agencies; and supplemental information provided in meetings, and by telephone and email. A complete administrative record of this consultation is on file in the Washington State Branch of the Habitat Conservation Division of NMFS, located in Lacey, Washington.

B. Description of the Proposed Action

The FHWA, through it designated non-Federal representative, WSDOT proposes to partially fund the Applicant's construction of an eastward extension of the existing 41st Street bridge at the southern end of Everett. The project is a freight mobility project, the purpose of which is to reduce conflicts between vehicular traffic and railroad traffic. The proposed project would extend across the Burlington Northern Santa Fe (BNSF) railroad tracks and touch down about 14 feet above grade on the former Applicant landfill (HDR *et al* , 2000). The proposed project will replace the at-grade rail crossing at 36th Street. The 36th Street at-grade rail crossing will close within six months of the opening of the new overcrossing.

The proposed project includes approximately 1,400 linear feet of roadway improvements, including the realignment of intersection of 3rd Avenue and 41st Street to create a more standard intersection and allow for potential future improvements to the 41st Street/Interstate 5 interchange. The new roadway would have 4 to 5 travel lanes, bicycle lanes, and sidewalks and creates 6 acres of new impervious surface while replacing about 3 acres of existing roadway (AESI 2000). Additionally, the project includes construction of a stormwater management system, retaining walls and reinforced embankment slopes, and relocation of utilities.

The project would cross over three existing BNSF railroad tracks and is designed to accommodate a future fourth track (HDR *et al* , 2000). The bridge profile was determined based on the BNSF track clearance to allow raising the existing easterly track ("turkey track") three feet and allow room for a fourth track 15 feet east of the turkey track (HDR *et al* , 2000). The existing westerly track (Mainline track) and the future fourth track dictate bridge profile grade, height of abutments, retaining walls, and roadway embankment fills (HDR *et al* , 2000). On its eastern end the 41st Street overcrossing curves to the south, where it connects to a temporary construction road that loops around under the bridge and provides access to the north (AESI 2000; Dave Davies, pers. comm., City Engineer, 2001).

The weight of the roadway is expected to induce large settlements in the landfill from underlying compressible native soils (peat and alluvial silt/clay) and with the continued decomposition of refuse. Consequently, initial construction will include preloading the site to induce settlement (phase 1a) before construction of the infrastructure begins. A portion of the fill material is surcharge material intended to induce consolidation of the underlying layers. An estimated 15,000 cubic yards may be removed following the settling period although the actual amount to be removed will depend upon the magnitude of the settling that occurs. Removed materials will be exported to a State regulated site, or deposited on the Applicant's landfill. Materials stockpiled or deposited on the landfill site must comply with requirements of the Model Toxics Control Act (MTCA) (Everett 2000a).

After sufficient site settling, the bridge foundations will be constructed in drilled shafts (Crawford 2001). Drilled shafts are proposed rather than some other foundation type (e.g., driven piles) to reduce the potential for creating a vertical migration pathway for contaminated leachate in the landfill to reach underlying layers. A temporary casing will be installed, and fluid concrete will be pumped into the shaft. Fluid concrete will penetrate the adjacent soils providing intimate contact between the shaft surface and surrounding soils when the casing is withdrawn. The bridge will have four piers with three drilled shafts each. The eastern most shafts will be located within the boundaries of the landfill. This construction method is particularly important for the east pier, which will penetrate the refuse and possibly transitional beds.

Storm water flow from the western most portion of the proposed project will be conveyed directly to the 36th Street combined sewer system, while the remaining project area will be conveyed to the surface ditches on or adjacent to the landfill. Storms up to the six month 24 hour event will be conveyed through the combined sewer system to the Applicant's Waste Water Treatment Plant (WWTP) (AESI 2001). Flows greater than the 6-month storm event will be conveyed by the BNSF ditches to the mainstem Snohomish River (AESI 2001).

Construction of the project will span approximately 2 years, beginning with fill placement and preloading of the site (phase 1a) in June 2001. Delivery and placement of fill will take 3 to 4 months, and settling will take about 18 months. Following preloading the final structure will be constructed (phase 1b), although some work may begin on the western end of the project during the preloading phase.

C. Interrelated and Interdependent Actions

Interrelated or interdependent actions are considered with the proposed project (50 C.F.R. §402.02). "Interrelated actions are those that are part of a larger action and depend on the larger action for their justification; interdependent actions are those that have no significant

independent utility apart from the action that is under consideration (50 C.F.R. §402.02)." NMFS has determined that the development that is proposed for the riverfront properties is interrelated with the proposed project and provides part of the of the justification for the scope of the project size and design. Furthermore, the roadway improvement (i.e., 41st Street overcrossing project) provides the access infrastructure for development of the riverfront properties to occur (Everett 2000a).

The development plans for the riverfront properties provide part of the justification for the scope of the overcrossing project. Specifically the width and number of lanes proposed with the overcrossing project would accommodate future traffic volumes anticipated around the development of the riverfront properties (Perteet 1999). The 41st Street overcrossing has been recognized as the backbone for the Applicant's redevelopment plans for the Snohomish River waterfront (Reid Shockey in Reardon 2000).

Presently, public access to Landfill and Simpson site is restricted and is insufficient to develop these sites as zoned. Improvements to existing transportation facilities will facilitate, if not enable development to occur. Conversely, development of the riverfront properties would have no independent utility without improved access to the sites. Road improvements would be necessary, whether undertaken by the Applicant or a future developer, before businesses could operate in the area (L. Crawford and Dave Davies, pers. comm., 2001).

Relocation of the railroad track that bisects the 41st Street project from the Simpson site is another action that while not part of the proposed action, is interrelated and interdependent to the proposed action. The length of the bridge was designed to accommodate the relocated track. Relocating the track is necessary to enable access to the Simpson site without creating another at-grade crossing.

1. Relocation of the Burlington Northern Santa Fe Railroad Tracks

A variety of railway improvements are planned in the action area. In addition to those planned as part of the proposed project, regional transit planners have proposed the construction and operation of a new commuter rail. Sound Transit and the Federal Transit Authority (FTA) are proposing to reconstruct two of the existing tracks that run north-south under the proposed overcrossing. Although a separate project and consultation, it bears some relevance in understanding this project. In early planning stages for its project, FTA intended to upgrade the easterly tracks that run through the action area and along the Snohomish River, but the Applicant expressed a desire to relocate the tracks to improve access to the riverfront (Glen Haugue, pers. comm., 2001). Presently, the Burlington Northern Santa Fe (BNSF) tracks split at about Lowell Junction with two lines (C-Line and Delta Yard) veering east of the proposed overcrossing alignment and along the Snohomish River shoreline. These easterly tracks bisect the proposed

overcrossing project from the Simpson site.

Presently, the Applicant is building a 45-acre development pad on the Simpson Site (discussed in following sections). Construction access to the property is achieved by crossing the railroad at the north end of the Simpson site.

The eastern BNSF lines would be relocated alongside the BNSF Mainline underneath the proposed overcrossing (Perteet 1998; Trent Hoodack, pers. comm., 2001; G. Haugue, pers. comm., 2001). According to BNSF, the Applicant's desire to relocate the easterly lines exceeded the obligation of the commuter rail project but BNSF agreed to continue negotiations regarding relocation through other mechanisms (T. Hoodack, pers. comm., 2001; G. Haugue, pers. comm., 2001). The Applicant is proposing to consolidate the split BNSF mainline south of 36th Avenue (Perteet 1998; T. Hoodack, BNSF, pers. comm., 2001; G. Haugue, BNSF, pers. comm., 2001). Recently, the Applicant has contracted HDR to study design alternatives for the reconfigured tracks (Everett 2000b). Although the plan is currently conceptual in nature, the proposed overcrossing project is designed to accommodate this future fourth track.

2. Riverfront Parkway

Another action is the development of a new roadway. For convenience, this roadway is referred to throughout this Opinion as the "Riverfront Parkway." The 41st Street overcrossing will ultimately connect with the new Riverfront Parkway. Although no design or plan specificity exists for the Riverfront Parkway, it has been included conceptually and schematically in numerous studies as an assumed condition and provides part of the justification for the number of lanes designed into the proposed 41st Street overcrossing project (Perteet 1998, 1999; HDR *et al* , 2000). The roadway will also provide the final connection between the Simpson site and the 41st Street overcrossing and will ultimately connect to Lowell River Road, providing a substantially improved east-west corridor between Snohomish and Everett (Haley 1999; Everett 2000c). The site cannot presently be developed without roadway improvements. Development on the Simpson site, for which the Applicant is currently preparing (see discussion below), does not have independent utility without the significantly improved access that the Riverfront Parkway would provide. The Riverfront Parkway, in fact, has frequently been referred as "Phase 2" of the 41st Street overcrossing project, for which grant applications have been prepared and submitted. Although not yet obligated with certainty, the Applicant anticipates roughly three-fourths of the funding for Phase 2 will be granted by the FMSIB (Everett 2000c; FMSIB 2000, 2001). The Riverfront Parkway is a logical extension of the proposed 41st Street overcrossing project.

For the purposes of this Opinion, NMFS has assumed that the new riverfront roadway will add about 8 acres of new impervious surface along the shoreline of the Snohomish River. This assumption is based on NMFS' estimate that the road will be 1.5 mile long (Everett 2000c) and

44 feet wide. This size would allow for two 12-feet wide lanes, two 5-feet wide sidewalks, and two 5-feet wide bike lanes, similar to the proposed 41st Street project (HDR *et al* , 2000). The actual footprint of the road, however, would likely be wider due to embankment construction. Some wetland fill would be necessary for this project and a portion of the wetland south of the Simpson development pad possibly creating a Federal nexus for Section 7 consultation with ACOE on elements of the Riverfront Parkway.

For the analysis of stormwater effects from the Riverfront Parkway, NMFS assumes that direct discharge of the roadway stormwater will occur in accordance with the City of Everett Stormwater Management Manual and the revised Washington State Department of Ecology stormwater manual (Ecology Manual) (AESI 2000; Ecology 2000a). NMFS is currently reviewing the Ecology Manual and will provide recommendations to Ecology to conserve fish habitat elements affected by stormwater management. Treatment of stormwater quality will be accomplished through the construction of a combination of wet ponds, oil water separators, and sand filters. These treatment systems would somewhat remove pollutants through settling, biological uptake, filtration and flotation of oil particles (AESI 2000).

3. Riverfront Development

Site access is directly related to potential development and use of the riverfront properties. Development of the Landfill and Simpson site is discussed in the BA for the 41st Street project (AESI 2000). Development of the Landfill site will result in approximately 50 acres of impervious surfaces with the remainder of the area contained in buffers, road right-of-way, and existing facilities. Development of the Simpson site will result in an estimated 39 acres of new impervious surfaces. Similar to the riverfront roadway, stormwater detention is proposed as direct discharge to the Snohomish River. According to the Everett Municipal Code (EMC) Section 19.37 (Environmentally Sensitive Areas) and the BA, 50-foot buffers would be provided for wetlands.

D. Action Area

The action area is defined as the geographic extent of all direct and indirect effects of a proposed agency action [50 C.F.R. 402.02 and 402.14(h)(2)]. For the purposes of this consultation, NMFS has defined the action area to include the mainstem Snohomish River downstream from near the project site (River Mile - RM 7) to the mouth; and the freshwater areas and adjacent uplands in the vicinity of Bigelow Creek, including the West ditch. This action area reflects the biotic, physical and chemical effects of the action as discussed in the "Effects of the Proposed Action" section of this Opinion.

II. STATUS OF THE SPECIES AND CRITICAL HABITAT

A. Rangewide Status

NMFS completed a status review of chinook salmon from Washington, Idaho, Oregon, and California in 1998, which identified fifteen distinct species (termed Evolutionarily Significant Units [ESUs]) of chinook in the region (Myers *et al* , 1998). After assessing information concerning chinook salmon abundance, distribution, population trends, risks, and protection efforts NMFS determined that chinook salmon in the Puget Sound ESU are at risk of becoming endangered in the foreseeable future. Subsequently, NMFS listed Puget Sound chinook salmon as threatened on March 24, 1999 (64 Fed. Reg. 14308; March 1999). This listing extends to all naturally spawning chinook salmon populations residing below natural barriers (e.g., long-standing, natural waterfalls) in the Puget Sound region from the North Fork Nooksack River to the Elwha River on the Olympic Peninsula, inclusive.

In most streams within Puget Sound both short-term and long-term trends in chinook salmon abundance are declining. Overall abundance of chinook salmon in this ESU has declined substantially from historical levels and many populations are small enough that genetic and demographic risks are likely to be relatively high. Migratory blockages and degradation of freshwater habitat, especially in upper river reaches, has contributed to these reduced abundances. Estuaries, lower tributaries, and mainstem rivers have been affected by widespread agriculture and urbanization. Particularly widespread declines have been observed in spring- and summer chinook salmon runs through the Puget Sound ESU, and a number of runs have been extirpated. These losses and the extensive intrabasin transfer of hatchery fish have significantly reduced life history diversity of this ESU (NMFS 1998; 64 Fed. Reg. 14308, March 1999). Populations least affected by hatcheries are in the North Puget Sound drainages of the Nooksack, Skagit, Stillaguamish, and Snohomish River systems (64 Fed. Reg. 14308, March 1999).

The Puget Sound ESU is a complex of many individual populations of naturally spawning chinook salmon, and 36 hatchery populations (64 Fed. Reg. 14308, March 1999). Recently, NMFS' Puget Sound Technical Recovery Team (TRT 2001) tentatively identified 21 geographically distinct populations of chinook in Puget Sound, including two in the Snohomish River basin. Through the recovery planning process NMFS will define how many and which naturally spawning populations of chinook salmon are necessary for the recovery of the ESU as a whole (McElhany *et al* , 2000).

Chinook salmon of this listed ESU that will be adversely affected by the proposed action inhabit the estuary and some 200 miles of mainstem Snohomish River and its tributaries (Williams *et al* , 1975).

B. Critical Habitat

Critical habitat for Puget Sound chinook salmon (PS chinook) was designated on February 16, 2000, and includes all waterways, substrate, and adjacent riparian zones below longstanding, naturally impassable barriers (i.e., natural waterfalls in existence for at least several hundred years). NMFS has identified the current freshwater, estuarine, and marine range of Puget Sound designated critical habitat to encompass all essential habitat features adequate to ensure the species' conservation (65 Fed. Reg. 7764, February 16, 2000). NMFS recognizes that estuarine habitats are important for rearing and migrating chinook salmon, and has included them in the designation for critical habitat (63 Fed. Reg. 11510, March 9, 1998).

NMFS believes that adopting a more inclusive, watershed-based description of critical habitat is appropriate because it: (1) recognizes the species' use of diverse habitats and underscores the need to account for all of the habitat types supporting the species' freshwater and estuarine life stages, from small headwater streams to migration corridors and estuarine rearing areas; (2) takes into account the natural variability in habitat use (e.g., some streams may have fish present only in years with plentiful rainfall) that makes precise mapping difficult; and (3) reinforces the important linkage between aquatic areas and adjacent riparian/upslope areas (63 Fed. Reg. 11511, March 9, 1998).

The proposed project action area is within the designated critical habitat for chinook salmon. Essential features of chinook salmon critical habitat include adequate substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, space and safe passage conditions (Simenstad *et al* , 1982, NRC 1996, Palmisano *et al*, 1993, Gregory and Bisson 1997, Spence *et al*, 1996). NMFS has identified a limited number of specific activities that may require special management considerations for freshwater, estuarine, and marine life stages of chinook salmon habitat, including water and land management activities such as road building and diking (65 Fed Reg. 7764, February 16, 2000).

Losses of wetlands, tidal sloughs, and estuaries in heavily urbanized or industrialized river basins have been extensive; in some areas of Puget Sound, greater than 95 percent of estuaries and coastal wetland habitats have been eliminated since the 19th century (Simenstad *et al*, 1993). The Snohomish River estuary has lost an estimated 85 percent of historic salmonid habitat (Haas 2001). These areas were primarily salt-marshes and tidally drained sloughs used by chinook juveniles in spring and early summer.

Juvenile salmon use estuaries for physiological adaptation, foraging, and refuge. As described by Simenstad (2000), some aspects of the early life history of juveniles in estuaries are obligatory, such as the physiological requirement to adapt from freshwater to saltwater. Other attributes of estuaries minimize predation mortality of PS chinook by providing shallow-water vegetation

(e.g., eelgrass meadows), turbid habitats; and forage opportunities on the typically high and concentrated densities of potential food organisms available along the shallow nearshore in estuaries (e.g., Meyer 1979; Miller 1993; Miller and Simenstad 1997; Simenstad *et al*, 1993; Simenstad *et al*, 1982; Myers and Horton 1982; Pearce *et al*, 1982; Shepard 1981; Thom *et al*, 1987). Generalized habitat requirements of juvenile chinook in estuaries include shallow-water, typically low gradient habitats with fine, unconsolidated substrates and aquatic, emergent vegetation; areas of low current and wave energy; and concentrations of small, epibenthic invertebrates (Simenstad *et al*, 1985).

III. EVALUATING PROPOSED ACTIONS

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 C.F.R. Part 402 (the consultation regulations). NMFS must determine whether the action is likely to jeopardize the listed species and/or whether the action is likely to destroy or adversely modify critical habitat. Initially, this analysis involves: 1) defining the biological requirements and current status of the listed species, and (2) evaluating the relevance of the environmental baseline to the species' current status.

The purpose of Section 7 consultation is to ensure that Federal activities do not jeopardize the continued existence of threatened and endangered species or destroy or adversely modify habitat that has been designated as critical to the conservation of listed species (16 U.S.C. 1536). NMFS must determine whether an action is or is not likely to jeopardize listed species and/or destroy or adversely modify critical habitat. In making this determination, NMFS must consider the: (1) collective effects of the proposed action, (2) the environmental baseline, and (3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed salmon's life stages that occur beyond the action area.

Furthermore, NMFS evaluates whether the action, directly or indirectly, is likely to destroy or adversely modify the listed species' designated critical habitat. Then NMFS must determine whether habitat modifications appreciably diminish the value of critical habitat for both survival and recovery of the listed species. If NMFS concludes that the action will adversely modify critical habitat it must identify any reasonable and prudent alternatives available.

NMFS relies upon guidance in *The Habitat Approach, Implementation of Section 7 of the Endangered Species Act for Actions Affecting the Habitat of Pacific Anadromous Salmonids,* August 1999 (Habitat Approach, Attachment 1) for making determinations of jeopardy and adverse modification of habitat. The Habitat Approach uses three classifications of the baseline functional condition of habitat pathways and indicators. These classifications are "properly functioning, functioning at-risk, and not properly functioning. Using the Habitat Approach as a

framework for assessing an actions effects, three findings are possible. These findings are that actions found likely to impair properly functioning habitat, appreciably reduce the functioning of already impaired habitat, or retard the long-term progress of habitat presently not properly functioning towards properly functioning conditions (PFC) at the population or ESU scale will generally be determined likely to jeopardize the continued existence of listed salmon, adversely modify their critical habitat or both (50 C.F.R. PART 402.02; NMFS 1999).

A. Biological Requirements

The first step in the methods NMFS 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. NMFS 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, NMFS starts with the determinations made in its decision to list Puget Sound chinook for ESA protection and also considers new data available that is relevant to the determination (see Table 1 for references).

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

Five general classes of features or characteristics determine the suitability of aquatic habitats for salmonids: flow regime, water quality, habitat structure, food (energy) source, and biotic interactions (Spence *et al,* 1996). For this consultation, flow regime, water quality, food, and habitat structure are features NMFS believes may be adversely affected as a result of this project.

B. Environmental Baseline

The term "environmental baseline" means "the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process" (50 C.F.R. § 402.02).

1. Snohomish River

The Snohomish River basin is the second largest drainage system in the Puget Sound, draining 1,856 square miles which includes two forks, the Skykomish and Snoqualmie Rivers (Williams *et al*, 1975). Similar to chinook habitat throughout the Puget Sound ESU, the Snohomish River watershed has been significantly altered by human activities for over a century.

Below the confluence of the Snoqualmie and Skykomish Rivers the mainstem Snohomish River, meanders for approximately 20.5 miles before it enters Puget Sound near the City of Everett at Port Gardiner Bay. The upper Snohomish mainstem (RM 15.5 to 20.5) contains some spawning habitat for PS chinook, and relative to the lower river it has a higher gradient, partially intact riparian corridors and minimal dike or levee systems (Williams *et al*, 1975, Pentec 1999, The Snohomish Basin Salmonid Recovery Technical Committee [SBSRTC]1999).

Below RM 15.5 the river flows through an extensive floodplain that exceeds 3 miles in width in some locations and is mostly utilized as agricultural land. Below approximately RM 6, the mainstem and portions of the slough channels have had many sections of bank greatly altered by long-standing development, while other portions of banks are relatively intact and provide some measure of ecological function for PS chinook. Pre-development, the riparian habitat along the Snohomish River banks consisted of a mosaic of diverse marsh habitats and large conifer trees, all subject to various degrees of tidal inundation (Haas 2001). In the mid 1800s timber harvest began in earnest and wood mills were developed along the river banks and the Everett waterfront to process the abundant product (Humphrey 1984; Berry 1985). Since then, waterfront uses along the lower river and Port of Everett have shifted to marinas, boat launches and a Navy base. In the early 1900s, the Army Corps of Engineers (ACOE) began dredging the river to better facilitate vessel access, in the process diverting the mainstem along what is now the City of Everett waterfront. Dredging continues in the lower river on a annual basis (Hass 2001). Over the past century or so, many of the lower river side-channel areas and sloughs have been filled or diked (Haas 2001, Williams *et al* , 1975).

Snohomish River Estuary

The Snohomish estuary includes the mainstem for about 14 miles, as well as Ebey, Steamboat, and Union Sloughs which diverge from the mainstem at RM 8 and RM 4 respectively and drain independently to Port Gardiner Bay. The slough channels have several interconnections and total over 25 miles of length (Williams *et al*, 1975).

The Snohomish estuary has undergone profound changes in habitat quantity and quality. Before non-native human influences began in the 1800s, the estuary included approximately 9,760 acres of tidal marsh from the mouth to the head of Ebey Slough (Haas 2001), by 1996 this had been reduced to roughly 1,500 acres, representing a 85 percent loss of habitat.

Remaining habitats in the estuary also show signs of degradation. Portions have been included on the Washington State 303(d) list of impaired waters for pH, fecal coliform, total PCBs, zinc, mercury, and phenol among other parameters. Impervious surface has been estimated at 15 percent (Purser and Simmonds, unpublished data), and many of the small tributary streams that drain to the estuary deliver elevated sediment yields and poor water quality (Steve Toth, *in prep;*

Robert Aldrich, Snohomish County Surface Water Management, pers. comm., 2000). Pentec (1999) reported that 29 percent of floodplain tributaries (including portions of Bigelow Creek) have been channelized and have no riparian vegetation, while 37 percent of reaches were classified as "severely degraded." Over 75 percent (44 river bank miles) of the shoreline downstream of Ebey Slough (RM 8) has been diked and more than 80 percent of the riparian zone in the estuary has been cleared or has early seral vegetation (SBSRTC 1999). The installation of dikes next to the river bank involved the placement of fill on edge habitats (habitat near shorelines), and often rip-rap was set with the purpose of preventing scour. As a consequence, edge habitats that are typically used by juvenile chinook have been simplified and offer a fraction of the quality of pre-disturbance habitat. For example, Haas (2001) estimated the early 1800s rearing capacity of the estuary as 2.6 million chinook smolts, while current smolt production capacity is estimated at 1.0 to 1.6 million smolts. This represents a decrease of 40 to 61 percent. From 1968 to 1999 average adult chinook annual returns to the Snohomish were 4,671 adults (SBSRTC 1999), and based on the assumption of 280 to 400 smolts/spawner survival (Beamer *et al*, 1999), it is estimated that juvenile chinook undergo density-dependant constraints on production in the estuary between 45 and 87 percent of the time (Haas 2001).

Simpson Site

The Simpson site refers to the 140 acre south bank of the Snohomish River from approximately RM 5.5 to the Marshland pumphouse at RM 7, which includes two public parks. Additionally, the Everett Landfill/Tire Fire Site (detailed below) is located to the north of the Simpson site, and can be delineated by the railroad tracks located on the southern end and which run through the Simpson site.

The Simpson Site contains two waterways of importance to PS chinook, Bigelow Creek and the West ditch. Bigelow Creek flows for less than a mile from the upland Lowell neighborhood, parallels the railroad tracks that travel through the site, and roughly splits flow between an adjacent drainage (termed the "Middle ditch") and the wetland. The creek again forms a channel near the mainstem Snohomish at about RM 5.8. Riparian areas adjacent to the creek before the wetland complex contain reed canary grass and some small shrubs. As the creek joins the river it has several beaver dams, and riparian areas contain a mix of deciduous trees and shrub species. At the confluence of Bigelow Creek and the Snohomish River, a sheet piling weir prohibits tidal influence and limits fish access at low tides. The upper Bigelow Creek watershed is largely urbanized, and is crossed by portions of Interstate 5. There are no stormwater controls in the basin (Larry Crawford, City of Everett, pers. comm. 2001), thus virtually all runoff enters the lower portions of the creek with no water quality or quantity treatment.

The West ditch is immediately south of the railroad tracks and carries surface water that originates from the upland Lowell Neighborhood. The drainages travel parallel to the tracks until

converging to flow into the Snohomish near RM 6. Impervious surface in the small watershed that drains to these two ditches is 40 percent (Mathias 2001). The lower 700 feet of these ditches are subjected to tidal influence (AESI 2000). These ditches regularly accumulate fine sediments and are dredged by BNSF on approximately an annual schedule to maintain water capacity and prevent flooding of the railroad tracks (L. Crawford, pers. comm. 2001). The northern part of the site has a 45 acre portion that was been cleared and filled by the Simpson Company and continues to be filled by the City of Everett with a goal of raising the site two feet above the flood plain for future development.

Existing roads are located to the south and north of the site. The Lowell River Road is located at the southern end of the site, and provides access to a parking lot. This road is located on top of the Marshland dike next to the mainstem river, and runs approximately seven miles to the town of Snohomish. In the mid 90s, this dike failed in a winter flood, washing away the road near RM 8 and flooding the Marshland. The road has been closed since the dike failure. Snohomish County Public Works is repairing the road, and it is scheduled to reopen Fall 2001. On the bluff above the Simpson and Landfill sites is 41st Street, which is an overpass of Interstate 5, and provides access at an intersection to the neighborhood of Lowell and eventually to the River Road. The site has two vehicle access points to a 45 acre area being filled (development "pad"), one gravel and one unimproved dirt, both of which have at-grade rail road crossings, are gated, and do not allow public use.

Between the Simpson site and the Landfill more than 70 small wetlands have been identified (Pentec 1994). Several of the wetlands are hydrologically connected. Roughly the lower 800 feet of Bigelow Creek is contained within a 34.5 acre wetland (Pentec 1994). Water levels are naturally regulated in part, by beaver dams (AESI 2000).

In the early 1990s, the Applicant cleared riparian vegetation (some re-planting of native vegetation has occurred since) at the southern end of the Simpson site and installed a gravel parking lot and a concrete path that travels from approximately RM 7 to RM 6. Some sections of this path are located on and parallel to an old levee on the southern portion of the site. This levee and path has filled portions and cut off surface water continuity to a southern part of the Bigelow Creek wetland.

Despite past habitat degradation, portions of the Simpson site presently offer a unique and now rare blend of estuarine and freshwater off-channel habitat adjacent to the mainstem river. The lowest portions of Bigelow Creek and the other drainages are subject to tidal influence and various levels of brackish water, while stream segments located further away from the mainstem river have virtually no salt-water influence. The extent to which PS chinook juveniles have access to and find favorable conditions for seasonal rearing in the brackish and freshwater habitats of these small streams and wetlands is not entirely known, but juvenile salmonid use of

the Simpson site has been documented by the Tulalip Tribes, and R2 Resources (AESI 2000). Juvenile chinook, coho, steelhead and cutthroat trout have been observed in lower Bigelow Creek and in the Middle ditch (AESI 2000). NMFS biologists have observed juvenile salmonids utilizing upper Bigelow Creek, the mouth of Bigelow Creek, the wetland complex, the mouth of Middle ditch, and the West ditch. In addition to the habitats now offered by the Simpson site, restoration efforts could potentially increase natural production and survival of juvenile chinook by as many as 5,000 chinook smolts annually (Haas 2001).

Landfill Site

The Everett Landfill/Tire Fire Site is a triangular area approximately 70 acres in size that is bordered on the east by railroad tracks and the Snohomish River, and west by additional railroad tracks. To the north it is bordered by 36th street (Floyd and Snider *et al,* 2000). Prior to development the site was a low-lying area formed by flood deposits. Soils are made up of peat, silt and clay. Because of soil composition and the volume and characteristics of capped landfills, the site has been subjected to settlement, and is expected to continue to settle up to one or two inches per year (Floyd and Snider *et al,* 2000). In some areas of the site, the landfill contains municipal waste up to a depth of 30 feet (Pentec 1994).

The site has three facilities located on the north end of the site, including the Snohomish County Transfer station, the Everett Animal Shelter, and a City of Everett equipment storage yard. Upland areas consist of grasses/shrubs and some small areas containing deciduous trees. Historic landfill and similar uses in the area (burn dump, a scrap metal recycling and burial yard, rubber tire disposal) contaminated the shallow aquifer that connects with the Snohomish River (Everett 1997). To minimize and prevent further contamination of surface and groundwater, the Applicant installed a leachate collection system designed to prevent the continued movement of contaminated fluid to the Snohomish River and the underlying deep aquifer. The system discharges the leachate to the Applicant's combined sewer system for treatment at the wastewater treatment facility.

The Landfill site has a relatively shallow aquifer, a confining layer and a deep aquifer (Floyd and Snider *et al,* 2000). The shallow aquifer has groundwater elevation heads ranging from 6 to 16 feet. Portions of this aquifer (outside of the leachate collection system) on the east side of the landfill near the West ditch are influenced by tidal fluctuations of the river. Groundwater flow in the shallow aquifer inside the landfill is generally east/southeast toward the leachate collection trench. As the system operates, water levels in the West ditch have been documented to be depressed up to one-half foot. The shallow aquifer has been documented to have contaminants related to landfill refuse, including benzene, beta hexachlorocyclohexane, nickel, zinc and others.

The deep aquifer is below the entire site. Monitoring wells have demonstrated that the aquifer is

hydraulically connected to the river (Floyd and Snider *et al*, 2000). Groundwater flow in the deep aquifer is generally east towards the river, which serves as the primary discharge point. While some water quality parameters (including copper, lead and zinc) have been documented in the deep aquifer in the past, the most recent sampling in 1999 did not reveal any water quality concerns. Past detections of the above parameters were considered inconclusive because these test wells were located up-gradient and north of the site.

Floodplain and River Margin Habitats

Similar to portions of the estuary, the mainstem has been documented to have poor water quality. The State 303(d) list for the mainstem includes fluorine, naphalene, phenanthrene, temperature, acenaphene, arsenic, copper, dibenzofuran, dioxin, dissolved oxygen, and fecal coliform (Ecology, 2000b).

From approximately RM 6 downriver to the Everett waterfront and into Port Gardner Bay, natural riparian characteristics (i.e. trees, non-hardened banks, salt-tolerant emergent vegetation, tidal inundation) are at best limited to isolated sections (Haas 2001).

As a result of past habitat elimination and degradation, the floodplain and mainstem of the Snohomish are thought to be capable of producing a fraction of the historic number of juvenile chinook (SBRTC 2000; Pentec 1999). Haas (2001) estimated that the mainstem rearing capacity has been reduced up to 76 percent relative to the historic habitat, while the floodplain pre-smolt rearing capacity for juvenile chinook has been estimated to have been reduced by 96 percent (1.2 million to 36,000).

2. Status of the Species in the Action Area, Snohomish River.

Recently, the TRT (2001) described PS chinook in the Snohomish River as comprising two genetically distinct populations: the Skykomish and the Snoqualmie. While the TRT acknowledges uncertainty about the status of naturally spawning chinook in the Snohomish, given the extent of hatchery influences, the timing and locations of spawning are key factors to differentiate several populations and identify which stocks should be managed for ESA conservation.

For this Opinion, chinook utilizing the Snohomish for juvenile rearing include all four stocks within the two populations. The Snohomish system has a combined natural chinook escapement goal of 5,250. The average over the last five years is 4,450 (range 3,176 to 6,300). The escapement of 6,300 in 1998 is the first time the identified escapement goal has been met since 1980. The distribution of spawners has also been relatively even across the four stocks, with none that suggest critical stock concerns. Although shown to have a negative trend (ranging from -0.7% for natural-origin fall chinook, to -11.3% for mixed hatchery and natural-origin fall

chinook), adult returns to the river have been relatively stable, falling below 3,000 only twice since 1968.

Snohomish River Juvenile Chinook Life History and Rearing Distribution

Juvenile chinook in the Snohomish River system are broadly characterized as typically displaying two dominant life history strategies (SBSRTC 1999; Pentec 1999). After emergence from redds, "ocean type" chinook typically spend from one to three weeks in freshwater habitats before moving to the estuary. After one to six months in the estuary, ocean type chinook then move to nearshore areas of Puget Sound and the Pacific Ocean. In contrast, "stream type" chinook typically remain in freshwater environments for up to a year or more before entering the saltwater environment. Accordingly, freshwater rearing habitat is particularly important for stream type fish.

In general, juvenile chinook utilize the edge habitat of the mainstem and sloughs, avoiding higher velocity flows near the center of the channel (Lister and Genoe 1970; Bjornn and Reiser 1991). Healey (1982) describes the use of the shoreline by young chinook as one of extreme dependence for feeding, rearing and refuge. All of the stocks in the Snohomish River utilize the estuary to various degrees to adjust to the salt water environment (Wedemeyer *et al*, 1980), seek shelter from predators (Simenstad *et al*, 1982) and pursue food sources (Salo 1969: Shepard 1981; Healey 1982; Simenstad *et al*, 1982) and thus have some potential to be affected by the proposed action.

Although annual variations likely occur, an estimated that 25 percent to 33 percent of Snohomish chinook display stream type life history characteristics (SBSRTC 1999). These estimates are mirrored by a 1993 study by Kirby (1995) in the Snohomish estuary in which it was extrapolated that 25 percent of that year juvenile chinook in the mainstem and sloughs were classified as yearling (stream type) chinook. Juvenile chinook have been documented to reside several weeks to several months in the various portions of the mainstem and sloughs (Regenthal 1954; Tulalip Tribes 1986, 1987).

Presently the mainstem Snohomish River delivers approximately 60 percent of the freshwater flow to Port Gardiner Bay, and it is thought that juvenile chinook utilize the Snohomish River habitats roughly proportional to the volume of water delivered by the channel (Curt Kraemer, WDFW, pers. comm., 2001). A study by Regenthal (1954) documented the relative juvenile chinook use in the three major channels as to being proportional to the percentage of flow through that channel. This report is summarized in table 5 below.

Table 5. Relative Use by Channel of Juvenile Chinook in the Snohomish River (Regenthal 1954*).

	Main Channel	Steamboat/Union Slough	Ebey Slough
Percentage of juvenile chinook utilizing the channel	39.2	49.3	11.5
Percentage of total flow discharged through the channel	32**	61	7

*sampling occurred from March 10 - August 13
**As mentioned above, the percentage of discharge in the main channel is now approximately 60 percent.

In addition, more recent studies (Tulalip Tribes 1986, 1987) have documented more juvenile chinook utilizing the main-stem relative to the sloughs, though these studies were not designed to fully explore this parameter, and results may be due to habitat variance among particular sampling locations.

C. Factors Affecting Chinook Salmon in the Action Area

In a chinook-specific supplement to ''Factors for Decline: A Supplement to the Notice of Determination for West Coast Steelhead'' (NMFS 1998), NMFS identified the factors that have generally led to the decline of chinook salmon. The report identifies destruction and modification of habitat, overutilization for commercial and recreational purposes, and natural and human factors as all contributing to the decline of chinook salmon.

This Opinion relates the biological requirements for chinook salmon in terms of the habitat attributes, or pathways, in the guidance established in the NMFS' Matrix of Pathways and Indicators (MPI). These ecological pathways are: water quality, habitat access, physical habitat elements, channel condition and dynamics, flow/hydrology, and watershed conditions. The pathways assess the biological, physical and chemical health of PS chinook salmon habitat. Specifically, each pathway is made up of a series of individual indicators (e.g., indicators for water quality are temperature, sediment/turbidity, chemical contamination/nutrients) that are measured or described directly (see, NMFS 1996). Based on the measurement or description, each indicator is described in terms of its existing functional condition. Three categories of functional condition are used to classify indicators: "properly functioning, at risk, and not properly functioning." Properly functioning condition is defined as "the sustained presence of natural habitat forming processes in a watershed that are necessary for the long-term survival of the species through the full range of environmental variation." As stated in the introduction to Section III, above, the Habitat Approach describes a framework for assessing changes in the existing functional condition of habitat indicators affected by a proposed action. The extent of

adverse changes, depending on the condition of affected indicators under the environmental baseline, provides a basis for making determinations regarding jeopardy and adverse modification of critical habitat. Thus, to find jeopardy, NMFS would have to demonstrate that the proposed action would appreciably reduce the function of those indicators, and that the reduction in function would reduce the likelihood of survival and recovery of the species in the wild.

The biological requirements of chinook salmon are not entirely met under the environmental baseline conditions in the action area, *i.e*., habitat conditions overall are functioning "at-risk." Long term and recent declines in distribution and abundance of PS chinook may be attributed, in part, to substantial fragmentation and simplification of habitat structure and distribution; and altered natural processes that route sediment and organic materials in the action area and throughout the watershed. One of the factors believed essential to improve the status of chinook salmon is an improvement to habitat conditions. With respect to this proposed action, this means providing access to functional conditions necessary to support the life history elements that are expressed in the mainstem, sloughs, and off-channel areas of the Snohomish River including migration and rearing activities in Bigelow Creek and West Ditch.

IV. EFFECTS OF THE PROPOSED ACTION

This section discusses the direct and indirect effects of the proposed action and its interrelated and interdependent activities. The ESA implementing regulations define "effects of the action" as "the direct and indirect effects of an action on the species or critical habitat together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 C.F.R. §402.02)." Direct effects include those occurring at the project site and can 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 are those effects that are caused by the proposed action and are later in time, but still are reasonably certain to occur. Indirect effects can occur throughout the action area, and are used to help define the extent of the action area. An interrelated activity is part of the proposed action and depends on the proposed action for its justification. An interdependent activity has no significant independent utility apart from the proposed action (50 C.F.R. §402.02). The effects of the 41st Street overcrossing project and the interrelated and interdependent actions are expressed in terms of whether it is likely to impair proper function condition, appreciably reduce the condition of habitat functioning at-risk, or retard the attainment of proper function where the environmental baseline is presently not properly functioning.

A. Direct Effects

1. Stormwater Effects

Under the proposed action, all stormwater from the project site up to and including the 6 month 24 hour storm will be discharged to a combined sewer system, the City's waste water treatment plant (WWTP). The 6 month storm and smaller storms account for 91% of the total average annual rainfall at Sea-Tac Airport (Mathias 2001). The 9% of annual rainfall exceeding this event will be conveyed through West Ditch to the Snohomish River.

Presently, 79 acres of the west hill drain to the West ditch and 45 percent of that area is considered impervious (Mathias 2001). The project will increase impervious surface in this subbasin by three percent. The West ditch is a defined wetland and critical habitat for PS chinook salmon. Increased impervious surface in the project area, without additional detention capacity, will increase water volume during peak flows above the 6 month event. Water volumes in the West ditch would increase by about 8 percent (Mathias 2001). Peak storm flow events in the West ditch will occur on a more frequent basis and discharge for a longer period than before the proposed action. The 10-year peak flow in the west ditch will increase approximately 6 percent. However, due to the almost flat gradient of the west ditch, the presence of wetland vegetation and beaver dams, and the backwater effect from the Snohomish River, the peak velocity in a 10-year storm will increase less than 2 percent (Mathias 2001).

Streamflow quantity and timing are critical components of water supply, water quality, and the ecological integrity of river and stream systems (Poff *et al*, 1997). Utility of systems like the West ditch as refugia depend on the ability of juvenile fish to tolerate flow velocity in the ditch. The swimming tolerance of juveniles is approximately 3 feet per second in systems with characteristics like the West ditch. In the 10-year storm event, the velocity will increase from 2.53 feet per second to 2.57 feet per second, remaining within the swimming tolerance.

Typically, the effects of increased water quantity on the functional quality of salmon habitat include increased bank erosion, and altered biological condition of the benthic macroinvertebrate community on which PS chinook depend for food (Booth 1991; May *et al*, 1996, Karr and Chu 1999). Increased turbidity from erosion or entrained particulates also lowers light penetration, affecting the reactive distance of juvenile chinook for food capture and predatory avoidance (Spence *et al*, 1996). Particulate materials also physically injure fish by mechanically disrupting respiratory structures (fish gills) and the respiratory epithelia of benthic macroinvertebrates (Rand and Petrocelli 1985). For the proposed action, the increase in stormwater volume and velocity is not likely to cause major change in the functional condition of habitat in the West ditch.

NMFS anticipates that the small increase in volume and duration of peak discharges in the West ditch may increase localized contaminant loading in the Snohomish River through the

resuspension of contaminated sediments. Recent sediment samples indicate the presence of several metals and organics at the site that currently exceed clean-up standards, including where ditches enter the mainstem Snohomish River (Floyd and Snider *et al*, 2000; Attorney General of Washington 2001). According to the Brownfield Study (Floyd and Snider *et al*, 2000) contaminant sources include the landfill leachate and sediments, and potentially the railroad ties and untreated stormwater discharged from up basin. The increase in stormwater volume will add a small increment of degradation to the water quality in the West ditch.

Stormwater collected from the roadway has the potential to carry a number of toxicants both in solution and in the sediments. Contaminants deposited on roads from automobiles include lubrication system losses, oil, grease, hydraulic fluids, antifreeze, particles from tires and brakes (particles of rubber and metals) (Ruediger and Ruediger 1999). Such runoff can convey pollutants (e.g., polynuclear aromatic hydrocarbons (PAHs) and metals) at concentrations that are toxic to fish (Spence *et al*, 1996). The majority of the stormwater (91%) from the proposed project will be conveyed to the WWTP (quantities up to the 6 month 24 hour event). The treatment efficiency of the WWTP is approximately 90%, as indicated by the percent removal of total suspended solids (TSS). As a result, approximately 82% of pollutants in stormwater runoff from the project site will be removed at the WWTP (Matthias, 2001). Water quantity above the present 6-month event would not be treated. The proposed action would add incrementally to this condition.

As a general matter, heavy metal concentrations found in street runoff are found to be 10 to 100 times greater than treated wastewater effluent (Spence *et al*, 1996). Biological oxygen demand is increased with the addition of sewage, organic metals, PAH's and other pollutants, and lethal or sublethal effects to Puget Sound chinook may occur with influxes of heavy metals. For example, copper causes a comparatively large upset in osmoregulation in freshwater fish; exposed fish exhibit a rather rapid decrease in plasma electrolytes and/or osmolality. While NMFS does not expect episodes of acute exposure, NMFS believes it is possible that some Puget Sound chinook may have exposure to small amounts of ionic copper which can affect their smoltification, migratory capability and early marine survival (Heath 1995).

2. Effects of Piling Installation

As mentioned previously, water quality is considered "at-risk" within the action area. The piling installation element of the proposed project would create a vertical conduit between the shallow, contaminated aquifer, and the underlying layers and deeper aquifer. Installation of the bridge foundation could also create a vertical pathway for the migration of leachate to transitional beds. To avoid the potential of introducing contaminated fluids to into the underlying layers, aquifer, and eventually adjacent surface waters (ditches and Snohomish River), cast in place concrete

pilings are proposed. This approach will vastly reduce the risk of contaminating groundwater during construction in the landfill, compared to other construction techniques, such as pile driving, which would displace refuse and soil when installed (Floyd and Snider *et al,* 2000). Furthermore, the proposed action calls for sealing any gap between the temporary casing and the foot or boot of the casing will be sealed with bentonite. This measure should prevent the creation of a vertical pathway for contaminated groundwater and soils in the shallow aquifer to reach the deep aquifer, decreasing the risk that contaminants reach surface waters and degrade chinook salmon habitat.

3. Effects of the Interrelated and Interdependent Actions

Relocation of the BNSF tracks, the Riverfront Parkway, and river front development in the action area could affect chinook salmon and their critical habitat by altering water quantity and quality, reducing off-channel habitat and refugia, altering peak and base flows, and increasing the drainage network and road density. As mentioned above, the indicators for water quality and quantity are already "at-risk" in the action area. The effect of the interrelated and interdependent actions on these indicators would be additive, except that issues such as stormwater management, including treatment and prevention of discharges to fish bearing waters, will be addressed when those actions are designed and built. Furthermore, some of these future actions will create bases for future interagency consultation. For example, wetland fills, if any are planned, will require permits issued by the Army Corps of Engineers. NMFS will consult with any Federal Agency whose proposed action would create a Federal nexus to the interrelated and interdependent actions.

NMFS anticipates that the relocation and removal of the eastern-most tracks near the Snohomish River will cause both beneficial and adverse results. Track and tie removal activities would cause short-term adverse affects on water quality that would be addressed through best management practices such as erosion and sediment controls, stormwater ponds, swales, and oil/water separators would reduce the risk of introducing contaminated sediments into these water bodies. Studies (Law and Band 1998; J.W. Morrissette & Associates Inc.1998; Maryland Department of the Environment 1987, 1991) reveal that these structures are often not maintained over time, and that their effectiveness decreases as a result. At the same time, the elimination of train traffic and its attendant pollution, along with rail and tie removal, would provide benefits to water quality in the area. The action area is considered at-risk for water quality and the combination of the elimination of rail traffic, rail and tie removal, and the use of best management practices during removal activities would minimize, if not avoid, reduction of the functional condition of this habitat indicator.

Road construction and land development in the action area could retard the long term improvement of impaired off-channel and refugia habitat, and floodplain connectivity.

Functionally, these areas are important for juvenile chinook salmon rearing and holding. One of the primary factors limiting chinook salmon productivity in the Snohomish River basin is the loss of juvenile rearing habitat. For example, of the over 6400 acres of once forested riverine and tidal shoreline of the Snohomish river estuary, about 322 acres remains today; of the 322 acres, only 85 of acres occur on the mainstem and are accessible to chinook on a regular basis (SBSRTC 1999; Haas 2001). The Bigelow Creek wetland complex comprises about half of the remaining acres of forested riverine habitat available to chinook on a regular basis (full range of flows, and only limited at lower flows). To increase this access, the Applicant has agreed to remove the sheet piling weir at the mouth of Bigelow Creek to reestablish tidal influence and facilitate access at a greater range of tides. Any wetland fill will create a nexus for interagency consultation, when permit issuance is proposed. Furthermore, reserving the area presently occupied by the BNSF rails as an environmental corridor would contribute to the functional condition of the West ditch, further minimizing the effects of the interrelated actions on these habitat types.

Adding impervious surface will reduce baseflows in floodplain wetlands and streams and increase pollutant loading. Total estimated impervious surface area attributed to the interrelated and interdependent actions is 87 acres. The majority of this area would be located on the floodplain hindering evapotranspiration and groundwater infiltration processes (May *et al*, 1997). There is a strong relationship between the impervious and compacted surface area in a basin and degraded fish habitat (Klein 1979; Karr and Chu 1999; Booth 2000). Changes can be detected when the total percentage of impervious surface in the watershed is between 5 and 10 percent although watershed degradation likely occurs with incremental increases in impervious surface area below these levels (Booth 2000; Booth and Reinelt 1993). The effects of added impervious surface, described under Direct Effects above, would be increased by adding the 87 acres. However, the Applicant will manage stormwater for these developments including capture and treatment of stormwater and preventing all discharges to fishbearing streams and wetlands such as Bigelow Creek and West Ditch. In addition, the Applicant will further provide for base flow protection and water quality enhancement by preserving and enhancing the functions and values of Class I wetlands commensurate with the water quality and quantity effects of the proposed action (41st Street project), and the effects of subsequent development of the riverfront and parkway construction. Therefore, these streams and wetlands will be protected from increased peak storm flows and durations, decreased base flow and degraded stormwater quality effects.

Finally, the Riverfront Parkway and associated development actions could decrease the opportunity to grow riparian vegetation in certain areas of the floodplain, if not protected when development occurs. Under an agreement with the Department of Ecology, the Applicant planted native vegetation within 200 feet of the Snohomish River shoreline along 3/4 of mile extending north from Rotary Park (the “Lowell Riverfront Shoreline Restoration Plan (Ecology,

City of Everett, 1996). The 1996 agreement requires the Applicant to, among other things, monitor and ensure the success of riparian plantings to restore and enhance shoreline values. Riparian vegetation and streambank conditions function at-risk in the action area, but the success of the Lowell Riverfront Shoreline Restoration Plan would enable the Applicant to contribute to the development of properly functioning riparian conditions along the Snohomish River. These functions include: shading, stabilizing streambanks, controlling sediments, contributing large woody debris and organic litter, and very importantly (especially in this portion of the river) regulating the flux and composition of nutrients (Spence *et al*, 1996). While processes occurring throughout a watershed can influence aquatic habitats, the most direct linkage between terrestrial and aquatic ecosystems occurs in the riparian area adjacent to the stream or river channel. For example, intact riparian corridors serve to minimize most all stormwater effects (May *et al*, 1997; May 2000 pers. comm.). Because five percent of riparian vegetation remains in the Snohomish river estuary today, NMFS believes it is important to maintain that which is left and seek to improve these conditions when ever possible.

V. CUMULATIVE EFFECTS

Cumulative effects are defined 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" (50 C.F.R. § 402.02). Future federal actions that are unrelated to the proposed action and that may affect PS chinook are not considered in this section because they would require separate consultation pursuant to section 7 of the ESA.

Three broad categories of future non-Federal actions may occur in the action area: (1) continued development, including conversion of now-pervious surfaces to impervious surfaces, (2) agriculture; and (3) water withdrawals and irrigation diversions. All of these actions can result in the temporary or permanent loss or degradation of suitable aquatic habitat for chinook salmon. Development actions include conversion of lands to urban, residential, commercial, or roads. Agricultural and vegetation management actions include farming activities inside and outside of riparian zones, road construction, and the increased application of herbicides or pesticides.

Future development to accommodate a growing urban population in the action area would be consistent with adopted plans and zoning regulations of the City of Everett and Snohomish County. Land uses in the action area are predominantly agricultural and urban. Agricultural lands occupy the right (west) bank, while urban uses dominate the left (east) bank.

Cumulative effects in the Snohomish River estuary and lower mainstem river will result from urban, residential, agriculture, transportation, and commercial activities. Shipping and boating activities result in fuel and oil spills; contamination from antifouling paint sloughing from vessel

bottoms; and the remobilization of contaminated sediments from vessel propellor wash. Sewage treatment plant discharges, log rafting, and failing septic systems, urban runoff, and dairy-farming runoff all contribute to low levels of dissolved oxygen and increased levels of nutrients and chemical contamination in the lower river.

Actions taken by the City of Everett and Snohomish County are likely to have cumulative effects. The City of Everett controls the majority of land use practices along the mainstem lower Snohomish River and its estuary. The Applicant determines growth patterns within its urban growth boundary through permits and City of Everett ordinances.

Until improvements in fish habitat conditions are documented from ongoing non-Federal actions, NMFS believes that ongoing adverse effects from non-Federal actions will continue at similar intensities as in recent years. However, since "harm" or "take" is prohibited for PS chinook, NMFS believes that private, state and local government project proponents will soon take steps to curtail or avoid actions that would result in the take of chinook. For example, the State of Washington has recently adopted a new "Shoreline Master Plan" for local governments to follow as they must now update their own shoreline development plans. The new shoreline rules emphasize maintaining important ecological functions along the shoreline and require each jurisdiction to analyze cumulative effects to these important functions. The implementation of the new shoreline plans should, in the long term, improve shoreline conditions for aquatic resources, including chinook salmon. Future Federal actions, including future cleanup actions and in-water and shoreline construction, will be reviewed through separate section 7 processes.

VI. CONCLUSION/OPINION

NMFS determines whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. NMFS' process for making jeopardy determinations for habitat-altering actions is explained in Appendix I. In making this determination, NMFS must consider the estimated level of injury or death attributable to: (1) collective effects of the proposed or continuing action, (2) the environmental baseline, and (3) any indirect or cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed species' life stages. NMFS also evaluates whether the action, directly or indirectly, is likely to destroy or adversely modify the listed species' critical habitat. NMFS must determine whether habitat modifications appreciably diminish the value of critical habitat for both survival and recovery of listed species. NMFS identifies those effects of the action that impair the function of any essential habitat element of critical habitat. NMFS considers whether such impairment appreciably diminishes the habitat's value for the species' survival and recovery. If NMFS concludes that the action will jeopardize the species or adversely modify or destroy critical habitat it must identify any reasonable and

prudent alternatives available.

NMFS reviewed the status of Puget Sound chinook, the environmental baseline for the action area, the direct, indirect, and cumulative effects of the proposed action and the effects of the interrelated and interdependent actions of the proposed project. The proposed action causes effects on a small scale, and where they occur only incrementally diminish habitat functional conditions that are presently "at risk" for water quality and quantity. These effects are either minimized (*e.g.* collection of stormwater at the new overcrossing site) or occur within the tolerance of juvenile chinook (*e.g.* the swimming tolerance of juvenile chinook to increased flow velocity). The adverse effects of the proposed action, and of interrelated and interdependent actions, will be offset by beneficial actions, including wetland enhancement and the potential for elimination of rail traffic. Avoiding the discharge of stormwater from future development to fish-bearing streams and wetlands in the project area would minimize effects of future development on the natural recovery of now-impaired habitat towards properly functioning condition (*e.g.*, off-channel habitat and water quality). Although the adverse effects of these actions could cause "take," these findings do not equal an appreciable reduction in the likelihood of survival and recovery of the affected species in the wild. Finally, while the proposed action could retard the natural recovery of habitat indicators that are now "at-risk," (*e.g.* riparian vegetation), the Applicant's Lowell Shoreline Restoration Plan would minimize the effects of the proposed action on riparian vegetation along the Snohomish River. Therefore, it is NMFS' opinion that the action will not jeopardize the continued existence of Puget Sound chinook. Furthermore, the proposed action will not result in the destruction or adverse modification of designated critical habitat.

VII. REINITIATION OF CONSULTATION

Consultation must be reinitiated if the amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; new information reveals effects of the action that may affect listed species in a way not previously considered; the action is modified in a way that causes an effect on listed species that was not previously considered; or, a new species is listed or critical habitat is designated that may be affected by the action (50 C.F.R. § 402.16).

VIII. INCIDENTAL TAKE STATEMENT

Sections 4 (d) and 9 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 by NMFS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, spawning, rearing, migrating, feeding, and sheltering (50 C.F.R. 222. 102). Harass is defined as actions that create the likelihood of injuring listed species to such an extent as significantly alter normal behavior patterns that 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(0)(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.

The measures described below are non-discretionary; in order for the exemption in section 7(0)(2) to apply, they must be implemented by the action agency so that they become binding conditions of any grant or permit issued to the applicant as appropriate. The FHWA/WSDOT have a continuing duty to regulate the activity covered in this incidental take statement. If FHWA/WSDOT fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(0)(2) may lapse.

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. The take statement 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.

A. Amount or Extent of Take

NMFS expects an undetermined number of PS chinook salmon may be taken as a result of full

implementation of the proposed action. The actual number of individual fish taken as a result of the entire project, however, is not possible to determine. While direct injury or death may unintentionally result during construction activities, harm is more likely to accrue by exposure of fish to further degradation of critical habitat during juvenile rearing and migration. The timing, duration, and extent of such exposure will vary during the course of implementing proposed project activities. The qualitative results of such effects are described in this Opinion, but no techniques presently exist to correlate those effects with the potential numerical extent of take. For purposes of this Opinion, the extent of take is correlated to the extent of habitat affected in the Bigelow Creek wetland complex and West ditch. Accordingly, the reasonable and prudent measures were developed to reduce the level of incidental take associated with the proposed action.

B. Reasonable and Prudent Measures

NMFS finds that the following reasonable and prudent measures are necessary and appropriate to minimize levels of incidental take of Puget Sound chinook salmon. The FHA/WSDOT shall ensure that the Applicant:

1. Avoids or limits the amount of chemical contaminants entering critical habitat.
2. Limits disturbance in riparian areas, and reduce impacts to wetlands, water quality, and water quantity.
3. Carries out monitoring activities and responds with appropriate measures.

C. Terms and Conditions

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

1. **Avoid or limit the amount of chemical contaminants entering critical habitat**. The FHWA/WSDOT shall ensure that:

a. Materials and fluids removed from the drilled shaft from the 41st overcrossing project will be disposed of at a regulated landfill site.

b. Earthwork will be performed in small areas and drilled shafts are covered nightly to minimize exposure to wet conditions.

c. Contaminated waters do not reach aquifers during landfill development activities such

as piling and foundation installation.

2. **Limit disturbance in riparian areas and reduce impacts to wetlands, water quality, and water quantity.** The FHWA/WSDOT shall ensure that:

a. The City shall develop and implement a wetland preservation and enhancement plan within the action area. The plan shall provide for the preservation and enhancement of the functions and values of Class I wetlands commensurate with the water quality and quantity effects of the proposed action (41st Street project) and the effects of subsequent development of the riverfront and parkway construction. Phase I of the wetland preservation and enhancement plan shall address water quantity and quality effects of the 41st Street project, and Phase I shall be implemented by completion of the 41st Street project. A report on Phase I planning and implementation must be included in the annual report to NMFS described in Term and Condition 3.b. The sheet piling weir at the mouth of Bigelow Creek shall be removed to reestablish tidal influence at a greater range of tides.

b. If and when the Simpson site, landfill site, Riverfront Parkway and other facilities are developed, storm water will be separated from the combined sewer system and managed on site to promote properly functioning conditions for water quality and quantity. No storm water from these sites will be discharged to Bigelow Creek, West ditch, or other fishbearing streams or wetlands in the action area.

c. Erosion and sediment control measures are fully applied (City of Everett Best Management Practice Codes: E1.15, E1.25, E2.10, E2.60, E2.75, E3.10, E3.25, E3.30, E3.40).

d. If the City acquires the BNSF right-of-way and rail lines east of the action area, and if and when the rail lines are relocated, rails and ties will be removed, which will improve habitat function. The area along West and Middle ditches to the confluence with the Snohomish River will be maintained as a corridor for bicycle and pedestrian-only access. No roads will be built in this corridor, with the exception of a perpendicular crossing to provide access to the Simpson site. The City shall make reasonable efforts to acquire the right-of-way from BNSF.

3. **Carry out monitoring activities and respond with appropriate measures**. The FHWA/WSDOT shall ensure that:

a. A five-year monitoring plan is developed to determine the effectiveness of stormwater

management practices. The plan will include monitoring:(1) the West ditch (wetland) hydroperiod; (2) morphological characteristics; (3) maintenance; (4) surface water velocities and discharge in the West ditch and at the culvert outflow; and (5) an evaluation of the effectiveness of management practices used to reduce stormwater sources of contamination. This monitoring plan shall be submitted to NMFS for review and concurrence by August 31, 2001, and ready for implementation before October 2002.

b. An annual report is provided to NMFS regarding implementation of all relevant terms and conditions. The report shall be submitted to NMFS Washington Habitat Branch Office in Lacey, Washington no later than June 1 for the preceding 12 month period. The report will confirm implementation and effectiveness of each appropriate term and condition.

c. NMFS is notified within three (3) working days upon locating any dead, injured, or sick chinook salmon. Initial notification must be made to NMFS's Law Enforcement Office at (800) 853-1963. Notification must include the date, time, precise location of the injured animal or carcass, and any other pertinent information.

d. If after three years following final completion of the 41st Street overcrossing, the results of monitoring show that storm water management practices for the bridge are inadequate to promote properly functioning habitat conditions, onsite detention, additional outfalls, or other appropriate storm water control measures shall be utilized.

IX. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat. The following are discretionary suggested actions that the FHWA and WSDOT can implement in furtherance of their responsibilities under section 7(a)(1) of the ESA.

1. WSDOT and FHWA should support future research to identify the extent and duration of off-channel habitat use by chinook salmon in the Snohomish River. A radio telemetry study should be designed to track fish, and evaluate limiting factors specifically related to off-channel habitat and floodplain rearing. The study should incorporate an analysis of the productivity of off-channel areas under the index of biological integrity. Based on the results of these studies, future research should also focus on enhancing this habitat type.

2. The WSDOT and FHWA should encourage support of public education and restoration of salmon habitat affected by their actions through the creation of interpretive access and active restoration of function affected by their actions. For example, the Bigelow Creek wetland complex would be an appropriate site for an interpretive trail along the existing dirt trail. Native riparian vegetation (woody and non-woody) should be planted during late fall around the wetlands, and river to provide bank stability, detritus, shade, and insects to support ecological functions contributing to rearing PS chinook salmon and to the overall ecological health within the action area. Where the trail crosses sensitive wetland areas (*e.g.*, saturated zones) the trail should be elevated on wood planks. Refuse should be cleared, and where the trail currently crosses at the mouth of Bigelow Creek, the trail should be diverted upland, and bare-soil areas near the mouth replanted to promote revegetation. Signs should be posted along the trail to educate visitors regarding the watershed values of wetland habitat and its importance to a wide variety of wildlife, including chinook salmon.

In order for NMFS to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed PS chinook or their habitats, NMFS requests notification of the implementation of the above conservation recommendations.

X. ESSENTIAL FISH HABITAT

A. Background

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2));
- NMFS shall provide conservation recommendations for any Federal or State activity that may adversely affect EFH (§305(b)(4)(A));
- Federal agencies shall within 30 days after receiving conservation recommendations from NMFS provide a detailed response in writing to NMFS 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 NMFS,

the Federal agency shall explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.110). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

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 NMFS is required by Federal agencies regarding any activity that may adversely affect EFH, regardless of its location.

The objective of this EFH consultation is to determine whether the proposed action may adversely affect designated EFH, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse impacts to EFH resulting from the proposed action.

B. 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 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)(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 the NMFS 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). Assessment of the impacts to these species' EFH from the proposed action is based, in part, on this information.

C. Proposed Actions

The proposed action and action area are detailed above in *Section I, Background and Consultation History*, of this Opinion. The action area includes habitats that have been designated as EFH for various life-history stages of 17 species of groundfish, four coastal pelagic species, and three species of Pacific salmon (Table 1).

D. Effects of the Proposed Actions

As described in detail in *Section IV* of this Opinion, the proposed action may result in adverse impacts to a variety of habitat parameters. These impacts may result from:

- Increases in peak flows due to increased stormwater runoff which could trigger additional nutrient delivery, chemical inputs, and turbidity on EFH designated for Pacific salmon. Decreases in base flows due to development of additional impervious surface which could decrease groundwater flows to streams and wetlands providing EFH for Pacific salmon. Also, physical disturbance to riparian areas could result in reduced EFH functions for Pacific salmon.

E. Conclusion

The NMFS believes that the proposed action may adversely affect designated EFH for Pacific salmon listed in Table 1.

F. EFH Conservation Recommendations

Pursuant to Section 305(b)(4)(A) of the MSA, NMFS is required to provide EFH conservation recommendations to Federal agencies regarding actions which may adversely affect EFH. While NMFS assumes that the conservation measures described in this Opinion will be implemented by WSDOT/FHWA, it does not believe that these measures are sufficient to address the adverse impacts to EFH described above. Consequently, NMFS has the following

EFH conservation recommendations that, if implemented, will minimize the potential adverse impacts of the proposed project and conserve EFH:

- Adopt Reasonable and Prudent Measures #1 and #2 and the associated Terms and Conditions, described in *Section VII* of this Opinion. These measures will minimize the adverse impacts to EFH resulting from increased nutrients and chemicals, changes in peak flows and base flows, and minimize impacts to riparian areas.

G. Statutory Response Requirement

Please note that the Magnuson-Stevens Act and 50 CFR 600.920(j) require the Federal agency to provide a written response to NMFS' EFH conservation recommendations within 30 days of its receipt of this letter. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity. In the case of a response that is inconsistent with the EFH Conservation Recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

H. Supplemental Consultation

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

Table 1. Species of fishes with designated EFH in the action area.

Groundfish Species	Sablefish *Anoplopoma fimbria*	**Coastal Pelagic Species**
Spiny Dogfish *Squalus acanthias*	Bocaccio *S. paucispinis*	anchovy *Engraulis mordax*
California Skate *R. inornata*	Brown Rockfish *S. auriculatus*	Pacific sardine *Sardinops sagax*
Ratfish *Hydrolagus colliei*	Copper Rockfish *S. caurinus*	Pacific mackerel *Scomber japonicus*
Lingcod *Ophiodon elongatus*	Quillback Rockfish *S. maliger*	market squid *Loligo opalescens*
Cabezon *Scorpaenichthys marmoratus*	English Sole *Parophrys vetulus*	**Pacific Salmon Species**
Kelp Greenling *Hexagrammos decagrammus*	Pacific Sanddab *Citharichthys sordidus*	chinook salmon *Oncorhychus tshawytscha*
Pacific Cod *Gadus macrocephalus*	Rex Sole *Glyptocephalus zachirus*	coho salmon *O. kisutch*
Pacific Whiting (Hake) *Merluccius productus*	Starry Flounder *Platichthys stellatus*	Puget Sound pink salmon *O. gorbuscha*

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