



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
WASHINGTON HABITAT BRANCH OFFICE  
510 Desmond Drive SE/Suite 103  
LACEY, WASHINGTON 98503

October 30, 2006

Paul Krueger  
WSDOT Environmental Manager  
SR 520 Project Office  
414 Olive Way, Suite 400  
Seattle, WA 98101



Dear Mr. Krueger:

Thank you for the opportunity to provide comments on the draft environmental impact statement (DEIS) for the State Route (SR) 520 Bridge Replacement and High Occupancy Vehicle (HOV) Project, as provided by the Federal Highway Administration (FHWA) and the Washington State Department of Transportation (WSDOT) on August 18, 2006. And thank you also for the ongoing discussions with the resource agencies involved in the pre-consultation of this vitally important transportation project. The National Marine Fisheries Service (NMFS) has reviewed the DEIS and is providing the comments, below, consistent with our statutory responsibilities under the Endangered Species Act (ESA) and the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Our comments focus on the potential direct and indirect effects to federally listed Puget Sound (PS) Chinook (*Oncorhynchus tshawytscha*) and their critical habitat and to the effects to Essential Fish Habitat (EFH) for PS steelhead (*Oncorhynchus mykiss*) and PS coho (*Oncorhynchus kisutch*).

Impact Disclosure in the DEIS and Appendices

F-003-001

The DEIS is written in a question- answer format which allows for easy reading of the document. However, detailed information is spread throughout the document, and at times is hard to locate and in some cases presents conflicting information (e.g. the number of columns proposed for the Pacific Interchange Option is unclear ranging from 4-10 depending on the appendix). In addition, the DEIS provides a qualitative rather than a quantitative analysis of the potential impacts of the project. For example, no analyses are provided for the effects from the existing or proposed floating bridge on lake functions, wave action, circulation and water quality; for the effects to the substrate by the anchoring system; and for the overall effects of construction activities on PS Chinook and their habitats.

NMFS therefore believes the analyses of habitat modifications in the DEIS are insufficient to analyze the potential impacts from this project. NMFS recommends that WSDOT follow the Council on Environmental Quality (CEQ) format that is designed to encourage a thorough analysis of the impacts of each alternative (see 40 CFR 1500-



F-003-001

Comment Summary:  
Format and Content

Response:

See Section 23.1 of the 2006 Draft EIS Comment Response Report.

F-003-001

1508). To help address this concern, please provide a complete table or series of tables of impacts from the proposed SR520 project alternatives in the text of the document.

F-003-002

Potential Effects to Species and their Habitats

The Lake Washington Ship Canal (LWSC) already presents physical challenges and stressors on fish traveling through this waterway. It is highly impacted by structures and surrounding development including the Hiram M. Chittenden Locks, commercial and industrial development, and boat maintenance and mooring operations. Fish leave the LWSC and enter salt water without the benefit of an estuary to acclimate to a higher or lower salinity before entering or leaving Puget Sound. Higher water temperatures and pollutants pose additional stress on juvenile and adult Chinook in this waterway. Lake Union currently exceeds the Department of Ecology water quality criterion for the pesticide dieldrin and is listed as an impaired water body on the 303(d) list for contaminated sediments.

Juvenile and adult PS Chinook (Cedar River and Sammamish River populations) migrate along the shorelines of Lake Washington and pass directly through the LWSC as they migrate to and from Puget Sound. Unfortunately, the SR520 Bridge is located across their main migratory corridor, and most of the corridor contains numerous Chinook predators such as small and large mouth bass and pikeminnow (formerly called northern squawfish). Recent research by Roger Tabor and others have begun to increase our understanding of how juvenile Chinook move through Portage Bay and Lake Union. However, little is known about the amount and extent of how predators utilize the system, especially pikeminnows. It is our understanding that with additional in-water structures in the Lake and the LWSC, the abundance and predation opportunities for bass and pikeminnows on juvenile PS Chinook would increase over time, thereby reducing the number of outmigrants.

F-003-003

NMFS has reviewed the impact analyses for each significant project activity, as outlined in the DEIS. To help refine the EIS, we provide the following comments and recommendations:

1. Construction Impacts

It is our understanding that the 4- or 6-lane alternatives are estimated to take at least eight years to complete construction and the temporary work and detour bridges will be in place 4-5 years depending on the alternative selected. This work could span up to two complete life cycles of PS Chinook. Unfortunately, it is also not clear from the DEIS which activities will be conducted during what time frames and what the on-going impacts of the project will be once the replacement bridge is built.

Because construction impacts could harm the Cedar River and Sammamish River wild Chinook populations during the construction phase, NMFS wants to work with you to find ways to reduce the length of construction. We recommend that a thorough analysis of the temporary and permanent construction-related impacts be identified so we can

F-003-002

**Comment Summary:**

Fish Effects

**Response:**

See Section 16.2 of the 2006 Draft EIS Comment Response Report.

F-003-003

**Comment Summary:**

Fish Effects

**Response:**

See Section 16.2 of the 2006 Draft EIS Comment Response Report.

F-003-003

assist you with ways to avoid, minimize, and mitigate those effects. One suggested way to address this concern would be to work together on an acceptable work window and to identify performance standards for contractors regarding construction-related activities.

F-003-004

#### 2. Pile Driving

The DEIS does not contain sufficient detail to analyze the effects of pile driving activities. We recommend the use of a performance standard for sound attenuation coupled with a detailed monitoring plan to ensure that effects to PS Chinook are avoided or minimized. NMFS is in the process of developing sample terms and conditions and design specifications for sound attenuation devices. Upon completion of that task, we will share our results with the Project Team in the hope of incorporating those parameters into the project design.

F-003-005

#### 3. Water Quality: Stormwater

The DEIS states that pollutant loading from the proposed project will be the same or reduced from existing conditions using the presumptive design approach from the 2004 Highway Runoff Manual (HRM). In addition, the DEIS contains average values for pollutant loading calculations rather than using existing monitoring data from the floating bridge collected by King County, and appears to use optimistic removal efficiencies for pollutant removal methods. There is also no indication that annual average daily traffic (AADT) on SR520 has been accounted for in the pollutant concentrations.

NMFS has reviewed and provided comments to WSDOT and the Department of Ecology on the use of the 2004 Highway Runoff Manual for stormwater treatment. We have determined that for projects of this scope, the proposed treatment, if implemented, may not adequately protect PS Chinook and their habitats. Furthermore, even if existing state water quality standards were met per the HRM, our recent analyses have indicated that those standards do not provide sufficient protection from the sublethal effects of dissolved metals to Chinook.

For example, the project proposes to meet state water quality standards for treated stormwater from the east and west approaches and the floating bridge by complying with the Washington State water quality criteria of 4.9 microgram per liter for dissolved copper. Current data indicate sublethal effects to juvenile salmonid's olfaction and subsequent alarm response behavior manifests at low micrograms per liter (Sandahl et al. 2006 submitted to the journal Environmental Science and Technology). The results of the study show that juvenile salmon exposed to sublethal dissolved copper concentrations as low as 2 micrograms per liter and concentrations likely even lower, might not recognize and respond to a predation event, and therefore have an increased risk of being eaten by other fishes or birds. Other experiments indicate that the salmonid's olfactory response to dissolved copper is not affected by hardness or alkalinity, therefore dissolved copper is bioavailable to salmon olfactory receptors (McIntyre et al. 2006). Additionally, typical dissolved organic carbon levels detected in Pacific Northwest streams and

F-003-004

#### Comment Summary:

Fish Effects

#### Response:

See Section 16.2 of the 2006 Draft EIS Comment Response Report.

F-003-005

#### Comment Summary:

Stormwater Treatment

#### Response:

See Section 15.3 of the 2006 Draft EIS Comment Response Report.

<b>F-003-005</b>	<p>nearshore estuarine environments may not confer adequate protection against copper olfactory toxicity (McIntyre et al. 2006).</p> <p>NMFS recommends that additional stormwater analyses be conducted per the recently approved Interim Stormwater Approach—an agreed-upon analytical approach for stormwater treatment developed by the Program Management Team (FHWA, WSDOT, U.S. Fish and Wildlife Service, NMFS). We also continue to support the use of high-efficiency sweeping along that portion of SR520 that discharges to Lake Washington, Lake Union and Portage Bay and to develop a rigorous maintenance regime to provide assurance that projected effluent pollutant concentrations will be met for the life of the project.</p>	<b>F-003-006</b>	<p>Comment Summary: Pier Treatment Wetlands</p> <p>Response: See Section 15.0 of the 2006 Draft EIS Comment Response Report.</p>
<b>F-003-006</b>	<p>Finally, the DEIS proposes the installation of wetland plants for water quality treatment within the coffer dams of 14-15 of the columns of the bridge in Union Bay. NMFS supports incorporating this innovative method for treating stormwater in the bridge design, although maintenance of the system has not been defined and efficacy of pollutant removal has yet to be determined.</p>	<b>F-003-007</b>	<p>Comment Summary: Water Resources Effects During Construction</p> <p>Response: See Section 15.5 of the 2006 Draft EIS Comment Response Report.</p>
<b>F-003-007</b>	<p>4. Water Quality:Turbidity</p> <p>Recent research has indicated that elevated levels of turbidity and suspended sediments affect juvenile behavior and render juvenile Chinook salmon more conspicuous and therefore more susceptible to avian and aquatic predators (Korstrom and Birtwell 2006). Unfortunately, the DEIS does not contain any performance standards for turbidity and suspended sediments that will be generated by construction or long-term operation of the facility.</p>	<b>F-003-008</b>	<p>Comment Summary: Water Resources Effects During Construction</p> <p>Response: See Section 15.5 of the 2006 Draft EIS Comment Response Report.</p>
<b>F-003-008</b>	<p>NMFS recommends that in addition to the development and implementation of erosion and spill control plans, detailed performance standards be developed to help avoid and minimize potential effects from significant construction activity (culvert replacement and excavation) on the east side of Lake Washington in Fairweather Creek Basin, Cozy Cove Basin, Yarrow Bay Basin and West Kelsey Creek Basin and on the west side (piling installation and temporary bridges) within Portage Bay, Union Bay and Lake Washington.</p>	<b>F-003-009</b>	<p>Comment Summary: Fish Effects</p> <p>Response: See Section 16.2 of the 2006 Draft EIS Comment Response Report.</p>
<b>F-003-009</b>	<p>5. Shading</p> <p>The DEIS proposes the construction of a pier for boat moorage on the east side of Lake Washington under the east approach to the floating bridge in an area where PS Chinook migrate along the shoreline. To help minimize these effects, NMFS recommends that the proposed dimensions of the new pier not exceed the guidelines for new and remodeled piers in Lake Washington, as described in the Corps of Engineer's Regional General Permit #3.</p>	<b>F-003-010</b>	<p>Comment Summary: Fish Effects</p>
<b>F-003-010</b>	<p>Some of the alternatives construct additional overwater structures above Lake Washington. Depending on the height of these structures, additional shading may</p>		

<b>F-003-010</b>	provide refuge for salmonid predators like bass and pikeminnow. It is our understanding, based on recent discussions with the Project Team, that a shade model is being developed by Battelle Labs to analyze these potential effects. We look forward to the results of that analysis to better understand effects to listed species.
<b>F-003-011</b>	<p>6. Wetlands</p> <p>The DEIS lacks sufficient detail to analyze the overall effects to existing wetlands and their functions. NMFS recommends the addition of a matrix that clearly outlines the amount, extent, and functions that will be affected and what mitigation will be implemented to replace any lost wetland functions.</p>
<b>F-003-012</b>	<p><u>Proposed Mitigation</u></p> <p>The DEIS contains a preliminary mitigation proposal for fisheries impacts that consists of a shallow sloped bench with small substrate along the north coasts of Foster and Marsh Islands. Our analysis has indicated that this created habitat will probably improve predator opportunities rather than establish suitable habitat for migrating juvenile PS chinook, as intended, because in the water temperatures in these shallow areas tend to promote the growth of invasive Eurasian milfoil which serves as a refuge for bass and pikeminnow.</p> <p>Subsequent to the release of the DEIS, the Project Team has met on a regular basis and has committed to meet with the resource agencies and regional fish experts to identify all of the potential aquatic impacts of the proposed alternatives and to develop a comprehensive list of avoidance, minimization, and mitigation measures for the effects to listed species and their habitats. NMFS looks forward to this collaborative process and will provide technical assistance, as needed, to help create a comprehensive mitigation plan.</p>
<b>F-003-013</b>	<p><u>Connected Actions</u></p> <p>Pontoon construction, transport and moorage have been identified as connected actions of the proposed project. Please provide the direct and temporal effects of these actions.</p>
<b>F-003-014</b>	The DEIS estimates the use of 1.1 million to 1.6 million net tons of soil and rock to construct the roadway foundations and embankments for SR520. This amount of aggregate represents between 1 and 2 percent of the annual production of aggregate in Washington State. Please provide an analysis of the potential effects to Chinook habitat from the removal of this quantity of aggregate at the specified locations.
<b>F-003-015</b>	<p><u>Indirect and Cumulative Effects</u></p> <p>The DEIS provides a population growth forecast under different alternative build scenarios based on the Puget Sound Regional Council's Destination 2030 report, which predicts an increase of 1.5 million people in Central Puget Sound over the next 30 years.</p>

**Response:**

See Section 16.2 of the 2006 Draft EIS Comment Response Report.

**F-003-011****Comment Summary:**

Format and Content

**Response:**

See Section 23.1 of the 2006 Draft EIS Comment Response Report.

**F-003-012****Comment Summary:**

Fish and Wildlife (Mitigation)

**Response:**

See Section 16.2 of the 2006 Draft EIS Comment Response Report.

**F-003-013****Comment Summary:**

Pontoon Construction, Transportation, and Moorage

**Response:**

See Section 4.3 of the 2006 Draft EIS Comment Response Report.

**F-003-014****Comment Summary:**

Fish Effects

**Response:**

See Section 16.2 of the 2006 Draft EIS Comment Response Report.

F-003-015

The DEIS forecasts a 1 percent growth redistribution due to the SR520 bridge and concludes that is a minor redistribution of the population. However, if up to 15,000 people are shifted from urban to rural areas, the impacts to fisheries could be significant when the effects of development and new infrastructure (roads) are analyzed.

NMFS recommends the DEIS analyze the redistribution of growth effects in terms of percent change in impervious surface by sub-basin, as outlined in earlier drafts of the DEIS. A change in impervious surface may or may not be a significant change depending on where it occurs in the landscape (i.e. which sub-basin, or how far from riparian areas).

A planned redevelopment of the Microsoft Campus in Redmond, adding 3.1 million square feet of new office space and accommodating 12,000 new employees over the next three years, will probably increase AADT over SR520. Please analyze the potential effects to listed salmonids and their habitats from this proposed increase in traffic on the SR 520 Bridge.

F-003-016

Finally, the DEIS states that the pontoons will be oversized to accommodate high capacity transit (HCT) in the future. Please include an analysis of the additional effects, including indirect effects on land use that will result from the future widening of the 520 Bridge for HCT.

F-003-017

#### The Range of Alternatives

The DEIS contains a suite of alternatives for the proposed project. However, there is not sufficient detail to determine the comparative extent of impacts to the environment for each alternative. Please provide detailed analyses of the effects to listed species and their habitats for each alternative and associated options.

After numerous discussions with the Project Team, one alternative, the Western Shift Option, appeared to have less environmental impacts than the other 6-lane options, but was dropped from the range of alternatives because of impacts to parks under Section 4(f) of the Department of Transportation Act of 1966. We recommend further analysis of the Western Shift Option to include consideration of the function and value of the areas of 4(f) resources that would be impacted by each alternative. In addition, we recommend the Western Shift Option be included in the range of alternatives because the preliminary design appears to keep pilings out of the LWSC and Lake Washington, thereby reducing in-water impacts, as outlined above.

F-003-018

Finally, it should be noted that subsequent to the publication of the DEIS, WSDOT has met with NMFS to consider multiple design options for the 6-lane alternatives that would place the piers either completely out of the water or at a minimum, out of the migratory pathway of juvenile and adult salmonids and would reduce the pier sizes to minimize habitat opportunities for predators. NMFS will continue to work with the Project Team as the design options are being analyzed to ensure the alternative selected will place the

F-003-015

#### **Comment Summary:**

Indirect and Cumulative Effects Methods of Analysis

#### **Response:**

See Section 20.1 of the 2006 Draft EIS Comment Response Report.

F-003-016

#### **Comment Summary:**

Indirect and Cumulative Effects Methods of Analysis

#### **Response:**

See Section 20.1 of the 2006 Draft EIS Comment Response Report.

F-003-017

#### **Comment Summary:**

Alternatives Development

#### **Response:**

See Section 1.1 of the 2006 Draft EIS Comment Response Report.

F-003-018

#### **Comment Summary:**

Fish Effects

#### **Response:**

See Section 16.2 of the 2006 Draft EIS Comment Response Report.

F-003-018

piers out of the migratory pathway of listed salmonids and minimize the opportunities for predators.

F-003-019

The Environmentally Preferred Alternative

As stated above, the information presented in the DEIS and appendices lacks the detail necessary to adequately determine which of the alternatives is the Least Environmentally Damaging Preferred Alternative for the proposed project. However, given the information presented, NMFS' ranking of the alternatives in order of the least effects to listed salmonids and their habitats are as follows:

1. The 4-lane Alternative.

The 4-lane design has the least amount of impervious surface of all the alternatives presented, and in turn produces the least amount of stormwater; the least amount of over-water coverage (shade), and as such requires less pilings in the LWSC and Lake Washington; and requires no new piers near the navigation channel in Union Bay. The 4-lane Alternative can be built within a shorter time frame than the 6-lane options which will reduce temporal construction-related impacts to Chinook in the LWSC.

It should be noted that if the design were to be revised to add lids over the 4-lane Alternative at Montlake and/or to add a second Montlake Bridge, neither of these design changes would affect NMFS' preference for this alternative. These design changes could help address other neighborhood issues identified in the public hearing process.

2. The 6-lane Alternative (excluding the Pacific Interchange Option)

This alternative has a larger impervious surface footprint than the 4-lane Alternative and will have increased Annual Average Daily Traffic (AADT). Both the increased footprint and AADT may result in higher water quality impacts (e.g. dissolved metals) to Lake Washington and the LWSC under current mitigation proposals as compared to the 4-lane Alternative. The 6-lane Alternative will have the largest amount of shading in the Portage Bay area but listed salmonids are probably not in this part of the Bay because of other environmental conditions such as milfoil and higher water temperatures.

Positive aspects of this alternative include the treatment of stormwater and the lack of additional pilings across Union Bay.

3. The 6-lane Alternative with a Second Montlake Bridge Option.

The second Montlake Bridge will not be grated like the existing bridge but stormwater will be treated, to some extent. However, additional shade will be produced over the LWSC by the second Montlake Bridge.

Positive aspects of this alternative include the placement of piers and foundations on land on either side of the Montlake Cut, which precludes the need for structures in the LWSC. This option also reduces the number of lanes over Portage Bay to eight rather

## F-003-019

### Comment Summary:

#### 6-Lane Alternative

### Response:

See Section 1.2 of the 2006 Draft EIS Comment Response Report.

F-003-019

than nine as proposed for the straight 6-lane Alternative, resulting in a smaller impervious surface footprint and less shading.

4. The 6-lane Alternative with the Pacific Interchange Option (PIO).

As currently configured this is the most environmentally damaging alternative proposed in the DEIS with regard to effects to listed salmonids. The PIO is the only option that places large pilings in the western part of Union Bay where migrating juvenile Chinook converge to enter the LWSC, thereby increasing risks of predation. Also the PIO is the only option where construction would occur directly in and over the entrance to the LWSC for 4-6 years, a significant potential impact to all anadromous salmonids that pass through this area.

As stated above, NMFS will continue to discuss different designs for this option to move the placement of the piers out of the migratory pathway for listed salmonids and to reduce their size to minimize potential habitat for predators.

We hope these comments are helpful to WSDOT and FHWA as you work to refine the EIS. NMFS will continue to work with your Project Team to identify a preferred alternative. We are confident, that with continued collaboration, the project will be designed to meet the transportation needs of the region, while avoiding, minimizing and mitigating any adverse effects to the environment and specifically to any tribal trust resources and species and their habitats listed under the ESA and MSA.

Should you have any questions or concerns about our review, please contact Mike Grady, at: (206) 526-4645.

Sincerely,



Steven W. Landino  
Washington State Director  
For Habitat Conversation

CC: HQ (Cristi Reid)  
USFWS (Ken Berg)

References Cited

King County. 2006. Highway 520 bridge storm water runoff study. Dean Wilson, Water and Land Resources Division. Seattle, Washington.

Korstrom, J.S. and I.K. Birtwell. 2006. Effects of suspended sediment on the escape behavior and cover-seeking response of juvenile Chinook salmon in freshwater. *American Fisheries Society*, Vol 135, Issue 4.

McIntyre, J., D. Baldwin, J. Meador, D. Beauchamp, and N. Scholz. 2006. Influence of water hardness, alkalinity, pH, and DOC on olfactory neurotoxicity of copper in juvenile salmon. University of Washington SAFS poster.

Sandahl, J., D. Baldwin, J. Jenkins, and N. Scholz. 2006 (in press) A sensory system at the interface between urban stormwater runoff and salmon survival.