UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

FEB - 6 2014

To All Interested Government Agencies and Public Groups:

Under the National Environmental Policy Act (NEPA), an environmental review has been performed on the following action.

TITLE: Environmental Assessment (EA) on the Issuance of an Incidental Harassment Authorization (IHA) to the Washington State Department of Transportation (WSDOT) to Take Marine Mammals by Harassment Incidental to Wingwalls Replacement Project at Bremerton Ferry Terminal, Washington

LOCATION: Bremerton, Washington

SUMMARY: The National Marine Fisheries Service (NMFS) proposes to issue an IHA to WSDOT for the taking, by Level B harassment, of small numbers of six marine mammal species incidental to construction activities related to wingwalls replacement at the Bremerton Ferry Terminal in Washington. The construction, which will involve the removal of deteriorated timber wingwalls and subsequent installation of steel wingwalls, is expected to occur between October 1, 2014 and September 30, 2015. WSDOT seeks an IHA because the underwater construction noise and increase of human activities and vessel traffic in the area could adversely affect marine mammals in the area. NMFS proposes to issue an IHA with mitigation measures, as described in Alternative 2 of the Environmental Assessment. Under Alternative 2, the issuance of the IHA may indirectly result in adverse effects on marine mammals, but such effects would be negligible or at most minor because the marine mammals in the area are likely to exhibit only brief and minor behavioral modification as a result of WSDOT's activities.

RESPONSIBLE OFFICIAL: Donna S. Wieting, Director, Office of Protected Resources

The environmental review process led us to conclude that this action will not have a significant effect on the human environment. Therefore, an environmental impact statement will not be prepared. A copy of the finding of no significant impact (FONSI) including the supporting environmental assessment (EA) is enclosed for your information. Although NOAA is not soliciting comments on this completed EA/FONSI we will consider any comments submitted that would assist us in preparing future NEPA documents. Please submit any written comments to the responsible official named above.

Sincerely,

for Patricia A. Montanio
NOAA NEPA Coordinator

Enclosure

FINAL ENVIRONMENTAL ASSESSMENT

Issuance of an Incidental Harassment Authorization
to the Washington State Department of Transportation to Take Marine Mammals
by Harassment Incidental to Wingwalls Replacement Project
at Bremerton Ferry Terminal, Washington, in 2014

February 2014

LEAD AGENCY:	USDOC, National Oceanic and Atmospheric Administration National Marine Fisheries Service, Office of Protected Resources 1315 East West Highway Silver Spring, MD 20910
RESPONSIBLE OFFICIAL:	Donna S. Wieting, Director, Office of Protected Resources
FOR INFORMATION CONTACT:	Office of Protected Resources National Marine Fisheries Service 1315 East West Highway Silver Spring, MD 20910 (301) 427-8401
LOCATION:	Bremerton, Washington
ABSTRACT:	The National Marine Fisheries Service proposes to issue an Incidental Harassment Authorization (IHA) to the Washington State Department of Transportation (WSDOT) Ferries Division (WSF) for the taking, by Level B harassment, of small numbers of marine mammals incidental to wingwalls replacement project at Bremerton Ferry Terminal in the State of Washington. The IHA would be valid from October 1, 2014 through September 30, 2015.

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List of Acronyms, Abbreviations, and Initialisms

CFR	Code of Federal Regulations
CEQ	President's Council on Environmental Quality
cm	centimeter
Commission	Marine Mammal Commission
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Program
dB	decibel
DPS	Distinct Population Segment
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
ft	foot/feet
ft^2	square foot/feet
ft^3	cubit foot/feet
FR	*Federal Register*
hr	hour
hrs	hours
Hz	hertz
IHA	Incidental Harassment Authorization
in	inch
kHz	kilohertz
km	kilometer
kPa	kilopascal
m	meter
m^2	square meter
m^3	cubic meter
mi	mile
MHHW	mean higher high water
MLLW	mean lower low water
MMPA	Marine Mammal Protection Act
MMO	marine mammal observer
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
NAO	NOAA Administrative Order
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
NWRO	NMFS Northwest Regional Office
OMB	Office of Management and Budget
OPR	Office of Protected Resources
p-p	peak-to-peak
Pa	pascal
PR1	NMFS OPR Permits, Conservation, and Education Division
PRD	Southwest Regional Office Protected Resources Division
psi	pound(s) per square inch
PTS	permanent threshold shift

rms	root-mean-square
SEL	Sound exposure level
SPL	Sound pressure level
SRKW	Southern Resident killer whale
TL	transmission loss
TS	threshold shift
TTS	temporary threshold shift
U.S.C.	United States Code
WDFW	Washington State Department of Fish and Wildlife
WDOT	Washington State Department of Ecology
WSDOT	Washington State Department of Transportation
ZOI	zone of influence
μPa	microPascal

CHAPTER 1 INTRODUCTION/DESCRIPTION OF ACTION AND BACKGROUND

1.1 INTRODUCTION/DESCRIPTION OF ACTION

In response to a receipt of a request from the Washington State Department of Transportation (WSDOT) Ferries Division (WSF), the National Marine Fisheries Service (NMFS) proposes to issue an Incidental Harassment Authorization (IHA) that authorizes takes by level B harassment of marine mammals in the wild pursuant to section 101(a)(5)(D) of the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. §§ 1631 *et seq.*), and the regulations governing the taking and importing of marine mammals (50 Code of Federal Regulations (CFR) Part 216).

This Environmental Assessment (EA), titled "*Issuance of an Incidental Harassment Authorization to the Washington State Department of Transportation to Take Marine Mammals by Harassment Incidental to Wingwalls Replacement Project at Bremerton Ferry Terminal, Washington, in 2014*," (hereinafter, the Bremerton 2014 EA) addresses the impacts on the human environment that would result from the issuance of this IHA.

1.2 BACKGROUND

On August 14, 2012, WSF submitted a request to NOAA requesting an IHA for the possible harassment of small numbers of six marine mammal species incidental to construction associated with the replacement of wingwall structures at the Bremerton Ferry Terminal in Washington State. On December 4, 2012, WSF submitted a revised IHA application with updated information. NMFS prepared an EA and a Finding of No Significant Impact Statement (FONSI) for the issuance of an IHA on June 10, 2013, and issued an IHA to WSF on June 12, 2013. However, due to a funding shortfall, WSF was unable to conduct the proposed construction activities during the IHA period. Subsequently, on September 30, 2013, WSF submitted another IHA application for the same actions and plans to conduct wingwalls replacement work at the Bremerton Ferry Terminal during fall, 2014.

To improve, maintain, and preserve marine terminals, WSF conducts construction, repair and maintenance activities as part of its regular operations. The current timber wingwalls at the Bremerton terminal are near the end of their design life, and need to be replaced with steel wingwalls to ensure safe and reliable functioning of the terminal. The proposed project at the Bremerton Ferry Terminal is to replace the existing Slip 2 timber wingwalls with new standard steel design wingwalls. The proposed construction activity includes: (1) removal of two timber wingwalls (112 13-inch timber piles and 100 tons of creosote-treated timber) with a vibratory hammer, direct pull or clamshell removal; and (2) vibratory pile-driving of eight 24- and two 30-inch hollow steel piles for each wingwall (20 piles total). All pile driving and pile removal activities would be conducted using vibratory piling hammer. The maximum time for pile removal is four days, and seven days for pile installation. The actual number of pile-removal/driving days is expected to be less.

Since underwater construction noise from these activities and the increase of human activities and vessel traffic could adversely affect marine mammal species and stocks in the proposed action area, WSF is seeking an IHA that would allow the incidental, but not intentional, take of marine mammals by Level B behavioral harassment during the wingwalls replacement construction at the Bremerton Ferry Terminal. The WSF states that small numbers of six species of marine mammals could potentially be taken by vibratory pile driving and removal activities associated with the proposed construction work. The marine mammals that could be affected are: Pacific harbor seal (*Phoca vitulina richardsi*), California sea lion (*Zalophus californianus*), Steller sea lion (*Eumetopias jubatus*), killer whale (*Orcinus orca*), gray whale (*Eschrichtius robustus*), and humpback whale (*Megaptera novaeangliae*).

IHA issuance criteria require that the take of marine mammals authorized by an IHA will have a negligible impact on the species or stock(s); and will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses. In addition, the IHA must, where applicable, set forth the permissible methods of taking, other means of effecting the least practicable adverse impact on the species or stock and its habitat, and requirements for monitoring and reporting of such takings.

Issuance of an IHA is a federal agency action. For purposes of section 7 of the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 *et. seq*), NMFS must consult with itself to ensure that its action is not likely to jeopardize the continued existence of any federally-listed species or result in the destruction or adverse modification of critical habitat.

In addition, this EA is prepared in accordance with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq*.) for the analysis of the potential environmental impacts as the result of the NMFS proposed issuance of the IHA.

1.2.1 PURPOSE AND NEED

The primary purpose of NMFS's proposed action—the issuance of an Authorization to the WSF—is to authorize (pursuant to the MMPA) the WSF's request for the take of marine mammals incidental to the WSF's proposed activities. The current timber wingwalls at the Bremerton terminal are near the end of their design life, and need to be replaced with steel wingwalls to ensure safe and reliable functioning of the terminal. In response to the receipt of an IHA application from the WSF, NMFS proposes to issue an IHA pursuant to the MMPA §101(a)(5)(D). The IHA will provide an exception from the take prohibitions under the MMPA and allow "takes" by "level B harassment" of marine mammals and thus authorize the incidental takes that may occur as a result of the wingwalls replacement work at the Bremerton Ferry Terminal in Washington State.

NMFS' issuance of the IHA is necessary for the wingwalls replacement work at the Bremerton Ferry Terminal to comply with the MMPA. Specifically the MMPA prohibits takes of marine mammals, with specific exceptions, including the incidental, but not intentional, taking of marine mammals, for periods of not more than one year, by United States citizens who engage in a specified activity (other than commercial fishing), when the required findings can be made.

1.2.2 SCOPING SUMMARY

The purpose of scoping is to identify the issues to be addressed and the significant issues related to the proposed action, as well as identify and eliminate from detailed study the issues that are not significant or that have been covered by prior environmental review. An additional purpose of the scoping process is to identify the concerns of the affected public and Federal agencies, states, and Indian tribes.

The MMPA and its implementing regulations governing issuance of an IHA require that upon receipt of a valid and complete application for an IHA, NMFS publish a proposed IHA in the *Federal Register* (*FR*). The notice summarizes the purpose of the requested IHA, includes a statement about whether an EA or an Environmental Impact Statement (EIS) was prepared, and invites interested parties to submit written comments concerning the proposal to issue the IHA.

NOAA Administrative Order (NAO) 216-6, established agency procedures for complying with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. §§ 4321 *et seq.*) and the implementing regulations issued by the President's Council on Environmental Quality (CEQ). NAO 216-6 specifies that the issuance of an IHA under the MMPA is among a category of actions that require further environmental review and the preparation of NEPA documentation.

1.2.3 COMMENTS ON APPLICATION AND EA

On December 3, 2013, NMFS published a notice of a proposed IHA in the *Federal Register* (78 FR 72655), which announced the availability of the application for public comment for 30 days. The public comment period for the proposed IHA afforded the public the opportunity to provide input on environmental impacts. In addition, NMFS will post the final Bremerton 2014 EA on
http://www.nmfs.noaa.gov/pr/permits/incidental.htm#applications.

NMFS only received comments from the Marine Mammal Commission (Commission). The Commission recommends that NMFS issue the IHA, subject to inclusion of the proposed mitigation and monitoring measures described in the *Federal Register* notice for the issuance of the IHA.

1.2.4 ISSUES WITHIN THE SCOPE OF THIS EA

This EA analyzes NMFS's proposal to issue an IHA under Section 101(a)(5)(D) of the MMPA and alternatives that also meet the purpose and need of the proposed action, as identified in Sec. 1.2.1, above. The IHA, if issued, would authorize the harassment of six species of marine mammals incidental to the wingwalls replacement construction at Bremerton Ferry Terminal in Washington State.

Because the pile driving and removal activities associated with the proposed wingwalls replacement project will produce loud noises, NMFS expects that marine mammals in the vicinity of the project area will be affected by man-made noises from pile driving, dredging, and other construction sounds. This EA provides detailed analyses and evaluation of the potential noise impacts to the affected environment that would result from the proposed pile removal and pile driving at the Bremerton Ferry Terminal.

1.2.5 APPLICABLE LAWS AND NECESSARY FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS

This section summarizes five of the federal laws that are triggered by WSF's Bremerton project. This section is not meant to be comprehensive.

1.2.5.1 NATIONAL ENVIRONMENTAL POLICY ACT

The NEPA, enacted in 1969, is applicable to all "major" federal actions significantly affecting the quality of the human environment. A major federal action is an activity that is fully or partially funded, regulated, conducted, or approved by a federal agency. NMFS' issuance of an IHA for incidental harassment of marine mammals represents approval and regulation of the applicant's activities. While NEPA does not dictate substantive requirements for an IHA, it requires consideration of environmental issues in federal agency planning and decision making. The procedural provisions outlining federal agency responsibilities under NEPA are provided in the CEQ's implementing regulations (40 CFR Parts 1500-1508).

NOAA has, through NAO 216-6, established agency procedures for complying with NEPA and the implementing regulations issued by the CEQ. NAO 216-6 specifies that issuance of an IHA under the MMPA and ESA is among a category of actions that require further environmental review. This EA is prepared in accordance with NEPA, its implementing regulations, and NAO 216-6.

1.2.5.2 ENDANGERED SPECIES ACT

Section 7 of the ESA requires consultation with the appropriate federal agency (either NMFS or the USFWS) for federal actions that "may affect" a listed species or critical habitat. NMFS' issuance of an IHA affecting ESA-listed species or designated critical habitat, directly or indirectly, is a federal action subject to these section 7 consultation requirements. Accordingly, NMFS is required to ensure that its action is not likely to jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of critical habitat for such species. Regulations specify the requirements for these consultations (50 CFR Part 402).

The NMFS Office of Protected Resources (OPR) Permits and Conservation Division (PR1) is required to consult with the NMFS Northwest Regional Office (NWRO) Protected Resources Division (PRD) on the issuance of an IHA under Section 101(a)(5)(D) of the MMPA. PR1 is required to consult with PRD because the action of issuing an IHA may affect threatened and endangered species under NMFS' jurisdiction.

As the effects of the activities on listed marine mammals and salmonids were analyzed during a formal consultation between the Federal Highway Administration (FHWA) and NMFS, and as the underlying action has not changed from that considered in the consultation, the discussion of effects contained in the Biological Opinion and accompanying memo issued to the FHWA on February 19, 2013, pertains also to this action. Therefore, NMFS has determined that issuance of an IHA for this activity would not lead to any effects to listed marine mammal species beyond those that were considered in the consultation on FHWA's action.

1.2.5.3 MARINE MAMMAL PROTECTION ACT

Section 101(a)(5)(D) of the MMPA (16 U.S.C. 1371(a)(5)(D)) directs the Secretary of Commerce (Secretary) to authorize, upon request, the incidental, but not intentional, taking by harassment of small numbers of marine mammals of a species or population stock, for periods of not more than one year, by United States citizens who engage in a specified activity (other than commercial fishing) within a specific geographic region if certain findings are made and notice of a proposed authorization is provided to the public for review.

Authorization for incidental taking of small numbers of marine mammals shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), and will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses. The authorization must set forth the permissible methods of taking, other means of effecting the least practicable adverse impact on the species or stock and its habitat, and requirements pertaining to the monitoring and reporting of such takings. NMFS has defined "negligible impact" in 50 CFR 216.103 as "an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival."

Section 101(a)(5)(D) of the MMPA established an expedited process by which citizens of the United States can apply for an authorization to incidentally take small numbers of marine mammals by harassment. Except with respect to certain activities not pertinent here, the MMPA defines "harassment" as:

> any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild ["Level A harassment"]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering ["Level B harassment"].

Section 101(a)(5)(D) of the MMPA establishes a 45-day time limit for NMFS' review of an application followed by a 30-day public notice and comment period on any proposed authorizations for the incidental harassment of small numbers of marine mammals. Not later than 45 days after the close of the public comment period, if the Secretary makes the findings set forth in Section 101(a)(5)(D)(i) of the MMPA, the Secretary shall issue the authorization with appropriate conditions to meet the requirements of Section 101(a)(5)(D)(ii) of the MMPA.

NMFS has promulgated regulations to implement the permit provisions of the MMPA (50 CFR Part 216) and has produced Office of Management and Budget (OMB)-approved application instructions (OMB Number 0648-0151) that prescribe the procedures (including the form and manner) necessary to apply for permits. All applicants must comply with these regulations and application instructions in addition to the provisions of the MMPA. Applications for an IHA must be submitted according to regulations at 50 CFR § 216.104.

1.2.5.4 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

Under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), "Essential Fish Habitat" (EFH) is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. § 1802(10)). The EFH provisions of the MSFCMA offer resource managers means to accomplish the goal of giving heightened consideration to fish habitat in resource management. NMFS, Office of Protected Resources Permits and Conservation Division has determined that issuance of the IHA for the taking of marine mammals incidental to the ferry terminals construction in Bremerton will not have an adverse impact on EFH; therefore, an EFH consultation is not required.

1.2.5.5 COASTAL ZONE MANAGEMENT ACT

Congress enacted the Coastal Zone Management Act (CZMA) (16 U.S.C. §§ 1451 *et seq.*) to protect the coastal environment from growing demands associated with residential, recreational, commercial, and industrial uses (e.g., State and Federal offshore oil and gas development). Those coastal states with an approved Coastal Zone Management Program, which defines permissible land and water use within the state's coastal zone, can review Federal actions, licenses, or permits for "Federal consistency."

“Federal consistency” is the requirement that those Federal permits and licenses likely to affect any land/water use or natural resources of the coastal zone be consistent with the Program’s enforceable policies. NMFS consults with States on issuance of permits for activities that fall within the State’s Coastal Zone Management Program.

Chapter 2 Alternatives Including The Proposed Action

The NEPA implementing regulations (40 CFR § 1502.14) and NAO 216-6 provide guidance on the consideration of alternatives to a federal proposed action and require rigorous exploration and objective evaluation of all reasonable alternatives. Each alternative must be feasible and reasonable in accordance with the President's Council on Environmental Quality (CEQ) regulations (40 CFR §§ 1500-1508). This chapter describes the range of potential actions (alternatives) determined reasonable with respect to achieving the stated objective, as well as alternatives eliminated from detailed study and also summarizes the expected outputs and any related mitigation of each alternative.

This EA evaluates the alternatives to ensure that they would fulfill the purpose and need, namely: (1) the issuance of an IHA for the take of marine mammals by level B behavioral harassment incidental to the WSF's wingwalls replacement construction project at the Bremerton Ferry Terminal in Washington State; and (2) compliance with the MMPA which sets forth specific standards (i.e., no unmitigable adverse impact and negligible impact) that must be met in order for NMFS to issue an IHA.

The Proposed Action (Preferred) alternative represents the activities proposed in the application for an IHA, with standard monitoring and mitigation measures specified by NMFS. In accordance of section 101(a) of the MMPA, NMFS may not issue the IHA if the action will (1) have more than a negligible impact on the species or stocks or (2) have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses.

2.1 WSF Project Objectives

The objective of the project at the Washington State Department of Transportation/Ferries Division Bremerton Ferry Terminal located in Bremerton, WA, is to replace existing timber wingwalls with new steel wingwalls.

2.2 Alternative 1: No Action Alternative – Deny Issuance of an IHA

Evaluation of the No Action Alternative is required by regulations of the CEQ as a baseline against which the impacts of the Proposed Action are compared.

Under the No Action Alternative, NMFS would not issue the proposed IHA for the activities proposed by the WSF. The MMPA prohibits all takings of marine mammals unless authorized by a permit or exemption under the MMPA. If authorization to take, by incidental harassment, of marine mammals is denied, the WSF may or may not decide not to conduct construction to replace wingwall structures at the Bremerton Ferry Terminal. If WSF conducts the construction without an IHA and incidental take occurs, it will be subject to the MMPA's penalty provisions. For purposes of this analysis we assume that the WSF would not proceed with the proposed action, marine mammals present in the vicinity of these areas would not be incidentally harassed from construction activities.

2.3 Alternative 2: Issuance of an IHA with Mitigation (Preferred Alternative)

The Proposed Action is the Preferred Alternative. Under this alternative, NMFS would issue an IHA to the WSF allowing the incidental take by Level B harassment of small numbers of six species of marine mammals during wingwalls replacement project at the Bremerton Ferry Terminal in Washington State.

NMFS will incorporate the mitigation and monitoring measures and reporting requirements described in Sections 2.3.4 and 2.3.5 into the IHA. The Preferred Alternative (Issuance of an IHA with Mitigation) would enable the agency and the WSF to comply with the statutory and regulatory requirements of the MMPA and ESA.

The specific project activity is to replace the existing Slip 2 timber wingwalls with new standard steel design wingwalls. The existing structures each have approximately 56 - 12” diameter creosote-treated timber piles, for a total of 112 timber piles. Each wingwall will be removed as a unit. The wingwall will be cut, lifted with a crane and placed on a barge. Remaining piles will then be removed using either a vibratory hammer or direct pull with a cable. A clamshell excavator will be used only if necessary.

The new wingwalls will consist of 10 steel piles each, for a total of 20 steel piles. Sixteen piles will be 24” in diameter and four piles will be 30” in diameter. The new steel piles will be installed with a vibratory hammer. No impact hammer will be used. There will be no proofing of piles.

In-water construction is planned to take place between October 2014 and September 2014. The on-site work will last approximately 8 weeks with actual pile removal and driving activities taking place over 11 days. All work at the Bremerton terminal will occur in water depths between -16 and -26 feet mean low water.

The following construction activities are anticipated:

- Remove two timber wingwalls (112 - 13-inch timber piles or 100 tons of creosote-treated timber) with a vibratory hammer, direct pull or clamshell removal. Vibratory pile-drive eight 24- and two 30-inch hollow steel piles for each wingwall (20 piles total). Attach rub timbers to new wingwall faces.

- A total of 100 tons of creosote-treated timbers will be removed from the marine environment. The total mudline footprint of the existing wingwalls is 206 square feet (ft^2). The total mudline footprint of the new wingwalls will be 95 ft^2, a reduction of 111 ft^2. The new wingwalls will have 20 piles, compared to the existing wingwalls, which have 112 tightly clustered piles with no space between them. The footprint of the new steel wingwalls will be more open, allowing fish movement between the piles.

Detailed description of pile removal and pile driving is provided below.

2.3.1 VIBRATORY HAMMER PILE REMOVALS

Vibratory hammer extraction is a common method for removing timber piles. A vibratory hammer is a large mechanical device mostly constructed of steel (weighing 5 to 16 tons) that is suspended from a crane by a cable. It is attached to a derrick and positioned on the top of a pile. The pile is then unseated from the sediments by engaging the hammer, creating a vibration that loosens the sediments binding the pile, and then slowly lifting up on the hammer with the aid of the crane.

Once unseated, the crane will continue to raise the hammer and pull the pile from the sediment. When the pile is released from the sediment, the vibratory hammer is disengaged and the pile is pulled from the water and placed on a barge for transfer upland. Vibratory removal will take approximately 10 to 15 minutes per pile, depending on sediment conditions.

2.3.2 Direct Pull and Clamshell Removal

Older timber piles are particularly prone to breaking at the mudline because of damage from marine borers and vessel impacts and must be removed because they can interfere with the installation of new piles. In some cases, removal with a vibratory hammer is not possible if the pile is too fragile to withstand the hammer force. Broken or damaged piles may be removed by wrapping the piles with a cable and pulling them directly from the sediment with a crane. If the piles break below the waterline, the pile stubs will be removed with a clamshell bucket, a hinged steel apparatus that operates like a set of steel jaws. The bucket will be lowered from a crane and the jaws will grasp the pile stub as the crane pulled up. The broken piles and stubs will be loaded onto the barge for off-site disposal. Clamshell removal will be used only if necessary. Direct pull and clamshell removal do not produce noise that could impact marine mammals.

2.3.3 Vibratory Hammer Pile Installation

Vibratory hammers are commonly used in steel pile installation where sediments allow and involve the same vibratory hammer used in pile extraction. The pile is placed into position using a choker and crane, and then vibrated between 1,200 and 2,400 vibrations per minute. The vibrations liquefy the sediment surrounding the pile allowing it to penetrate to the required seating depth. The type of vibratory hammer that will be used for the project will likely be an APE 400 King Kong (or equivalent) with a drive force of 361 tons.

2.3.4 Mitigation Measures

As required under the MMPA, NMFS considered mitigation to effect the least practicable adverse impact on marine mammals and has developed a series of mitigation measures, as well as monitoring and reporting procedures (Section 2.3.5) that would be required under the IHA.

The following measures are designed to eliminate the potential for injury or mortality and to minimize Level B behavioral harassment to marine mammals found in the vicinity of the proposed project area. These measures would be required under Alternative 2 (Preferred Alternative).

For the proposed Bremerton Ferry Terminal wingwalls replacement construction work, the following mitigation measures are required to minimize the potential impacts to marine mammals in the project vicinity. These mitigation measures would be employed during all pile removal and installation activities at the Bremerton Ferry Terminal. The language in monitoring measures would be included in the Contract Plans and Specifications and must be agreed upon by the contractor prior to any pile activities.

Since the measured source levels (at 10 and 16 m) of the vibratory hammer involved in pile removal and pile driving are below NMFS current thresholds for Level A takes, i.e., below 180 dB_{rms} re 1 μPa, no exclusion zone would be established, and there would be no required power-down and shutdown measures. Instead, WSF would establish and monitor the 120 dB_{rms} re 1 μPa zone of influence (ZOI, see below Proposed Monitoring and Reporting section). Geographic map of the monitoring zone at the Bremerton Ferry Terminal is provided in Figures 2-1.

One major mitigation measure for WSF's proposed pile removal and pile driving activities is ramping up, or soft start, of vibratory pile hammers. The purpose of this procedure is to reduce the startling behavior of marine mammals in the vicinity of the proposed construction activity from sudden loud noise.

Soft start requires contractors to initiate the vibratory hammer at reduced power for 15 seconds with a 1 minute interval, and repeat such procedures for an additional two times.

In addition, monitoring for marine mammal presence will take place 30 minutes before, during and 30 minutes after pile driving to ensure that marine mammals are not injured by the proposed construction activities (see Proposed Monitoring and Reporting section below).

In addition, WSF will implement power down or shutdown measures whenever Southern Resident killer whales (SRKWs) are present in the vicinity of the project area and make the best efforts not to take SRKWs.

Finally, if the number of any allotted marine mammal takes reaches the limit under the IHA (if issued), WSF will implement shutdown and power down measures if such species/stock of animal approaches the 120 dB Level B harassment zone.

2.3.5 MONITORING AND REPORTING

Under the Preferred Alternative (Alternative 2), NMFS would require the WSF to undertake the following monitoring activities for the Bremerton Ferry Terminal wingwalls replacement project in Washington State. The reporting requirements described in Section 2.3.5.3 would also be implemented under Alternative 2.

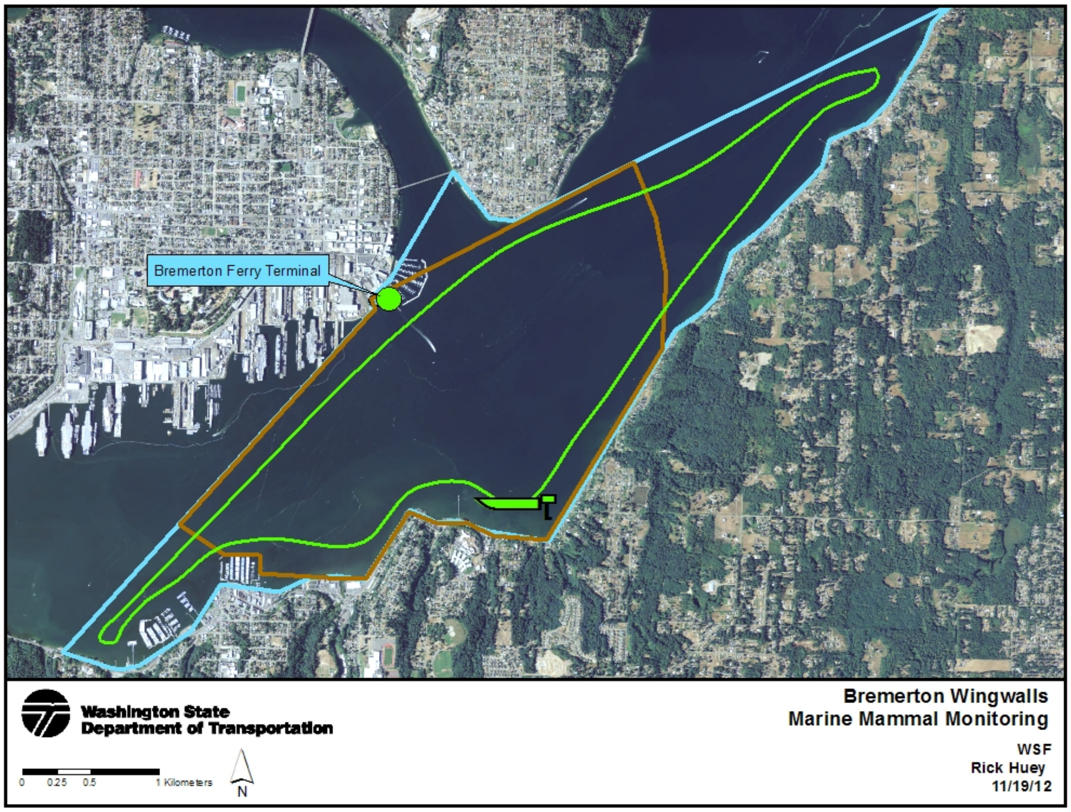

Figure 2-1. Bremerton Ferry Terminal monitoring zone (blue line bounded area). Orange line shows the 120-dB ensonified zone, and the green line is the vessel survey route.

2.3.5.1 Marine Mammal Observers

WSF will employ qualified protected species observers (PSOs) to monitor the 120 dB re 1 µPa (rms) for marine mammals. Qualifications for marine mammal observers include:

- Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance. Use of binoculars may be necessary to correctly identify the target.

- Advanced education in biological science, wildlife management, mammalogy or related fields (Bachelor's degree or higher is preferred, but not required).

- Experience or training in the field identification of marine mammals (cetaceans and pinnipeds).

- Sufficient training, orientation or experience with the construction operation to provide for personal safety during observations.

- Ability to communicate orally, by radio or in person, with project personnel to provide real time information on marine mammals observed in the area as necessary.

- Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience).

- Writing skills sufficient to prepare a report of observations that would include such information as the number and type of marine mammals observed; the behavior of marine mammals in the project area during construction, dates and times when observations were conducted; dates and times when in-water construction activities were conducted; and dates and times when marine mammals were present at or within the defined ZOI.

2.3.5.2 MARINE MAMMAL MONITORING PROTOCOLS

PSOs will be present on site at all times during pile removal and driving. Marine mammal behavior, overall numbers of individuals observed, frequency of observation, and the time corresponding to the daily tidal cycle will be recorded.

The following protocols will be taken for marine mammal monitoring for WSF's proposed Bremerton Ferry Terminal construction work:

- A range finder or hand-held global positioning system device will be used to ensure that the 120 dB_{rms} re 1 μPa Level B behavioral harassment ZOI is monitored.

- A 30-minute pre-construction marine mammal monitoring will be required before the first pile driving or pile removal of the day. A 30-minute post-construction marine mammal monitoring will be required after the last pile driving or pile removal of the day. If the constructors take a break between subsequent pile driving or pile removal for more than 30 minutes, then additional pre-construction marine mammal monitoring will be required before the next start-up of pile driving or pile removal.

- If marine mammals are observed, the following information will be documented:
  - Species of observed marine mammals;
  - Number of observed marine mammal individuals;
  - Behavioral of observed marine mammals;
  - Location within the ZOI; and
  - Animals' reaction (if any) to pile-driving activities.

- During vibratory pile removal and driving, one land-based biologist will monitor the area from the terminal work site, and one boat with a qualified PSO shall navigate the ZOI in a circular path. All PSOs shall use binoculars to observe the ZOI.

- In addition, WSF will contact the Orca Network and/or Center for Whale Research to find out the location of the nearest marine mammal sightings. Sightings are called or emailed into the Orca Network and immediately distributed to other sighting networks including: the Northwest Fisheries Science Center of NOAA Fisheries, the Center for Whale Research, Cascadia Research, the Whale Museum Hotline, and the British Columbia Sightings Network.

- Marine mammal occurrence information collected by the Orca Network also includes detection by the following hydrophone systems: (1) The SeaSound Remote Sensing Network, a system of interconnected hydrophones installed in the marine environment of Haro Strait (west side of San Juan Island) to study killer whale communication, underwater noise, bottom fish ecology, and local climatic conditions, and (2) A hydrophone at the Port Townsend Marine Science Center that measures average underwater sound levels and automatically detects unusual sounds.

2.3.5.3 Reporting Requirements

WSF will provide NMFS with a draft monitoring report within 90 days of the conclusion of the proposed construction work. This report will detail the monitoring protocol, summarize the data recorded during monitoring, and estimate the number of marine mammals that may have been harassed.

If comments are received from the NMFS Northwest Regional Administrator or NMFS Office of Protected Resources on the draft report, a final report will be submitted to NMFS within 30 days thereafter. If no comments are received from NMFS, the draft report will be considered to be the final report.

In the unanticipated event that WSF's construction activities clearly cause the take of a marine mammal by injury (Level A harassment), serious injury or mortality (e.g., ship-strike, gear interaction, and/or entanglement), WSF shall immediately cease construction operations and immediately report the incident to NMFS OPR and NMFS NWRO.

2.4 Alternatives Considered But Eliminated From Detailed Study

NMFS considered an alternative where NMFS issues an IHA without the mitigation measures described in Alternative 2–Issuance of an IHA with Mitigation (the Preferred Alternative). This alternative, however, failed to meet the statutory and regulatory requirements of the MMPA for an IHA (e.g., negligible impact, effecting the least practicable adverse impact, and monitoring and reporting of such takings) because MMPA requires certain monitoring and mitigation measures to be implemented to reduce the effects on marine mammals. Accordingly, NMFS did not consider this alternative further.

CHAPTER 3 AFFECTED ENVIRONMENT

This chapter presents baseline information necessary for consideration of the alternatives, and describes the resources that would be affected by the alternatives, as well as environmental components that would affect the alternatives if they were to be implemented. The effects of the alternatives on the environment are discussed in Chapter 4.

The Bremerton Ferry Terminal is located in the city of Bremerton, Kitsap County, in Northwest Washington State. The following descriptions focus on physical features, major living marine resources—their biology, habitat, and current status of the resource—with special emphasis on the six species of marine mammals that may be present in the in-water marine habitat during project pile removal and driving activities.

The following descriptions focus on physical features, major living marine resources—their biology, habitat, and current status of the resource—with special emphasis on the six species of marine mammals that may be present in the in-water marine habitat during project pile removal and driving activities.

3.1 PHYSICAL ENVIRONMENT

3.1.1 BREMERTON

The proposed wingwalls replacement project is located in Bremerton (Figure 3-1), Washington. Bremerton, the largest city in Kitsap County, is located on the Kitsap Peninsula and is bounded on the southeast and east by Sinclair Inlet and the strait of Port Orchard respectively. The city is divided by the Port Washington Narrows, a strait spanned by two bridges that connects Dyes Inlet, which lies northwest of the city, to Port Orchard. The part of the city northeast of the narrows is referred to as East Bremerton. The city has a total area of 32.29 square miles (83.63 km^2), of which, 28.41 square miles (73.58 km^2) is land and 3.88 square miles (10.05 km^2) is water.

Annual precipitation in Bremerton area is approximate 39.98 in, with average annual snowfall between 0 and 15 in per winter season. Average summer temperatures are high in the upper 70s to around 80^{o}F and average winter lows at 45^{o}F daytime and 34^{o}F night.

3.1.2 AMBIENT SOUND

The need to understand the marine acoustic environment is critical when assessing the effects of anthropogenic noise on marine wildlife. Sounds generated by coastal construction such as pile driving and dredging within the marine environment can affect its inhabitants' behavior (e.g., deflection from loud sounds) or ability to effectively live in the marine environment (e.g., masking of sounds that could otherwise be heard). Understanding of the existing environment is necessary to evaluate the potential effects of oil and gas exploration and development.

Ambient sound levels are the result of numerous natural and anthropogenic sounds that can propagate over large distances and vary greatly on a seasonal and spatial scale. These ambient sounds occupy all frequencies and contributions in ocean soundscape from a few hundred Hz to 200 kHz (NRC 2003). In typical urban coastal waters such as the one at the proposed action area, the main sources of underwater ambient sound would be associated with:

- Wind and wave action
- Precipitation
- Vessel and industrial activities
- Biological sounds (fish, snapping shrimp)

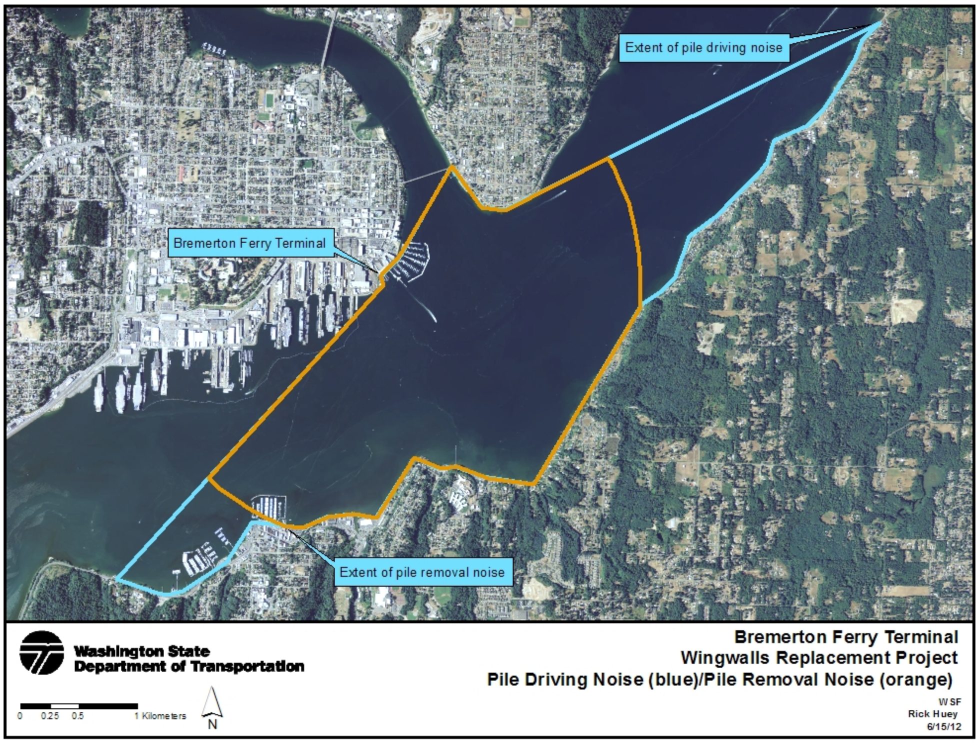

Figure 3-1. Bremerton Ferry Terminal location.

The contribution of these sources to the background sound levels differs with their spectral components and local propagation characteristics (e.g., water depth, temperature, salinity, and ocean bottom conditions). In deep water, low-frequency ambient sound from 1–10 Hz mainly comprises turbulent pressure fluctuations from surface waves and the motion of water at the air-water interfaces. At these infrasonic frequencies, sound levels depend only slightly on wind speed. Between 20–300 Hz, distant anthropogenic sound (ship transiting, etc.) dominates wind-related sounds. Above 300 Hz, the ambient sound level depends on weather conditions, with wind- and wave-related effects mostly dominating sounds. Biological sounds arise from a variety of sources (e.g., marine mammals, fish, and shellfish) and range from approximately 12 Hz to over 100 kHz. The relative strength of biological sounds varies greatly; depending on the situation, biological sound can be nearly absent to dominant over narrow or even broad frequency ranges (Richardson *et al.* 1995).

No ambient noise measurement has been done in the Bremerton area.

3.1.3 Essential Fish Habitat

The action areas includes marine habitat, and is within designated Pacific groundfish, and coastal pelagic and Pacific salmonid EFHs. These three EFHs include habitats for 44 groundfish species, 3 salmon species, and 5 coastal pelagic species. As explained above in

Section 1.2.5.4, however, NMFS has determined that issuance of this IHA will not have an adverse impact on any EFH; and therefore a detailed discussion of EFHs is not included.

3.2 BIOLOGICAL ENVIRONMENT

3.2.1 MARINE FLORA

Marine flora consists of floating algae (phytoplankton) and attached plants which include both algae and vascular plants such as eelgrass. As described by Gustafson *et al.* (2000), phytoplankton productivity in the open waters of the central basin of Puget Sound is dominated by intense blooms of microalgae beginning in late April or May and recurring through the summer. Annual primary productivity in the central basin of the Sound is about 465 grams of carbon per square meter. This high productivity is due to intensive upward transport of nitrate by the estuarine mechanism and tidal mixing.

Substrates for attached plants in the action areas consists of riprap along the shorelines of Port Washington Narrows, Sinclair and Dyes Inlets as well as tide flats, marshes, and a shallow lagoon. The subtidal and intertidal habitat in and around the action area consists mostly of sand with a little mixed mud, clay, and wood substrates. The subtidal and intertidal areas of these waters are dominated by brown and green algae as well as eelgrass beds. Eelgrass grows in the muddy or sandy substrate of the shallow subtidal zone, down to a depth of approximately 7 m (22 ft), and forms a complex and highly productive ecosystem that is an important component of nearshore habitat in estuaries and bays throughout Puget Sound. Eelgrass meadows are biologically rich habitats, sheltering a diverse group of fish and invertebrate species that are dependent on eelgrass beds for food resources and cover (Phillips 1984). Gammarid amphipods are dependent on ingesting eelgrass particles for their growth and development and are preferred prey items of juvenile salmon. Epibenthic harpacticoid copepods are an important food resource for juvenile chum salmon and were reported to be four times more prevalent in a stand of eelgrass compared to a neighboring habitat without eelgrass (Simenstad and Kenney 1978). Pacific herring, another commercially important species, utilize eelgrass beds as a spawning substratum to deposit their eggs and as a nursery ground for young herring. Apart from Pacific herring and juvenile salmon, numerous other commercially and non-commercially important fish are associated with eelgrass meadows. In addition to supporting fish fishery resources, eelgrass beds also support many invertebrate fishery resources like clams, oysters, shrimps, crabs, etc.

3.2.2 MARINE INVERTEBRATES

3.2.2.1 PELAGIC INVERTEBRATES

Pelagic habitat comprises the water column and is defined by the depth to which light can penetrate, or the photic zone, allowing photosynthesis to occur with existing marine flora. Depth of this layer varies seasonally and locally, generally ranging to depths of 20 to 80 m (66 to 262 ft) (NOAA 1993). Light, temperature, and nutrients all determine the occurrence and succession of zooplankton species (Gustafson *et al.* 2000). Zooplankton exhibit daily vertical migration patterns and will go deeper than the photic zone. However, during the high phytoplankton production months of spring and summer, zooplankton tend to stay near their food source.

Zooplankton such as ciliates, copepods, euphausiids, and pelagic tunicates as well as larval stages of crabs, worms, mollusks, and barnacles occur in the pelagic habitat of the action area in and around the Port Washington Narrows and Sinclair and Dyes Inlets. The most dominant zooplankton species in Puget Sound are calanoid copepods as well as cnidarians and polychaetes that thrive throughout the year (Gustafson *et al.* 2000).

3.2.2.2 SUBTIDAL BENTHIC INVERTEBRATES

Subtidal benthic or bottom habitat is defined as depths not uncovered by the tides (i.e., below the level of the extreme-low-spring tide at a given location). The most abundant (in terms of biomass) bivalve in the subtidal benthic habitat is the Pacific geoduck. Geoducks occur in soft bottom habitat from the intertidal zone to the deep subtidal zone. In Puget Sound they have been found as deep as 110 m (360 ft). Although a highly productive and popular fishery, geoduck associated with eelgrass beds are not harvested out to a 1-m (2-ft) buffer zone around rooted eelgrass to protect the eelgrass beds (Bradbury *et al.* 2000).

Other marine invertebrate species utilizing the sand/mud habitat in and around the Port Washington Narrows action area and surrounding waters include cockles and horse mussel. Other bivalves found in the area include numerous species of hardshell clams such as piddocks, littleneck clam, butter clam, and horse clam (WDFW 2004). Dungeness crab occurs throughout Puget Sound, both intertidally and subtidally on a variety of substrates; juveniles and subadults are often associated with eelgrass (Fisher and Velasquez 2008).

3.2.2.3 INTERTIDAL BENTHIC INVERTEBRATES

In addition to their utilization of subtidal habitat, clams and cockles inhabit the intertidal areas within the vicinity of the action area. Other invertebrates found in the intertidal and subtidal areas include shrimp, tunicates, crab, barnacles, sun star, sea cucumber, and sea anemones. Clams and cockles as well as crab, oyster, sea anemones, and barnacles are most associated with a hard substrate bottom. Sea anemones and barnacles adhere to rocks and other hard structures found in the intertidal areas.

3.2.3 FISH SPECIES

3.2.3.1 NON-ESA-LISTED FISH SPECIES

3.2.3.1A Coastal Pelagic and Forage Fish Species

Pelagic fishes inhabit the open, upper portion of marine waters rather than waters adjacent to land or near the sea floor. Some pelagic fish rear in intertidal or freshwater environments for periods of time, but move into marine waters for two to five years until they are sexually mature. When ready to spawn, these fish move to waters closer to shore. Predominant pelagic fish species found in marine waters adjacent to Washington include: Pacific herring, Pacific sand lance, surf smelt, Pacific sardine, northern anchovy, and eulachon. These species are considered "forage fish" and are important prey for various fish, marine mammals, and seabirds and are also harvested in commercial, recreational, and Tribal usual and accustomed fisheries. Although technically anadromous, eulachon are discussed under the pelagic fish section because of their extensive pelagic life stage and their role as forage fish for other marine animals.

Pacific Herring Most Washington State herring stocks spawn in intertidal and shallow subtidal areas on hard bottom, algae, and other substrates from late January through early April, and hatching of larvae occurs 10 to 14 days later. The larvae become part of the pelagic community and drift with the ocean currents. Puget Sound herring stocks spend their first year in Puget Sound (Bargmann 1998). Some herring stocks spend their entire lives within Puget Sound (“resident stocks”) while other stocks (“migratory stocks”) summer in the coastal areas of Washington and southern British Columbia (Trumble 1983).

Herring stocks are defined by spawning grounds. At least 18 stocks spawn inside Puget Sound and one stock spawns on the Washington coast in central Willapa Bay. The Washington State Department of Fish and Wildlife’s (WDFW’s) ongoing annual assessment survey results (which indicate stock specific age structures and strong site specificity, spawn timing, and prespawner holding area characteristics) support the assumption of stock autonomy for Puget Sound herring. Therefore, conservation of herring spawning habitat and minimizing disturbance in the prespawning holding areas is key to the preservation of the herring stocks inside Puget Sound. Herring stock assessment data are very useful for localized habitat management and planning. The Pacific herring is of considerable interest in the Puget Sound region because of the species' value as forage for other fish, seabirds, and marine mammals; its popularity as recreational fishing bait; its significance to local commercial and Tribal usual and accustomed fisheries; and its importance as an indicator of the general “health and productivity” of Puget Sound (WDFW 1997).

Sand Lance The Pacific sand lance is widespread and can be found from California to Alaska and across the Bering Sea to Japan. Sand lance are found from the intertidal zone to approximately 200 m (656 ft) deep and feed in the upper water column during the day and bury in the sand substrate during the night (Hobson 1986). Puget Sound sand lance populations appear to be obligatory upper intertidal spawners, depositing their eggs in sand-gravel substrates between the mean high-tide line and about 2 m (5 ft) in tidal elevation (WDFW 1997). Spawning takes place annually from approximately the beginning of November through mid-February. Individual broods of eggs incubate in the beach substrate for about 1 month, after which time the larvae are a common component of the nearshore plankton in many parts of Puget Sound.

Several spawnings may occur at any given site during the November to February spawning season (Bargmann 1998). Sand lance spawning activity appears to be distributed throughout the shorelines of the Puget Sound basin.

Sand lance are an important part of the trophic link between zooplankton and larger predators in the local marine ecosystem. Like all forage fish, sand lance are a significant component in the diet of many economically important resources in Washington. On average, 35 percent of juvenile salmon diets are composed of sand lance. In particular, 60 percent of the diet of juvenile Chinook are composed of sand lance. Other economically important species, such as Pacific cod, Pacific hake, and dogfish feed heavily on juvenile and adult sand lance (WDFW 1997).

Sand lance populations are widespread within Puget Sound, the Strait of Juan de Fuca, and the coastal estuaries of Washington. They are most commonly noted in more localized areas, such as the eastern Strait and Admiralty Inlet. However, WDFW plankton surveys and ongoing spawning habitat surveys suggest that there are very few if any bays and inlets in the Puget Sound basin that do not support sand lance spawning activity. Sand lance are not regularly harvested for bait or human consumption in

Washington and when harvested are commonly dip netted for salmon sport bait. The stock status of sand lance within Washington is unknown (WDFW 1997).

Surf Smelt Surf smelt occur from Southern California to central Alaska and have an entirely marine/estuarine life history. Surf smelt are very widespread in Washington, occurring in the outer coastal estuaries, the shores of the Olympic Peninsula, and the greater Puget Sound basin from Olympia to the U.S.-Canada border (Bargmann 1998).

Surf smelt within the Puget Sound basin are somewhat unusual in having an extended spawning season, with some areas receiving several months of spawning activity centered in either the summer months or a fall-winter period. Surf smelt deposit adhesive, semitransparent eggs on beaches, which have a specific mixture of coarse sand and pea gravel. Larvae emerge after approximately 11 to 16 days in the summer months and 27 to 56 days in the winter months. After emerging, they are planktonic for a period of time before settling in estuaries and nearshore waters for several months. Juvenile surf smelt rear in the nearshore waters throughout Puget Sound. Spawning maturity may be reached during their first year of life, although the majority reach spawning maturity during their second year. Surf smelt do not die after spawning and may spawn during successive seasons (WDFW 1997).

Surf smelt are harvested in commercial, recreational and Tribal usual and accustomed fisheries in Washington and are currently "passively managed" by the WDFW. Stock status of surf smelt within Washington is unknown (WDFW 1997).

3.2.3.1B Groundfish

Groundfish are marine fish species that live near or on the bottom of marine waters for most of their adult lives. These include groundfish species such as rockfish, flatfish (flounder, sole, halibut), roundfish (greenlings, ling cod, Pacific cod, sablefish, walleye pollock, Pacific hake), sharks, and skates. There are over 90 species of groundfish on the Pacific coast of the U.S. managed under the Pacific Coast Groundfish Fishery Management Plan (PFMC 2004), many of which support important commercial, recreational and Tribal usual and accustomed fisheries. There are at least 150 species of groundfish in Puget Sound (Palsson *et al.* 1998).

While the majority of groundfish on the west coast of Washington are harvested in the commercial trawl fishery, both recreational and Tribal usual and accustomed fisheries also harvest groundfish. Washington coastal treaty Indian tribes (Hoh, Makah, Quileute and the Quinault Indian Nation) hold formal allocations in their usual and accustomed fishing areas for sablefish, Pacific hake, and black rockfish.

A preliminary 2002 assessment of groundfish stocks has shown that over half of key groundfish stocks in South Puget Sound are at or below average abundance (Puget Sound Water Quality Action Team [PSWQAT] 2002). Some of the species that once dominated the catches of recreational and commercial fishers are now at depressed or critical abundances, resulting in historic low catches and reduced fisheries (Palsson *et al.* 1998). Additionally, eight species of West Coast groundfish have recently been declared overfished including widow rockfish, canary rockfish, yelloweye rockfish, darkblotched rockfish, bocaccio, Pacific ocean perch, lingcod, and cowcod.

Cod, Sablefish, and Lingcod Pacific cod are found in continental shelf and upper continental slope waters and are widely distributed in the coastal North Pacific, from the Bering Sea and Alaska south to Santa Monica, California in the east and the Sea of Japan in the west (Hart 1973; Department of Fisheries and Oceans Canada [DFOC] 2001).

Garrison and Miller (1982) reported that all Pacific cod life stages are found in various bays in Puget Sound and in the Strait of Juan de Fuca. Adults occur as deep as 875 m (2,871 ft), but the majority occurs from 50 to 300 m (164 to 984 ft). They are typically associated with mixed-coarse and mixed-fine sand substrata on the bottom of Puget Sound (Matthews 1987). Pacific cod migrate from shallow waters in spring and summer to deeper waters in fall and winter. Sexual maturity is reached by 2 to 3 years of age (DFOC 2001) and spawning occurs at depths of 40 to 265 m (131 to 869 ft) from late fall to early spring in Puget Sound (Garrison and Miller 1982). Eggs and larvae are found over the continental shelf between Washington and central California from winter through summer (Dunn and Matarese 1987; Palsson 1990). Small juveniles usually settle into intertidal and subtidal habitats, commonly associated with sand and eel grass, and gradually move into deeper water with increasing age (Miller *et al.* 1976; NOAA 1990).

The status of Pacific cod in Puget Sound is based primarily on recreational and commercial fishery statistics since 1970 and bottom trawl surveys that were conducted throughout Puget Sound in 1987, 1989, and 1991. A biological review identified several concerns: 1) the apparent loss of the major, known spawning locations in Puget Sound; 2) general synchronicity in declining trends in cod abundance from Puget Sound to Southeast Alaska; and 3) relatively little quantitative information or understanding about the effects of potential risk factors (Gustafson *et al.* 2000).

Sablefish inhabit shelf and slope waters to depths greater than 1,494 m (4,900 ft) from central Baja California to Japan and the Bering Sea. Spawning occurs from January to March along the continental shelf at depths greater than 1,000 m (3,281 ft). Larval sablefish are found in surface waters over the shelf and slope from April to May. Juveniles are commonly encountered in shallower waters, including Puget Sound (Hart 1973).

Lingcod are demersal fish that range from Baja California to Kodiak Island in the Gulf of Alaska (Hart 1973). In Puget Sound, adult lingcod live on and adjacent to rocky bottoms and reefs while juveniles are found on sandy bottom areas adjacent to rocky reefs (Matthews 1987). Spawning occurs between December and March with eggs laid in rocky crevices in shallow areas with strong water motion. After dispersing from their nests, larvae spend two months in pelagic habitat. In late spring-early summer, juveniles move to demersal habitats and settle in shallow-water vegetated habitats (Cass *et al.* 1990; West 1997). It is likely that juveniles use nearshore habitats for shelter and feeding.

Flatfish At least 13 species of flatfish occur in Washington waters and include the Pacific halibut, butter sole, rock sole, curlfin sole, Dover sole, flathead sole, English sole, petrale sole, sand sole, rex sole, starry flounder, and Pacific sanddab. Most flatfish are demersal species associated with shallow, soft-bottom (sand and mud) habitats in Puget Sound and Washington coast waters (Emmett *et al.* 1991). They spawn offshore between September and April (Kruse and Tyler 1983). Larvae are found in nearshore habitats between March and May. Juveniles are found throughout the year in gravel, sand-eelgrass, and mud-eelgrass habitats. English sole is the most numerous flatfish in Puget Sound.

Sharks and Skates Species of sharks and skates that are known to occur in Washington waters include the spiny dogfish, big skate, and longnose skate. The spiny dogfish occurs worldwide in temperate seas and on the Pacific Coast occurs from the Aleutian Islands to central Baja. It is frequently encountered over rocky reefs up to 900 m (2,953 ft) deep and is known to inhabit estuarine, coastal, and offshore waters. Tagging studies have indicated that they are capable of long migrations and have been documented to travel 7,000 km (4,350 mi) from British Columbia to Japan. The spiny dogfish is ovoviviparous (eggs or embryos develop inside the maternal body, but do not receive nutritive or other metabolic aids from the parent; offspring are released as miniature adults). They have a slow maturity rate (around 12 years) which makes them highly vulnerable to overfishing (Elasmodiver 2006).

The big skate is found in temperate waters of the eastern Pacific Ocean including the eastern Bering Sea and Aleutian Islands, west to Unalaska Island and south to Baja, California. It inhabits waters from the intertidal to depths of 120 m (394 ft) and can be found along the coast in estuaries, bays, and over the continental shelf (Florida Museum of Natural History 2006).

The longnose skate was once frequently encountered in British Columbia and Washington but are now uncommon from Alaska to Southern California. The longnose skate is generally found on gently sloping sand and mud bottoms at depths of 20 to 600 m (66 to 1,968 ft) and inhabits coastal areas, estuaries, bays, and continental shelves (Elasmodiver 2006).

Sharks and skates form part of the demersal and near-bottom fish communities in Puget Sound and are not classified as food fish. These species are often caught as bycatch in groundfish fisheries. Stock status of these species in Washington is unknown.

3.2.3.1C Non-ESA-Listed Salmonids

Non ESA-listed salmonid species that are known to inhabit streams flowing into Port Orchard Reach near the action area include chum and Coho salmon (WDFW 2004).

Chum salmon within the vicinity of the action area are considered to be part of the Dyes Inlet/Liberty Bay fall chum stock and are found in Big Scandia, Little Scandia, and Crouch creeks, as well as in an unnamed stream located north of the action area. Other stocks of chum might be present in the action area during their migrations to and from natal streams. The Dyes Inlet/Liberty Bay fall chum stock is considered to be healthy. Escapement estimates based on live spawner counts in Chico, Barker, Dogfish, Clear, Steele, and Scandia creeks have ranged from 5,266 in 1997 to 75,920 in 2003 (WDFW 2003).

Puget Sound fall-run chum enter their natal streams in October and November and spawn from November through January. Out-migrating juvenile fall-run chum are found in nearshore marine waters from January through the end of July. Adult Coho return from the marine environment from early August to the end of December, with spawning occurring from late October to late December. Juvenile Coho out-migration to estuarine areas occurs from mid-February through September, with a few individuals remaining as late as November (Williams *et al.* 1975; WDFW 2003; Dorn and Best 2005; May *et al.* 2005; Fresh *et al.* 2006).

Coho salmon near the action area are considered to be part of the East Kitsap Coho stock due to their distinct spawning distribution and common history of hatchery releases, mainly from Minter Creek Hatchery (WDFW 2003). Coho populations are found in Big Scandia, Little Scandia, and Crouch creeks and in two unnamed streams on Bainbridge Island. Other Coho stocks are also likely to move through the action area. Escapement estimates for the East Kitsap Coho stock have ranged from 800 in 1992 to 18,000 in 2000. This stock is considered to be healthy.

No known populations of anadromous cutthroat or bull trout/Dolly Varden are present within the action area, although resident populations of cutthroat trout are found in two unnamed streams north of the WSF action area (WDFW 2003, 2004; PSMFC 2006).

The status of the East Kitsap winter steelhead stock is unknown (WDFW 2003).

3.2.3.2 ESA-LISTED FISH SPECIES

Two ESA-listed salmonid and three ESA-listed rockfish species potentially occur within the Keyport action area: Puget Sound Chinook Salmon ESU, Puget Sound Steelhead Trout Distinct Population Segment (DPS), Puget Sound/Georgia Basin yelloweye rockfish DPS, Puget Sound/Georgia Basin canary rockfish DPS, and Puget Sound/Georgia Basin bocaccio DPS.

Puget Sound Chinook Salmon ESU Chinook salmon occur in the action area as both adults and as juveniles. Chinook salmon spawning has been documented in Chico Creek, Clear Creek and other tributary streams to Dyes Inlet, and Blackjack Creek and Gorst Creek, tributaries to Sinclair Inlet (WDFW 2008). These spawning subpopulations are considered part of the South Puget Sound Chinook salmon stock defined by the WDFW and Western Washington Treaty Tribes (Tribes). This stock is classified as being of hatchery origin and not self-sustaining based on the typical habitat conditions present in these tributary habitats (WDFW 2002). It is nonetheless considered part of the ESU because individual spawning populations are supported in part by natural production. Spawning typically occurs from late September through October (WDFW 2002), but staging adult Chinook salmon are likely to be present in the action area as early as the last week of August. The Kitsap Pogie Club hosts an annual salmon fishing derby in mid-August targeting hatchery reared Chinook salmon staging in Sinclair Inlet before returning to spawn in Gorst Creek.

Juvenile Chinook salmon are known to utilize both nearshore and mid-water habitats throughout Sinclair Inlet, Dyes Inlet, and the PWN. Fresh *et al.* (2006) studied marine habitat utilization weekly between February and September in 2001 and 2002 using beach seines, mid-water seines, and mid-water tow nets. They found juvenile Chinook salmon at sampling sites located within the action area as early as March and as late as September, with peak abundance in May and June. The majority of these fish are of hatchery origin from outplants in local streams. However, tagged hatchery origin fish from other rivers in the region including the Nisqually, Puyallup, Skykomish, and Samish River systems, tributaries to the Strait of Juan de Fuca, and even the Fraser River were also captured during sampling. Assuming that wild origin fish display similar habitat use, the action area is likely to be utilized by juvenile Chinook salmon from several populations distributed throughout the ESU.

Puget Sound Steelhead Trout DPS Puget Sound steelhead occur in the action area as adults migrating to spawning habitats and as outmigrant juveniles. Steelhead are known to spawn in several tributary streams in the vicinity, including Gorst, Ross, Anderson, and Blackjack Creeks in Sinclair Inlet; and Chico, Clear, and Barker Creeks in Dyes Inlet. The WDFW considers these discrete spawning subpopulations to be part of the South Sound - East Kitsap Winter Steelhead stock (WDFW 2002). This stock is of native origin and supported entirely by wild production. These populations are not routinely monitored for abundance and productivity and their status is rated as unknown (WDFW 2002). Spawning typically occurs from February through mid-April, meaning that adult fish will be migrating through the action area from late January through early April.

The majority of juvenile Puget Sound steelhead migrate to marine waters from early April through mid-May as two-year old smolts, typically 140 to 160 mm in length (NMFS 2005). The inshore migration patterns of steelhead in Puget Sound are not well understood (NMFS 2005); however, an increasing body of evidence indicates that juveniles migrate rapidly to offshore marine habitats upon exiting freshwater. For example, Welch *et al.* (2004) and Melnychuk *et al.* (2007) found that tagged Keogh River steelhead smolts migrated rapidly from freshwater release areas to open marine waters, the majority moving into open water habitats within one week. Oregon Coast steelhead has also been shown to migrate rapidly to offshore environments (Pearcy 1992).

Studies of Puget Sound steelhead populations have demonstrated similar behavior. Berger and Ladley (2006) studied the migratory patterns of juvenile Puyallup River steelhead using acoustic telemetry. They found that steelhead smolts spent little time in estuarine and nearshore habitats, migrating rapidly towards the open ocean upon leaving their home river. The majority of tagged fish were detected at distant receiver arrays (i.e., West Point, Dalco Passage, Admiralty Inlet, and the Strait of Juan de Fuca) within 6 to 30 days of release near the mouth of the White River. Given the similarity in behavior demonstrated by steelhead populations throughout the Pacific Northwest, it is reasonable to conclude that juvenile steelhead are unlikely to be present in the action area beyond mid-June. Data on juvenile steelhead utilization of nearshore and midwater habitats in Sinclair Inlet are consistent with these observations. Fresh *et al.* (2006) conducted beach and midwater surveys in Sinclair Inlet using a variety of capture techniques. Only four of the over 20,000 juvenile salmonids captured in two years of effort were steelhead, indicating that offshore migration is rapid and nearshore habitat use by this species is limited at best.

Rockfish Rockfish on the Pacific coast typically inhabit the continental shelf and upper slope regions and consequently are sometimes described as nearshore, shelf, or slope rockfish. As adults, rockfish inhabit rocky reef habitats, slopes, pinnacles, pilings, or submerged debris and typically remain within 31 to 50 m (100 to 164 ft) of their preferred habitat (Matthews 1990). Rockfish are long-lived and sexual maturity is attained between 5 and 20 years of age. Spawning for most species generally takes place in the early spring (April) or late fall. Once hatched (late winter to mid-summer) the juvenile larvae form part of the pelagic community for up to 3 years and use nearshore habitats. Due to their long lives and late sexual maturity, rockfish are extremely susceptible to over harvest and stock depletion. The spawning potential of rockfish in

Puget Sound has declined by approximately 75 percent since the historic peak levels observed during the 1970s (PSWQAT 2002).

On April 28, 2010, NMFS listed the Puget Sound/Georgia Basin DPSs of yelloweye rockfish and canary rockfish as threatened, and listed the Puget Sound/Georgia Basin DPS of bocaccio as endangered under the ESA (72 FR 2276; April 28, 2010). The listing of each species will become effective on July 27, 2010. These DPSs include all yelloweye rockfish, canary rockfish, and bocaccio found in waters of the Puget Sound, the Strait of Georgia, and the Strait of Juan de Fuca east of Victoria Sill.

Yelloweye rockfish within the Puget Sound/Georgia Basin (in U.S. waters) are very likely the most abundant within the San Juan Islands region of the DPS. Though there is a lack of a reliable population-census within the regions of Puget Sound Proper, the San Juan region has the most suitable rocky benthic habitat (Palsson *et al.* 2009) and historically was the area of greatest angler catches (Moulton and Miller 1987). Productivity for yelloweye rockfish is influenced by long generation times that reflect intrinsically low annual reproductive success. Natural mortality rates have been estimated from 2 - 4.6% (Yamanaka and Kronlund 1997). Productivity may also be particularly impacted by Allee effects. As adults have been removed by fishing, the density and proximity of mature fish is decreased. Adult yelloweye typically occupy relatively small ranges (Love *et al.* 2002), and may not move to find suitable mates. Maternal effects on yelloweye rockfish productivity within the DPS are similar to those previously described for rockfish generally.

Historically the South Puget Sound was thought to be a population stronghold for the canary rockfish within the DPS, but it appears to be greatly depleted (Drake *et al.* 2010). Natural annual mortality ranges from six to nine percent (Methot and Stewart 2005; Stewart 2007). Life history traits suggest intrinsically slow growth rate and low rates of productivity for this species, specifically its age at maturity, long generation time and its maximum age (84 years) (Love *et al.* 2002). Past commercial and recreational fishing removals may have depressed the DPS to a threshold beyond which optimal productivity is unattainable (Drake *et al.* 2010). Maternal effects on canary rockfish productivity within the DPS are similar to those previously described for rockfish.

Bocaccio within the Puget Sound/Georgia Basin were historically most common within the South Sound and Central Sound regions (Drake *et al.* 2010), with just several documented occurrences within Hood Canal and none within the San Juan region. Though bocaccio were never a predominant segment of the multi-species rockfish population within the Puget Sound/Georgia Basin (Drake *et al.* 2010), their present-day abundance is likely a fraction of their pre-contemporary fishery abundance. Bocaccio may be absent in significant segments of their formerly-occupied habitat; from 1998 to 2008 fish were reported by anglers in only one region of the DPS. Productivity is driven by high fecundity and episodic recruitment events, largely correlated with environmental conditions, thus bocaccio populations do not follow consistent growth trajectories and sporadic recruitment drives population structure (Drake *et al.* 2010). Natural annual mortality is approximately 15% (Tolimeri and Levin 2005). Demographically, this species demonstrates some of the highest recruitment variability among rockfish species, with many years of failed recruitment being the norm (Tolimieri and Levin 2005). Given their severely reduced abundance, Allee effects may be particularly acute for bocaccio, even considering the propensity of some individuals to move long distances and potentially find mates.

Relevance of the Environmental Baseline Condition to Species and Critical Habitat Status

The degraded condition of habitat in the action area undermines function in support of the Puget Sound Chinook salmon or Puget Sound steelhead life histories expressed in the Port Washington Narrows. In general, the status of Puget Sound Chinook salmon and Puget Sound steelhead as threatened species is, in part, a function of declining conditions across the range of key habitats. With regard to nearshore marine habitats, various anthropogenic features, such as modified shorelines, modified bathymetry, overwater structures, disruption of hydrologic and sediment transport processes, habitat fragmentation, and degraded water quality have negatively influenced the biotic features necessary to support healthy populations of these species. While other factors, such as ocean conditions, harvest levels, and natural mortality from predation and disease also influence species status, the baseline conditions within the action area contribute to the net effect of depressing population viability. This effect is primarily realized through depressed juvenile survival during early marine rearing, which in turn is reflected in population productivity.

These factors also contribute to the degraded condition of Puget Sound Chinook salmon PCE 5 in the vicinity of the action area. Specifically, numerous overwater structures and shoreline development have degraded habitat suitability for juvenile Chinook salmon. Shallow water nearshore habitats have been eliminated in many areas, and numerous overwater structures pose a partial migration barrier through physical and shading effects. Shoreline development has resulted in the removal of submerged and overhanging vegetation and woody debris in many areas. Degraded water quality causes behavioral and sublethal injury responses that reduce individual fitness of Chinook salmon for their present and subsequent life histories. Additionally, these conditions effect the productivity of the salmonid prey base, decreasing the availability of food, having further, indirect effects on individual fitness. Despite these limiting factors, the action area and vicinity still provide important habitat functions. The action area is characterized by contiguous shallow water habitat and abundant forage fish and other prey resources, creating important transitional and migratory habitat for juvenile salmonids.

Critical habitat has not yet been designated for the listed yelloweye rockfish, canary rockfish, or bocaccio DPSs.

3.2.4 MARINE MAMMALS

The marine mammal species under NMFS jurisdiction most likely to occur in the proposed construction area include Pacific harbor seal (*Phoca vitulina richardsi*), California sea lion (*Zalophus californianus*), Steller sea lion (*Eumetopias jubatus*), killer whale (*Orcinus orca*), gray whale (*Eschrichtius robustus*), and humpback whale (*Megaptera novaeangliae*).

General information on the marine mammal species found in Washington inland waters can be found in Caretta *et al.* (2011), which is available at the following URL: http://www.nmfs.noaa.gov/pr/pdfs/sars/po2011.pdf. Refer to that document for information on these species. Specific information concerning these species in the vicinity of the proposed action area is provided below.

3.2.4.1 HARBOR SEAL

Harbor seals are members of the true seal family (Phocidae). For management purposes, differences in mean pupping date (Temte 1986), movement patterns (Jeffries 1985; Brown 1988), pollutant loads (Calambokidis *et al.* 1985), and fishery interactions have led to the recognition of three separate harbor seal stocks along the west coast of the continental U.S. (Boveng 1988). The three distinct stocks are: (1) inland waters of Washington State (including Hood Canal, Puget Sound, Georgia Basin and the Strait of Juan de Fuca out to Cape Flattery), (2) outer coast of Oregon and Washington, and (3) California (Carretta *et al.* 2011).

Pupping seasons vary by geographic region. For the southern Puget Sound region, pups are born from late June through September. After October 1 all pups in the inland waters of Washington are weaned.

Harbor seals, like all pinnipeds, communicate both on land and underwater. Harbor seals have the broadest auditory bandwidth of the pinnipeds, estimated by Southall *et al.* (2007) as between 75 hertz (Hz) and 75 kilohertz (kHz) for “functional” in-water hearing and between 75 Hz and 30 kHz for “functional” in-air hearing. At lower frequencies (below 1 kHz) sounds must be louder to be heard (Kastak and Schusterman 1998). Studies indicated that pinnipeds are sensitive to a broader range of sound frequencies in-water than in-air (Southall et al. 2007). Hearing capabilities for harbor seals in-water are 25 to 30 dB better than in-air (Kastak and Schusterman 1998).

Of the two pinniped species that commonly occur within the region of activity, harbor seals are the most numerous and the only one that breeds in the inland marine waters of Washington (Calambokidis and Baird 1994). In 1999, Jeffries *et al.* (2003) recorded a mean count of 9,550 harbor seals in Washington’s inland marine waters, and estimated the total population to be approximately 14,612 animals (including the Strait of Juan de Fuca). The population across Washington increased at an average annual rate of 10 percent between 1991 and 1996 (Jeffries *et al.* 1997) and is thought to be stable (Jeffries *et al.* 2003).

The nearest documented harbor seal haulout site to the Bremerton Ferry Terminal is 8.5 km north and west (shoreline distance). The number of harbor seals using the haulout is less than 100.

From July 2006 to January 2007, a consultant completed 10 at-sea surveys in preparation for replacement of the WSDOT Manette Bridge, located in Bremerton. Marine mammals were recorded during these surveys: 29 harbor seals were observed in an area approximately the same as the Bremerton wingwalls project ZOI. Seals observed outside of the Bremerton ZOI were subtracted from the total observed (36) during this project. According to the dates on harbor seal observation tags, the most seals seen in any one day is two (given that two tags cover others, the dates may be the same underneath).

From August 2010 to January 2012, marine mammal monitoring was implemented during construction of the Manette Bridge. Counts were conducted only during pile removal/driving days, not every day of the month. Counts were recorded in blocks of working days (not counts per day). The highest number of harbor seals observed was 93 over three days (10/18-20, 2011). The highest number observed during one day was 59

(10/18/2011). It was assumed that these included multiple observations of the same animal by different observers (David Evans & Assoc. Inc. 2011a; 2011b).

Harbor seals are not listed as endangered or threatened under the ESA or as depleted under the MMPA. They are not considered a strategic stock under the MMPA.

3.2.4.2 CALIFORNIA SEA LION

NMFS recognizes three stocks of California sea lion based on their geographic distribution: (1) the U.S. stock begins at the U.S./Mexico border and extends northward into Canada; (2) the Western Baja California stock extends from the U.S./Mexico border to the southern tip of the Baja California Peninsula; and (3) the Gulf of California stock, which includes the Gulf of California from the southern tip of the Baja California peninsula and across to the mainland and extends to southern Mexico (Lowry et al. 1992). California sea lions in the Washington State belong to the U.S. stock.

The U.S. stock was estimated at 296,750 in the 2011 Stock Assessment Report (SAR) and may be at carrying capacity (Carretta *et al.* 2011). The number of California sea lions in the San Juan Islands and the adjacent Strait of Juan de Fuca totaled fewer than 3,000 in the mid-1980s (Bigg 1985; Gearin *et al.* 1986). In 1994, it was reported that the number of sea lions had stabilized or decreased in some areas (Gearin et al. 1988; Calambokidis and Baird 1994). More recently, 3,000 to 5,000 animals are estimated to move into northwest waters (both Washington and British Columbia) during the fall (September) and remain until the late spring (May) when most return to breeding rookeries in California and Mexico (Jeffries et al. 2000; WSF 2013). Peak counts of over 1,000 animals have been made in Puget Sound (Jeffries *et al.* 2000).

The closest documented California sea lion haulout site to the Bremerton Ferry Terminal is the Puget Sound Naval Shipyard security barrier, located approximately 435 m SW of the ferry terminal. The next closest documented California sea lion haulout sites to the Bremerton Ferry Terminal are navigation buoys and net pens in Rich Passage, approximately nine and ten km east of the terminal, respectively. The number of California sea lions using each haulout is less than 10.

From August 2010 to February 2011, marine mammal monitoring was implemented during construction of the Manette Bridge. Counts were conducted only during pile removal/driving days, not every day of the month. Counts were recorded in blocks of working days (not counts per day). The highest number of California sea lions observed was 21 (September) over six days, an average of 3.5/day (David Evans & Assoc. Inc. 2011a; 2011b).

The Bremerton Puget Sound Naval Shipyard (PSNS) is located to the west of the Bremerton Ferry Terminal. Since November 2010, PSNS personnel have been conducting monthly counts of the number of sea lions that use the security barrier floats as a haulout. As of June 13, 2012, the highest count has been 144 observed during one day in November 2011. All are believed to be California sea lions.

California sea lions do not avoid areas with heavy or frequent human activity, but rather may approach certain areas to investigate. This species typically does not flush from a buoy or haulout if approached.

California sea lions are not listed as endangered or threatened under the ESA or as depleted under the MMPA. They are not considered a strategic stock under the MMPA.

3.2.4.3 STELLER SEA LION

Steller sea lions comprise two recognized management stocks (eastern and western), separated at 144º W longitude (Loughlin 1997). Only the eastern stock is considered here because the western stock occurs outside of the geographic area of the proposed activity. Breeding rookeries for the eastern stock are located along the California, Oregon, British Columbia, and southeast Alaska coasts, but not along the Washington coast or in inland Washington waters (Allen and Angliss 2012). Steller sea lions primarily use haulout sites on the outer coast of Washington and in the Strait of Juan de Fuca along Vancouver Island in British Columbia. Only sub-adults or non-breeding adults may be found in the inland waters of Washington (Pitcher *et al.* 2007).

The eastern stock of Steller sea lions is estimated to be between 58,334 and 72,223 individuals based on 2006 through 2009 pup counts (Allens and Angliss 2012). Washington's estimate including the outer coast is 651 individuals (non-pups only) (Pitcher et al. 2007). However, recent estimates are that 1,000 to 2,000 individuals enter the Strait of Juan de Fuca during the fall and winter months (WSDOT 2012).

Steller sea lions in Washington State decline during the summer months, which correspond to the breeding season at Oregon and British Columbia rookeries (approximately late May to early June) and peak during the fall and winter months (Jeffries *et al.* 2000). A few Steller sea lions can be observed year-round in Puget Sound/Georgia Basin although most of the breeding age animals return to rookeries in the spring and summer.

For Washington inland waters, Steller sea lion abundances vary seasonally with a minimum estimate of 1,000 to 2000 individuals present or passing through the Strait of Juan de Fuca in fall and winter months. However, the number of haulout sites has increased in recent years. The nearest documented Steller sea lion haulout site to the Bremerton Ferry Terminal are the Orchard Rocks in Rich Passage, approximately nine and ten km east of the terminal, respectively (Kitsap Transit 2012).

From July 2006 to January 2007, a consultant completed 10 at-sea surveys in preparation for replacement of the WSDOT Manette Bridge that is located in Bremerton. Marine mammals were recorded during these surveys, but no Stellar sea lions were observed (USDA 2007).

From August 2010 to February 2011, marine mammal monitoring was implemented during construction of the Manette Bridge. No Stellar sea lions were observed (David Evans & Assoc. Inc. 2011).

The Eastern Steller sea lions were listed as threatened under the Endangered Species Act (ESA). On October 23, 2013, NMFS removed the Eastern Steller sea lion from the ESA list as this stock is determined to have been recovered.

3.2.4.4 KILLER WHALE

Two sympatric ecotypes of killer whales are found within the proposed activity area: transient and resident. These types vary in diet, distribution, acoustic calls, behavior, morphology, and coloration (Baird 2000; Ford *et al.* 2000). The ranges of transient and resident killer whales overlap; however, little interaction and high reproductive isolation occurs among the two ecotypes (Barrett-Lennard 2000; Barrett-Lennard and Ellis 2001; Hoelzel et al. 2002. Resident killer whales are primarily piscivorous, whereas transients primarily feed on marine mammals, especially harbor seals (Baird and Dill 1996). Resident killer whales also tend to occur in larger (10 to 60 individuals), stable family groups known as pods, whereas transients occur in smaller (less than 10 individuals), less structured pods.

One stock of transient killer whale, the West Coast Transient stock, occurs in Washington State. West Coast transients primarily forage on harbor seals (Ford and Ellis 1999), but other species such as porpoises and sea lions are also taken (NMFS 2008a).

Two stocks of resident killer whales occur in Washington State: the Southern Resident and Northern Resident stocks. Southern Residents occur within the activity area, in the Strait of Juan de Fuca, Strait of Georgia, and in coastal waters off Washington and Vancouver Island, British Columbia (Ford *et al.* 2000). Northern Residents occur primarily in inland and coastal British Columbia and Southeast Alaska waters and rarely venture into Washington State waters. Little interaction (Ford *et al.* 2000) or gene flow (Barrett-Lennard 2000; Barrett-Lennard and Ellis 2001; Hoelzel *et al.* 2004) is known to occur between the two resident stocks.

The West Coast Transient stock, which includes individuals from California to southeastern Alaska, was estimated to have a minimum number of 354 (NMFS 2010b). Trends in abundance for the West Coast Transients were unavailable in the most recent stock assessment report (Allen and Angliss 2012).

The Southern Resident stock was first recorded in a 1974 census, at which time the population comprised 71 whales. This population peaked at 97 animals in 1996, declined to 79 by 2001 (Center for Whale Research 2011), and then increased to 89 animals by 2006 (Carretta *et al.* 2011). As of October 2012, the population collectively numbers 85 individuals: J pod has 25 members, K pod has 20 members, and L pod has 40 members (Whale Museum 2012b).

Both West Coast Transient and the Southern Resident stocks are found within Washington inland waters. Individuals of both forms have long-ranging movements and thus regularly leave the inland waters (Calambokidis and Baird 1994).

The West Coast Transient stock occurs in California, Oregon, Washington, British Columbia, and southeastern Alaskan waters. Within the inland waters, they may frequent areas near seal rookeries when pups are weaned (Baird and Dill 1995).

There are only two reports of Transient killer whale in the Bremerton terminal area. From May 18-19 of 2004, a group of up to 12 individuals entered Sinclair and Dyes Inlet. From May 26-27 of 2010, a group of up to five individuals again entered the same area (Orca Network 2012b).

Southern Residents are documented in coastal waters ranging from central California to the Queen Charlotte Islands, British Columbia (NMFS 2008a). They occur in all inland marine waters within the activity area. While in the activity area, resident killer whales generally spend more time in deeper water and only occasionally enter water less than 15 feet deep (Baird 2000). Distribution is strongly associated with areas of greatest salmon abundance, with heaviest foraging activity occurring over deep open water and in areas characterized by high-relief underwater topography, such as subsurface canyons, seamounts, ridges, and steep slopes (Wiles 2004).

West Coast Transients are documented intermittently year-round in Washington inland waters. Records from 1976 through 2006 document Southern Residents in the inland waters of Washington during the months of March through June and October through December, with the primary area of occurrence in inland waters north of Admiralty Inlet, located in north Puget Sound (The Whale Museum 2008a).

Beginning in May or June and through the summer months, all three pods (J, K, and L) of Southern Residents are most often located in the protected inshore waters of Haro Strait (west of San Juan Island), in the Strait of Juan de Fuca, and Georgia Strait near the Fraser River. Historically, the J pod also occurred intermittently during this time in Puget Sound; however, records from The Whale Museum (2008a) from 1997 through 2007 show that J pod did not enter Puget Sound south of the Strait of Juan de Fuca from approximately June through August.

In fall, all three pods occur in areas where migrating salmon are concentrated such as the mouth of the Fraser River. They may also enter areas in Puget Sound where migrating chum and Chinook salmon are concentrated (Osborne 1999). In the winter months, the K and L pods spend progressively less time in inland marine waters and depart for coastal waters in January or February. The J pod is most likely to appear year-round near the San Juan Islands, and in the fall/winter, in the lower Puget Sound and in Georgia Strait at the mouth of the Fraser River.

Under contract with the NMFS, the Friday Harbor Whale Museum keeps a database of verified marine mammal sightings by location quadrants. Whale sightings do not indicate sightings of individual animals. Instead, sightings can be any number of animals. Between 1990 and 2008, in the September to February window proposed for the Bremerton project, an average of 2.9 SR killer whale sightings/month were annually reported for Quad 411 (which encompasses the Bremerton action area) (WSDOT 2012). Between September 2009 and February 2012, there was one unconfirmed report of a single SR killer whale in the Bremerton action area (January 2009) during the proposed in-water work window for this project (Orca Network 2012b). Based on this information, the possibility of encountering killer whales during the Bremerton project is low to medium, depending on the actual work month.

In one highly unusual 1997 event, 19 L pod individuals entered Sinclair and Dyes Inlet, and remained in Dyes Inlet for 30 days, from October 21 to November 19. As this event unfolded, whale specialists became increasingly concerned that the whale’s exit was blocked by shallow water and the need to pass under several bridges, even though they had passed under the same bridges to enter the inlet. After several individuals displayed signs of weight loss, hazing was considered to drive them out of the inlet. However, on day 30 the group exited on their own (Kitsap Sun 2012).

Killer whales are protected under the MMPA of 1972. The West Coast Transient stock is not designated as depleted under the MMPA or listed as "threatened or "endangered" under the ESA. The Southern Resident stock is listed as an endangered distinct population segment (DPS) under the ESA. On November 29, 2006, NMFS published a final rule designating critical habitat for the Southern Resident killer whale DPS (71 FR 69054). Both Puget Sound and the San Juan Islands are designated as core areas of critical habitat under the ESA, but areas less than 20 feet deep relative to extreme high water are not designated as critical habitat (71 FR 69054). A final recovery plan for southern residents was published in January of 2008 (NMFS 2008a).

3.2.4.5 GRAY WHALE

Gray whales are recorded in Washington waters during feeding migrations between late spring and autumn with occasional sightings during winter months (Calambokidis *et al.* 1994, 2002; Orca Network 2011).

Early in the 20th century, it is believed that commercial hunting for gray whales reduced population numbers to below 2,000 individuals (Calambokidis and Baird 1994). After listing of the species under the ESA in 1970, the number of gray whales increased dramatically resulting in their delisting in 1994. Population surveys since the delisting estimate that the population fluctuates at or just below the carrying capacity of the species (~26,000 individuals) (Rugh *et al.* 1999; Calambokidis *et al.* 1994; Allen and Angliss 2012).

Gray whales migrate within 5 to 43 km of the coast of Washington during their annual north/south migrations (Green *et al.* 1995). Gray whales migrate south to Baja California where they calve in November and December, and then migrate north to Alaska from March through May (Rice *et al.* 1984; Rugh *et al.* 2001) to summer and feed. A very few gray whales are observed in Washington inland waters between the months of September and January, with peak numbers of individuals from March through May. Peak months of gray whale observations in the area of activity occur outside the proposed work window of September through February. The average tenure within Washington inland waters is 47 days and the longest stay was 112 days.

Although typically seen during their annual migrations on the outer coast, a regular group of gray whales annually comes into the inland waters at Saratoga Passage and Port Susan from March through May to feed on ghost shrimp (Weitkamp *et al.* 1992). During this time frame they are also seen in the Strait of Juan de Fuca, the San Juan Islands, and areas of Puget Sound, although the observations in Puget Sound are highly variable between years (Calambokidis *et al.* 1994).

Between December 2002 and May 2012, there were three reports of gray whale in the Bremerton area during the proposed in-water work window months for this project: January 8 and 10, 2008 (likely the same individual); November 28-29, 2008; and December 2-6, 2009 (Orca Network 2012b). There were also two reports of gray whale stranding, one on May 3, 2005 at the US Navy Puget Sound Naval Shipyard to the west of the Bremerton terminal (Cascadia 2005), and one on a beach in the Bremerton area on

July 27, 2011. Typically 4-6 gray whales strand every year in Washington State (Cascadia 2011).

The Eastern North Pacific stock of gray whales was removed from listing under the ESA in 1994 after a 5-year review by NOAA Fisheries (Allen and Angliss 2012). In 2001 NOAA Fisheries received a petition to relist the stock under the ESA, but it was determined that there was not sufficient information to warrant the petition (Allen and Angliss 2012).

3.2.4.6 HUMPBACK WHALE

Humpback whales are wide-ranging baleen whales that can be found virtually worldwide. They summer in temperate and polar waters for feeding, and winter in tropical waters for mating and calving. Humpbacks are vulnerable to whaling due to their tendency to feed in near shore areas. Recent studies have indicated that there are three distinct stocks of humpback whale in the North Pacific: California-Oregon-Washington (formerly Eastern North Pacific), Central North Pacific and Western North Pacific.

The California-Oregon-Washington (CA-OR-WA) stock calve and mate in coastal Central America and Mexico and migrate up the coast from California to southern British Columbia in the summer and fall to feed (Carretta *et al.* 2011). Although infrequent, interchange between the other two stocks and the Eastern North Pacific stock occurs in breeding areas (Carretta *et al.* 2011). Few Eastern North Pacific stock humpback whales are seen in Puget Sound, but more frequent sightings occur in the Strait of Juan de Fuca and near the San Juan Islands. Most sightings are in spring and summer. Humpback whales feed on krill, small shrimp-like crustaceans and various kinds of small fish.

The 2007/2008 estimate of 2,043 humpback whales is the best estimate for abundance for the CA-OR-WA stock, though it does exclude some whales in Washington (Calambokidis *et al.* 2009).

Historically, humpback whales were common in inland waters of Puget Sound and the San Juan Islands (Calambokidis *et al.* 2002). In the early part of this century, there was a productive commercial hunt for humpbacks in Georgia Strait that was probably responsible for their long disappearance from local waters (Osborne *et al.* 1988). Since the mid-1990s, sightings in Puget Sound have increased. Between 1996 and 2001, Calambokidis *et al.* (2002) recorded only six individuals south of Admiralty Inlet (northern Puget Sound).

Between September 2003 and February 2012, there was one unconfirmed report (February 24, 2012) of humpback whale in the Bremerton action area (Orca Network 2012).

Humpback whales are listed as “endangered” under the ESA, and consequently the stock is automatically considered a depleted stock under the MMPA.

Table 3-1. List of marine mammals species in the proposed action area

Common Name	Scientific Name	ESA and MMPA Status
Pacific harbor seal	*Phoca vitulina richardsi*	Not ESA-listed, non-depleted

California sea lion	*Zalophus californianus*	Not ESA-listed, non-depleted
Steller sea lion	*Eumetopias jubatus*	Not ESA-listed, non-depleted
Killer whale	*Orcinus orca*	Only Southern Resident killer whale stock listed under ESA and depleted under MMPA. Other stocks are not ESA-listed and non-depleted
Gray whale (Eastern North Pacific stock)	*Eschrichtius robustus*	Not ESA-listed, non-depleted
Humpback whale	*Megaptera novaeangliae*	ESA-listed and depleted

3.3 SOCIAL AND ECONOMIC ENVIRONMENT

Bremerton is located in Kitsap County, Washington, approximately 11 miles (18 km) west of Seattle.

The economic outlook for Kitsap County appears to be improving slowly. The county has registered an unemployment rate consistently below the state and national averages over the years 2011 and 2012, with May's rate for not seasonally adjusted unemployment at 7.8 percent (WSDOT 2012). Median household income in Kitsap County for 2009 was $56,863 (WSDOT 2012).

Kitsap County, while facing its share of economic hardships during the slow growth post-recession period, is noting increased economic activity in the form of new businesses, business growth and infrastructure improvements. New manufacturing efforts in the advanced-composites industry are taking hold, and jobs in the private services sector have also started to rebound with some gains seen in retail and finance.

Infrastructure improvements in Kitsap County include major upgrades to area roads and bridges. The 80 year old Manette Bridge that connects West Bremerton to East Bremerton was replaced with a new bridge, and opened to traffic on November 10, 2011 (WSF 2013).

Bremerton's Puget Sound Naval Shipyard services U.S. Navy ships and its yard employs 8,000 civilians and as many active duty military work aboard ships or for the yard's attendant commands (WSF 2013).

Because of Kitsap County's geographic configuration, the Washington State Ferry System is an important infrastructure link for Kitsap residents. In 2011, close to 6 million passenger trips were taken on the Seattle-Bainbridge ferry run, and more than 2.5 million trips were taken on the Seattle-Bremerton route.

This infrastructure supports the economy based on public sector Department of Defense jobs, as well as over 10,000 uniform service personnel based there. Today spending by the U.S. Navy centers at Bremerton, Keyport and Bangor continues to dominate the economy of the county as demonstrated by the more than $700 million in defense contracts in 2009. The balance of economic activity in the county includes a thriving gaming industry with large casinos located on tribal properties, a major medical center and a regional retail hub attracting shoppers from Kitsap County as well as the surrounding rural counties.

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

This chapter represents the scientific and analytic basis for comparison of the direct, indirect, and cumulative effects of the alternatives. Regulations for implementing the provisions of NEPA require consideration of both the context and intensity of a proposed action (40 CFR Parts 1500-1508).

4.1 EFFECTS OF ALTERNATIVE 1: DENY ISSUANCE OF AN IHA (NO ACTION)

Under the No Action Alternative, NMFS would not issue the proposed IHA for the activities proposed by the WSF. Accordingly, should WSF proceed without an IHA, any takes of marine mammals resulting from the proposed wingwalls replacement construction work at Bremerton Ferry Terminal would not be authorized and any incidental take of marine mammals would be a violation of the MMPA. If the WSF decides not to proceed with the proposed wingwalls replacement project at the Bremerton Ferry Terminal, the impacts to the human environment at the proposed action area would remain the status quo, which is described in detail in Chapter 3 Affected Environment.

4.1.1 IMPACTS ON THE PHYSICAL ENVIRONMENT

Under the No Action alternative, it is likely that WSF would not proceed and thus that no wingwalls replacement work would occur at the Bremerton Ferry Terminal. The only affects to the physical environment would be from existing ferry and ferry terminal operations. There would be no additional effects in the physical environment, including the turbidity and elevated ambient noise from construction activities.

4.1.2 IMPACTS ON THE BIOLOGICAL ENVIRONMENT

Under the No Action alternative, it is likely that WSF would not proceed and thus that there would be no effects on the biological environment as there would be no wingwalls replacement at the Bremerton Ferry Terminal. Any effects to marine mammals, marine flora, invertebrates, or fish species in the proposed action area would be from existing ferry and ferry terminal operations. No Level B behavioral harassment would result from vibratory pile driving and pile removal.

4.1.3 SOCIAL AND ECONOMIC ENVIRONMENT

Under the No Action Alternative, it is likely that WSF would not proceed and thus that there would be no effects to the social and economic environment. The only effects to the social and economic environment would be from existing ferry and ferry terminal operations.

4.2 EFFECTS OF ALTERNATIVE 2: ISSUANCE OF AN IHA WITH MITIGATION (PREFERRED)

4.2.1 IMPACTS ON THE PHYSICAL ENVIRONMENT

Water and Sediment Quality: Short-term turbidity is a water quality effect of most in-water work, including removing and installing piles. Roni and Weitkamp (1996) monitored water quality parameters during a pier replacement project in Manchester, Washington. The study measured water quality before, during, and after pile removal and pile replacement. The study found that construction activity at the site had "little or no effect on dissolved oxygen, water temperature, and salinity", and turbidity (measured in nephelometric turbidity units [NTU]) at all depths nearest the construction activity was typically less than 1 NTU higher than stations farther from the construction area throughout construction.

Similar results were recorded during pile removal operations at two WSF ferry facilities. At the Friday Harbor terminal, localized turbidity levels (from three timber pile removal events) were generally less than 0.5 NTU higher than background levels and never exceeded 1 NTU. At the Eagle Harbor maintenance facility, local turbidity levels (from removal of timber and steel piles) did not exceed 0.2 NTU above background levels. In general, turbidity associated with pile installation is localized to about a 25-foot radius around the pile (Everitt et al. 1980).

Cetaceans are not expected to be close enough to the Bremerton Ferry Terminal to experience effects of turbidity, and any pinnipeds will be transiting the terminal area and could avoid localized areas of turbidity. Therefore, the impact from increased turbidity levels is expected to be discountable to marine mammals.

Removal of the timber wingwalls at the Bremerton Ferry Terminal will result in 112 creosote-treated piles (100 tons) removed from the marine environment. This will result in the potential, temporary and localized sediment re-suspension of some of the contaminants associated with creosote, such as polycyclic aromatic hydrocarbons. However, the actual removal of the creosote-treated wood piles from the marine environment will result in a long-term improvement in water and sediment quality. The net impact is a benefit to marine organisms, especially toothed whales and pinnipeds that are high in the food chain and bioaccumulate these toxins. This is especially a concern for long-lived species that spend their entire life in Puget Sound, such as Southern Resident killer whales (NMFS 2008a).

***Acoustical Environment**:* The pile removal and installation work associated with wingwalls replacement at Bremerton Ferry Terminal is expected to raise the overall ambient noise at the proposed action area. The level of increase would largely depend on the piling hammer and the distance from the noise source(s). However, WSF would only use vibratory pile hammer for pile removal and installation, which generates significantly less noise compared to impact pile hammer.

The project includes vibratory removal of 13-inch timber piles, and vibratory driving of 24-inch and 30-inch hollow steel piling.

No source level data is available for 13-inch timber piles. Based on in-water measurements at the WSF Port Townsend Ferry Terminal (Laughlin 2011), removal of 12-inch timber piles generated 149 to 152 dB_{rms} re 1 μPa with an overall average root-mean-square (RMS) value of 150 dB_{rms} re 1 μPa measured at 16 meters. A worst-case noise level for vibratory removal of 13-inch timber piles will be 152 dB_{rms} re 1 μPa at 16 m.

Based on in-water measurements at the WSF Friday Harbor Ferry Terminal, vibratory pile driving of a 24-inch steel pile generated 162 dB_{rms} re 1 μPa measured at 10 meters (Laughlin 2010a).

Based on in-water measurements during a vibratory test pile at the WSF Port Townsend Ferry Terminal, vibratory pile driving of a 30-inch steel pile generated 170 dB_{rms} re 1 μPa (overall average), with the highest measured at 174 dB_{rms} re 1 μPa measured at 10 meters (Laughlin 2010b). A worst-case noise level for vibratory driving of 30-inch steel piles will be 174 dB_{rms} re 1 μPa at 10 m.

If no site-specific in-water noise attenuation data is available, the distances at which received noise level drops to 120 dB_{rms} re 1 μPa from the vibratory pile removal and pile driving, based on practical spreading model, are:

- 152 dB_{rms} re 1 μPa at 16m (13-inch vibratory pile removal) = ~2.2 km (1.4 mi)
- 162 dB_{rms} re 1 μPa at 10m (24-inch vibratory steel pile driving) = ~6.3 km (3.9 mi)
- 174 dB_{rms} re 1 μPa at 10m (30-inch vibratory steel pile driving) = ~39.8 km (24.7 mi)

However, land mass is intersected before the extent of vibratory pile driving is reached, at a maximum of 4.7 km (2.9 miles) at the Bremerton Terminal proposed construction area.

For airborne noise, currently NMFS uses an in-air noise disturbance threshold of 90 dB_{rms} re 20 μPa (unweighted) for harbor seals, and 100 dB_{rms} re 20 μPa (unweighted) for all other pinnipeds. Using the above aforementioned measurement of 97.8 dB_{rms} re 20 μPa @ 50 ft, and attenuating at 6 dBA per doubling distance, in-air noise from vibratory pile removal and driving will attenuate to the 90 dB_{rms} re 20 μPa within approximately 37 m, and the 100 dB_{rms} re 20 μPa within approximately 12 m.

Essential Fish Habitat: The proposed action will not adversely affect EFH for the following reasons:

- The footprint of the new steel wingwalls will be more open, allowing fish movement between the piles. The new wingwalls will have 20 piles, compared to the existing wingwalls, which have approximately 112 tightly clustered piles with no space between them.
- The projects will remove 100 tons of creosote-treated wood from the marine environment.
- The total mudline footprint of the existing wingwalls is 206 ft^2. The total mudline footprint of the new wingwalls will be 95 ft^2, a reduction of 111 ft^2.

4.2.2 IMPACTS ON THE BIOLOGICAL ENVIRONMENT

4.2.2.1 MARINE MAMMALS

WSF and NMFS determined that open-water pile driving and pile removal associated with the construction activities at Bremerton Ferry Terminal has the potential to result in (1) hearing threshold shifts (TS), (2) masking, and (3) behavioral disturbance of marine mammal species and stocks in the vicinity of the proposed activity. The adverse effects on marine mammals from the WSF construction activities, however, are expected to be minor or negligible because marine mammals in the project vicinity are expected to exhibit only minor and brief behavioral modification. No injury or TS is expected.

Marine mammals exposed to high intensity sound repeatedly or for prolonged periods can experience TS, which is the loss of hearing sensitivity at certain frequency ranges (Kastak *et al.* 1999; Schlundt *et al.* 2000; Finneran *et al.* 2002; 2005). TS can be permanent (PTS), in which case the loss of hearing sensitivity is unrecoverable, or temporary (TTS), in which case the animal's hearing threshold will recover over time (Southall *et al.* 2007). Because marine mammals depend on acoustic cues for vital biological functions, such as orientation, communication, finding prey, and avoiding predators, marine mammals that suffer from PTS or TTS will have reduced fitness in survival and reproduction, either permanently or temporarily. Repeated noise exposure that leads to TTS could cause PTS. As explained below, it is very unlikely that any marine mammals would experience TTS or PTS as a result of noise exposure to WSF's proposed construction activities at Bremerton Ferry Terminal.

Experiments on a bottlenose dolphin (*Tursiops truncates*) and beluga whale (*Delphinapterus leucas*) showed that exposure to a single watergun impulse at a received level of 207 kPa (or 30 psi) peak-to-peak (p-p), which is equivalent to 228 dB (p-p) re 1 μPa, resulted in a 7 and 6 dB TTS in the beluga whale at 0.4 and 30 kHz, respectively. Thresholds returned to within 2 dB of the pre-exposure level within 4 minutes of the exposure (Finneran *et al.* 2002). No TTS was observed in the bottlenose dolphin. Although the source level of pile driving from one hammer strike is expected to be much lower than the single watergun impulse cited here, animals being exposed for a prolonged period to repeated hammer strikes could receive more noise exposure in terms of SEL than from the single watergun impulse (estimated at 188 dB re 1 μPa^2-s) in the aforementioned experiment (Finneran *et al.* 2002).

Currently, NMFS considers that repeated exposure to received noise levels at 180 dB and 190 dB_{rms} re 1 μPa could lead to TTS in cetaceans and pinnipeds, respectively. For the proposed wingwalls replacement work at Bremerton Ferry Terminal, only vibratory pile driving would be used. Noise levels measured near the source of vibratory hammers (10 m and 16 m from the source, see above) are much lower than the 180 dB_{rms} re 1 μPa.

Chronic exposure to excessive, though not high-intensity, noise could cause masking at particular frequencies for marine mammals that utilize sound for vital biological functions (Clark *et al.* 2009). Masking can interfere with detection of acoustic signals such as communication calls, echolocation sounds, and environmental sounds important to marine mammals. Therefore, under certain circumstances, marine mammals whose acoustical sensors or environment are being severely masked could also be impaired from maximizing their performance fitness in survival and reproduction.
Masking occurs at the frequency band which the animals utilize. Therefore, since noise generated from in-water vibratory pile driving and removal is mostly concentrated at low frequency ranges, it may have less effect on high frequency echolocation sounds by odontocetes (toothed whales). However, lower frequency man-made noises are more likely to affect detection of communication calls and other potentially important natural sounds such as surf and prey noise. It may also affect communication signals when they occur near the noise band and thus reduce the communication space of animals (e.g., Clark *et al.* 2009) and cause increased stress levels (e.g., Foote *et al.* 2004; Holt *et al.* 2009).

Unlike TS, masking can potentially impact the species at population, community, or even ecosystem levels, as well as individual levels. Masking affects both senders and receivers of the signals and could have long-term chronic effects on marine mammal species and populations. Recent science suggests that low frequency ambient sound levels have increased by as much as 20 dB (more than 3 times in terms of SPL) in the world's ocean from pre-industrial periods, and most of these increases are from distant shipping (Hildebrand 2009). All anthropogenic noise sources, such as those from vessels traffic, pile driving, dredging, and dismantling existing bridge by mechanic means, contribute to the elevated ambient noise levels, thus intensify masking.

Nevertheless, the sum of noise from the proposed WSF construction activities is confined in an area that is bounded by landmass, therefore, the noise generated is not expected to contribute to increased ocean ambient noise. Due to shallow water depth near the ferry terminals, underwater sound propagation for low-frequency sound (which is the major noise source from pile driving) is expected to be poor.

Finally, exposure of marine mammals to certain sounds could lead to behavioral disturbance (Richardson *et al.* 1995), such as: changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities, changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping), avoidance of areas where noise sources are located, and/or flight responses (e.g., pinnipeds flushing into water from haulouts or rookeries).

The biological significance of many of these behavioral disturbances is difficult to predict, especially if the detected disturbances appear minor. However, the consequences of behavioral modification could be expected to be biologically significant if the change affects growth, survival, and reproduction. Some of these significant behavioral modifications include:

- Drastic change in diving/surfacing patterns (such as those thought to be causing beaked whale stranding due to exposure to military mid-frequency tactical sonar);
- Habitat abandonment due to loss of desirable acoustic environment; and
- Cease feeding or social interaction.

For example, at the Guerreo Negro Lagoon in Baja California, Mexico, which is one of the important breeding grounds for Pacific gray whales, shipping and dredging associated with a salt works may have induced gray whales to abandon the area through most of the 1960s (Bryant *et al.* 1984). After these activities stopped, the lagoon was reoccupied, first by single whales and later by cow-calf pairs.

The onset of behavioral disturbance from anthropogenic noise depends on both external factors (characteristics of noise sources and their paths) and the receiving animals (hearing, motivation, experience, demography) and is also difficult to predict (Southall *et al.* 2007).

The proposed project area is not believed to be a prime habitat for marine mammals, nor is it considered an area frequented by marine mammals. Therefore, behavioral disturbances that could result from anthropogenic noise associated with SF-OBB construction activities are expected to affect only a small number of marine mammals on an infrequent basis. Therefore, the expected direct and indirect environmental impact will be minor.

4.2.2.1.1 REQUESTED NUMBER OF TAKES

WSF requests an IHA to incidentally take by Level B acoustical harassment small numbers of harbor seals, California sea lions, Steller sea lions, killer whales, gray whales, and humpback whales.

The requested number of takes is documented in the 2012 *Request for Incidental Harassment Authorization Under the Marine Mammal Protection Act Bremerton Ferry Terminal Wingwalls Replacement Project* (WSF 2013), which is incorporated by reference and discussed below.

For all species except the SRKW, incidental take is estimated for each species by estimating the likelihood of a marine mammal being present within a ZOI during active pile driving and removal. Expected marine mammal presence is determined by past observations and general abundance near the Bremerton Ferry Terminal during the construction window. Typically, potential take is estimated by multiplying the area of the ZOI by the local animal density. This provides an estimate of the number of animals that might occupy the ZOI at any given moment. However, there are no density estimates for any Puget Sound population of marine mammal. As a result, the take requests were estimated using local marine mammal data sets (e.g., Orca Network, state and federal agencies), opinions from state and federal agencies, and incidental observations from WSF biologists. In the case of SRKW, WSF states that it will use its best efforts to avoid the take of SRKW by powering down or shutting down the vibratory pile hammer when the animals are sighted in the vicinity of the project area. However, WSF requested incidental take of 4 individuals (5% of the total population) of SRKW should individual undetected animals enter the ZOI. Requested numbers of takes are summarized in Table 4-1.

Table 4-1. Requested number of level B Behavioral Harassment Takes

Species	Estimated marine mammal takes	Percentage
Pacific harbor seal	649	2.02%
California sea lion	1,841	0.53%
Steller sea lion	66	0.11%
Killer whale, transient	24	6.8%
Killer whale, Southern Resident	4	5.0%
Gray whale	8	0.04%
Humpback whale	8	0.39%

4.2.2.2 FISH SPECIES

Although high levels of underwater sound have been shown to have negative physiological and neurological effects on a wide variety of fish species (Yelverton *et al.* 1973; Yelverton and Richmond 1981; Hastings and Popper 2005), the adverse effects of WSF's proposed project on fish species are highly unlikely to include fish mortality because WSF plans to use vibratory pile driving instead of impact hammer for pile driving and thus would not produce intense pulses. The potential effects of high levels of underwater sound on fish species are described below.

High intensity sounds can injure and/or kill exposed individuals, temporarily stun them, and/or cause behavioral alterations (Popper 2003; Hastings and Popper 2005). There have been few directed experimental studies to date on fish response to elevated SPLs generated during pile driving. The information that is available has been derived from opportunistic studies of previously planned pile driving activities, the majority examining effects on caged fishes placed at varying distances from the noise source. These studies have produced variable results. For example, two studies in California (CALTRANS

2003) demonstrated significant injury in caged fishes exposed to approximately 4,000 pile strikes at peak pressures as low as 198 dB re: 1 μPa. The cages were located as far as 311 m (1,020 ft) from pile driving, indicating that injury level effects can occur at distance. In contrast, Ruggerone *et al.* (2008) found no evidence of injury in juvenile coho salmon (*Oncorhynchus kisutch*) exposed to driving of small steel piles at relatively close proximity. It is difficult to generalize from these findings, however, because of the opportunistic nature of the studies and the fact that several important environmental factors were largely uncontrolled.

Broadly, the effects of organism exposure to elevated underwater noise can vary from no observable response, to behavioral alteration, to temporary impairment, to permanent injury, to delayed or immediate death. Over this continuum of effect, there is no easily identifiable point at which behavioral responses begin, or where these responses transition to physical injury. While specific thresholds are unclear, noise from impact pile driving has clearly been implicated in fish injury and mortality, with sensitivity varying dependent on species specific physiology (Stotz and Colby 2001; Fordjour 2003; Gaspin 1975; Hastings and Popper 2005).

The primary mechanism of injury from impulsive sounds (sounds of very short duration with a rapid rise in pressure) is the effect of rapid, high amplitude pressure changes on body tissues. The injuries resulting from this type of exposure are referred to as barotraumas (Turnpenny *et al.* 1994). Gas-filled organs, such as swim bladders, are particularly sensitive to this type of injury because they resonate (i.e., vibrate at a frequency determined by the physical parameters of the affected object) to a greater degree than most other tissues. When a sound pressure wave strikes the swim bladder, the gas-filled space vibrates (rapidly expands and contracts) at the resonant frequency of that organ. When the amplitude of this vibration is sufficiently high, the pulsing swim bladder can rapidly compress adjacent organs, such as the liver and kidney. This pneumatic compression causes demonstrable injury, in the form of ruptured capillaries, internal bleeding, and maceration of highly vascular tissues (CALTRANS 2002). Hastings and Popper (2005) also noted that sound waves can cause non-gas-filled tissues to vibrate at different frequencies, leading to tearing of mesenteries and other sensitive connective tissues. Exposure to impulsive sounds can also induce "rectified diffusion." Rectified diffusion describes the process by which rapid pressure changes draw dissolved gasses out of solution, creating bubbles. When these bubbles form in body tissues they can cause inflammation, cellular damage, and blockage or rupture of capillaries, arteries, and veins (Stroetz *et al.* 2001; Vlahakis and Hubmayr 2000), leading to overt injury or even mortality. Death from barotrauma and rectified diffusion injuries can be instantaneous, or delayed for minutes, hours, or even days following exposure.

Regardless of species, smaller fish appear to be far more sensitive to injury of non-auditory tissues (Yelverton *et al.* 1975). For example, NMFS biologists observed that approximately 100 surf perch from three different species (*Cymatogaster aggregata*, *Brachyistius frenatus*, and *Embiotoca lateralis*) were killed during impact pile driving of 30-inch diameter steel pilings at Bremerton, Washington (NMFS 2009). Dissections revealed complete swim bladder destruction across all species in the smallest fish (80 mm fork length (FL)), while swim bladders in the largest fish (170 mm FL) were nearly intact. However, swim bladder damage was typically more extensive in *C. aggregata* when compared to *B. frenatus* of similar size. Comparable size specific results have been demonstrated in other species. Due to their large size, adult salmon can tolerate higher noise levels and are generally less sensitive to injury of non-auditory tissues than juveniles (Hubbs and Rechnitzer 1952). However, no information is available to determine whether or not the risk of auditory tissue damage decreases with increasing size of the fish.

Gravid female salmon, specifically ovarian tissues and egg masses, may face elevated injury risk relative to immature adults and sub-adults of comparable size. Eggs and supporting mesenteries are highly vascular tissues located in close proximity to the swim bladder, suggesting elevated sensitivity to barotrauma. These risks could include direct injury to individual eggs, tearing of the mesenteries that hold the eggs in place (resulting in the eggs being extruded prematurely), and loss of blood flow leading to developmental abnormalities or death. While this form of barotrauma has not been the subject of directed study, some inferences can be drawn from studies of other species. For example, Banner and Hyatt (1973) demonstrated increased mortality of sheepshead minnow eggs and embryos when exposed to continuous broadband noise (100 to 1,000 Hz) approximately 15 dB above ambient. Hatched sheepshead minnow fry were unaffected by the same exposure, as were the eggs and fry of the longnose killifish (*Fundulus similis*). It must be noted, however, that the sounds produced by impact driving of steel piles are very different in character than the sounds in this study, and the eggs were free floating and not contained within the ovaries of the mother. As such, extrapolations from this study to eggs in a gravid female salmon are tenuous, at best. As mentioned above, WSF plans to use vibratory pile driving instead of impact hammer for pile driving, thus eliminating the likelihood of fish mortality from intense pulses.

Overall due to the short duration and limited scale of the proposed action, direct and indirect impacts to fish species are expected to be minor or negligible.

4.2.2.3 MARINE INVERTEBRATES

Information is scant on invertebrate sensitivity to sound, and the ecological and behavioral functions of sound receptors. For example, squid have demonstrated responses to sound which has been hypothesized to be related to their schooling nature (which requires synchronization and predator aversion mechanisms). Statocysts and/or proprioception (the sensing of movement of bodily tissue by acoustic energy) may be involved in the detection of sound.

Information is even more scant on the sensitivity of sound by mollusks (i.e. clams, mussels, oysters, chiton, snails, slugs and limpets). Response to sound has been evident by changes in aggregations. Eradication of zebra muscles, for example, has been accomplished by using ultrasound (Donskoy *et al.* 1996). A study on the Ox-Heart Clam (*Glossus humanus*) has demonstrated sensitivity to vibrations and hypothesized that the sensitivity was related to sensing breaking waves on the incoming tide, to move with the tide (Frings 1964).

Nevertheless, there is no evidence that sound sources from human activities have adverse impacts to invertebrates, especially, the noise generated from the WSF's proposed wingwalls replacement construction using vibratory pile hammer is much less intense when compared to impact hammers. Therefore, it is unlikely that there will be environmental impacts to marine invertebrates.

4.2.3 SOCIAL AND ECONOMIC ENVIRONMENT
The issuance of the IHA would not have a direct effect on the social and economic environment of the Bremerton ferry terminal action areas because the issuance of the IHA does not directly affect the construction activities.

4.3 UNAVOIDABLE ADVERSE EFFECTS
NMFS does not expect WSF's requested activities to have adverse consequences on the viability of the species and populations of marine mammals in the vicinity of the proposed action area. Further, the noise source levels from vibratory pile driving and pile removal are of low intensity, and the project duration is brief. Given this and the likely response by marine mammals to the proposed wingwalls replacement project, individual animals are likely to be adversely affected by pile driving and removal noise during proposed project activities, as mentioned throughout this EA, but the project would have a negligible impact on the affected species or stocks of marine mammals.

4.4 CUMULATIVE EFFECTS
Cumulative effects are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions" (40 CFR §1508.7). Cumulative impacts can result from individually minor but collectively significant actions that take place over a period of time.

The proposed wingwalls replacement project at the Bremerton Ferry Terminal is located in Bremerton in Northwest Washington State, near Puget Sound. The waters of Puget Sound are heavily used by vessels from both commercial and recreational activities. The cumulative effects of the local environment are discussed in the following subsections.

4.4.1 FERRY TERMINAL CONSTRUCTION
Beside the proposed wingwalls replacement at the Bremerton Ferry Terminal, WSDOT/WSF also performs other types of coastal construction activities. Between August 2010 and February 2011, WSF conducted pile driving activities associated with the Manette Bridge replacement in the city of Bremerton in Kitsap County. From November 2012 to February 2013, WSF's Washington State Ferry (WSF) replaced a cable-lift transfer span at the Port Townsend Ferry Terminal. In addition, WSF is also working on replacement of the dolphin structure at the Orcas Island and Friday Harbor ferry terminals between September 2013 and February 2014. Furthermore, WSF is planning several other ferry terminal engineering projects, which include Vashon Terminal timber trestle and terminal replacement, Seattle Terminal building and north trestle replacement, Spur/Anacortes Terminal tie-up slips dolphin and wingwall replacement, and Southworth Terminal timber trestle and terminal replacement in 2015, and Spur/Friday Harbor Terminal timber trestle and terminal replacement and Coupeville Terminal bridge timber towers preservation in 2016. These activities, however, are not expected to have significant impacts to the overall region environment as the activities involved are brief, localized, and of small scales. In addition, most of these projects will not be occurring concurrently.

4.4.2 COASTAL DEVELOPMENT
Between 2000 and 2008, the population of Kitsap County increased by roughly 15,000. Thus, NMFS assumes that future public and private actions will continue within the action

area, increasing as the population density rises. NMFS does not expect that areas already set-aside as limited and public open space will be converted to intensive land uses. Furthermore, much of the area that may be redeveloped in future years is already under uses that impair or reduce ecological function.

4.4.3 Marine Pollution

Marine mammals are exposed to contaminants via the food they consume, the water in which they swim, and the air they breathe. Point and non-point source pollutants from coastal runoff, offshore mineral and gravel mining, at-sea disposal of dredged materials and sewage effluent, marine debris, and organic compounds from aquaculture are all lasting threats to marine mammals in the project area. The long-term impacts of these pollutants, however, are difficult to measure.

The persistent organic pollutants (POPs) tend to bioaccumulate through the food chain; therefore, the chronic exposure of POPs in the environment is perhaps of the most concern to high trophic level predators such as Southern Resident killer whales, Eastern Pacific gray whales, California sea lions, Pacific harbor seals, and Steller sea lions.

The WSF's construction and demolition activities associated with the Manette Bridge replacement project are not expected to cause increased exposure of POPs to marine mammals in the project vicinity due to the small scale and localized nature of the activities. Additionally, the WSF will use barges to carry out all construction debris and demolition material for proper disposal.

4.4.4 Disease

Disease is common in many marine mammal populations and has been responsible for major die-offs worldwide, but such events are usually relatively short-lived.

As recent as April 2010, five gray whales were found dead in Puget Sound. The die-off raised concerns among researchers who monitor gray whales and the health of marine mammals in the region. The total number of recent mortalities remains well below the peak numbers documented in big mortality year and the 5 that have died so far in 2010 is still under the average for an entire year. These mortalities are currently being investigated by scientists from the Northwest Marine Mammal Stranding Network including NMFS, Cascadia Research, Central Puget Sound Marine Mammal Stranding Network, and Washington Department of Fish and Wildlife.

4.4.5 Commercial and Private Marine Mammal Watching

Although marine mammal watching is considered by many to be a non-consumptive use of marine mammals with economic, recreational, educational and scientific benefits, it is not without potential negative impacts. One concern is that animals may become more vulnerable to vessel strikes once they habituate to vessel traffic (Swingle *et al.* 1993; Laist *et al*. 2001; Jensen and Silber 2004; Douglas *et al.* 2008). Another concern is that preferred habitats may be abandoned if disturbance levels are too high. Several recent research efforts have monitored and evaluated the impacts of people closely approaching, swimming, touching and feeding marine mammals and has suggested that marine mammals are at risk of being disturbed ("harassed"), displaced or injured by such close interactions. Researchers investigating the adverse impacts of marine mammal viewing activities have reported boat strikes, disturbance of vital behaviors and social groups, separation of mothers and young, abandonment of resting areas, and habituation to humans (Nowacek *et al.* 2001).

There are no known marine mammal watching operations based in the vicinity of the proposed action area. Marine mammal watching operations, however, especially killer whale watching operations, are common in the nearby Greater Puget Sound area, and thus marine mammals that occur in both the action area and the Puget Sound area could be adversely affected by such marine mammal watching operations over time. These cumulative adverse effects, however, are not expected to be significant.

4.4.6 SHIPPING

The Puget Sound is home to major Pacific Northwest shipping routes; literally thousands of vessels enter and leave the major ports of Washington State and British Colombia. In addition, to cargo ships, vacation cruise lines, and fishing vessels that travel on a regular basis throughout the region there are scores of recreational vehicles, ferry traffic, and whale watching boats. While long-term studies are needed to better understand the impact of vessel traffic on marine mammals like whales, short-term research has already begun and findings suggest that boat noise directly affects the behavior of marine mammals. Increased boat traffic not only has the potential to increase the likelihood of ship strike of marine mammals, it also contributes to increased ambient noise level. The proposed action area is mainly served by WSDOT ferries that shuttle among different city ports within the Puget Sound region. There is no increase in ferry services and number in the foreseeable future.

4.4.7 COMMERCIAL FISHING

Commercial fisheries may affect marine mammals indirectly by altering the quality of their habitat. The removal of large numbers of fish (both target and non-target or bycatch species) from a marine ecosystem can change the composition of the fish community, altering the abundance and distribution of prey available for marine mammals. In addition, by removing large amounts of biomass, commercial fisheries compete with other consumers that depend on the target species for food, which can, in turn, increase competition between different piscivorous predators. Nevertheless, the proposed action area is a ferry terminal where no fishing activity is occurring. The proposed ferry terminal wingwall replacement will not change the current status quo of commercial fisheries in the Pudget Sound area.

4.4.8 CLIMATE CHANGE

Global climate change could significantly affect the marine resources of the Northwest Pacific region. Possible impacts include temperature and rainfall changes and potentially rising sea levels and changes to ocean conditions. These changes may affect the coastal marine ecosystem in the proposed action area by increasing the vertical stratification of the water column and changing the intensity and rhythms of coastal winds and upwelling. Such modifications could cause ecosystem regime shifts as the productivity of the regional ecosystem undergoes various changes related to nutrients input and coastal ocean process (FWS 2011).

The precise effects of global climate change on the action area, however, cannot be predicted at this time because the coastal marine ecosystem is highly variable in its spatial and temporal scales.

4.4.7 SUMMARY OF CUMULATIVE EFFECTS

Although commercial harvest no longer takes place and existing subsistence harvest is set by quotas, scientific research activities, whale watching, coastal construction and development, marine pollution, and disease continue to result in some level of impact to marine mammal populations in the area. Nonetheless, the proposed wingwalls replacement project at the Bremerton Ferry Terminal would only add negligible additional impacts to marine mammals in the project area due to the limited project footprint and brief duration within the action area.

The vibratory pile driving and pile removal activities associated with the wingwalls replacement project are well planned to minimize impacts to the biological and physical environment of the areas by implementing mitigation and monitoring protocols. Therefore, NMFS has determined that the WSF's wingwalls replacement project would not have a significant cumulative effect on the human environment, provided that the mitigation and monitoring measures described in Sections 2.3.4 and 2.3.5 are implemented.

List of Preparers and Agencies and Persons Consulted

List of Preparer:

Shane Guan
Fishery Biologist
Office of Protected Resources
NOAA/National Marine Fisheries Service
Silver Spring, MD

List of Agencies and Persons Consulted

Michael Lisitza
NOAA/NMFS Northwest Regional Office
Protected Resources Division

Richard D. Huey
Biologist
Washington State Ferries/Washington State Department of Transportation
Seattle, WA

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FINDING OF NO SIGNIFICANT IMPACT
FOR THE ISSUANCE OF AN INCIDENTAL HARASSMENT AUTHORIZATION TO THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION TO TAKE MARINE MAMMALS BY HARASSMENT INCIDENTAL TO BREMERTON FERRY TERMINAL WINGWALLS REPLACEMENT PROJECT IN WASHINGTON STATE

NATIONAL MARINE FISHERIES SERVICE

BACKGROUND

On August 14, 2012, the Washington State Department of Transportation (WSDOT) Washington Ferries Division (WSF) submitted a request to the National Oceanic and Atmospheric Administration (NOAA) requesting an incidental harassment authorization (IHA) for the possible harassment of small numbers of six marine mammal species incidental to construction associated with the replacement of wingwall structures at the Bremerton Ferry Terminal in Washington State. On December 4, 2012, WSF submitted a revised IHA application with updated information. NOAA Fisheries (NMFS) prepared an EA and a Finding of No Significant Impact Statement (FONSI) for the issuance of an IHA on June 10, 2013, and issued an IHA to WSF on June 12, 2013. Due to a funding shortfall, however, WSF was unable to conduct the proposed construction activities during the IHA period. On September 30, 2013, after funding issues were addressed, WSF submitted a second IHA application for the same actions and plans to conduct wingwalls replacement work at the Bremerton Ferry Terminal during fall, 2014.

In response to a receipt of the request from the WSF, NMFS proposes to issue an IHA that authorizes takes by level B harassment of marine mammals in the wild pursuant to section 101(a)(5)(D) of the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. §§ 1631 *et seq*.), and the regulations governing the taking and importing of marine mammals (50 Code of Federal Regulations (CFR) Part 216). NMFS' IHA issuance criteria require that the taking of marine mammals authorized by an IHA will have a negligible impact on the species or stock(s), and, where relevant, will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses. In addition, the IHA must set forth, where applicable, the permissible methods of taking, other means of effecting the least practicable adverse impact on the species or stock and its habitat, and requirements pertaining to the monitoring and reporting of such takings.

In accordance with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. §§ 4321 *et seq*.), NMFS has prepared a Environmental Assessment (EA) titled, "*Issuance of an Incidental Harassment Authorization to the Washington State Department of Transportation to Take Marine Mammals by Harassment Incidental to Wingwalls Replacement Project at the Bremerton Ferry Terminal, Washington, in 2014*" (hereinafter, the Bremerton 2014 EA). NMFS proposes to issue the IHA with mitigation measures, as described in Alternative 2 of the Bremerton 2014 EA.

ANALYSIS

National Oceanic and Atmospheric Administration Administrative Order (NAO) 216-6 contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality (CEQ) regulations at 40 C.F.R. § 1508.27 state that the significance of an action should be analyzed both in terms of “context” and “intensity.” Each criterion listed is relevant to making a finding of no significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the NAO 216-6 criteria and CEQ’s context and intensity criteria. These include:

1) **Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in Fishery Management Plans (FMP)?**

   Response: The proposed action (i.e., issuing an IHA to WSF as described in Alternative 2 of the Bremerton 2014 EA) cannot reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat (EFH). The footprint of the new steel wingwalls will be more open, allowing fish movement between the piles. The new wingwalls will have 20 piles, compared to the existing wingwalls, which have approximately 112 tightly clustered piles with no space between them. In addition, the projects will remove 100 tons of creosote-treated wood from the marine environment. Finally, the total mudline footprint of the existing wingwalls is 206 ft^2. The total mudline footprint of the new wingwalls will be 95 ft^2, a reduction of 111 ft^2.

   The wingwalls replacement work at Bremerton Ferry Terminal will result in temporary disturbance to fish species in the close vicinity of the pile driving site, but the elevated sound pressure levels (SPLs) are not expected to reach sufficient magnitude to cause injury to fish from of pile driving, due to that only vibratory pile driving will be conducted. In addition to behavioral disturbance on EFH species, elevated SPLs could lead to a localized decrease in the abundance of forage fish species. However, due to the low noise levels and short duration of the in-water construction activity(approximately 4 days for pile removal and 7 days for pile driving), any adverse effects would be negligible.

2) **Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?**

   Response: The proposed action cannot be expected to have a substantial impact on biodiversity and/or ecosystem functions in the vicinity of the proposed wingwalls replacement projects at Bremerton Ferry Terminal because NMFS does not expect the issuance of the IHA to WSF to significantly (1) affect the susceptibility of any of the animals found in the vicinity of the project area to predation, (2) alter dietary preferences or foraging behavior, (3) change distribution or abundance of predators or prey, or (4) disturb the behaviors of marine mammals.

   The impacts of the action on marine mammals are only related to disturbance of marine mammals from vibratory pile removal and pile driving noise. The construction noise levels would be minimized by limiting pile driving and pile removal to vibratory hammer only. NMFS considers the disturbances from construction noise to be localized and short-term. NMFS expects that these acoustic disturbances would not result in substantial impact to marine mammals or to their role in the ecosystem.

3) **Can the proposed action reasonably be expected to have a substantial adverse impact on public health or safety?**

   Response: The proposed action cannot reasonably be expected to have a substantial adverse impact on public health or safety because the authorized activity does not pose a risk to public health or human safety. The Bremerton Ferry Terminal wingwalls replacement project is port terminal construction work that is performed by construction crews in other project areas on a regular basis. All construction debris and demolishing materials will be shipped off site and will be disposed of properly.

4) Can the proposed action reasonably be expected to adversely affect endangered or threatened species, their critical habitat, marine mammals, or other non-target species?

Response: The proposed action cannot reasonably be expected to adversely affect endangered or threatened species, their critical habitat, marine mammals, or other non-target species because NMFS has made a determination that potential impacts from the proposed activities on marine mammals and other affected species range from negligible and minor to none. In addition, NMFS Northwest Regional Office has concluded that the issuance of an IHA is: (1) not likely to jeopardize the continued existence of the endangered Southern Resident killer whales, or humpback whales; and (2) not likely to adversely modify or destroy critical habitat, as the proposed Bremerton Ferry Terminal wingwalls replacement project sites are neither within nor nearby designated critical habitat for humpback whales.

The proposed issuance of an IHA to WSF constitutes an agency action that authorizes an activity that may affect ESA-listed species and, therefore, is subject to section 7 of the ESA. As the effects of the activities on listed marine mammals and salmonids were analyzed during a formal consultation between the FHWA and NMFS, and as the underlying action has not changed from that considered in the consultation, the discussion of effects that are contained in the Biological Opinion (BiOp) and accompanying memo issued to the FHWA on December XX 19, 2013, pertains also to this action. The ESA findings in that BiOp are incorporated by reference in the EA. Based on those findings, NMFS has determined that issuance of an IHA for this activity would not lead to any effects to listed marine mammal species beyond those that were considered in the consultation on FHWA's action.

5) Are significant social or economic impacts interrelated with natural or physical environmental effects?

Response: NMFS does not expect the issuance of an IHA to WSF to result in significant social or economic impacts interrelated with natural or physical environmental effects. Effects of the wingwalls replacement work at the Bremerton Ferry Terminal would be limited to the short-term harassment of the marine mammals authorized by the permit. Authorization of the proposed wingwalls replacement activities could result in a low level of economic benefit to construction companies performing the work. However, such impacts would likely be negligible and on a regional or local level.

The activities authorized would not substantially impact use of the environment or use of natural or depletable resources, such as might be expected from large scale construction or resource extraction activities. Further, issuance of the IHA would not result in inequitable distributions of environmental burdens or access to environmental goods.

NMFS has determined that issuance of the IHA will not adversely affect low-income or minority populations. There will be no impact of the activity on the availability of the species or stocks of marine mammals for subsistence uses, as there are no subsistence uses that take place in the areas affected.

6) Are the effects on the quality of the human environment likely to be highly controversial?

Response: The effects of issuing an IHA to WSF as described in Alternative 2 of the Bremerton 2014 EA on the quality of the human environment are not likely to be highly controversial because: (1) there is no substantial dispute regarding the size, nature, or effect of the proposed action; (2) there is no known scientific controversy over the potential impacts of the proposed action; and (3) all comments received during the public comment period supported the issuance of the IHA.

To allow other agencies and the public the opportunity to review and comment on the actions, NMFS published a notice of receipt of the WSF application and proposed IHA in the *Federal Register* on December 3, 2013 (78 FR 72655). During the 30-day comment period, NMFS received comments from the Marine Mammal Commission (Commission). None of the comments are considered controversial and all will be addressed in the *Federal Register* notice for the issuance of the IHA.

7) Can the proposed action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers, essential fish habitat, or ecologically critical areas?

Response: The proposed action cannot reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers, essential fish habitat, or ecologically critical areas because none of these are found in the project areas. Similarly, as described in the response to question 1 above, no substantial impacts to EFH, designated critical habitat (DCH) or ecologically critical areas are expected as the wingwalls replacement activities would have a limited footprint for a short duration. The natural processes in the environment are expected to fully recover from any impacts resulting from the construction and demolishing activities within the short term.

8) Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

Response: The action of issuing an IHA to the WSF for the incidental take, by Level B harassment only, of small numbers of marine mammals is not expected to have significant effects on the human environment that would be unique or involve unknown risks because this type of construction work has been performed routinely.

While NMFS' judgments on impact thresholds for marine mammals in the vicinity of the project area are based on limited data, the risks are known and would involve the temporary, minimal harassment of marine mammals. No deaths or injuries to animals have been documented due to past coastal construction activities using vibratory hammer for pile removal or pile driving in general. The most common response to construction noise is for marine mammals to depart the construction area temporarily.

The construction activities associated with the Bremerton Ferry Terminal wingwalls replacement projects are well planned to minimize any impacts to the biological and physical environment of the areas by implementing mitigation and monitoring protocols which ensure the least practicable adverse impact on the affected species or stocks of marine mammals.

9) Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?

Response: The proposed action is not related to other actions with individually insignificant, but cumulatively significant impacts. While the stocks of marine mammals to which the animals in the vicinity of the ferry terminals wingwalls replacement sites have the potential to be impacted by other human activities in inland waters in Washington (i.e., shipping and boating activities development) described in the cumulative impacts analysis in the Bremerton 2014 EA, these activities are generally separated both geographically and temporally from the proposed actions in the ferry terminals wingwalls replacement sites and are not occurring simultaneously on the same individuals of the population within the action area.

The short-term stresses (separately and cumulatively when added to other stresses the marine mammals in the vicinity of ferry terminals construction sites face in the environment) resulting from the proposed Bremerton Ferry Terminal wingwalls replacement project would be expected to be minimal. Thus, NMFS concluded that the impacts of issuing an IHA to the WSF for the incidental take, by Level B harassment only, of small numbers of marine mammals are expected to be no more than minor and short-term.

10) Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or cause loss or destruction of significant scientific, cultural or historical resources?

Response: The issuance of an IHA is not expected to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or cause loss or destruction of significant scientific, cultural or historical resources either because such resources do not exist within the project area or are not expected to be adversely affected. In particular, the Bremerton Ferry Terminal is not considered a significant scientific, cultural or historical resource, nor is it listed in the National Register of Historic Places.

11) Can the proposed action reasonably be expected to result in the introduction or spread of a non-indigenous species?

Response: The issuance of an IHA cannot reasonably be expected to lead to the introduction or spread of any non-indigenous species into the environment because the activities associated with the proposed project are not likely to introduce or spread any non-indigenous species.

12) Is the proposed action likely to establish a precedent for future actions with significant effects or does it represent a decision in principle about a future consideration?

Response: The issuance of an IHA is not expected to set a precedent for future actions with significant effects nor represent a decision in principle regarding future considerations. The issuance of an IHA to take marine mammals incidental to in-water construction activities in the coastal environment is a routine process under the MMPA. To ensure compliance with statutory and regulatory standards, NMFS' actions under section 101(a)(5)(D) of the MMPA must be considered individually and be based on the best available information, which is continuously evolving. Issuance of an IHA to a specific individual or organization for a given activity does not guarantee or imply that NMFS will authorize others to conduct similar activities. Subsequent requests for incidental take authorizations would be evaluated upon their own merits relative to the criteria established in the MMPA, ESA, and NMFS implementing regulations on a case-by-case basis.

The project has no unique aspects that would suggest it would be a precedent for any future actions. For these reasons, the issuance of an IHA to the WSF to conduct the wingwalls replacement project is not precedent setting.

13) Can the proposed action reasonably be expected to violate any Federal, State, or local law or requirements imposed for the protection of the environment?

Response: The issuance of an IHA would not violate any federal, state, or local laws for environmental protection. NMFS has fulfilled its section 7 responsibilities under the ESA (see response to Question 4). The WSF has fulfilled its responsibilities under MMPA for this action and the IHA currently contains language stating that the applicant is required to obtain any state and local permits necessary to carry out the action which would remain in effect upon issuance of the proposed amendment.

14) Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

Response: The issuance of an IHA is not expected to result in any significant cumulative adverse effects that could have a substantial effect on target or non-target species because the minor and short-term stresses (separately and cumulatively when added to other stresses experienced by the marine mammals in the vicinity of the ferry terminals construction sites) resulting from the ferry terminals wingwalls replacement project would be expected to be minimal.

DETERMINATION

In view of the information presented in this document and the analysis contained in the supporting Final Environmental Assessment titled, "*Issuance of an Incidental Harassment Authorization to the Washington State Department of Transportation to Take Marine Mammals by Harassment Incidental to Wingwalls Replacement Project at Bremerton Ferry Terminal, Washington, in 2014*" prepared by NMFS, it is hereby determined that the issuance of an IHA for the take, by harassment, of small numbers of marine mammals incidental to the WSF's Bremerton Ferry Terminal wingwalls replacement project in Washington State, will not significantly impact the quality of the human environment, as described in this document and in the Bremerton 2014 EA.

In addition, all beneficial and adverse impacts of the action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an Environmental Impact Statement for this action is not necessary. The EA, thereby, provides a supporting analysis for this FONSI.

Donna S Wieting

Donna S. Wieting,
Director, Office of Protected Resources,
National Marine Fisheries Service

FEB 04 2014

Date