

# FINAL ENVIRONMENTAL ASSESSMENT

## PIER 6 PILE REPLACEMENT NAVAL BASE KITSAP



DEPARTMENT OF THE NAVY

September 2013

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Department of the Navy

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**FINAL ENVIRONMENTAL ASSESSMENT  
PIER 6 PILE REPLACEMENT  
NAVAL BASE KITSAP  
KITSAP COUNTY, WASHINGTON**

**SEPTEMBER 2013**

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<b>LEAD AGENCY:</b>	United States Department of the Navy
<b>PROPOSED ACTION:</b>	The Proposed Action is to remove and replace approximately 400 structurally unsound Pier 6 fender piles at NAVBASE Kitsap Bremerton in Sinclair Inlet over a three-year period, beginning in October 2013.
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**ABSTRACT:**

This environmental assessment (EA) evaluates the potential environmental impacts associated with the United States (U.S.) Department of the Navy's (Navy's) proposed action to remove and replace fender piles at Naval Base (NAVBASE) Kitsap Bremerton. The piles to be replaced occur along the perimeter of Pier 6. The Proposed Action is planned to begin in 2013 and will take approximately three years to complete. The Proposed Action would remove approximately 380 creosote treated timber piles and 20 steel piles, and replace them with approximately 330 prestressed concrete piles. As part of the Navy's mission, maintaining facilities and readiness is a priority. Since the action is to replace existing piles, the only alternative would be to not replace the piles; therefore, no practical or feasible action alternatives were identified. This EA will analyze the Proposed Action and the No Action alternative. The analysis addresses potential direct and indirect impacts on sediments, water quality, threatened and endangered species, essential fish habitat, marine mammals, cultural resources, American Indian traditional resources and cumulative impacts. There is no cooperating agency for this document.

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**FINAL ENVIRONMENTAL ASSESSMENT**  
**PIER 6 PILE REPLACEMENT**  
**NAVAL BASE KITSAP BREMERTON, KITSAP COUNTY, WA**  
**EXECUTIVE SUMMARY**

**Proposed Action**

The Navy is proposing to remove and replace approximately 400 deteriorated fender piles on Pier 6 in Sinclair Inlet at Naval Base (NAVBASE) Kitsap Bremerton over a three-year period, beginning in October 2013. The Proposed Action would remove approximately 380 creosote treated timber piles and 20 steel piles by vibratory extraction, and replace them with approximately 330 prestressed concrete piles by impact pile driving. As part of the Navy's mission, maintaining facilities and readiness is a priority. In addition to replacing piles, the project would remove and install a new galvanized steel wale system (i.e. a bumper system attached to the edge of the pier to protect against impact), rope guards, ladders, high density plastic rubbing strips and a cathodic protection system (i.e. a rust prevention system).

**Purpose of and Need for the Proposed Action**

The purpose of the Proposed Action is to maintain the existing Pier 6 in working condition and to ensure structural integrity. The need for the Proposed Action is to ensure that Pier 6 on NAVBASE Kitsap Bremerton continues to fulfill shore infrastructure needs and meets assigned operational mission requirements.

**Alternatives Considered**

Alternatives to the Proposed Action must be considered in accordance with National Environmental Policy Act (NEPA), Council of Environmental Quality (CEQ) regulations for implementing NEPA, and OPNAVINST 5090.1C CH-1 (July 2011). However, only those alternatives determined to be reasonable relative to their ability to fulfill the purpose and need for the Proposed Action require detailed analysis. Since the purpose of the Proposed Action is to maintain the existing Pier 6 (Figure 2-1) in working condition and to ensure structural integrity, the only alternative would be to not repair Pier 6; therefore, no practical or feasible action alternatives were identified. This EA will analyze the Proposed Action and the No Action alternative.

Under the No Action Alternative, existing piles at Pier 6 at NAVBASE Kitsap Bremerton would not be replaced to maintain pier integrity and mission readiness. The No Action Alternative does not meet the purpose of and need for the Proposed Action, but represents the baseline condition against which potential consequences of the Proposed Action can be compared. As required by CEQ guidelines, the No Action Alternative is carried forward for analysis in this EA.

**Summary of Environmental Effects**

The following is a summary of the potential environmental consequences of the Preferred Alternative (Proposed Action):

*Sediments.* Some degree of localized changes in sediment composition would occur during construction. Impacts from sediment resuspension would be minor and localized in the area of pile removal and pile installation due to weak, stable tide currents in the project area, which

would allow sediments disturbed during construction to resettle in the general area of pile removal/installation. The Navy has completed cleanup actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in Sinclair Inlet, and continues to monitor the site. Project-related construction activities would not create sediment contamination concentrations or physical changes that violate state standards or interfere with beneficial uses of Sinclair Inlet because the Navy will coordinate with the EPA before construction to confirm conformance with CERCLA requirements for these locations. Therefore, there would be no significant impact to sediments.

*Water Quality.* Direct discharges of waste would not occur. Construction-related impacts would be limited to short-term and localized changes associated with re-suspension of bottom sediments. These changes would be spatially limited to the construction site and areas immediately adjacent that may be impacted by plumes of re-suspended bottom sediments. Temporary impacts would not violate applicable state or federal water quality standards because the Navy would implement Best Management Practices (BMPs) and minimization measures to prevent accidental losses or spills of construction debris. Therefore, no significant impacts to water quality are expected.

*Noise.* The City of Bremerton and the State of Washington exempt temporary construction noise from 7:00 A.M. to 10:00 P.M. and the City of Port Orchard exempts temporary construction noise from 7:00 A.M. to 9:00 P.M. from exceeding maximum permissible noise levels. As the noise from the Proposed Action is temporary and will occur between the hours of 7:00 A.M. and 9:00 P.M. noise from implementation of the Proposed Action is exempt and would not result in a significant impact.

*Threatened, Endangered, and Sensitive Species.* Individual Endangered Species Act (ESA)-listed fish may be exposed to impacts from pile replacement including sound pressure levels which may result in injury or behavioral disturbance depending on the distance of the fish to the sound source. Fish that occur in the immediate vicinity of the project site could be exposed to underwater noise that exceeds the injury criteria for fish during impact pile driving activity only. Behavioral disturbances from impact pile driving could occur over a relatively broader range; however, because each session of pile driving would be relatively short, few individuals are expected to be impacted. Impacts to ESA-listed fish from changes in water quality as a result of pile driving operations are expected to be minor and temporary. Dissolved oxygen levels are not expected to drop to levels that would result in harm to fish species. Some degree of localized, short-term increase in turbidity is expected to occur during installation and removal of the piles, but would not affect overall conditions in the area. With implementation of protection measures including limiting work to the in-water work window, the Navy has determined that the Proposed Action ‘may affect, not likely to adversely affect’ Chinook salmon, steelhead, yelloweye rockfish, canary rockfish, bull trout, and bocaccio, and therefore would not result in significant impacts to ESA-listed fish species.

ESA-listed marine mammals (humpback whales, killer whales, and Steller sea lions) are not frequent visitors to Sinclair Inlet and even less likely to occur within the industrial confines of the industrial shipyard surrounding the project area. The high level of existing background noise (underwater and airborne) combined with the high level of marine activity limits the attractiveness of NAVBASE Kitsap Bremerton for marine mammals. To minimize impacts to marine mammals, including ESA-listed marine mammals, the Navy would develop and implement a Marine Mammal Monitoring Plan, which will include monitoring and potential shut

down within a 10-meter zone around pile driving activities for purposes of avoiding injurious effects. Additionally, a soft-start procedure will be implemented at the beginning of each impact pile driving session. The soft-start procedure provides a warning and/or gives animals in close proximity to pile driving a chance to leave the area prior to operating at full capacity thereby, exposing fewer animals to loud underwater and airborne sounds. With implementation of the Marine Mammal Monitoring Plan and other avoidance measures, the Navy has determined that the Proposed Action ‘may affect, but is not likely to adversely affect’ Steller sea lions and killer whales and have no effect on humpback whales, and therefore would not result in significant impacts to ESA-listed marine mammals.

Regarding ESA-listed avian species, underwater and airborne sound levels from impact and vibratory pile driving have the potential to harass marbled murrelets foraging and resting in the project area. Nearshore waters in the vicinity are highly industrial, but may provide foraging habitat and prey species. The presence of construction workers, cranes, vessels (i.e. tugs, barges, small monitoring boats, etc.), pile equipment, and associated activities would create visual disturbances for marbled murrelets attempting to forage or rest in surrounding waters. Exposure to underwater sounds from pile replacement could cause behavioral disturbance, but would not be anticipated to result in injury or mortality. To minimize impacts to marbled murrelets the Navy would monitor impact pile driving of 77 piles along the southeast corner of the pier. Monitoring and potential shutdown would occur within a 42 meter zone surrounding each pile. With implementation of monitoring and other avoidance measures, the Navy has determined the Proposed Action ‘may affect, not likely to adversely affect’ marbled murrelets, and therefore would not result in significant impacts to ESA-listed avian species.

The Navy has completed informal consultations under the ESA with the USFWS (April, 2013) and NMFS (December, 2012). USFWS and NMFS concur with the Navy’s findings of ‘may affect, not likely to adversely affect’ for the species discussed above.

*Essential Fish Habitat (EFH).* The action area includes habitats for various life stages of groundfish, five coastal pelagic species, and three species of Pacific salmon. The action would result in a short-term increase in underwater sound-pressure levels. The Proposed Project would not result in excessive levels of organic materials, inorganic nutrients or heat, would not alter physical conditions that could adversely affect water temperature or beach contours, would not remove large woody debris, or other natural beach complexity features, nor would it affect any vegetated shallows. NMFS determined that the Proposed Action would adversely affect EFH by decreasing water quality and suitability through increased sound energy levels. The project will also cause short term, localized increases in turbidity. However, with implementation of protection measures the Proposed Action would not result in significant impacts to EFH. The Navy completed informal consultation under the EFH with NMFS in December, 2012. NMFS concurred that the Navy's protective measures were sufficient to offset adverse effects to EFH.

*Marine Mammals.* Individual marine mammals may be exposed to sound pressure levels during pile driving operations, which may result in Level B behavioral harassment (defined by the Marine Mammal Protection Act (MMPA) as potential behavioral disruption). Any marine mammals that are exposed (harassed) may change their normal behavior patterns (i.e., swimming speed, foraging habits, etc.) or be temporarily displaced from the area of construction. Any exposures will likely have only a minor effect on individuals and no effect on the population. As

discussed previously in Threatened, Endangered, and Sensitive Species, the Navy would develop and implement avoidance measures to include limiting work to the in-water work window, soft-starts and a Marine Mammal Monitoring Plan to avoid injurious exposures to marine mammals. In compliance with the MMPA, the Navy will receive an Incidental Harassment Authorization from NMFS Headquarters and comply with all conditions. Therefore, there would be no significant impact to marine mammal populations.

*Cultural Resources.* Pier 6 is a contributing element to the Puget Sound Naval Shipyard National Historic Landmark (NHL). The replacement of existing piles will have no impact to the characteristics that makes Pier 6, the NHL or nearby National Register of Historic Properties (NRHP) historic districts eligible for inclusion in the NRHP or affect any known NRHP eligible archaeological sites. Construction activities would take place in previously disturbed areas along the industrial waterfront. The Navy has determined that the Proposed Action would have no adverse effect to cultural resources and therefore will result in no significant impact.

*American Indian Traditional Resources.* The Proposed Action is located within the usual and accustomed fishing grounds and stations of The Suquamish Tribe. Accordingly, the tribe has adjudicated tribal treaty rights in the area that includes the Proposed Action. Pier 6 is located within the Waterfront Restricted Area (WRA) and access for fishing is not currently allowed. The proposed action will not change this restriction. The Proposed Action would not appreciably impact the quantities of fish available for harvest by the Suquamish Tribe in Sinclair Inlet, nor would it restrict access to existing traditional harvest areas in Sinclair Inlet. As such, no significant impacts to American Indian traditional resources would occur with implementation of the Proposed Action.

Under the No Action Alternative, no piles would be removed or driven, thus there would be no change to the natural and physical environment or the relationship of people with that environment.

### **Resources Eliminated From Further Study**

The following resource areas were not analyzed in the EA because impacts were determined to be negligible or non-existent:

*Land Use.* All project activities would be conducted in previously disturbed areas at or adjacent to existing structures and would not result in any changes to land use.

*Air Quality.* The EPA has established NAAQS for seven pollutants. NAVBASE Kitsap Bremerton is located in Kitsap County which is an attainment area. A formal conformity determination is not required. Emissions for the Proposed Action would come from mobile sources: one pile driver and associated support vehicles and would be well below applicable thresholds.

*Visual Resources.* The Proposed Action includes repair and replacement of piles at existing structures, which are part of the installation's waterfront. The Proposed Action would not change the appearance of the waterfront areas of the installation.

*Recreational and Commercial Fishing.* Recreational and commercial fishing does not occur near the project site as this area is restricted from access by the general public. The project site occurs in a dredged area where no geoduck or other intact shellfish beds occur. The closest shellfish bed is over 1 mile from the project site. Additionally, Sinclair Inlet is closed to shellfish harvesting

due to pollution (WA Dept of Health 2013). As such, the Proposed Action would have no impact on recreational and commercial fishing.

*Terrestrial Wildlife.* The Proposed Action would occur entirely within the waters of Sinclair Inlet and does not have a terrestrial component. Any land-based construction equipment and material staging or support activities, if required, would take place in the already heavily-industrialized portions of NAVBASE Kitsap Bremerton.

*Non ESA-Listed Avian Species.* Avian species, including migratory and resident species, in the project area would generally be species that have adjusted to the high noise and boat traffic associated with the shipyard. Avian species foraging in the area may be disturbed by boat movement or pile installation, but are expected to continue foraging or temporarily leave the area. No bald eagle nests exist on NAVBASE Kitsap Bremerton or on adjacent properties. The Proposed Action is limited to work at Pier 6 and will not impact undisturbed areas. Given the industrial nature and existing elevated ambient noise levels in the project area, the Proposed Action would have negligible impacts on non ESA-listed avian species.

*Socioeconomics and Environmental Justice.* The Proposed Action is located entirely within NAVBASE Kitsap Bremerton. Implementation of the Proposed Action is limited to repairs at Pier 6 and would not result in displacement of people or businesses and would not change the economic character or stability of the installation or surrounding area. The Proposed Action would generate very few temporary jobs and would contribute minimally to local spending. There would not be an increased demand on housing, schools, or other social services. The project occurs in a dredged area within the Waterfront Restricted Area where no fishing is allowed. Under the Proposed Action, minority and low-income populations and children would not be exposed to noise, safety hazards, pollutants, or hazardous materials. Therefore, no disproportionately high and adverse environmental, human health, or socioeconomic affects would occur to minority, low income populations or children, and no significant short- or long term environmental justice impacts would occur.

*Traffic and Transportation.* The volume of marine and vehicle traffic would temporarily increase during pile replacement activities with the presence of contractor vehicles and marine vessels arriving and working on-site. Marine vessel traffic would include a barge mounted crane for pile installation and removal, a barge to deliver new piles and remove extracted piles (anticipated frequency of one barge delivery every one to three weeks), and tugs to assist barge movement. Marine vessels would operate and stage in the Waterfront Restricted Area. The influx of vehicles and marine vessels would be similar to existing traffic due to government vehicles or contractors arriving and leaving for other activities that are concurrently going on at the facility. As such, there would be no or negligible impact to transportation.

*Bathymetry.* Changes to bathymetry would not occur as the Proposed Action is replacing existing piles in a highly localized and disturbed area.

*Marine Vegetation and Benthic Invertebrates.* Past surveys have shown that marine vegetation is sparse throughout NAVBASE Kitsap Bremerton and does not exist along Pier 6 (Navy 2102). The Proposed Action would include temporary disruption of the benthic community (marine worms, snails and bivalves, crustaceans, and sea stars) in a highly localized area where pile

replacement occurs. However, benthic organisms are very resilient to habitat disturbance and will quickly recover to pre-disturbance levels.

*Health and Safety.* The waterfront area of NAVBASE Kitsap Bremerton is restricted from public access. Construction contractors and Navy employees would adhere to all applicable regulations with respect to environmental and safety regulations. Children are restricted from access to the Waterfront Restricted Area. The removal and replacement of piles at Pier 6 would not cause environmental health risks and safety risks, such as products and substances that children could come in contact with or ingest, that may disproportionately affect children. Therefore, the activities described under the Proposed Action would have a negligible impact on health and safety of the public, children, construction contractors, or Navy employees with adherence to construction safety standards.

### **Public Involvement**

The Navy made the Draft EA available for public review and comment from May 27, 2013 to June 10, 2013. Comments received and responses are provided in Appendix E.

### **Conclusion**

Based on the analyses in this EA, the Navy has concluded that implementing the Proposed Action would have no significant impact on the quality of the human environment and preparation of an Environmental Impact Statement (EIS) is not required.

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## ACRONYMS AND ABBREVIATIONS

ACQR	Puget Sound Interstate Air Quality Control Region
BA	Biological Assessment
BMP	Best Management Practices
CAA	Clean Air Act
CCD	Coastal Consistency Determination
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIA	Controlled Industrial Area
CISS	Cast in Steel Shell
CZMA	Coastal Zone Management Act
DAHP	Department of Archaeological and Historic Preservation
dB	Decibel
dBA	Decibels Adjusted
DNR	Department of Natural Resources
DO	Dissolved Oxygen
DoD	Department of Defense
DON	Department of the Navy
DPS	Distinct Population Segment
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EPP	Environmental Protection Plan
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FONSI	Finding of No Significant Impact
Hz	Hertz
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fisheries Conservation and Management Act
NAAQS	National Ambient Air Quality Standards
NAVBASE	Naval Base
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOA	Notice of Availability
OPNAVINST	Office of the Chief of Naval Operations Instruction
PCB	Polychlorinated Biphenyls
PSNS & IMF	Puget Sound Naval Shipyard and Intermediate Maintenance Facility
RCRA	Resource Conservation and Recovery Act
RMS	Root Mean Square
ROD	Record of Decision
ROI	Region of Influence

SECNAVINST	Secretary of the Navy Instruction
SHPO	State Historic Preservation Officer
STA	Sediment Trend Analysis
U&A	Usual and Accustomed
USACE	United States Army Corps of Engineers
U.S.	United States
USEPA	United States Environmental Protection Agency
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
WAC	Washington Administrative Code
WDOE	Washington Department of Ecology
WQC	Water Quality Certification

# **1 PURPOSE OF AND NEED FOR PROPOSED ACTION**

## **1.1 INTRODUCTION**

The United States (U.S.) Department of the Navy (Navy) has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S. Code [USC] §4321-4370h), as implemented by the Council on Environmental Quality (CEQ) Regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508); Navy regulations for implementing NEPA (32 CFR Part 775); and Chief of Naval Operations Instruction (OPNAVINST) 5090.1C CH-1, *Environmental Readiness Program Manual*.

The Navy proposes to remove and replace fender piles on Pier 6 in Sinclair Inlet at Naval Base (NAVBASE) Kitsap Bremerton (Figure 1-1). Construction of Pier 6 was completed in 1926. The pier is 1,320 feet in length and 100 feet wide and is a concrete deck on pilings. In addition to replacing piles, the project would remove and install a new galvanized steel wale system (i.e. a bumper system attached to the edge of the pier to protect against impact), rope guards, ladders, high density plastic rubbing strips and a cathodic protection system. The Proposed Action is planned to begin in 2013 and will take approximately three years to complete. NAVBASE Kitsap, the Action Proponent, is the command that manages several properties in Kitsap County Washington, including NAVBASE Kitsap Bremerton.

This EA will be reviewed by the Navy, who will make a determination regarding the Proposed Action and whether a finding of no significant impacts (FONSI) or an EIS is appropriate. There are no cooperating agencies for the Proposed Action.

## **1.2 LOCATION**

NAVBASE Kitsap Bremerton is located on the north side of Sinclair Inlet within the city of Bremerton in Kitsap County (Figure 1-2). The NAVBASE Kitsap Bremerton waterfront, including Pier 6, is restricted from public access. This area is designated as the Waterfront Restricted Area and is delineated by the Port Security Barriers shown on Figure 1-2. Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF) is the major tenant command of NAVBASE Kitsap Bremerton and possesses the capabilities to overhaul and repair all types and sizes of ships while also serving as homeport for a nuclear aircraft carrier and other Navy vessels. Other significant capabilities include alteration, construction, deactivation, and dry-docking of all types of naval vessels.

## **1.3 PURPOSE AND NEED**

The purpose of the Proposed Action is to maintain the existing Pier 6 in working condition and to ensure structural integrity. The need for the Proposed Action is to ensure that Pier 6 on NAVBASE Kitsap Bremerton continues to fulfill shore infrastructure needs and meets assigned operational mission requirements.

## **1.4 SCOPE OF ENVIRONMENTAL ANALYSIS**

This EA includes an analysis of potential environmental impacts associated with the Proposed Action. The environmental resource areas analyzed in this EA include: sediments, water quality, noise, Endangered Species Act (ESA)-listed species, essential fish habitat (EFH), marine mammals, cultural resources, and American Indian traditional resources.

Because potential impacts were considered to be negligible or nonexistent, the following resources were not evaluated in this EA:

*Land Use* – Implementation of the Proposed Action would not alter existing land use on- or off-base. All project activities would be conducted in previously disturbed areas at or adjacent to existing structures. Implementation of the Proposed Action would have no impact to the quality of nearby residential areas, parklands, prime farmlands, or wetlands. The Proposed Action would have no impact on local or regional development patterns. Therefore, there would be no impact on land use from the Proposed Action.

*Air Quality* – Effects on air quality from the implementation of the Proposed Action would be negligible due to the classification of attributed air sources and the attainment designation of Kitsap County in relation to the National Ambient Air Quality Standards. As described in 40 CFR Part 51, Determining Conformity of General Federal Actions to State or Federal Implementation Plans (the "General Conformity Rule"), all federal actions occurring in air basins designated in nonattainment or in a maintenance area must conform to an applicable implementation plan. Since Kitsap County is designated an attainment area for all criteria pollutants, the General Conformity Rule does not apply. The activities associated with the Proposed Action are limited to mobile sources and sources excluded from Notice of Construction requirements per Puget Sound Clean Air Agency Regulation I Article 6.03; therefore, New Source Review and Prevention of Significant Deterioration requirements do not apply. The Proposed Action, particularly with respect to pile driving, will not impact PSNS & IMF's Title V air permit since the contractors shall operate equipment in a manner that is in compliance with Puget Sound Clean Air Agency Regulations I, II, and III.

*Visual Resources* – Visual resources are the natural and man-made features that give a particular environment its aesthetic qualities. In developed areas, the natural landscape is more likely to provide a background for more obvious man-made features. The size, forms, materials, and functions of buildings, structures, roadways, and infrastructure would generally define the visual character of the built environment. These features form the overall impression that an observer receives of an area or its landscape character. The Proposed Action is consistent with the appearance of the waterfront area as it is limited to repair and replacement of piles at existing structures, which are part of the installation's waterfront. The Proposed Action would not change the appearance of the waterfront areas of the installation; therefore, no impacts to visual resources would occur.

*Recreational and Commercial Fishing* – Recreational and commercial fishing does not occur near the project sites as this area is within the Waterfront Restricted Area which is restricted from access by the general public. Fish could flee the immediate construction areas as a result of the Proposed Action, but would be expected to return to the area after the pile driving activities were concluded. The project site occurs in a dredged area where no geoduck or other intact shellfish beds occur. The closest shellfish bed is over 1 mile from the project site. Additionally Sinclair Inlet is closed to shellfish harvesting due to pollution (WA Dept of Health 2013). Therefore, the activities described under the Proposed Action would not impact recreational and commercial fishing.

*Terrestrial Wildlife* – The Proposed Action would occur entirely within the water at the installation and does not have a terrestrial component. Construction activities would not adversely impact terrestrial habitats and airborne sound associated with construction would not harm native terrestrial wildlife. Any land-based construction equipment and material staging or support activities, if required, would take place in the already heavily-industrialized portions of NAVBASE Kitsap Bremerton. No clearing or excavation would be required. Therefore, the activities described under the Proposed Action would not impact terrestrial wildlife.

*Non ESA-Listed Avian Species*– Proposed pile driving activities and associated boat movements could cause avian species to move from the immediate project area. Avian species, including migratory and resident species, in the project area would generally be species that have adjusted to the high noise and boat traffic associated with the shipyard. Avian species foraging in the area may be disturbed by boat movement or pile installation, but are expected to continue foraging or temporarily leave the area. This behavior is consistent with day to day operations at the shipyard with boat movements, drydock operations, and vessel repair activities. No bald eagle nests exist on NAVBASE Kitsap Bremerton or on adjacent properties. The Proposed Action is limited to work at Pier 6 and will not impact undisturbed areas. Given the industrial nature and existing elevated ambient noise levels in the project area, the Proposed Action would have negligible impacts on non ESA-listed avian species.

*Socioeconomics and Environmental Justice* – The Proposed Action is located entirely within NAVBASE Kitsap Bremerton. Implementation of the Proposed Action is limited to repairs at Pier 6 and would not result in displacement of people or businesses and would not change the economic character or stability of the installation or surrounding area. Pile driving activities would be conducted by contractors. The socioeconomic impacts related to temporary construction employment, if needed, would occur intermittently over a three year period. The Proposed Action may create a small number of temporary jobs and contribute minimally to local earnings spending. Any additional population associated with this temporary employment would not create undue demand on housing, schools, or other social services. As such, no socioeconomic impacts are anticipated as a result of the construction associated with the Proposed Action.

Environmental justice concerns related to construction activity typically include: exposure to noise, safety hazards, pollutants, and other hazardous materials. Although low income and minority populations are present in the surrounding region, none reside near the project site and, thus, would not be subject to any disproportionate adverse impacts. There would be no disproportionately high and adverse environmental, human health, and socioeconomic effects upon minority and low-income populations, American Indian Tribes, or children.

*Traffic and Transportation* – The volume of marine and vehicle traffic would temporarily increase during pile replacement activities with the presence of contractor vehicles and marine vessels arriving and working on-site. Marine vessel traffic would include a barge mounted crane for pile installation and removal, a barge to deliver new piles and remove extracted piles (anticipated frequency of one barge delivery every one to three weeks), and tugs to assist barge movement. Marine vessels would operate and stage in the Waterfront Restricted Area. The influx of vehicles and marine vessels would be similar to existing traffic due to government vehicles or

contractors arriving and leaving for other activities that are concurrently going on at the facility. As such, there would be no or negligible impact to transportation.

*Bathymetry* – The Proposed Action occurs entirely within an industrial shipyard with bathymetry that has been altered over the past 100 years due to periodic dredging, pier construction, and shoreline armoring. Changes to bathymetry would not occur as the Proposed Action is replacing existing piles in a highly localized and disturbed area. Therefore, the activities proposed under the Proposed Action would not impact bathymetry.

*Marine Vegetation* – The Proposed Action includes replacement of piles at or adjacent to existing piles along a heavily modified industrial waterfront. The impacts related to construction would be minimal and localized to the footprint of the new piles. Underwater surveys conducted in 2012 show that marine vegetation is sparse throughout the NAVBASE Kitsap Bremerton waterfront and does not exist along Pier 6 (Navy 2012). Therefore, the activities described under the Proposed Action would have negligible or no impact to marine vegetation.

*Benthic Invertebrates* – The Proposed Action include would include temporary disruption of the benthic community (marine worms, snails and bivalves, crustaceans, and sea stars) in a highly localized area where pile replacement occurs. However, benthic organisms are very resilient to habitat disturbance and will quickly recover to pre-disturbance levels. Therefore the localized and temporary nature of the Proposed Action would have a negligible impact to benthic invertebrates.

*Health and Safety* – The waterfront area of NAVBASE Kitsap Bremerton is restricted from public access by a Port Security Barrier and upland fencing which prevent recreational and commercial boater access to the waterfront areas. The Proposed Action does not differ significantly from normal day-to-day activities that occur at NAVBASE Kitsap Bremerton. Construction contractors and Navy employees would adhere to all applicable regulations with respect to environmental and safety regulations.

Children are restricted from access to the Waterfront Restricted Area. The removal and replacement of piles at Pier 6 would not cause environmental health risks and safety risks, such as products and substances that children could come in contact with or ingest, that may disproportionately affect children. Therefore, the activities described under the Proposed Action would have a negligible impact on health and safety of the public, children, construction contractors, or Navy employees with adherence to construction safety standards.

## **1.5 RELEVANT LAWS AND REGULATIONS**

The Navy has prepared this EA integrating federal and state laws, statutes, and regulations that are relevant to the implementation of the Proposed Action including but not limited to :

- NEPA (42 USC 4321-4370h), which requires an environmental analysis for major federal actions that have the potential to significantly impact the quality of the human environment;
- CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500-1508);

- Navy regulations for implementing NEPA (32 CFR 775), which provides Navy policy for implementing CEQ regulations and NEPA;
- Clean Air Act (CAA) (42 USC 7401 *et seq.*);
- Clean Water Act (CWA) (33 USC 1251 *et seq.*);
- Coastal Zone Management Act (CZMA) (16 USC 1451 *et seq.*);
- National Historic Preservation Act (NHPA) (16 USC 470 *et seq.*);
- Endangered Species Act (ESA) (16 USC 1531 *et seq.*);
- Magnuson–Stevens Fishery Conservation and Management Act (16 U.S.C. 1800)
- Marine Mammal Protection Act (MMPA) (16 USC 1361 *et seq.*)
- Migratory Bird Treaty Act (MBTA) (16 USC 703-712);
- Bald and Golden Eagle Protection Act (16 USC 668-668d);
- Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-income Populations*;
- EO 13175, *Consultation and Coordination with Indian Tribal Governments*; and
- EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*.

A description of the Proposed Action's consistency with these policies and regulations is presented in Section 5 (Table 5-1).

## **1.6 PUBLIC INVOLVEMENT**

*Public Review of the Draft EA.* The Draft EA was made available to the public for review and comment from May 27, 2013 to June 10, 2013 with a notice of availability (NOA) for comment posted in the local newspaper (Kitsap Sun). The Draft EA was also posted on the internet for review and comment. A summary of comments received, as well as the Navy's responses, is provided in Appendix E.

*Release of the Final EA and Decision Document.* The Final EA and decision document will be made available to the public. The NOA will be posted in the local newspaper and the Final EA and decision document will be posted on the internet.



Figure 1-1. Regional Map Showing NAVBASE Kitsap Bremerton

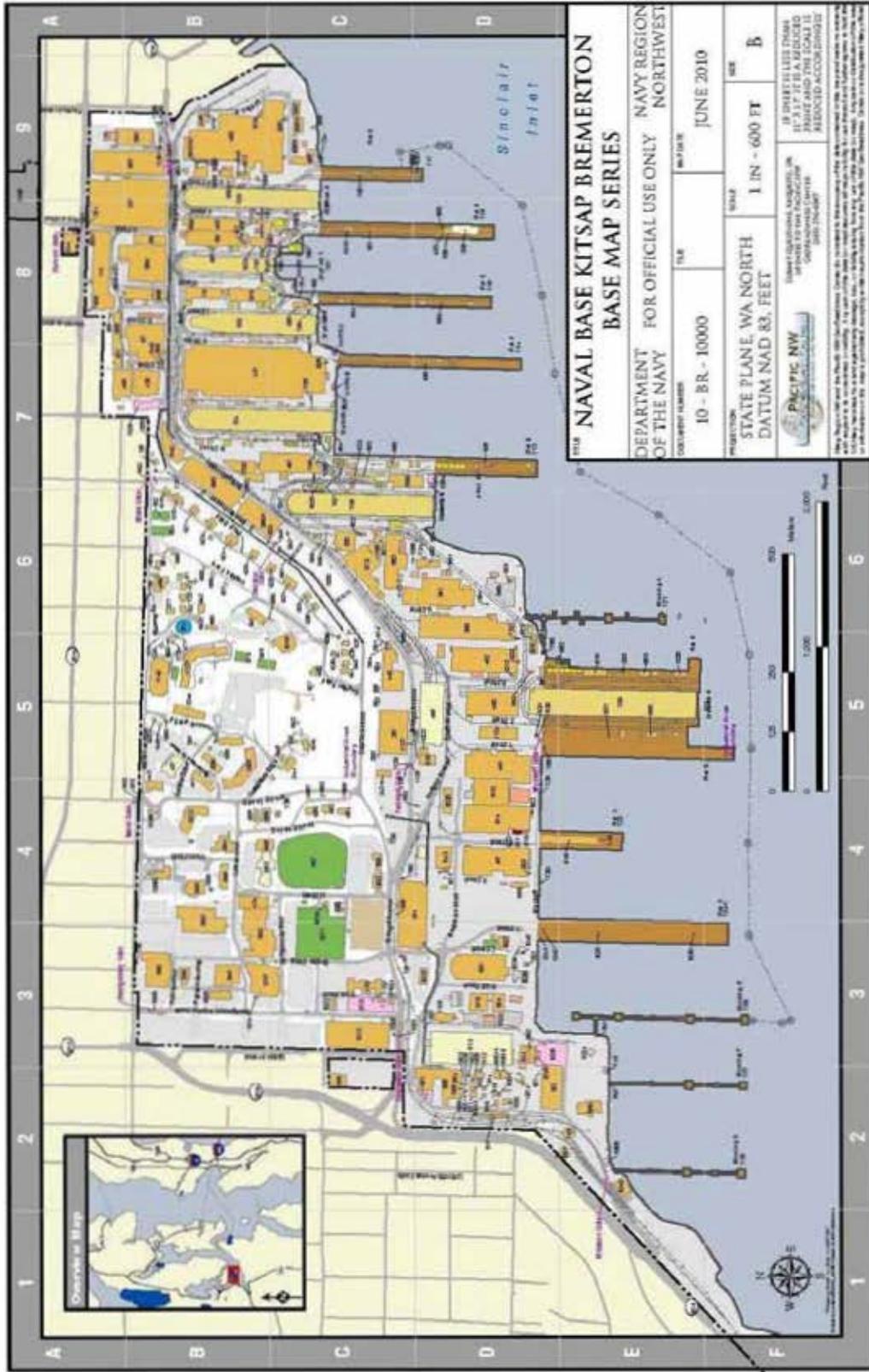


Figure 1-2. NAVBASE Kitsap Bremerton

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## 2 PROPOSED ACTION AND ALTERNATIVES

### 2.1 PROPOSED ACTION

The Navy proposes to remove and replace approximately 400 structurally unsound piles at Pier 6, located at NAVBASE Kitsap Bremerton over a three-year period, beginning in October 2013. Pier 6 is 1320 feet in length, 100 feet wide and is a concrete deck on pilings. Construction of the pier was completed in 1926. The Proposed Action would remove approximately 380 creosote treated timber piles and 20 steel piles, and replace them with approximately 330 prestressed concrete piles at Pier 6 (Figures 2-1 and 2-2). As part of the Navy's mission, maintaining facilities and readiness is a priority. Table 2-1 provides pile size, material, and number of piles to be replaced. New piles would be placed in the same general location as the removed piles. In addition to replacing piles, the Proposed Action would remove and install a new galvanized steel wale system (i.e. a bumper system attached to the edge of the pier to protect against impact) (Figure 2-3), rope guards, ladders, high density plastic rubbing strips and a cathodic protection system (i.e. a rust prevention technique).

The overwater coverage (or footprint) of Pier 6 and associated fenders, dolphins, and structures would not change.

**Table 2-1. Piles Schedule**

<b>Pile Type</b>	<b>Size</b>	<b>No. Removed</b>	<b>Removal Method</b>	<b>No. Installed</b>	<b>Installation Method</b>
Creosote treated timber fender	12"	380	Vibratory Extraction	0	N/A
Steel pipe fender	12"	20	Vibratory Extraction	0	N/A
Pre-stressed concrete fender	18" x 18"	0	N/A	240	Impact Driving
Pre-stressed concrete reaction	24" x 24"	0	N/A	90	Impact Driving
<b>Total:</b>		<b>400</b>		<b>330</b>	

### 2.2 ALTERNATIVES

A reasonable range of alternatives to the Proposed Action must be considered in accordance with NEPA, CEQ regulations for implementing NEPA, and OPNAVINST 5090.1C CH-1. However, only those alternatives determined to be reasonable relative to their ability to fulfill the purpose and need for the Proposed Action require detailed analysis. Since the purpose of the Proposed

Action is to maintain and repair Pier 6 through the replacement of structurally unsound piles and the replacement of an existing galvanized steel wale system, the only alternative would be to not repair Pier 6; therefore, no practical or feasible action alternatives were identified. Consequently this EA will analyze the Proposed Action and the No Action alternative.

Under the No Action Alternative, existing piles at Pier 6 at NAVBASE Kitsap Bremerton would not be replaced to maintain pier integrity and mission readiness. The No Action Alternative does not meet the purpose of and need for the Proposed Action, but represents the baseline condition against which potential impacts of the Proposed Action can be compared. As required by CEQ guidelines, the No Action Alternative is carried forward for analysis in this EA.

### **2.3 CONSTRUCTION METHODS AND DESCRIPTIONS**

This section describes methods of pile removal and installation that are planned to be used to accomplish the work included as part of the Proposed Action. Removing and installing in-water piles are construction activities that have occurred regularly at NAVBASE Kitsap Bremerton as in-water structures have been built and maintained over the past 100 years.

Most in-water structures are pile-supported; therefore, repair of these structures typically involves removal of existing piles and installation of new piles. Fender piles (or guide piles) protect piers from direct contact with vessels and consist of upright freestanding piles driven into the sea floor several feet away from the pier. Fender piles are a common method to protect docks, wharves, and other structures from the impact of large vessels.

No in-water dredging or placement of fill would occur under the Proposed Action.

#### **2.3.1 Pile Removal**

Vibratory extraction would be the primary method for removing all pile types. A barge-mounted crane operates from the water adjacent to the pile during removal activities. A vibratory driver is a large mechanical device (5-16 tons) suspended from a crane by a cable and clamped onto a pile. The vibrations induced into the pile liquefy the surrounding sediments and allow removal with the aid of the crane. The vibratory driver is shut off once the end of the pile reaches the mudline and the pile is pulled from the water and placed on a barge. Vibratory extraction would be expected to take approximately 5 to 10 minutes per pile. Sediments attached to the outside of the pile fall back to the seafloor.

In some cases, complete removal with a vibratory driver is not possible because the pile may break apart from the force of the clamp and the vibration. If piles break or are damaged, a chain or clamshell bucket would be used, if practical, to attempt to entirely remove the broken pile. If the entire pile cannot be removed, the pile would be cut at the mudline using a pneumatic underwater chainsaw to prevent disturbing contaminated sediment.

#### **2.3.2 Pile Installation**

Concrete piles would be driven with an impact hammer. Impact hammers are large mechanical hammers that have guides that hold the hammer in alignment with the pile while a heavy piston moves up and down, striking the top of the pile, driving the pile into the substrate from the downward force of the hammer. To drive the pile, a pile is first moved into position and set into

the proper location by placing a choker cable around a pile and lifting it into vertical position with the crane. Once the pile is properly positioned, pile installation can take from 5 to 60 minutes to reach the required tip elevation depending on substrate conditions. New piles would be installed in the same general location as extracted piles.

### **2.3.3 Pile Disposal**

All materials and waste would be disposed of in accordance with federal and state requirements. Creosote treated piles are not considered a hazardous waste (40 CFR 261.4(b)(9)) or a dangerous waste (Washington Administrative Code (WAC) 173-303-071); however, the disposal of creosote treated wood, is subject to regulation under rules developed under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). In accordance with FIFRA, all removed creosote piles will be disposed of in a Washington state approved non-hazardous waste landfill. Prior to disposal, the creosote-treated piles would be cut into smaller segments in a manner that precludes further use. Pile disposal would also be in accordance with the Washington State Department of Natural Resources (DNR) Best Management Practices (BMPs) for creosote pile removal and disposal. With the exception of creosote-treated piles, the Navy would evaluate if it would be possible to reclaim or recycle the materials.

## **2.4 BEST MANAGEMENT PRACTICES AND MINIMIZATION MEASURES**

The Proposed Action includes BMPs for construction and general minimization measures that will be implemented to minimize or avoid potential environmental impacts. Mitigation measures, such as endangered species monitoring, are discussed in Section 5 of the EA.

### **2.4.1 General**

The Navy will require the construction contractor to develop an Environmental Protection Plan (EPP) that will be implemented throughout the duration of in-water work. The EPP would be completed prior to the commencement of any construction activities. The EPP would identify construction planning elements and recognize spill sources at the site. The EPP would outline BMPs, responsive actions in the event of a spill or release, and notification and reporting procedures. The EPP would also outline contractor management elements such as personnel responsibilities, project site security, site inspections, and training.

Other general BMPs incorporated in the EPP and implemented during project construction would include:

- Washwater resulting from washdown of equipment or work areas will be contained for proper disposal, and shall not be discharged unless authorized.
- Equipment that enters surface water will be maintained to prevent any visible sheen from petroleum products.
- There will be no discharge of oil, fuels, or chemicals to surface waters, or onto land where there is a potential for re-entry into surface waters. Fuel hoses, oil drums, oil or fuel transfer valves, fittings, etc. will be checked regularly for leaks. Materials shall be maintained and stored properly to prevent spills.

- No cleaning solvents or chemicals used for tools or equipment cleaning will be discharged to ground or surface waters.
- Oil-absorbent materials will be used in the event of a spill if any oil product is observed in the water.
- Waste materials will be disposed of in a state approved landfill or recycled. All creosote-treated material would be cut to prevent reuse as piling and disposed of as discussed in Section 2.3.3.
- Removed piles and associated sediments (if any) will be contained on a barge or stored in a containment area on the pier.
- Construction materials will not be stored where high tides, wave action, or upland runoff could cause materials to enter surface waters.
- Any floating debris generated during construction will be retrieved. Any debris in the containment boom will be removed by the end of the work day or when the boom is removed, whichever occurs first.
- Whenever activities that generate sawdust, drill tailings, or wood chips from treated timbers are conducted, tarps or other containment material will be used to prevent debris from entering the water.

#### **2.4.2 Timing Restrictions**

- To minimize the number of fish exposed to underwater noise and other construction disturbance, in-water work would be performed between June 15 and March 1, when juvenile salmon are less likely to be migrating through the construction area.
- To minimize impacts to foraging marbled murrelets during their nesting season, impact pile driving would begin 2 hours after sunrise and end 2 hours before sunset from June 15 through September 30. This timing restriction applies only to impact pile driving activity conducted on the south end of the pier and on the southeast side of the pier as detailed in Appendix A. Pile driving in this area is limited to 75 days during the summer (June 15 to September 30) and 30 days in the winter (October 1 to March 30). Pile driving in this area is limited to 90 minutes per day.
- To minimize noise impacts to surrounding residents, noise generating construction activities would not occur between the hours of 9:00 p.m. and 7:00 a.m.

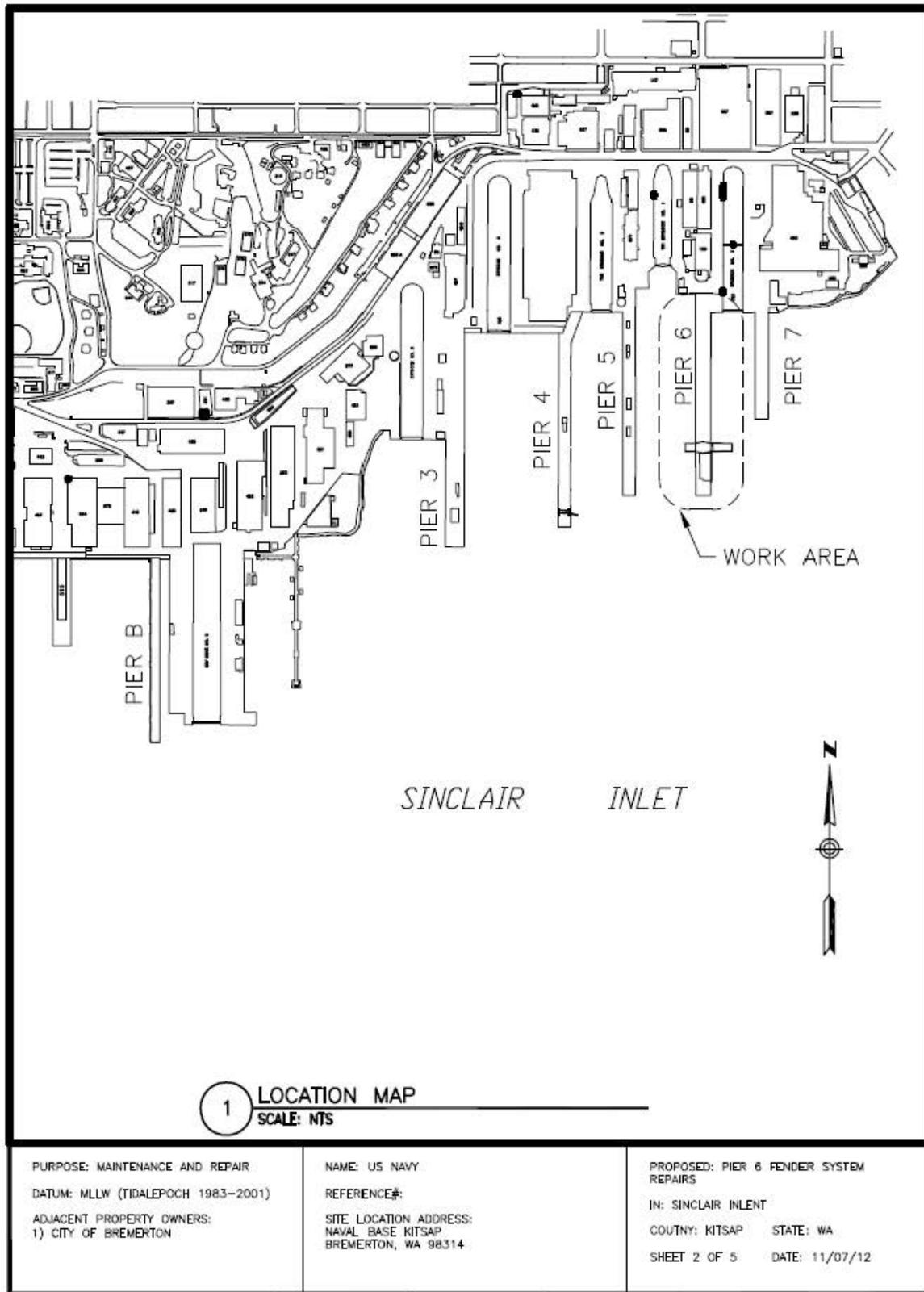


Figure 2-1. Pier 6 Work Area

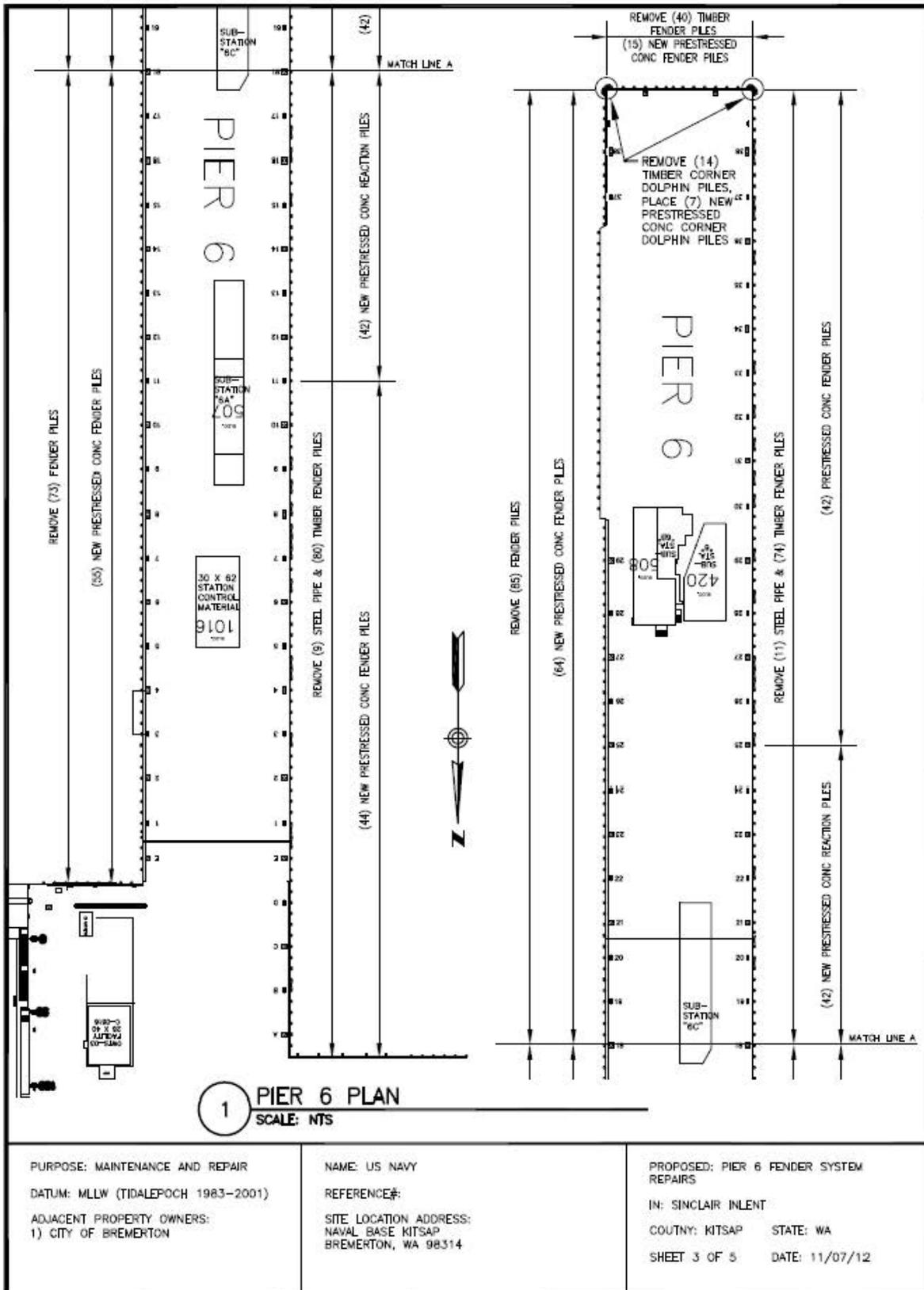


Figure 2-2. Site Plan

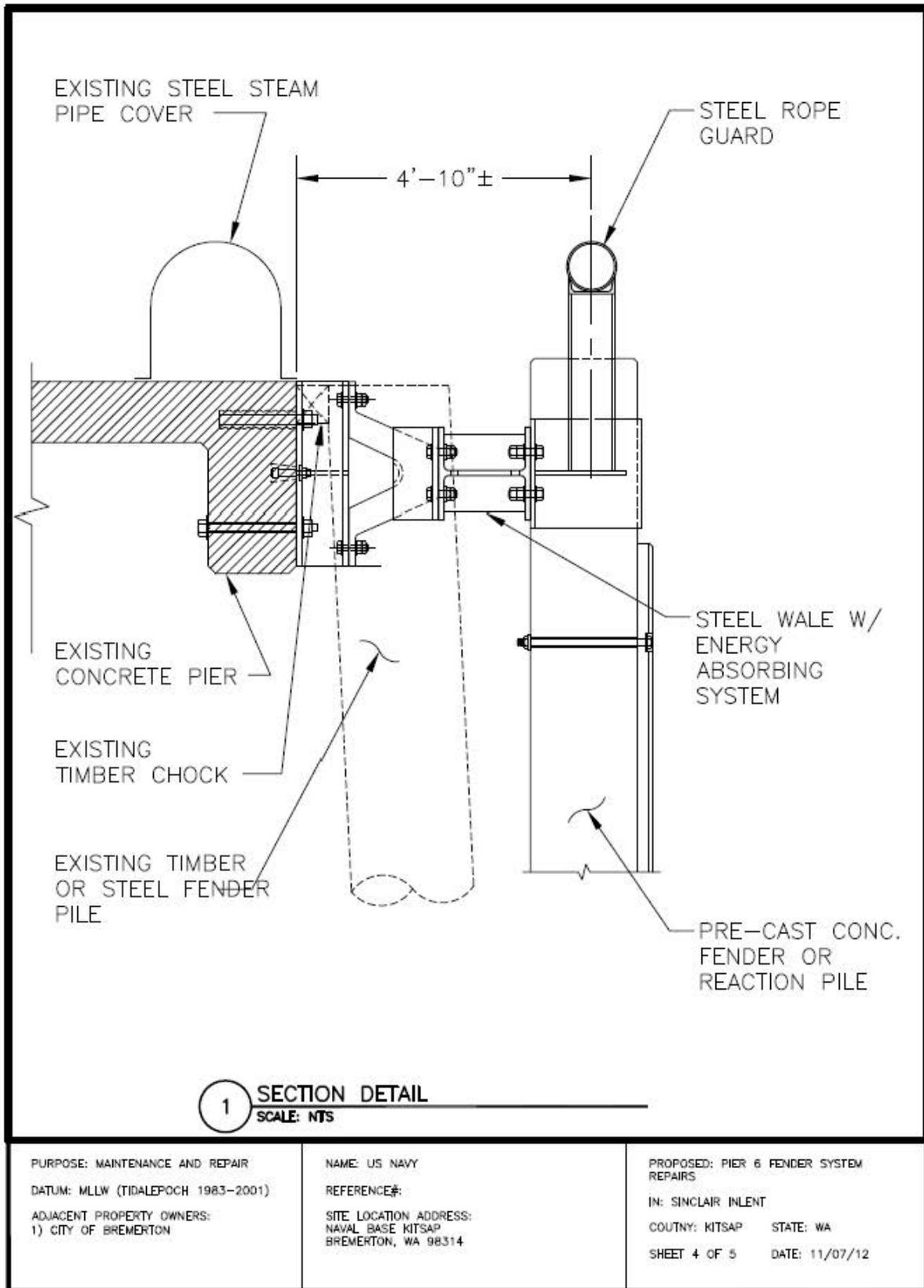


Figure 2-3. Typical Fender System Detail

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### **3 EXISTING ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

This section describes the existing environmental resources at NAVBASE Kitsap Bremerton and in the region of influence (ROI) that could be affected by the Proposed Action and the No Action Alternative. This section also analyzes the potential environmental impacts of the Proposed Action and No Action Alternative. To evaluate impacts, the analysis presented in this section overlays the components of the alternatives described in Chapter 2.0 onto baseline conditions within the ROI. In compliance with NEPA, CEQ regulations, and Navy procedures for implementing NEPA, the description of the affected environment and environmental consequences focuses only on those resources potentially subject to impacts. Accordingly, the resources evaluated include sediments, water quality, noise, ESA-listed species, EFH, marine mammals, cultural resources, and American Indian traditional resources.

#### **3.1 SEDIMENTS**

##### **3.1.1 Existing Environment**

The waterfront area at Bremerton has been significantly altered by industrial development and dredging including the construction of 6 drydocks, 13 piers or wharves, and acres of former tidelands filled and paved to enlarge the installation. Sinclair Inlet exhibits a weak estuarine flushing (i.e. water and sediments stay within Sinclair Inlet instead of being flushed out quickly to other parts of the Puget Sound), clockwise current pattern and sediment deposition along the northern shoreline (URS and SAIC, 1999). Weak tide currents move water in and out of the inlet with a maximum velocity of 0.2 to 0.3 knots (URS and SAIC, 1999). This effect and the generally weak nature of these currents make the inlet more depositional than erosional for both mud (silt and clay) and sand-sized particles. Currents are generally not capable of re-suspending bottom sediments. Existing sedimentation rates at the project site are 0.2 to 0.8 in (0.5 to 2 cm) per year (URS and SAIC, 1999).

In 1998, a Sediment Trend Analysis (STA) was performed on samples taken from Sinclair Inlet and the adjacent Port Orchard waterway (McLaren, 1998). This study has been the basis for determination of areas of erosion, stability of sediments (dynamic equilibrium), and deposition of sediments in Sinclair Inlet. In general, muddy sediments show a dominant clockwise pattern with flood-directed transport on the south side of the Inlet and ebb-directed transport on the north side of the Inlet (McLaren, 1998). The STA study demonstrates the sediments throughout Sinclair Inlet do not move with great speed, but do accumulate in certain areas. This is especially true on the northside of the inlet, near the project site, where the movement of sediments terminates inside the docks and piers of the shipyard (McLaren, 1998).

Sediment contamination within Sinclair Inlet, including the project area, has been well documented and includes a variety of metals and organic chemicals originating from human sources (USEPA, 2000). The marine sediments have been affected by past shipyard operations, leaching from creosote-treated piles, and other activities in Sinclair Inlet. A 2000 Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Record of Decision (ROD) for Operable Unit (OU) B-Marine documents the Navy's decision to cleanup sediment contamination by a combination of sediment removal and disposal in a Confined Aquatic Disposal site located on Navy property, sediment capping, and natural attenuation. The ROD was developed in cooperation with the US Environmental Protection Agency (EPA) and Washington Department of Ecology (Ecology). The active cleanup actions are complete and monitoring of

the site is ongoing (USEPA, 2000). Since the time the active cleanup was completed, the Navy has completed two fender pile replacement projects at NAVBASE Kitsap Bremerton. Each time preconstruction and post-construction sediment sampling was completed to demonstrate that no sediments were adversely impacted by pile replacement work.

### **3.1.2 Environmental Consequences**

The evaluation of impacts to marine sediments considers whether project-related construction activities create conditions, such as sediment contamination or physical changes that violate state standards. Impacts would be considered significant if they violated state standards (Sediment Quality Standards, WAC 172-204-320). The ROI for analyzing potential impacts to sediments is the northern shoreline of Sinclair Inlet within the Navy's Waterfront Restricted Area.

#### **Proposed Action**

The Proposed Action would result in disturbance of bottom sediments through pile removal (vibratory extraction) and installation (impact hammer pile driving). Impacts from sediment resuspension would be minor and localized in the area of pile removal and pile installation due to weak, stable tide currents in the project area (URS and SAIC, 1999). These stable subsurface conditions would allow any disturbed sediments to resettle in the general area of pile removal/installation. Setting spuds and anchors for the barges used for pile removal and installation could also cause disturbance of bottom sediments. Impacts from sediment resuspension from these activities would be minor and localized in the area of the spud or anchor placements. Propeller wash could also disturb bottom sediments, but would not differ from day-to-day activities occurring in this industrial waterfront area. Impacts from sediment re-suspension would be further reduced through the implementation of BMPs during construction. These measures would limit re-suspension of sediments by shutting down the vibratory pile hammer when piles to be removed have broken free from the marine sediments. In the event that a pile breaks and cannot be removed, cutting existing piles at the mudline will minimize disturbance of bottom sediments.

Installation of the galvanized steel wale system, rope guards, ladders, high density plastic rubbing strips and a cathodic protection system would have no impact on sediments because these elements of the Proposed Action would not disturb bottom sediments.

Impacts to sediment contaminant levels (WAC 172-204-320) would be negligible as no new sources of contaminants are proposed. Additionally, there would be no direct discharges of wastes or contaminants to the marine environment during construction. Long term minor beneficial impacts are possible from the removal of creosote treated piles which are known to leach toxins (DNR, 2013). However, due to the age of the existing creosote piles, they are likely no longer leaching appreciable amounts of toxic materials.

Replacement piles would be located at, or adjacent to, the same location as the existing piles, immediately adjacent to other large industrial facilities, and in a low-energy depositional environment (McLaren, 1998). The Proposed Action would not substantially alter existing sediment re-suspension or deposition patterns near the project sites. The Navy will coordinate with EPA Region X before construction to confirm conformance with CERCLA requirements for these locations. Pre construction and post construction sediment sampling is planned to ensure the Proposed Action does not adversely impact past cleanup actions.

Implementation of the Proposed Action would result in minor and localized impacts from resuspension of sediments but would not result in the violation of Washington Sediment Quality Standards (WAC 172-204-320). As such, no significant impacts to sediments would occur with implementation of the Proposed Action.

### **No Action Alternative**

Under the No Action Alternative, no piles would be removed or driven and disturbance to sediments would not occur. As such, no significant impacts to sediments would occur with implementation of the No Action Alternative.

## **3.2 WATER QUALITY**

### **3.2.1 Existing Environment**

NAVBASE Kitsap Bremerton and Pier 6 are located within Sinclair Inlet, a 3.5-mile-long shallow, poorly flushing estuary with freshwater input from Gorst, Blackjack, Ross, Anderson, Sacco, and Karcher creeks. While water quality in Sinclair Inlet is considered high enough to support many different uses from sailing to fishing, it has been detrimentally affected by runoff and sediment contamination from the surrounding watersheds, including such land uses as forest land, highways, urban development, commercial development and industrial development.

Washington Department of Ecology (WDOE) has established uses for Sinclair Inlet as follows: aquatic life, recreation, wildlife habitat, harvesting, commerce, navigation, boating, and aesthetics (WAC 173-201A-612). Sinclair Inlet is popular amongst private boaters, with several marinas in Port Orchard and Bremerton. While shellfish harvesting is not allowed due to pollutant levels, Sinclair Inlet remains an active water body for fishing.

Periodically, WDOE conducts an assessment of the water quality of the surface waters in the state (WDOE, 2008). The outcome of the assessment represents the Integrated Report for Sections 303(d) and 305(b) of the Clean Water Act. The Integrated Report identifies water bodies where water quality does not achieve standards. It also gives an overall indication of water quality of each water body. The most recent report is the 2008 Integrated Water Quality Assessment which conceptually divides Sinclair Inlet in approximately 20 grids. Each grid, or segment, is evaluated by WDOE separately with respect to water quality. For instance, one grid may achieve the dissolved oxygen (DO) standard while the adjacent grid may not.

Waters in the western portions of the waterfront area are classified as Category 2 for fecal coliform, temperature, and DO. Category 2 waters are waters of concern where there is some evidence of a water quality problem, but usually not in violation of water quality standards. Piers 4 and 5 are located within a grid which is classified as Category 4B (waters that have pollution problems, but where a plan is in place that is expected to resolve the problem) for Polychlorinated Biphenyls (PCBs). Pier 6 and eastward is located in a grid that is not classified in any category. Several areas within Sinclair Inlet outside of the immediate Bremerton waterfront area are classified as Category 5 (the water quality standards have been violated and there is no plan to resolve the problem) for fecal coliform and DO and Category 2 for temperature.

Turbidity within Sinclair Inlet generally meets the state of Washington Class A (excellent) standards for marine waters (Gartner et al., 1998). The U.S. Geological Survey (USGS) performed studies during 1998 which measured turbidity within Sinclair Inlet 12 inches (31 cm) above the bottom. Results indicated that the average suspended sediment concentrations were 2.3 mg/l with increases of 1 mg/ml during peak tide movement (Gartner et al., 1998).

Sinclair Inlet experiences isolated events of low DO associated with elevated nutrient concentrations and phytoplankton blooms (URS and SAIC 1999). DO exceedances were recorded by Kitsap County during 1998, 2001, and 2003. Anthropogenic sources were identified as the major contributor to the low DO readings (WDOE, 2008). DO levels within Sinclair Inlet are seasonably variable; however, increasing development continues to contribute to DO problems (WDOE, 2008).

While problems exist in Sinclair Inlet due to the surrounding land uses (highways, urban development, commercial development and industrial development), Sinclair Inlet retains a water quality standard that continues to support its designated uses from fishing and sailing to wildlife viewing (WAC 173-201A-612).

### **3.2.2 Environmental Consequences**

The ROI for analyzing potential impacts to water quality is the northern shoreline of Sinclair Inlet within the Navy's Waterfront Restricted Area. The threshold of significance for adverse effects on water quality is defined by the Clean Water Act and Washington's Water Quality Standards for Surface Waters of the State of Washington. Washington's Water Quality Assessment lists the water quality status for water bodies in the state including Sinclair Inlet. The water quality impacts from the proposed activity would be significant if they:

- Reduced the ability of Sinclair Inlet to support its designated uses (aquatic life, recreation, wildlife habitat, harvesting, etc.) (WAC 173-201A-612).
- Increased pollution levels (e.g., temperature, dissolved oxygen, turbidity, etc) to a point where Sinclair Inlet is placed in a reduced category in Washington's Water Quality Assessment Categories as described in Sections 303(d) and 305(b) of the Clean Water Act.

### **Proposed Action**

Direct discharges of waste to the marine environment would not occur with implementation of the Proposed Action. Impacts to water quality would be limited to short-term and localized changes associated with re-suspension of bottom sediments from pile removal and installation and barge and tug operations, such as anchoring and propeller wash. Because the project area is characterized as having weak and stable tide currents, these changes would be short term and spatially limited to the construction site and areas immediately adjacent that may be impacted by re-suspended bottom sediments (URS and SAIC, 1999). Minor long term water quality benefits are possible from the removal of creosote treated piles which are known to leach toxins (DNR, 2013). However, due to the age of the existing creosote piles, they are likely no longer leaching appreciable amounts of toxic materials.

Construction-related impacts would not increase pollution levels or violate applicable state or federal water quality standards, nor would they reduce the ability of Sinclair Inlet to support its designated uses. BMPs and minimization measures will be implemented to prevent accidental

losses or spills of construction debris into Sinclair Inlet. Therefore, no significant impacts to water quality would occur with implementation of the Proposed Action.

### **No Action Alternative**

Under the No Action Alternative, no piles would be removed or driven and impacts to water quality would not occur. The existing creosote treated timber piles would remain in place. While removal of creosote-treated pilings and structures has been a priority in the Puget Sound, the existing piles are likely no longer leaching appreciable amounts of toxic materials. Therefore, no significant impacts to water quality would occur with implementation of the No Action Alternative.

## **3.3 NOISE**

### **3.3.1 Existing Environment**

NAVBASE Kitsap Bremerton is located in an urban setting with marine industrial uses characterized by airborne and underwater noise from truck and automobile traffic; marine vessel traffic; ship-loading cranes; diesel-powered equipment; railroad traffic; continuously operating transmission lines for steam, water, and fuel; and compressors. The primary concentration of these types of noise sources is along the shore and piers. Noise is also generated by commercial vessels (e.g., tugs, barges, Navy vessels, and fishing vessels), ferry traffic, and recreational vessels operating on Sinclair Inlet. Depending on the noise-generating activities and distance from those activities, industrial shipyard noise is typically between 60 and 90 dBA (WSDOT, 2008). Typical noise from the piers (Table 3-1) is generated by the use of skiffs and small vessels, tugs (Table 3-2), aircraft carriers, submarines, transfer of equipment to and from the pier, ship repair, and motor vehicle traffic to and from the piers. Noise from the shipyard can be heard throughout areas in the City of Bremerton as well as Port Orchard across Sinclair Inlet.

The closest off-base sensitive receptors are single family residences located north of the base along Gregory Avenue, approximately 0.5 miles from Pier 6. This residential area is well buffered by distance from most of the industrial noise sources on the NAVBASE Kitsap Bremerton waterfront and is exposed to noise levels typical of an urban residential neighborhood which are approximately 50 to 70 dBA. Forest Ridge Park is located in a residential area west of Callow Avenue, approximately 1.3 miles from Pier 6. Other nearby sensitive receptors include single family residences across Sinclair Inlet in Port Orchard. The nearest residential areas in Port Orchard are approximately 1.5 miles from most of the industrial noise sources on the base waterfront.

The State of Washington, the City of Bremerton, and the City of Port Orchard have developed maximum permissible environmental noise levels for receiving properties. However, both Washington and Bremerton have exempted noise generated by construction activities, as long as these activities do not occur between the hours of 10:00 p.m. and 7:00 a.m. (WAC Chapter 173-60 and City of Bremerton Code Chapter 6.32 Noise). The City of Port Orchard has exempted noise generated by construction activities, as long as these activities do not occur between the hours of 9:00 p.m. and 7:00 a.m. (Port Orchard Municipal Code 9.24).

**Table 3-1. Maximum Air Noise Levels at 50 Feet for Common Construction Equipment**

Equipment Type	Maximum Noise Level (dBA) <sup>1</sup>
Impact Pile Driver	105
Vibratory Pile Driver	95
Scraper	90
Backhoe	90
Crane	81
Pumps	81
Generator	81
Front Loader	79
Air Compressor	78

Source: WSDOT, 2008.

<sup>1</sup> Maximum Sound Pressure Levels in dBA re 20µPa (A-weighted)**Table 3-2. Representative Underwater Noise Levels of Anthropogenic Sources**

Noise Source	Frequency Range (Hz)	Underwater Noise Level (dB re 1 µPa)	Reference
Small vessels	250 – 1,000	151 dB rms at 1 meter (m)	Richardson et al. 1995
Tug docking gravel barge	200 – 1,000	149 dB rms at 100 m	Blackwell and Greene 2002
Container ship	100 – 500	180 dB rms at 1 m	Richardson et al. 1995
Impact driving of 24-inch cast-in-steel-shell (CISS) piles	100 – 1,500	203 dB peak at 10 m 190 dB rms at 10 m	Reviewed in Hastings and Popper 2005
Vibratory driving of 36-inch steel pipe piles	400 – 2,500	164 dB rms at 56 m	Blackwell 2005
Impact driving of 66-inch CISS piles	100 – 1,500	210 dB peak at 10 m 195 dB rms at 10 m	Reviewed in Hastings and Popper 2005
Impact driving of 96-inch CISS piles	100 – 1,500	220 dB peak at 10 m 205 dB rms at 10 m	Reviewed in Hastings and Popper 2005

Source: WSDOT, 2008.

### 3.3.2 Environmental Consequences

For this analysis, the ROI for noise is the industrial waterfront and the immediately adjacent nearshore region of Sinclair Inlet, including areas of Bremerton and Port Orchard. The threshold of significance for noise impacts would be exceedances of an applicable noise threshold at a sensitive receptor (e.g., residential land uses, nursing homes, hospitals, etc.). Noise impacts to ESA-listed species, EFH, and marine mammals are discussed in Sections 3.4, 3.5 and 3.6, respectively.

## Proposed Action

Noise generated from construction activities associated with the Proposed Action would include impact pile driving, vibratory pile removal, and installation of the galvanized steel wale system. The sounds produced by these activities fall into one of two sound types: pulsed and non-pulsed. Impact pile driving produces pulsed sounds, vibratory pile removal and machinery operations to install the steel wale system produce nonpulsed (or continuous) sounds. The distinction between these two general sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (e.g. Ward 1997 as cited in Southall et al. 2007).

Pulsed sounds (e.g. explosions, gunshots, sonic booms, seismic airgun pulses, and impact pile driving) are brief, broadband, atonal transients (ANSI 1986; Harris 1998) and occur either as isolated events or repeated in some succession (Southall et al. 2007). Pulsed sounds are all characterized by a relatively rapid rise from ambient pressure to a maximal pressure value followed by a decay period that may include a period of diminishing, oscillating maximal and minimal pressures (Southall et al. 2007). Pulsed sounds generally have an increased capacity to induce physical injury as compared with sounds that lack these features (Southall et al. 2007).

Nonpulsed sounds (intermittent or continuous) can be tonal, broadband, or both (Southall et al. 2007). Some of these nonpulsed sounds can be transient signals of short duration but without the essential properties of pulses (e.g. rapid rise time) (Southall et al. 2007). Examples of nonpulsed sounds include vessels, aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems (Southall et al. 2007). The duration of such sounds, as received at a distance, can be greatly extended in highly reverberant environments (Southall et al. 2007).

Residential areas in Bremerton could receive noise levels between 60 and 65 dBA during impact pile driving, which is within the typical range of noise in an urban residential neighborhood (50 to 70 dBA) (Cavanaugh and Tocci 1998). Residential areas across Sinclair Inlet in Port Orchard could receive sound levels of approximately 60 dBA during impact pile driving. These estimates assume that noise will be attenuated by distance between the source and the receptor, but would not be obstructed by trees, other vegetation, or structures. Typical noise attenuation by distance is 6 dBA for every doubling of distance (WSDOT 2010). In addition, the estimates do not account for other noise sources at the shipyard. Noise impacts due to other construction activities (i.e., cranes, barges, wale installation, etc.) would not exceed normal background noise levels for day-to-day operations at NAVBASE Kitsap Bremerton.

Scuba divers diving in Sinclair Inlet could experience underwater noise levels that could cause a behavioral response including increased breathing and elevated heart rate (154 dB re 1 $\mu$ Pa) (Naval Submarine Medical Research Laboratory 2002) within 40,000 feet of the construction site during pile driving activity but would not receive levels sufficient to cause injury (SPL of 200 dB re 1 $\mu$ Pa). Other recreational users (i.e., boating, kayaking, fishing, etc.) in the vicinity could be exposed to noise levels. The sound levels would not be injurious but could result in a behavioral response such as avoiding the area around the installation. These noise impacts would be experienced by greater numbers of recreational users during the summer months when recreational uses are likely to increase. However, the floating security barrier would prevent

recreational and commercial users from getting close enough to the pile drivers to sustain injury from noise levels associated with pile driving.

Noise generating activities associated with the Proposed Action would not occur between the hours of 09:00 p.m. and 07:00 a.m. and are therefore exempt from Washington State, City of Bremerton and City of Port Orchard noise codes.

Additionally, the Proposed Action is a temporary action occurring between June and March over three years. Noise generated during impact pile driving would attenuate to levels typically experienced in the nearest residential neighborhoods. As such, no significant impacts to noise would occur with implementation of the Proposed Action.

### **No Action Alternative**

Under this alternative, no pile driving would take place, thus no change to noise levels would occur. As such, no significant impacts to noise would occur with implementation of the No Action Alternative.

## **3.4 ENDANGERED SPECIES ACT (ESA) LISTED SPECIES**

### **3.4.1 Existing Environment**

There are ten species that have been listed as threatened or endangered under the ESA that could occur near NAVBASE Kitsap Bremerton (Table 3-3). Details on the life history, critical habitat, and distribution of ESA-listed species are provided in the Biological Assessment (BA) in Appendix A. In 2005 the NMFS designated critical habitat for Puget Sound Chinook salmon in Puget Sound (70 Federal Register 170, September 2, 2005). Critical habitat is not located in the project area.

The majority (77 percent) of ESA-listed Chinook salmon found in Sinclair Inlet are estimated to be of hatchery origin from facilities in Gorst Creek (Fresh, et al. 2006). Ten percent are estimated to have naturally spawned in Sinclair Inlet area streams, with the remainder coming from other hatchery populations (Fresh, et al. 2006). There are no historic populations of Chinook salmon in streams draining into Sinclair Inlet.

ESA-listed Puget Sound steelhead can also potentially be found in Sinclair Inlet including the project area (Fresh, et al. 2006). ESA-listed bull trout do not utilize any of the East Kitsap drainages due to a lack of suitable spawning habitat. Bull trout use of the project area would be on an incidental basis. However, anadromous forms of bull trout could overwinter or forage in Sinclair Inlet and thus be found rarely in the project area (University of Washington, 2002).

Pier 6 at NAVBASE Kitsap Bremerton lacks the deep water habitat preferred by mature bocaccio, canary rockfish and yelloweye rockfish, so no adult rockfish are anticipated to be in the immediate project area (Drake, et al. 2008). Larval rockfish are pelagic and do have the potential to be found in Sinclair Inlet, but the industrial conditions at Pier 6 limit the likelihood of this (Drake, et al. 2008). Juvenile rockfish have the potential to occur near pier side locations, if their preferred, high relief or kelp bed habitat is nearby, but kelp does not occur at NAVBASE Kitsap at Bremerton.

**Table 3-3. Endangered Species Act Listed Species**

<b>Species</b>	<b>ESA-Listed Status</b>	<b>Critical Habitat Designated</b>	<b>Occurrence in Sinclair Inlet</b>
Chinook salmon <i>Oncorhynchus tshawytscha</i> Puget Sound ESU	Threatened	Yes	Juveniles - May to Jul; Adults - Jul to Oct
Marbled murrelet <i>Brachyramphus marmoratus</i> California-Oregon-Washington	Threatened	Yes	Rare
Steelhead trout <i>Oncorhynchus mykiss</i> Puget Sound DPS	Threatened	Proposed	Year-round
Bull Trout <i>Salvelinus confluentus</i> All U.S. stocks	Threatened	Yes	Rare adults and subadults – March to July
Bocaccio <i>Sebastes paucispinis</i> Puget Sound/Georgia Basin DPS	Endangered	No	Year-round
Canary rockfish <i>Sebastes pinniger</i> Puget Sound/Georgia Basin DPS	Threatened	Proposed	Year-round
Yelloweye rockfish <i>Sebastes ruberrimus</i> Puget Sound/Georgia Basin DPS	Threatened	Proposed	Year-round
Steller Sea Lion <i>Eumetopias jubatus</i> Eastern U.S. stock/DPS	Threatened	Yes	Rare
Killer Whale <i>Orcinus orca</i> Eastern North Pacific Southern Resident/DPS	Endangered	Yes	Rare
Humpback Whale <i>Megaptera novaeangliae</i> California-Oregon-Washington stock	Endangered	No	Rare

ESA-listed marine mammals with the potential to occur in the waters surrounding NAVBASE Kitsap Bremerton include southern resident killer whale, humpback whale, and the Steller sea lion. Southern resident killer whales occasionally move into rarely visited areas and inlets, probably in response to locally abundant food sources. In 1997, southern residents moved into Dyes Inlet near Bremerton and spent nearly a month feeding on a salmon run (Wiles 2004).

Humpback whales were common in inland Washington State waters in the early 1900s; however, there have only been a few sightings in this area since the whales were heavily hunted in the eastern North Pacific (Scheffer and Slipp 1948; Calambokidis and Steiger 1990; Pinnell and Sandilands 2004).

There are currently no Steller sea lion haul-out sites within Sinclair Inlet and no rookeries within Washington State. This, combined with the fact that fish abundance is only available seasonally within Sinclair Inlet, makes Steller sea lion residence in the area highly unlikely (Jefferies et al. 2000). Steller sea lions are rarely observed at NAVBASE Kitsap Bremerton due to high noise and activity levels from the industrial shipyard. An ongoing marine mammal survey within Puget Sound by Washington Department of Fish and Wildlife (WDFW) recently reported a lone Steller sea lion hauled out on the Navy's floating fence off of NAVBASE Kitsap Bremerton (Lance, 2012). Depending on the section, the floating fence occurs approximately 300 to 500 ft from Pier 6. While all three ESA-listed marine mammals have the potential to occur in Sinclair Inlet, confirmed sightings have been very rare over the past twenty years.

Marbled murrelets occur in Puget Sound marine habitats in relatively low numbers (Speich and Wahl 1995). Preliminary results from a 2012-2013 WDFW marbled murrelet survey of Sinclair Inlet have shown no presence of the species around NAVBASE Kitsap Bremerton or the surrounding waterways (Pearson, 2013). Although old-growth forest is the preferred habitat for nesting, marbled murrelets are known to nest in mature second growth forest with trees as young as 80 years old (Hamer and Nelson, 1995). The majority of Kitsap County, including NAVBASE Kitsap Bremerton and the area surrounding Sinclair Inlet, has been logged several times over the past 150 years and no longer contains old growth forest or the large trees necessary for marbled murrelet nesting. The closest documented habitat is on the west side of the Hood Canal in the Olympic National Forest (61 Federal Register 26256). The project area is in an industrial shipyard, miles from known nesting habitat and where high activity and noise levels limit any potential for foraging. While marbled murrelets can be seen in the South Puget Sound foraging, they have not been identified in the industrial waters surrounding NAVBASE Kitsap Bremerton (Pearson 2013). The Navy is currently partnered with WDFW to conduct marbled murrelet surveys surrounding Navy installations.

### **3.4.2 Environmental Consequences**

Impacts to ESA-listed species would be considered significant if there was a loss of critical habitat and/or a finding of *likely to adversely affect* issued by the US Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) during the Section 7 consultation.

#### **Proposed Action**

Individual ESA-listed fish may be exposed to impacts from pile replacement including sound pressure levels which may result in injury or behavioral disturbance depending on the distance of the fish to sound source. Fish that occur in the immediate vicinity of the project site could be exposed to underwater noise that exceeds the injury criteria for fish during impact pile driving activity only. Behavioral disturbances from impact pile driving could occur over a relatively broader range; however, because each session of pile driving would be relatively short, few individuals are expected to be impacted. The most likely impact to fish from pile driving activities would be temporary behavioral disturbance. Sound pressure levels from vibratory pile removal would not exceed the injury thresholds for fish.

Any exposures would likely have a minor effect and temporary impact on individuals and are not expected to result in population level impacts. Adherence to minimization measures and best management practices would likely avoid most potential adverse impacts to fish from pile driving. Nevertheless, some level of impact is unavoidable. To minimize the number of fish exposed to underwater noise and other construction disturbance, in-water work would be performed between June 15 and March 1, when juvenile salmon are less likely to be migrating through the construction area. This in-water work window is consistent with work restrictions imposed by the US Army Corps of Engineers (USACE) under their nationwide permitting requirements and NMFS and USFWS under the ESA consultation (refer to Appendix A). Any modifications to this window would require additional consultation with the USACE, NMFS, and USFWS.

Impacts to ESA-listed fish from changes in water quality as a result of pile driving operations are expected to be minor and temporary. DO levels are not expected to drop to levels that would result in harm to fish species. Some degree of localized, short-term increase in turbidity is expected to occur during installation and removal of the piles, but would not affect overall conditions in the area. Fish species are expected to avoid areas with elevated suspended sediments or experience minor behavioral effects due to changes in turbidity. Though some sediment at the project location is listed as contaminated, contaminants re-suspended from sediments are not expected to rise to levels that would cause toxicity in fish present. The numbers of fish exposed to underwater noise above injury and behavioral disturbance thresholds, and resulting in a take, would be very small because:

- The activity occurs when few juvenile Chinook salmon and steelhead are present;
- migrating adult salmon do not orient to nearshore areas like juveniles of some species and are unlikely to be close enough to the piles for injurious effects to occur;
- steelhead do not use nearshore habitat in the project area;
- there are very few juvenile or larval yelloweye rockfish, canary rockfish, and bocaccio anywhere at any time;
- bull trout are unlikely to be in the project area;
- the project area is a very small proportion of the total area occupied by the listed fish; and

Given these considerations, the Navy expects very small numbers of ESA-listed fish species to be present during the in-water work window and fewer of those to be exposed to sound levels that would elicit adverse behavioral or physical responses. The Navy has determined that the Proposed Action ‘may affect, not likely to adversely affect’ Chinook salmon, steelhead, yelloweye rockfish, canary rockfish, bull trout, and bocaccio.

While critical habitat has been designated for Puget Sound Chinook salmon in Puget Sound, there is no critical habitat located in the project area. The Navy has determined that the Proposed Action “will have no affect” on Puget Sound Chinook salmon critical habitat.

ESA-listed marine mammals (humpback whales, killer whales, and Steller sea lions) are not frequent visitors to Sinclair Inlet and even less likely to occur within the industrial confines of the industrial shipyard surrounding the project area. The high level of existing background noise

(underwater and airborne) combined with the high level of marine activity limits the attractiveness of NAVBASE Kitsap Bremerton for marine mammals.

To minimize impacts to marine mammals, including ESA-listed marine mammals, the Navy would develop and implement a Marine Mammal Monitoring Plan. Implementation of this Plan would prevent exposure to potentially injurious noise levels. In accordance with the Plan, monitoring would occur within a 10-meter shutdown zone for purposes of avoiding injurious effects. Marine mammal monitoring would take place from 15 minutes prior to initiation through 15 minutes post-completion of pile driving. Should a marine mammal enter the shutdown zone, pile driving would be immediately halted until the marine mammal has left the area. The 10-meter shutdown zone can be easily monitored by a trained observer from pier side or stationed on the pile driving barge and will prevent injury to any marine mammals in the unlikely event they are in the area. A larger shutdown zone may be applied pending the completion of consultation the Incidental Harassment Authorization (IHA) with NMFS. Additionally, a soft-start procedure will be implemented at the beginning each of impact pile driving session. The soft-start procedure provides a warning and/or gives animals in close proximity to pile driving a chance to leave the area prior to operating at full capacity thereby, exposing fewer animals to loud underwater and airborne sounds.

With implementation of the Marine Mammal Monitoring Plan, the Navy has determined that the Proposed Action “may affect, but is not likely to adversely affect” Steller sea lions and killer whales and have no effect on humpback whales.

Underwater and airborne sound levels from impact and vibratory pile driving have the potential to harass marbled murrelets foraging and resting in the project area. Nearshore waters in the vicinity are highly industrial, but may provide foraging habitat and prey species. The presence of construction workers, cranes, vessels (i.e. tugs, barges, small monitoring boats, etc.), pile equipment, and associated activities would create visual disturbances for marbled murrelets attempting to forage or rest in surrounding waters. Exposure to underwater sounds from pile replacement could cause behavioral disturbance, but would not be anticipated to result in injury or mortality.

To minimize impacts to marbled murrelets the Navy would monitor impact pile driving of 77 piles along the southeast corner of the pier. Monitoring would be conducted within a 42 meter shutdown zone surrounding each pile. Marbled murrelet monitoring would take place from 30 minutes prior to initiation of impact pile driving through 30 minutes post-completion of impact pile driving. Should a marbled murrelet enter the shutdown zone, impact pile driving would be immediately halted until the marbled murrelet has left the area. Additionally, during the marbled murrelet breeding season (June 15 through September 30), in-water work will not begin until 2 hours after sunrise and will end 2 hours before sunset. This timing restriction applies only to impact pile driving activity conducted on the south end of the pier and on the southeast side of the pier as detailed in Appendix A. Pile driving in this area is limited to 75 days during the summer (June 15 to September 30) and 30 days in the winter (October 1 to March 30). Pile driving in this area is limited to 90 minutes per day.

The low chance of encountering marbled murrelets in the project area, combined with best management practices and monitoring would limit the exposure of marbled murrelets to sound pressure levels above the behavioral guidance criterion. No critical habitat for the marbled murrelet is located within the project area; therefore pile replacement activities will not affect critical habitat for the species. As such, the Navy has determined the Proposed Action ‘may affect, not likely to adversely affect’ marbled murrelets.

The Navy has completed informal consultations under the ESA with the USFWS (April, 2013) and NMFS (December, 2012). USFWS and NMFS concur with the Navy’s findings of ‘may affect, not likely to adversely affect’ for the species discussed above. Detailed analysis can be found in the BA (See Appendix A).

The analysis presented above indicates that pile replacement activities at NAVBASE Kitsap Bremerton may have impacts to individual species, but any impacts observed at the population, stock, species, or evolutionary significant unit level would be negligible. Therefore, under NEPA, there would be no significant impact to ESA-listed species or critical habitat from the Proposed Action with implementation of the minimization measures and best management practices.

### **No Action Alternative**

Under this alternative, no piles would be removed or driven, thus there would be no change to ESA-listed species. As such, no significant impacts to ESA-listed species would occur with implementation of the No Action Alternative.

## **3.5 ESSENTIAL FISH HABITAT (EFH)**

### **3.5.1 Existing Environment**

The Pacific Fishery Management Council designated Puget Sound “riverine, estuarine, and marine areas used by life stages of managed salmon species and riverine areas found within watersheds of documented occurrence” as EFH for the Pacific salmon fishery. The Pacific salmon management unit includes Chinook, coho, and pink salmon. All three species use the marine nearshore environment for rearing as juveniles and migration for both adults and juveniles. The EFH designation for the Pacific salmon fishery in estuarine and marine environments in the state of Washington extends from nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (200 nautical miles) offshore (PFMC 2003).

All types of Pacific groundfish form another fishery which is managed by the Pacific Fishery Management Council that occurs in Puget Sound. Broad swaths of EFH have been designated for this fishery, and include, but are not limited to, sea mounts, eelgrass, kelp, estuaries and rocky reefs. In addition to salmonids and groundfish, the Pacific Fishery Management Council manages coastal pelagic species that occur in Puget Sound including, krill, northern anchovy, mackerels, Pacific sardine, and market squid.

While EFH for the above species does exist in Sinclair Inlet, the industrial nature of NAVBASE Kitsap Bremerton minimizes the quality of this habitat in the area surrounding Pier 6.

### **3.5.2 Environmental Consequences**

Impacts to EFH would be considered significant if there was a loss of high value habitat or a finding of adverse affect issued by NMFS that cannot be adequately avoided, minimized, or otherwise offset by conservation measures.

#### **Proposed Action**

The action area includes habitats for various life stages of groundfish, five coastal pelagic species, and three species of Pacific salmon. The action would result in a short-term increase in underwater sound-pressure levels. The Proposed Project would not result in excessive levels of organic materials, inorganic nutrients or heat, would not alter physical conditions that could adversely affect water temperature or beach contours, would not remove large woody debris, or other natural beach complexity features, nor would it affect any vegetated shallows. NMFS determined that the proposed action would adversely affect EFH by decreasing water quality and suitability through increased sound energy levels. The project will also cause short term, localized increases in turbidity. The Navy completed consultation under the EFH with NMFS in December, 2012. NMFS concurred that the Navy's protective measures were sufficient to offset adverse effects to EFH. Detailed analysis can be found in the BA (See Appendix A). Therefore, the Proposed Action will not significantly affect EFH for Pacific salmon, groundfish, and coast pelagic species.

#### **No Action Alternative**

Under this alternative, no piles would be removed or driven, thus there would be no change to EFH. As such, no significant impacts to EFH would occur with implementation of the No Action Alternative.

## **3.6 MARINE MAMMALS**

### **3.6.1 Existing Environment**

Marine mammal species that may occur in Sinclair Inlet are listed in Table 3-4. Three of these species are federally listed under the ESA as discussed above. For more detail on the life history, critical habitat, and distribution of ESA-listed species please refer to the BA in Appendix A.

Any of the species listed in Table 3-4 have the potential to occur within Puget Sound. However, marine mammals regularly identified within Sinclair Inlet are limited to a smaller list of species. The species most likely to be encountered are non ESA-listed harbor seals and California sea lions. Monthly observations indicate that the California sea lion is the animal most abundantly hauled out in the immediate vicinity of the installation (Mollerstuen personal communication, 2012). Harbor seal pupping occurs from late June through September in this area of the Puget Sound (NOAA and WDFW, 2009). The submarines at NAVBASE Kitsap Bremerton are not used as a haul out by marine mammals. The preferred haul out locations for these species in the vicinity of the project are the pontoons associated with the floating security barrier that runs from Mooring E to Pier 7 (Figure 1-2). Sea lions hauled out on the barrier have become accustomed to frequent noise from the industrial waterfront of NAVBASE Kitsap Bremerton. Observations from previous pile driving projects have shown no behavioral impacts to sea lions hauled out on

the security barrier (Mollerstuen personal communication, 2012). Humpback whales, Minke whales, gray whales, Pacific white sided dolphins, harbor porpoises, Dall’s porpoises, and northern elephant seals are extremely unlikely to be in the project area and are included in Table 3-4 for informational purposes only. For more information on marine mammals, refer to the application for an IHA in Appendix B.

**Table 3-4. Sinclair Inlet Marine Mammals Protected Under the MMPA**

Species	Stock(s)	ESA Status
Humpback Whale ( <i>Megaptera novaeangliae</i> )	California-Oregon-Washington stock	Endangered
Minke Whale ( <i>Balaenoptera acutorostrata</i> )	California-Oregon-Washington stock	None
Gray Whale ( <i>Eschrichtius robustus</i> )	Eastern North Pacific stock	None
Killer Whale ( <i>Orcinus orca</i> )	(1) West Coast transient stock (2) Eastern North Pacific Southern Resident/DPS	(1) Not listed (2) Endangered
Pacific white-sided dolphin ( <i>Lagenorhynchus obliquidens</i> )	California-Oregon-Washington, Northern and Southern stock	None
Harbor Porpoise ( <i>Phocoena phocoena</i> )	Washington inland waters stock	None
Dall’s Porpoise ( <i>Phocoenoides dalli</i> )	California-Oregon-Washington stock	None
Steller Sea Lion ( <i>Eumetopias jubatus</i> )	Eastern U.S. stock/DPS	Threatened
California Sea Lion ( <i>Zalophus californianus</i> )	U.S. stock	None
Northern Elephant Seal ( <i>Mirounga angustirostris</i> )	California breeding stock	None
Harbor Seal ( <i>Phoca vitulina</i> )	Washington inland waters stock	None

### 3.6.2 Environmental Consequences

Impacts to marine mammals would be considered significant if there was a loss of high value habitat and/or physical injury would result from the Proposed Action.

#### Proposed Action

Non ESA-listed marine mammals would experience similar impacts as described above for killer whales, Steller sea lions, and humpback whales. Individual marine mammals may be exposed to sound pressure levels during pile driving operations, which may result in Level B behavioral harassment (defined by the Marine Mammal Protection Act (MMPA) as potential behavioral disruption). Any marine mammals that are exposed (harassed) may change their normal behavior patterns (i.e., swimming speed, foraging habits, etc.) or be temporarily displaced from the area of construction. Any exposures will likely have only a minor effect on individuals and no effect on

the population. The sound generated from vibratory pile driving is nonpulsed (e.g., continuous), which is not known to cause injury to marine mammals. The Navy does not anticipate Level A harassment (defined by the MMPA as potential to injure). The reasons for this are two-fold. First, vibratory pile driving used for pile extraction has a relatively low source level (less than 190 dB). Second, pile driving will be either delayed or halted if a marine mammal approaches the shutdown zones as agreed to with NMFS in the IHA. Consultation with NMFS on the IHA is ongoing.

The exposure assessment methodology in the IHA Application (Appendix B) provides estimates for the numbers of individuals exposed to the effects of pile driving activities exceeding NMFS established thresholds. The calculated acoustic impact numbers should be regarded as conservative overestimates that are strongly influenced by limited marine mammal population data. To reduce the number of animals affected, the Navy will implement BMPs and mitigation measures (i.e. monitoring, soft-starts, shutdown zones, coordination with the Orca Network for whale sightings in the area, etc.).

The analysis presented above indicates that activities associated with the Proposed Action at NAVBASE Kitsap Bremerton may impact the behavior of individual marine mammals, but any impacts observed at the population, stock, or species level would be negligible. There would be no impacts to high value habitat or physical injuries to marine mammals from the Proposed Action. Therefore, no significant impacts to marine mammal populations would occur with implementation of the Proposed Action.

### **No Action Alternative**

Under this alternative, no piles would be removed or driven, thus there would be no change to marine mammals. Therefore, no significant impacts to marine mammal populations would occur with implementation of the No Action Alternative.

## **3.7 CULTURAL RESOURCES**

### **3.7.1 Existing Environment**

Areas regarded as having a potential for archaeological sites at NAVBASE Kitsap Bremerton are along the original shoreline and upland areas. The original shoreline is deeply buried under fill and out of the proposed construction area. No known archaeological sites occur within the project area (Lewarch et. al, 2002). The proposed construction site is in a highly disturbed area where dredging, armoring, and general construction has been occurring for over 100 years.

Four NRHP Historic Districts and one National Historic Landmark (NHL) have been designated at NAVBASE Kitsap Bremerton (Officers Row; Puget Sound Radio Station District; Marine Reservation District; Naval Hospital; and the Puget Sound Naval Shipyard NHL). The NHL is historically significant for its association with World War II (Thompson 1990). The shipyard was the principal repair establishment for battle-damaged battleships and aircraft carriers as well as smaller warships of the Pacific Fleet during World War II. Five of the eight battleships bombed at Pearl Harbor on December 7, 1941, were repaired at the shipyard and returned to sea. During the war, the Navy yard repaired 26 battleships (some more than once), 18 aircraft carriers, 13 cruisers, and 79 destroyers. In addition, 50 ships were built or fitted out at the yard. More than 30,000 workers built, fitted out, repaired, over-hauled or modernized 394 fighting ships between

1941 and 1945. The shipyard's contribution to the success of the Pacific Fleet from the first to the last day of the war was inestimable.

Puget Sound Naval Shipyard shares with Mare Island Naval Shipyard the distinction of epitomizing the rise of the United States to world power in the Pacific and thus on two oceans. While Mare Island was the Navy's first permanent installation on the Pacific coast, Puget Sound became the focus of attention because it was the only west coast yard capable of repairing modern battleships, which emerged as the symbol and reality of US naval power. Pier 6 is a contributing element to the NHL. Pier 6's most striking feature is the 250-ton hammerhead crane located near the end of the pier.

### **3.7.2 Environmental Consequences**

Impacts to cultural resources would be considered significant if the Proposed Action resulted in adverse effects to NRHP eligible resources that could not be mitigated or reduced through a memorandum of agreement with the State Historic Preservation Office (SHPO).

#### **Proposed Action**

Implementation of the Proposed Action would not affect any known NRHP-eligible archaeological sites. Construction activities would take place in previously disturbed underwater areas. Although there are no known or expected underwater cultural resources, if there was an "inadvertent discovery" of archaeological resources, the Navy would evaluate the eligibility and effects to the discovered resources through consultation with the SHPO, the Suquamish tribe and other interested parties in accordance with federal regulations and Navy policy. Similarly, if American Indian human remains, funerary items, sacred objects, or items of cultural patrimony are encountered, the Navy would comply with the Native American Graves and Repatriation Act.

The replacement of existing piles will have no impact to the characteristics that makes Pier 6, the NHL or nearby historic districts eligible for inclusion in the NRHP. The Navy has determined that the Proposed Action would not adversely affect historic properties or those contributing to the NHL. Consultation with SHPO under Section 106 of the NHPA is completed. The SHPO concurred that the Proposed Action would not have an adverse effect on Pier 6 or the NHL. Refer to Appendix C for consultation documentation. No significant impacts to cultural resources would occur with implementation of the Proposed Action.

#### **No Action Alternative**

Under this alternative, no piles would be removed or driven, thus there would be no change to Pier 6. As such, no significant impacts to cultural resources would occur with implementation of the No Action Alternative.

## **3.8 AMERICAN INDIAN TRADITIONAL RESOURCES**

### **3.8.1 Existing Environment**

In accordance with Executive Order 13175 and DOD instructions, the Navy has implemented a policy for government-to-government consultation with federally recognized American Indian tribes, for actions with the potential to significantly affect protected tribal resources, tribal rights, or Indian lands. This policy, included in Secretary of the Navy Instruction 11010.14A (Navy

2005) and Commander, Navy Region Northwest Instruction 11010.14 (Navy 2009), describes the Navy's process and responsibilities during consultation. The Suquamish Tribe is the only federally recognized American Indian tribe that has adjudicated tribal treaty rights in Sinclair Inlet.

The Suquamish harvest a variety of fish throughout Sinclair Inlet which continues to be a culturally and economically important area for the Tribe. However, the Suquamish Tribe does not fish within the Waterfront Restricted Area and shellfish harvesting is prohibited throughout Sinclair Inlet due to pollutant levels.

### **3.8.2 Environmental Consequences**

#### **Proposed Action**

The Navy initiated Government-to-Government consultation with the Suquamish Tribe in July 2012 and concluded consultation on the proposed project in December 2012. Tribal concerns were identified and addressed during these consultations. The Proposed Action would not alter access to, or use of, tribal traditional resources. Access for fishing is currently not allowed inside the Waterfront Restricted Area that surrounds Pier 6. This restriction would remain unchanged. The Proposed Action would not appreciably impact the quantities of fish available for harvest by the Suquamish Tribe in Sinclair Inlet, nor would it restrict access to existing traditional harvest areas in Sinclair Inlet. As such, no significant impacts to American Indian traditional resources would occur with implementation of the Proposed Action.

#### **No Action Alternative**

Under this alternative, no piles would be removed or driven, thus there would be no change to American Indian traditional resources. As such, no significant impacts to American Indian traditional resources would occur with implementation of the No Action Alternative.

**Table 3-5. Summary of Potential Environmental Consequences by Resource**

Section / Resource Area	Proposed Action	No Action Alternative
<b>Sediments</b>	Some degree of localized changes in sediment composition would occur during construction. Impacts from sediment resuspension would be minor and localized in the area of pile removal and pile installation due to weak, stable tide currents in the project area, which would allow any disturbed sediments to resettle in the general area of pile removal/installation. Project-related construction activities would not create sediment contamination concentrations or physical changes that violate state standards. Therefore, there would be no significant impact to sediments.	Under this alternative, no piles would be removed or driven, thus there would be no change to sediments due to the No Action Alternative.
<b>Water Quality</b>	Direct discharges of waste would not occur. Construction-related turbidity impacts would be limited to short-term and localized changes associated with re-suspension of bottom sediments. These changes would be spatially limited to the construction site and areas immediately adjacent that may be impacted by re-suspended bottom sediments. Temporary impacts would not violate applicable state or federal water quality standards. BMPs and minimization measures will be implemented to prevent accidental losses or spills of construction debris. Therefore, no significant impacts to water quality are expected.	Under this alternative, no piles would be removed or driven, thus there would be no change to water quality due to the No Action Alternative.
<b>Noise</b>	The City of Bremerton and the State of Washington exempt temporary construction noise from 7:00 A.M. to 10:00 P.M. and the City of Port Orchard exempts temporary construction noise from 7:00 A.M. to 9:00 P.M. from exceeding maximum permissible noise levels. As the noise from the Proposed Action is temporary and will occur between the hours of 7:00 A.M. and 9:00 P.M. noise from implementation of the Proposed Action is exempt and would not result in a significant impact.	Under this alternative, no piles would be removed or driven, thus there would be no change to noise due to the No Action Alternative.
<b>ESA-Listed Species</b>	With implementation of the protection measures including limiting work to the in-water work windows, and implementing monitoring protocols for marine mammals and marbled murrelets, the Proposed Action would not result in significant impacts to ESA-listed species or critical habitat.	Under this alternative, no piles would be removed or driven, thus there would be no change to ESA-listed species due to the No Action Alternative.

**Table 3-5. Summary of Potential Environmental Consequences by Resource**

<b>Section / Resource Area</b>	<b>Proposed Action</b>	<b>No Action Alternative</b>
<b>Essential Fish Habitat</b>	NMFS determined that the proposed action would adversely affect EFH by decreasing water quality and suitability through increased sound energy levels. The project will also cause short term, localized increases in turbidity. The Navy completed consultation under the EFH with NMFS in December, 2012. NMFS concurred that the Navy's protective measures were sufficient to offset adverse effects to EFH. Therefore, the Proposed Action will not significantly affect EFH for Pacific salmon, groundfish, and coast pelagic species.	Under this alternative, no piles would be removed or driven, thus there would be no change to EFH due to the No Action Alternative.
<b>Marine Mammals</b>	Construction activities may impact the behavior of individual marine mammals, but any impacts observed at the population, stock, or species level would be negligible. Shutdown zones and monitoring would reduce potential impacts. Therefore, there would be no significant impact to marine mammal populations.	Under this alternative, no piles would be removed or driven, thus there would be no impact to marine mammals resources due to the No Action Alternative.
<b>Cultural Resources</b>	The replacement of existing piles would have no adverse affect to the historic districts or national landmark or affect any known NRHP-eligible archaeological sites. Construction activities would take place in previously disturbed areas along the industrial waterfront. In the unlikely event historic properties or cultural materials such as archaeological deposits or human remains are encountered during construction, ground disturbing activities in the vicinity of the find will immediately cease and the Navy will initiate consultation with the SHPO and affected tribes, as appropriate. The Navy has determined that the Proposed Action would have no adverse effect to cultural resources and therefore will result in no significant impact.	Under this alternative, no piles would be removed or driven, thus there would be no change to cultural resources due to the No Action Alternative.
<b>American Indian Traditional Resources</b>	The Proposed Action would not appreciably impact the quantities of fish available for harvest by the Suquamish Tribe in the Sinclair Inlet, nor would it restrict access to existing traditional harvest areas in the Sinclair Inlet. As such, no significant impacts to American Indian traditional resources would occur with implementation of the Proposed Action.	Under this alternative, no piles would be removed or driven, thus there would be no change to American Indian traditional resources due to the No Action Alternative.

## 4 CUMULATIVE IMPACTS

CEQ regulations implementing the procedural provisions of NEPA define cumulative impacts 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. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.” (40 CFR 1508.7).*

Each resource, ecosystem, and human community must be analyzed in terms of its ability to accommodate additional effects, based on its own time and space parameters. Therefore, cumulative effects analysis normally will encompass a ROI or geographic boundaries beyond the immediate area of the Proposed Action, and a time frame including past actions and foreseeable future actions, to capture these additional effects.

For the Proposed Action to have a cumulatively significant impact to an environmental resource, two conditions must be met. First, the combined effects of all identified past, present, and reasonably foreseeable projects, activities, and processes on a resource, including the effects of the Proposed Action, must be significant. Second, the Proposed Action must make an appreciable contribution to that significant cumulative impact. In order to analyze cumulative effects, a cumulative effects region must be identified for which effects of the Proposed Action and other past, present, and reasonably foreseeable actions would occur.

### 4.1 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

This analysis depends on the availability of data and the relevance of effects of past, present, and future actions. Although certain data (e.g., extent of forest cover) may be available for extensive periods in the past (i.e., decades), other data (e.g., water quality) may be available for much shorter periods. Because specific information and data on past projects and action are usually scarce, the analysis of past effects is often qualitative (CEQ 1997).

Table 4-1 provides the past, present, and reasonably foreseeable future actions within the ROI that have had, continue to have, or would be expected to have some impact to the natural and human environment. The projects in this list are limited to those implemented in the last 5 years or those with ongoing contributions to environmental effects. Projects with measureable contributions to impacts within the ROI for a resource area were included in the cumulative analysis.

**Table 4-1. Past, Present, and Reasonably Foreseeable Future Projects at NAVBASE Kitsap Bremerton and the ROI**

Project	Project Description	Project Timeframe		
		Past	Present	Future
Installation Establishment & Maintenance	Since 1890, the Navy has filled-in several acres of nearshore to create NAVBASE Kitsap Bremerton with its current 13 piers and moorings, 6 drydocks, and miles of armored shoreline. Infrastructure maintenance in support of the installation includes shoreline armoring, stormwater/sewer replacement, paving, and other activities.	X	X	X
Mission Support Facilities	Mission support facilities include activities or projects such as the addition of power booms, installation of emergency power generation capability, and other activities to support facilities, piers, or operations.	X	X	X
Pier D Construction	In 2003, construction of Pier D was completed. The new concrete pile supported pier (210,000 ft <sup>2</sup> ) was constructed to support homeported aircraft carriers at NAVBASE Kitsap Bremerton.	X		
Pier D Mitigation	As mitigation for construction of Pier D, the Navy created a new beach and restored intertidal habitat (Charleston Beach); installed a fish ladder on Heinz Creek; and, removed creosote treated pilings along the north shore of Sinclair Inlet.	X		
Dredging	Dredging for navigational and CERCLA purposes included over 368,000 cubic yards of material from berthing areas at Piers 3, B and D and from the inner channel south of the installation in Sinclair Inlet. Disposal of this soil occurred in upland locations and at the Elliott Bay Puget Sound Dredged Disposal sites.	X		
Waterfront Restricted Area and Security Barriers	This project includes construction of a floating security barrier for the eastern half of NAVBASE Kitsap Bremerton. Proposed movement of the barrier may extend it from Pier 7 to the eastern edge of the installation	X		X
Piers 5 & 6 Pile Replacement	In 2011, 70 creosote treated timber piles at Piers 5 and 6 were replaced with new concrete piles.	X		
Manette Bridge Replacement	In 2011, Washington Departments of Transportation completed the replacement of the Manette Bridge, crossing the nearby Washington Narrows. This included the demolition of existing in-water structures and the construction of a new in-water foundation for the bridge.	X		
Pier B Construction	In 2012, the Navy completed construction of the aircraft carrier Maintenance Wharf (Pier B) at NAVBASE Kitsap at Bremerton. The new concrete pile supported pier (165,000 ft <sup>2</sup> ) was constructed to support vessel overhaul and maintenance.	X		
Pier B Mitigation	As mitigation for construction of Pier B, Pier 8 on the east side of the installations was demolished. Additional mitigation funding was set aside for the restoration of 0.8 acres of intertidal habitat, as well as restoration efforts on Chico Creek including fish passage improvement and the purchase/preservation of two properties.	X	X	X

**Table 4-1. Past, Present, and Reasonably Foreseeable Future Projects at NAVBASE Kitsap Bremerton and the ROI**

<i>Project</i>	<i>Project Description</i>	<i>Project Timeframe</i>		
		<i>Past</i>	<i>Present</i>	<i>Future</i>
Port Orchard Boat Launch	In 2013, the City of Port Orchard installed a new floating pier with steel piles at the public boat launch in Port Orchard.	X		
Bremerton Ferry Terminal Maintenance	In 2013, Washington Department of Transportation plans to remove 112 creosote treated piles and install 20 steel piles in support of the Bremerton Ferry Terminal.			X
Pile Repair and Replacement Program	Under the Pile Repair and Replacement Program, the Navy plans to repair or replace structurally unsound piles at various Navy installations in the Puget Sound area over a five-year period beginning October 2013. At NAVBASE Kitsap Bremerton, 43 missing or broken 24-inch diameter steel fender piles at Pier 4 would be replaced in 2015 and 380 24-inch pre-stressed concrete piles at Pier 5 would be replaced in 2016, as well as emergent repair projects at other piers and wharfs over the five year project.			X
Northwest Training and Range Complex (NWTRC) and Northwest Training and Testing (NWTT)	The Navy's Proposed Action is to conduct training and testing activities primarily within existing range complexes, operating areas, testing ranges and select Navy pier side locations in the Pacific Northwest. The Proposed Action includes pier side sonar testing conducted as part of overhaul, modernization, maintenance and repair activities at Puget Sound Naval Shipyard in Bremerton, NAVBASE Kitsap Bangor and Naval Station Everett. The NWTT EIS/OEIS will reassess the environmental analyses of Navy at-sea training and testing activities contained in the EISs/OEISs for NWTRC and Keyport Range and various environmental planning documents, and consolidate these analyses into a single environmental planning document.	X	X	X

## 4.2 ASSESSMENT OF CUMULATIVE IMPACTS BY RESOURCE

### 4.2.1 Sediment

The ROI for examining cumulative impacts to sediment quality is Sinclair Inlet. Past, present, and future actions involving in-water construction near NAVBASE Kitsap Bremerton have caused and continue to cause short-term disturbances to sediments. Previous sediment contamination has occurred from historic Navy operations resulting in high levels of polychlorinated biphenyl and metals (USEPA, 2000). A Record of Decision (ROD) is in place for managing these sediments which are not expected to worsen or spread due to ongoing installation operations (USEPA, 2000). Disturbed sediment from pile driving or vessel movements can create plumes of turbid water that carry fine-grained material down current from the disturbed area. This disturbance has increased as the installation has grown as many of the in-water projects including the construction of piers marinas, boat ramps, and Navy piers and the filling of intertidal areas to create more land have resulted in an increased use of boats in the nearshore area. Vessels that operate in these areas have the potential to disturb sediments from their propeller wash. The cumulative impact of sediment movement from in-water construction

or propeller wash has been inconsequential compared to the movement of sediment by tides and currents. Preconstruction and post-construction sediment sampling of similar projects at NAVBASE Kitsap Bremerton have demonstrated that pile driving does not adversely impact the Navy's sediment cleanup actions under the 2000 ROD. In combination with the past, present, and foreseeable future projects, implementing the Proposed Action would not have a significant cumulative impact to sediments.

#### **4.2.2 Water Quality**

Water quality in Puget Sound has been and is being impacted by past and present in-water actions and would potentially be impacted by future actions. Specific actions include: 1) incidental spills; 2) sediment disturbance and turbidity; 3) toxin leakage attributable to use over time of materials such as treated wood pilings; 4) stormwater runoff; and 5) nutrient and pollutant loading from septic systems or development.

Most of the future actions would have no impact or variable (sometimes minimal) short-term impact, and some future actions would be designed to minimize such impacts. For example, pile repair and maintenance at the Bremerton Ferry Terminal and NAVBASE Kitsap Bremerton's Piers 4 and 5 would use concrete or steel piles, which, unlike creosote-treated piles used in the past, would not have the potential for leaching toxic compounds into the water. Additionally new piers (e.g. the new Pier B at NAVBASE Kitsap Bremerton) will be designed to include current stormwater control and treatments systems thereby reducing input of impacted stormwater runoff into Sinclair Inlet.

Past Navy projects including Pier 5 and 6 have helped make incremental improvements to water quality in Sinclair Inlet by removing 70 creosote piles and replacing them with concrete piles. Ongoing Navy mitigation projects, such as Pier D mitigation and Pier B mitigation have also improved water quality in Sinclair Inlet through beach creation and removal of Pier 8.

Implementation of the Proposed Action would not be expected to add appreciably to cumulative water quality impacts because spills would be avoided through adherences to BMPs and minimization measures; sediment disturbance would be minimal and localized; creosote-treated piles would not be used; no stormwater runoff would be generated; and no nutrients or pollutants would be discharged.

Therefore, in combination with the past, present, and foreseeable future projects, implementing the Proposed Action would not have a significant cumulative impact to water quality.

#### **4.2.3 Noise**

The ROI for evaluating cumulative impacts for airborne noise includes Sinclair Inlet and the adjacent upland areas including the industrial waterfront and areas within the Cities of Bremerton and Port Orchard. NAVBASE Kitsap Bremerton has been an industrial ship repair facility for 100 years. While surrounded by suburban to urban residential land uses, noise from the shipyard has likely been fairly constant since the installation's creation. Completed past actions listed in Table 4-1 would not contribute cumulatively to the noise environment within the ROI. The current and reasonably foreseeable future projects would contribute to the noise environment primarily during construction, and secondarily during operations.

Construction noise would come primarily from pile driving activities, as well as supporting equipment (e.g., cranes, truck traffic). This noise is expected to be similar to background noise from the shipyard which includes operational noise from cranes, trains, large vessels, and ship maintenance and repair activities. Airborne noise tends to extend over limited distances, while underwater noise travels for longer distances. Future projects such as the repair of pilings at Piers 4 and 5, and the replacement of piles at the Bremerton Ferry Terminal will have similar noise impacts. Construction would likely be limited to the hours between 07:00 a.m. and 09:00 p.m. and would be exempt from applicable state and city noise regulations. After construction, operations at these facilities would be similar to existing operations, and no significant change to current airborne and underwater sound is anticipated.

Overall, proposed construction activities included in the Proposed Action, combined with known present and future projects would be short term, would be limited to daytime hours, and would be exempt from WAC 173-60-040 noise limits. Due to the limited duration of construction activities and anticipated consistency with current operations, the Proposed Action in combination with known past, present, and future actions would not have a significant adverse noise impact.

#### **4.2.4 ESA-listed Species and EFH**

Past actions have adversely impacted ESA-listed populations of fish, marine mammals, and avian species in Sinclair Inlet and tributaries through loss of foraging and refuge habitat in shallow areas, reduced function of migratory corridors, loss and degradation of spawning habitat in streams, interfering with migration, adverse impacts to forage fish habitat and spawning, contamination of water and sediments, and removal of old growth forest habitat. Ongoing fish harvest has resulted in adverse impacts to salmonid abundance and the impact has been greatest on native stocks. Practically all chum salmon, most Chinook, and all sockeye salmon spawning in Sinclair Inlet and in the Puget Sound stream systems are derived from naturalized hatchery stock. Populations of pink salmon, coho salmon, bull trout, and steelhead are also in decline. The net result is that several Puget Sound salmonid species have been listed under the ESA. Similar impacts have occurred to ESA-listed marine mammals including killer whales and humpback whales whose populations have dropped significantly due to hunting. Marbled murrelet nesting habitat has been lost throughout the Puget Sound area as the removal of old growth forests has pushed the breeding population in Washington to small areas on the Olympic Peninsula.

The State of the Sound Report (PSAT 2007) describes several trends that may be indicative of cumulative impacts to the growth and development of salmonids and marine mammals. There is an increasing trend for toxics to be concentrated in the tissues of salmon and marine mammals. Both salmon and killer whales have been found to have PCB levels much higher than species outside of the Puget Sound. Wild salmon stocks have declined from 93 to 81 healthy stocks from 1992 to 2002, and during that same period seven stocks have become extinct.

Existing Navy structures have affected salmonid and forage fish habitat, and have potentially impeded and continue to impede juvenile salmon migration to some degree. The placement of in-water structures by the Navy and from non-Navy actions has changed and would continue to change fish habitat in and around these structures. In-water structures can impact fish in several ways, including:

- Increasing the presence of predators that prey on juvenile fish;
- Posing a barrier to fish movement, particularly juvenile fish;
- Causing direct loss of marine vegetation such as eelgrass, which is important habitat for forage fish and other species; and
- Creating shade that reduces the productivity of aquatic vegetation and benthic organisms, which are preyed on by fish.

Currently, efforts are being made to reverse the decline of fish populations by regulating development and restoring fish habitat. Numerous salmon preservation and restoration groups have proposed and constructed habitat restoration projects in Puget Sound. Efforts to reduce construction impacts to salmonids and other fish have resulted in a schedule of in-water work periods that all projects must adhere to if authorized by state (WDFW) or federal regulatory (USACE) authorities. The in-water work windows help minimize adverse impacts to fish.

Current and future waterfront projects at NAVBASE Kitsap Bremerton would be designed and implemented to minimize impacts to salmonids and other fish habitat and migration. The protective measures taken to minimize impacts during construction activities, and the design elements that reduce long-term impacts to nearby habitats is expected to reduce impacts to fish populations. In addition, many regional habitat restoration projects would benefit all fish species.

The Navy's construction of Piers B and D included several projects that are ongoing to mitigate for impacts to salmonids. This included demolition of Pier 8 at Bremerton, creation of Charleston Beach, installation of a fish ladder on Heinz Creek, restoration of 0.8 acres of inter-tidal habitat, and restoration funding for Chico Creek.

Since the Proposed Action would not impact upland bird habitat, it will not make any contribution to cumulative adverse impacts to marbled murrelet nesting. Cumulative impacts to marbled murrelets have the greatest potential to occur during simultaneous pile driving activities. However, it is very unlikely that pile driving activities associated with planned pile replacement work at Piers 4 or 5 would occur simultaneously with pile driving activities associated with the Proposed Action. Other projects listed on Table 4-1 would not overlap temporally with the Proposed Action. With implementation of avoidance and minimization measures including marbled murrelet monitoring and pile-driving shutdown zones, cumulative impacts to ESA-listed marbled murrelets from the Proposed Action and past, present, and reasonably foreseeable future actions would not be significant.

Due to the temporary and localized extent of the Proposed Action, including measures to avoid and minimize impacts to ESA-listed species; it would not make an appreciable contribution to cumulative adverse impacts.

#### **4.2.5 Marine Mammals**

Past and present Navy and non-Navy actions, including marinas, residential docks, boat ramps, and piers have resulted in increased human presence, underwater and airborne noise, boat movement, and other activities, and have likely impacted some water-dependent wildlife (e.g., marine mammals) in the area. Increased anthropogenic noise in the marine environment has the

potential to cause behavioral reactions in marine mammals including avoidance of certain areas. However, the abundance and coexistence of marine mammals with existing anthropogenic activities suggests that cumulative effects have not been significant. The MMPA regulatory process ensures that each project that could affect marine mammals is assessed in light of the status of the species and other actions affecting it in the same region.

Future Navy and non-Navy waterfront projects may have similar impacts to past and present actions including increased anthropogenic sound (both airborne and underwater), increased human presence, increased boat movements and other associated activities. These actions could result in behavioral impacts to local populations of marine mammals, such as temporary avoidance of habitat, decreased time spent foraging, increased or decreased time spent hauled out (depending on the activity), and other minor behavioral impacts. All impacts would likely be short-term and temporary in nature and unlikely to affect the overall fitness of the animals. Additionally, the NAVBASE Kitsap Bremerton projects including Security Barrier movement and Piers 4 and 5 pile repairs, are within an existing, heavily developed installation waterfront. These areas already have industrial uses with higher than normal activity and noise levels. Thus, there is little loss of habitat for marine mammals, and the marine mammals in the area may be habituated to these higher levels of ongoing activity and less impacted by ongoing waterfront development.

The primary impact of in-water construction projects, including the Proposed Action, to marine mammals is behavioral disturbance from underwater sound due to pile driving. Any marine mammals that are behaviorally disturbed may change their normal behavior patterns (i.e., swimming speed, foraging habits, etc.) or be temporarily displaced from the area of construction. Any exposures would likely have only a minor effect and temporary impact on individuals. The Northwest Training and Range Complex program has several procedures and mitigation measures in place and will evaluate other mitigation measures to reduce impacts to marine mammals. The current procedures of monitoring, safety zones and level of sonar transmissions, and working with NMFS and local resources groups reduce the cumulative effects of the various exercise and training activities covered under this program.

Two species of pinnipeds, California sea lions and harbor seals, are abundant in Sinclair Inlet and at the NAVBASE Kitsap Bremerton waterfront in particular. The seals would likely be foraging in Sinclair Inlet as no haul outs exist on the installation, however California sea lions are known to use the floating waterfront security barrier as a haul out. Airborne noise from construction is not anticipated to have significant impacts to hauled-out pinnipeds because sea lions have grown accustomed to frequent 70 to 90 dBA noise levels associated with existing shipyard operations. Pile driving is the loudest construction noise source anticipated within the ROI, and no pile driving is anticipated within 50 ft of the waterfront security barrier. Over 50 ft away from pile driving activities, sound attenuates to below 94 dBA, a level to which the seals have shown to be accustomed (WSDOT 2012).

Cumulative impacts to marine mammals have the greatest potential to occur during simultaneous pile driving exposure events from the Proposed Action and other present and future projects in the vicinity. However, it is very unlikely that pile driving activities associated with planned pile replacement work at Piers 4 or 5 would occur simultaneously with pile driving activities

associated with the Proposed Action. Other projects listed on Table 4-1 would not overlap temporally with the Proposed Action. With implementation of avoidance and minimization measures including marine mammal monitoring and pile-driving shutdown zones, cumulative impacts to marine mammals would not be significant.

#### **4.2.6 Cultural Resources**

The ROI for evaluating impacts to cultural resources is defined as NAVBASE Kitsap Bremerton, but specifically the Puget Sound Navy Shipyard NHL. Cultural resources are unique as well as finite in nature, so that an adverse effect to a single historic property affects the complement of historic properties within the area. Continued construction projects and modifications to Navy facilities have the potential to adversely affect historic properties.

While no archeological sites have been identified, the shipyard itself is a NHL with four NRHP historic districts located further upland from Pier 6. Future pile replacement projects including pile replacement at Piers 4 and 5 are not expected to impact these historic districts, but would be consulted on with the SHPO to ensure no adverse effects. Thus, the Proposed Action would not contribute to cumulative adverse impacts to cultural resources. Therefore, in combination with the past, present, and foreseeable future projects, implementing the Proposed Action would not have a significant cumulative impact to cultural resources.

#### **4.2.7 American Indian Traditional Resources**

Regionally, tribes have expressed concern over loss of access to traditional foraging areas along the coastline of Puget Sound, especially as a result of the incremental habitat loss from construction of new piers, bulkheads, and docks. The Proposed Action would not have an appreciable contribution to impacts to quantities of fish available for harvest by the Suquamish Tribe, nor would it restrict access to existing traditional harvest areas, since the tribe does not currently harvest inside the Waterfront Restricted Area that surrounds Pier 6. Pile repairs at Piers 4 and 5 would have similar effects to the Proposed Action and would not be expected to have an appreciable contribution to cumulative impacts to tribal resources.

The Navy will continue to consult with the Suquamish Tribe regarding future Navy activities and projects that may have the potential to significantly effect tribal treaty rights and resources.

Therefore, in combination with the past, present, and foreseeable future projects, implementing the Proposed Action would not have a significant cumulative impact to American Indian traditional resources.

## 5 OTHER CONSIDERATIONS REQUIRED BY NEPA

In accordance with 40 CFR Section 1502.16(c), analysis of environmental consequences shall include discussion of possible conflicts between the Proposed Action and the objectives of Federal, regional, State and local land use plans, policies, and controls. Table 5-1 identifies the principal federal and state laws and regulations that are applicable to the Proposed Action, and describes briefly how compliance with these laws and regulations would be accomplished.

**Table 5-1. Principal Federal and State Laws Applicable to the Proposed Action**

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	Status of Compliance
National Environmental Policy Act (NEPA) (42 USC §4321 et seq.); CEQ NEPA implementing regulations (40 CFR 1500-1508; Navy procedures for Implementing NEPA ((32 CFR Part 775 and OPNAVINST 5090.1C CH-1, Chapter 5)	Preparation of this EA has been conducted in compliance with NEPA and in accordance with CEQ regulations and the Navy's NEPA procedures.
Clean Air Act (42 USC §7401 et seq.)	The EPA has established NAAQS for seven pollutants. NAVBASE Kitsap Bremerton is located in Kitsap County which is an attainment area. A formal conformity determination is not required. Emissions for the Proposed Action would come from mobile sources: one pile driver and associated support vehicles and would be well below applicable thresholds. As a result, the project would comply with the requirements of the Clean Air Act, as amended.
Clean Water Act (Sections 401 and 404, 33 USC 1251 et seq.)	The Proposed Action is not expected to require a Section 404 Permit or Section 401 Water Quality Certification because the Action does not involve discharge of fill materials into water of the U.S. However, should Section 404 and 401 permits be required, the Navy would obtain these permits prior to construction. All chemicals, liquid products, petroleum products, and other wastes present at the construction site would be covered, contained, and protected.
Rivers and Harbors Act (33 U.S.C. 401 et seq.)	A permit under Section 10 of the Rivers and Harbors Act is required for the removal and replacement of pilings in navigable waters. The Proposed Action is expected to qualify for a USACE Nationwide Permit (NWP #3 Maintenance). The Navy submitted a Joint Aquatic Resource Permit Application to the USACE, which serves as the pre-construction notification required under NWP #3. The Navy would obtain a Nationwide Permit from the USACE prior to construction and would comply with any conditions applied to the project during the coordination process between the Navy and the USACE.
Coastal Zone Management Act (16 USC 1451 et seq.)	Washington is a coastal state and has an approved CZMA program. CZMA requires federal development activities such as the Proposed Action to be consistent to the maximum extent practicable with the enforceable policies of the Washington Coastal Zone Management program and to consider the potential effect on coastal resources. The Proposed Action is expected to qualify for a USACE Nationwide Permit (#3 Maintenance), which has been certified as consistent with Coastal Zone Management Act. No further action is required by the Navy.

**Table 5-1. Principal Federal and State Laws Applicable to the Proposed Action**

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	Status of Compliance
National Historic Preservation Act (Section 106, 16 USC 470 <i>et seq.</i> )	The NHPA requires federal agencies to identify, evaluate, inventory, and protect NRHP resources (or resources that are potentially eligible for listing in the NRHP on properties that they control (16 USC 470h-2). In accordance with Section 106 of the NHPA, the Navy determined that the Proposed Action would have no adverse effect on historic properties. The SHPO concurred with the Navy's finding. In the unlikely event historic properties or cultural materials such as archaeological deposits or human remains are encountered during construction, ground disturbing activities in the vicinity of the find will immediately cease and the Navy will initiate consultation with the SHPO and affected tribes, as appropriate.
Endangered Species Act (16 USC 1531 <i>et seq.</i> )	In accordance with ESA Section 7 requirements, the Navy prepared a Biological Assessment and consulted informally with USFWS and NMFS regarding potential effects to ESA-listed species and critical habitat. The Navy received Letters of Concurrence from NMFS and USFWS, concluding informal consultation (appendix A). For listed marine mammal species, NMFS would issue an incidental take statement after issuance of an IHA.
Marine Mammal Protection Act (16 USC 1361 <i>et seq.</i> )	Based on potential impacts to marine mammals, the Navy prepared an IHA application to request take for level "B" harassment. The IHA application was submitted to NMFS, which will issue the IHA after public review of the Draft IHA. In compliance with the MMPA, the Navy will comply with all IHA conditions.
Magnuson-Stevens Fishery Conservation and Management Act MSA (16 USC 1801-1882)	The Navy prepared an EFH Assessment and submitted it to NMFS with the BA. The Navy received a Letter of Concurrence from NMFS concluding consultation.
Migratory Bird Treaty Act (16 USC 703-712)	The Proposed Action is not likely to adversely affect migratory bird populations and would be in compliance with the MBTA.
Bald and Golden Eagle Protection Act (16 USC 668-668d)	No bald or golden eagle nests occur on NAVBASE Kitsap Bremerton.
Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-income Populations	No disproportionately high or adverse impacts to minority and low-income populations would be expected from the Proposed Action.
EO 13045, Protection of Children from Environmental Health Risks and Safety Risks.	Pier 6 is within the Waterfront Restricted Area, which restricts access for children. The removal and replacement of piles at Pier 6 would not cause environmental health risks and safety risks, such as products and substances that children could come in contact with or ingest, that may disproportionately affect children.
Consultation and Coordination with Indian Tribal Governments (EO 13175)	As required under Secretary of the Navy Instruction 11010.14A, <i>Department of the Navy Policy for Consultation with Federally Recognized Tribes</i> ; DoD Instruction 4710.02, <i>DoD Interactions with Federally Recognized Tribes</i> ; and DoD Policy, <i>American Indian and Alaska Native Policy Alaska Implementation Guidance</i> , the Navy initiated consultation with the Suquamish Tribe regarding potential impacts to Tribal U&A fishing grounds and stations in July 2012. Consultations with the Tribe were concluded in December 2012.

### **5.1 Irreversible or Irretrievable Commitment of Natural or Depletable Resources (40 CFR Section 1502.16)**

Resources that are irreversibly or irretrievably committed to a project are those that are used on a long-term or permanent basis. This includes the use of non-renewable resources such as metal and fuel, and natural or cultural resources. These resources are irretrievable in that they would be used for this project when they could have been used for other purposes. Human labor is also considered an irretrievable resource.

Implementation of the Proposed Action would involve human labor, the consumption of fuel, oil, and lubricants for construction vehicles and loss of natural resources (to make the construction materials).

### **5.2 Relationship between Local Short-Term Use of the Human Environment and Maintenance and Enhancement of Long-Term Natural Resource Productivity (40 CFR Section 1502.16)**

NEPA requires an analysis of the relationship between a project's short-term impacts on the environment and the effects that these impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. This refers to the possibility that choosing one development site reduces future flexibility in pursuing other options, or that using a parcel of land or other resources often eliminates the possibility of other uses at that site.

In the short-term, effects to the human environment with implementation of the Proposed Action would primarily relate to the construction activity itself. Air quality and noise would be impacted in the short-term. In the long-term, there would be beneficial impacts to the environment by removing the structurally unsound creosote piles.

### **5.3 Means to Mitigate and/or Monitor Adverse Environmental Impacts (40 CFR Section 1502.16(h))**

The Proposed Action would not result in any significant adverse environmental impacts with implementation of the following mitigation measures and monitoring techniques to avoid, minimize and/or mitigate impacts. Performance and enforcement mechanisms are described in Table 5-2.

- In-water work will be conducted between June 15 and March 1 to avoid the juvenile salmon migration period in Sinclair Inlet.
- When impact driving new concrete piles at the end of the pier, the Navy will provide a qualified person familiar with marbled murrelets to monitor pile driving at the end of the pier. Pile driving will be suspended if a marbled murrelet is spotted within the specified radius.
- To minimize impacts to foraging marbled murrelets during their nesting season, impact pile driving would occur between 2 hours after sunrise and end 2 hours before sunset June 15 through September 30. This timing restriction applies only to impact pile driving activity conducted on the south end of the pier and on the southeast side of the pier as detailed in Appendix A. The in-water work window would be adjusted between October 1 and March 1, with work occurring from sunrise to sunset.

- The Navy has applied for an IHA under the MMPA. The IHA application includes additional mitigation measures, including a shutdown area that will be implemented during pile removal and installation. Consultation with NMFS on the IHA is ongoing.
- Piles that break during construction will be cut at mudline to avoid disturbing contaminated sediment.
- Removed piles will be cut into four ft lengths and placed in a dumpster for disposal at a certified landfill.
- All work will be accomplished so that no debris or deleterious material enters the water. Other BMPs discussed in Chapter 2.4.

**Table 5-2 Performance and Enforcement Mechanisms**

Mitigation Measure	Timing and Method(s)	Responsible Party(ies)	Performance and Enforcement
Develop and implement EPP	EPP to be completed prior to start of construction and implemented throughout construction.	Navy construction contractor	Navy oversight of construction contractor.
In-water work timing restrictions to avoid the juvenile salmon migration period	In-water work will be conducted between June 15 and March 1	Navy construction contractor	Navy oversight of construction contractor.
Marbled murrelet monitoring during pile driving	Implemented during pile driving	Navy construction contractor	Navy will submit monitoring plan to USFWS for approval and implement approved plan.
Marine mammal monitoring during pile driving	Implemented during pile driving	Navy construction contractor	Navy will submit monitoring plan to NMFS for approval and implement approved plan.
Broken piles cut at mudline	Implemented during pile removal	Navy construction contractor	Navy oversight of construction contractor.
Proper disposal of removed piles	Implemented during pile removal	Navy construction contractor	Navy oversight of construction contractor.
Prevent debris or deleterious material from entering water	Implemented during pile removal	Navy construction contractor	Navy oversight of construction contractor.

The Navy's construction contractor will develop an EPP to be implemented throughout the duration of in-water work. The EPP will be completed prior to the commencement of any construction activities. The EPP will identify construction planning elements and recognize spill sources at the site. The EPP will outline BMPs, responsive actions in the event of a spill or release, measures to comply conditions in the BA and IHA, and notification and reporting procedures. The EPP will also outline contractor management elements such as personnel responsibilities, project site security, site inspections, and training for implementing the requirements agreed to in the ESA and IHA consultations.

#### **5.4 Any Probable Adverse Environmental Effects That Cannot Be Avoided and Are Not Amenable To Mitigation**

This EA has determined that the Proposed Action would not result in any significant impacts; therefore, there are no probable adverse environmental effects that cannot be avoided or are not amenable to mitigation.

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## 7 LIST OF PREPARERS

In accordance with OPNAVINST 5090.1C, CH-1, this section lists the names and qualifications (expertise/experience, professional disciplines) of the persons who were primarily responsible for preparing the EA.

### NAVFAC NORTHWEST

Eric Beckley  
Biologist

Michael Hardiman  
Environmental Engineer

Ben Keasler  
Environmental Planner

Gregory Leicht  
Environmental Engineer

Eric Mollerstuen  
Environmental Protection Specialist

Sharon Rainsberry  
Fish Biologist

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**Appendix A**  
**Endangered Species Act Consultations**

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

Refer to NMFS No:  
 NWR-2012-9501

December 20, 2012

Captain P. Dawson  
 Commanding Officer  
 Naval Base Kitsap  
 120 South Dewey St  
 Bremerton, WA 98314-5020

Attn: Eric Mollerstuen

Re: Endangered Species Act Section 7 Informal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Pier 6 Fender System Repairs, Bremerton, Kitsap County, Washington (Lat: 47.559669, Long: -122.530278, 6<sup>th</sup> Field HUC 171100190705).

Dear Captain Dawson:

On December 11, 2012, the National Marine Fisheries Service (NMFS) received your request for a written concurrence the proposed action is not likely to adversely affect (NLAA) species listed as threatened or endangered or critical habitats designated under the Endangered Species Act (ESA). This response to your request was prepared by NMFS pursuant section 7(a)(2) of the ESA, implementing regulations at 50 CFR 402, and agency guidance for preparation of letters of concurrence.<sup>1</sup>

NMFS also reviewed the proposed action for potential effects on essential fish habitat (EFH) designated under the Magnuson-Stevens Act (MSA), including conservation measures and any determination that you made regarding the potential effects of the action. This review was pursuant to section 305(b) of the MSA, implementing regulations at 50 CFR 600.920, and agency guidance for use of the ESA consultation process to complete EFH consultation.<sup>2</sup>

This letter is in compliance with section 515 of the Treasury and General Government Appropriations Act of 2001 (Data Quality Act) (44 U.S.C. 3504 (d) (1) and 3516), and underwent pre-dissemination review using standards for utility, integrity and objectivity.

<sup>1</sup> Memorandum from D. Robert Lohn, Regional Administrator, to ESA consultation biologists (guidance on informal consultation and preparation of letters of concurrence) (January 30, 2006).

<sup>2</sup> Memorandum from William T. Hogarth, Acting Administrator for Fisheries, to Regional Administrators (national finding for use of Endangered Species Act section 7 consultation process to complete essential fish habitat consultations) (February 28, 2001).



### **Consultation History**

The United States Navy (Navy) gave a Biological Evaluation (BE) to the NMFS for the project referenced above on October 10, 2012. The Navy requested informal consultation and concurrence with the determinations of “may affect, not like to adversely affect” for Puget Sound Chinook salmon, PS steelhead, PS/Georgia Basin (GB) bocaccio, PS/GB yellow rockfish, PS/GB canary rockfish, Steller sea lions, and Southern Resident Killer Whales. The project location includes no designated critical habitat for any ESA listed species.

Consultation was initiated on December 11, 2012. A complete record of this consultation is on file at the Washington State Habitat Office in Lacey, Washington.

### **Description of the Proposed Action and the Action Area**

The Navy is proposing to remove and replace the existing fender piles and associated hardware associated with Pier 6 at Bremerton. This will remove approximately 380 creosote treated piles and 20 steel pipe fender piles, and will replace them with 216 fender and corner and 84 pre-stressed concrete piles. The existing creosote treated piles will be removed with a vibratory hammer, while the replacement piles will be installed with an impact hammer. If any of the existing piles cannot be removed, they will be cut at least 2 feet below the mud line. The project will also remove the existing chocks, wales, access ladders, and steel rope guards and replace them with galvanized steel.

All work will be conducted during 2 consecutive work windows to avoid the presence of salmonids (June 15 to March 1). No forage fish spawning areas or submerged aquatic vegetation will be impacted by the project.

### **Action Area**

The action area includes all marine waters within the project line of sight, to include areas of increased noise disturbance from operations. The project site is located at Bremerton, Kitsap County, Washington (Lat: 47.559669, Long: -122.530278, 6<sup>th</sup> Field HUC 171100190705).

## **ENDANGERED SPECIES ACT**

### **Effects Determinations**

For purposes of the ESA, “effects of the action” means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR 402.02). The applicable standard to find that a proposed action is NLAA listed species or critical habitat is that all of the effects of the action are expected to be discountable, insignificant, or completely beneficial.<sup>3</sup> Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant

<sup>3</sup> U.S. Fish and Wildlife Service and National Marine Fisheries Service. 1998. Endangered Species Act Consultation Handbook: Procedures for Conducting Section 7 Consultations and Conferences. March, 1998. Final. p. 3-12.

effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur.

Listed species of fish are unlikely to occur in the action area when the proposed action is occurring. Salmonids are less likely to occur in the area due to project timing (June 15 to March 1), and rockfish are unlikely to occur in the action area because of the maximum depth of the project (50 feet) and there is no submerged aquatic vegetation that would provide suitable habitat for rearing juvenile rockfish. For listed fish, including salmonids and rockfish, the potential for effects include elevated sound energy levels and small increases in turbidity of short duration from pile installation and removal. However, NMFS has no known documented incidents of take occurring from pile driving of concrete piles, and any increase in turbidity is expected to be localized and of short duration.

Marine mammals are unlikely to occur in the action area. The project includes a trained observer that will shut down pile driving operations in the event that marine mammals are observed within the 33 foot radius of pile driving. Peak sound volumes are expected to be 192 decibels and are less than the injury threshold for marine mammals. The project also does not include any vibratory pile driving which could interfere with the normal behavior of marine mammals.

The project will lead to long term improvements in water quality due to the removal and disposal of the 380 creosote treated piles and other treated material, and will create no additional impairments to habitat function in the project area.

#### **Conclusion**

Based on the above analysis, NMFS concludes that all potential effects of the proposed action are insignificant or discountable, and are not likely to adversely affect the subject ESA listed species or critical habitat.

#### **Reinitiation of Consultation**

Reinitiation of consultation is required and shall be requested by the Federal agency, or by NMFS, where discretionary Federal involvement or control over the action has been retained or is authorized by law and (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) the identified action is subsequently modified in a manner that causes an effect on the listed species or critical habitat that was not considered in this concurrence letter; or if (3) a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16). This concludes the ESA portion of this consultation.

#### **MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT ACT**

Federal and other consulting agencies operating under Federal authority are required, under section 305(b)(2) of the MSA and its implementing regulations (50 CFR 600 Subpart K), to consult with NMFS regarding actions that are authorized, funded, or undertaken by that agency that may adversely affect essential fish habitat (EFH). For purposes of the MSA, EFH means

“those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity”, and includes the associated physical, chemical, and biological properties that are used by fish (50 CFR 600.10), and “adverse effect” means any impact which reduces either the quality or quantity of EFH (50 CFR 600.910(a)). Adverse effects may include direct, indirect, site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. If an action would adversely affect EFH, NMFS is required to provide the Federal action agency with EFH conservation recommendations (section 305(b)(4)(A)). This consultation is based, in part, on information provided by the Federal agency and descriptions of EFH for Pacific salmon contained in the Fishery Management Plans developed by the Pacific Fishery Management Council and approved by the Secretary of Commerce.

#### **Effects of the Action**

NMFS determined that the proposed action would adversely affect EFH by decreasing water quality and suitability through increased sound energy levels. The project will also cause short term, localized increases in turbidity. Over the long term, the project is expected to increase water quality through the removal of 380 creosote treated piling. The action area includes approximately 3700 acres of intertidal and subtidal marine nearshore habitat, based on expected spread of sound-pressure levels. The project area includes habitat which has been designated as EFH for various life stages of coastal pelagic species, Pacific coast groundfish, and Pacific salmon.

#### **Essential Fish Habitat Conservation Recommendations**

Because the conservation measures that the Navy included as part of the proposed action to address ESA/EFH concerns are adequate to avoid, minimize, or otherwise offset potential adverse effects to EFH, conservation recommendations pursuant to the MSA (section 305(b)(4)(A)) are not necessary. Since the NMFS is not provided conservation recommendations at this time, no 30 day response is from the Navy is required (MSA section 305(b)(4)(B)).

#### **Statutory Response Requirement**

Within 30 days after receiving this recommendation, you must provide NMFS with a detailed written response, per 50 CFR 600.920(k)(1). If your response is inconsistent with the EFH conservation recommendation, you must explain why the recommendation will not be followed, including the scientific justification for any disagreements over the anticipated effects of the action and the measures needed to avoid, minimize, mitigate, or offset such effects.

In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, we ask that in your statutory reply to the EFH portion of this consultation, you clearly identify the number of conservation recommendations accepted.

**Supplemental Consultation**

The Navy must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations, 50 CFR 600.920(l).

This concludes consultation under the ESA and MSA. If you have questions concerning these consultations, please contact Zach Hughes of the Washington State Habitat Office at 360-753-6052, or by e-mail at zach.hughes@noaa.gov.

Sincerely,



 William W. Stelle, Jr.  
Regional Administrator

**From:** [Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32](mailto:eric.w.mollerstuen@navy.mil)  
**To:** ["Zach Hughes - NOAA Federal"](mailto:zach.hughes@noaa.gov)  
**Subject:** RE: Pier 6 Fender Repairs  
**Date:** Monday, August 12, 2013 16:10:59

---

Yes, there was supposed to be a 'not' in there. Thanks!

-----Original Message-----

From: Zach Hughes - NOAA Federal [<mailto:zach.hughes@noaa.gov>]  
Sent: Monday, August 12, 2013 4:09 PM  
To: Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32  
Subject: Re: Pier 6 Fender Repairs

Hi Eric,

You say in your e-mail that "an increase from 300 to 330 does alter our NLAA determination". Is there supposed to be a 'not' in there?

Going from 300 to 330 using all of the same best management practices would not change NMFS determination of potential effects from the project, since when we performed the consultation we considered that the 300 concrete piles would be installed using an impact hammer. With the timing, limitations on duration of pile driving, and use of concrete piles, the potential for effects to listed species is still insignificant and discountable. If changing the number from 300 to 330 is the only change at this time, NMFS would concur that the change would not increase the likelihood for potential effects to listed species, and no additional consultation would be required.

Thanks,  
Zach

On Mon, Aug 12, 2013 at 3:31 PM, Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32 <[eric.mollerstuen@navy.mil](mailto:eric.mollerstuen@navy.mil)> wrote:

Hello Zach,

One additional item. The Environmental Assessment for this project lists total # of new concrete piles to be installed as 330 while the Section 7 LOC lists the total as 300 [216+84]. 300 is consistent with what we provided you in the BE but we are now trying to make everything consistent with the EA.

We have determined that an increase from 300 to 330 does alter our NLAA determination. Reason is that the 30 additional piles are concrete and will be driven with an impact hammer. A vibratory hammer will not be used for installation of piles.

Please let me know if you need any additional information.

V/r,  
Eric Mollerstuen  
Puget Sound Naval Shipyard and Intermediate Maintenance Facility  
Environmental, Code 106.32  
(360) 476-9384

-----Original Message-----

From: Zach Hughes - NOAA Federal [<mailto:zach.hughes@noaa.gov>]  
Sent: Friday, August 09, 2013 11:38 AM  
To: Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32

**From:** [Zach Hughes - NOAA Federal](#)  
**To:** [Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32](#)  
**Subject:** Re: Pier 6 Fender Repairs  
**Date:** Friday, August 09, 2013 11:38:55

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Hi Eric,

I concur that the proposed changes you describe will not change the potential for effects to listed species, and therefore the Navy does not need to reinitiate consultation at this time. No further action is needed at this time for the proposed changes as described. Please let me know if you have any questions.

Thanks,  
Zach

On Fri, Aug 9, 2013 at 11:06 AM, Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32 <[eric.mollerstuen@navy.mil](mailto:eric.mollerstuen@navy.mil)> wrote:

Hello Zach,

We have a slight modification to the schedule of our Pier 6 project here at Naval Base Kitsap in Bremerton. It's looking like construction is not going to start until early 2014 at the soonest. Revised project plan would have the complete project occurring over three consecutive in-water work windows versus two as stated on pg. 2 of the attached LOC. This is purely a schedule change as the actual work remains as described in our BE. This change does not alter our "may affect, not likely to adversely affect" determination for T/E species. Do you concur?

V/r,  
Eric Mollerstuen  
Puget Sound Naval Shipyard and Intermediate Maintenance Facility  
Environmental, Code 106.32  
(360) 476-9384 <<tel:%28360%29%20476-9384>>

-----Original Message-----

From: Zach Hughes - NOAA Federal [<mailto:zach.hughes@noaa.gov>]  
Sent: Friday, December 14, 2012 11:27 AM  
To: Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32  
Subject: Pier 6 Fender Repairs

Hello Mr. Mollerstuen,

I need just a bit more information regarding the above project in order to begin consultation.

Could you please provide the sizes of the piles to be installed.

Thank you for your time,  
Zach

--

Zach Hughes  
Marine Ecologist  
National Marine Fisheries Service  
Email: [zach.hughes@noaa.gov](mailto:zach.hughes@noaa.gov)



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

Washington Fish and Wildlife Office  
510 Desmond Dr. SE, Suite 102  
Lacey, Washington 98503



APR - 5 2013

In Reply Refer To:  
01EWF00-2013-I-0089

Captain P. M. Dawson, Captain  
U. S. Navy, Naval Base Kitsap  
ATTN: Environmental Director (Mollerstuen)  
120 South Dewey St.  
Bremerton, Washington 98314-5020

Dear Captain Dawson:

Subject: Naval Base Kitsap Bremerton Pier 6 Fender System Repairs

This letter is in response to your request for informal consultation for the Pier 6 Fender System Repairs at Naval Base Kitsap Bremerton located in Sinclair Inlet in Kitsap County, Washington. The Department of the Navy (Navy) proposes to remove creosote-treated piles at Pier 6 and replace them with concrete piles. You requested the U.S. Fish and Wildlife Service (Service) concurrence with your “may affect, not likely to adversely affect” for the marbled murrelet (*Brachyramphus marmoratus*) and bull trout (*Salvelinus confluentus*). No marbled murrelet or bull trout critical habitat occurs within the affected area. Your letter and the Biological Evaluation (BE), dated December 7, 2012, were received on December 11, 2012. We requested additional information regarding the proposed action via email on February 21, March 7, and March 13, 2013, and received responses via email on February 21, March 12, and March 14, 2013. This informal consultation has been completed in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*)(Act).

The Navy proposes to remove up to 380 creosote-treated piles and 20 steel pipe piles using vibratory extraction at Pier 6 in Sinclair Inlet. Deteriorated creosote-treated timber chocks, wales, steel access ladder, and steel rope guards will also be removed and replaced with galvanized steel and plastic elements. The piles will be replaced with up to 318 24-inch diameter pre-stressed concrete piles to be installed with an impact hammer. Additionally, a cathodic protection system will also be installed. The proposed action will occur in two phases over two consecutive in-water work periods (June 15 to March 1). Work is anticipated to begin in 2013. Of the proposed 318 piles, up to 77 of these piles may be installed in areas that may affect marbled murrelets (Figures 1 and 2).

Captain P.M. Dawson

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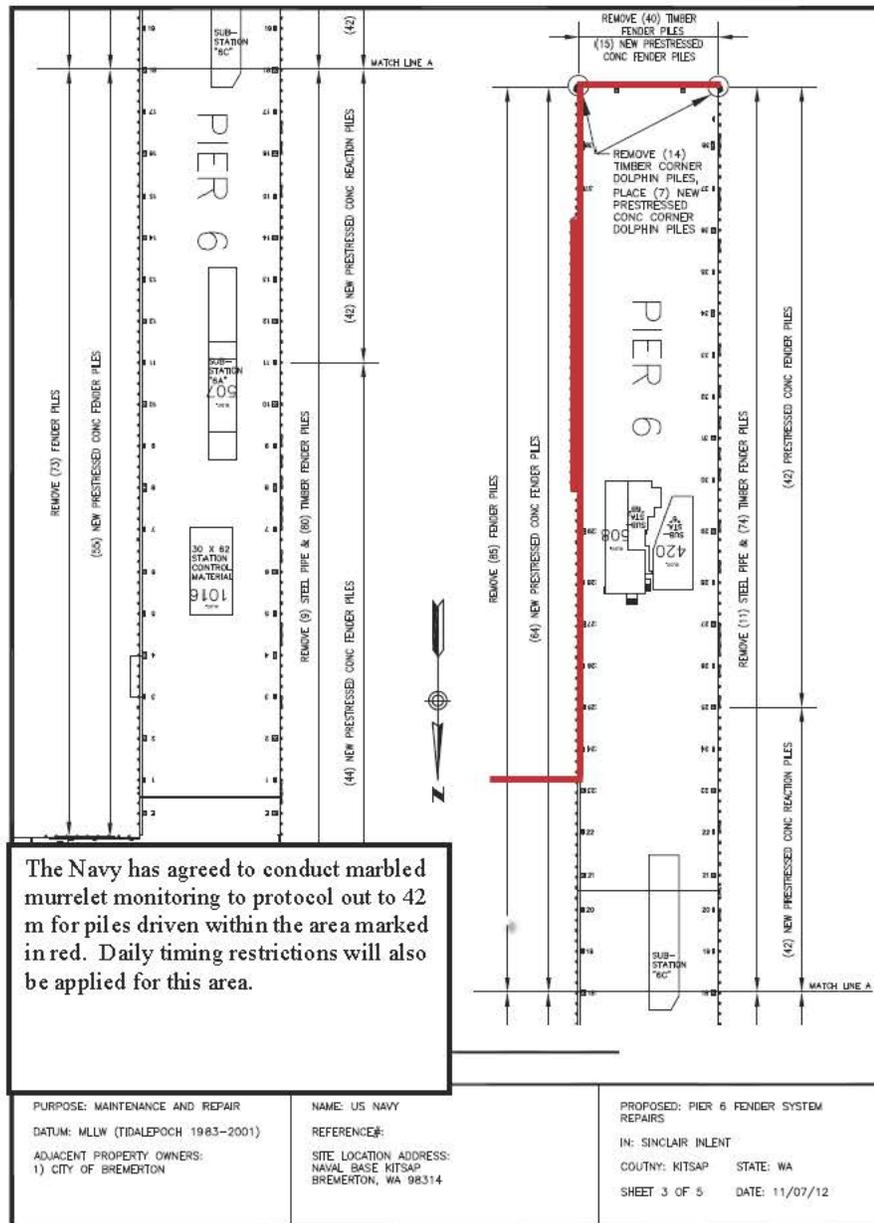


Figure 1. Location (denoted by red line) of the piles that may affect marbled murrelets due to underwater and in-air sound.

Captain P.M. Dawson

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Figure 2. Approximate marbled murrelet survey area outlined in blue (area of survey is approximate and is smaller than shown in figure).

The Navy proposes to implement the following measures during installation of these 77 piles to minimize the effects of the proposed action on marbled murrelets.

- 1) During the marbled murrelet breeding season (April 1 through September 30), in-water work will not begin until 2 hours after sunrise and will end 2 hours before sunset.
- 2) The Navy will survey to protocol for marbled murrelets during impact pile driving within the area identified in Figures 1 and 2 (77 piles) to a distance of 42 meters from each pile.
- 3) The Navy will provide a marbled murrelet monitoring plan to the Service within 60 days prior to the start of in-water work for review and approval. No in-water work will occur until the Service has approved the plan.
- 4) The Navy will limit the installation of piles within the area identified in Figures 1 and 2 to the following:
  - Summer (April 1 to September 30) - 75 days of total of pile driving up to 90 min/day
  - AND
  - Winter (October 1 to March 30) - 30 days of total pile driving up to 90 min/day

Captain P.M. Dawson

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Based on the information provided in the cover letter, BE, personal communications, and other documents, we have concluded that effects of the proposed action to the marbled murrelet and bull trout would be insignificant. Therefore, for the reasons identified below, we concur with your “may affect, not likely to adversely affect” determination for the bull trout and marbled murrelets.

#### **Effects of the Proposed Action**

The proposed action may result in negative effects to marbled murrelets and bull trout during the installation and removal of piles. Marbled murrelets and bull trout that are in the area during construction of the proposed project may be affected as a result of a) exposure to elevated in-air (marbled murrelets only) and underwater sound pressure levels; b) exposure to contaminants; and c) reduced forage availability.

#### Effects to Marbled Murrelet

There is limited information on the presence of marbled murrelets in Sinclair Inlet. Monitoring of marbled murrelets occurs during the summer months (May 15 to July 31 each year) as part of the Northwest Forest Plan Marbled Murrelet Effectiveness Monitoring Program (Raphael et al. 2007) and in December of each year as part of the Puget Sound Ambient Monitoring Program conducted by the Washington Department of Fish and Wildlife. Summer surveys are not conducted in proximity to the proposed action. Winter aerial surveys were conducted adjacent to the project area. Additionally, Washington Department of Fish and Wildlife is currently conducting winter marbled murrelet surveys for the Navy. The first year of this survey effort resulted in no detections of marbled murrelets in marine waters within the area associated with the Bremerton Naval ship yard (Cindi Kunz, U.S. Navy, Bangor, in litt. March 7, 2013). Based on the available information, we anticipate that marbled murrelets may occur within Sinclair Inlet, though in limited numbers. Additionally, due to the current activity and configuration of the site, we do not anticipate that marbled murrelets are likely to occur between the piers. Therefore, direct effects to marbled murrelets are limited to those areas associated with Figures 1 and 2.

#### *Effects from Underwater Sound Pressures*

We developed a model to estimate the probability of exposure of a marbled murrelet to sound pressures that could result in physical injury (e.g., 202 dB SEL or higher). Using the available information on marbled murrelet densities during the time of year the project will be implemented, average dive times and foraging bouts, and incorporating the effectiveness of the survey protocols, we determined that the probability of exposure to the injury threshold would be below 0.1. Therefore, we do not anticipate marbled murrelets to be exposed to underwater sound pressure levels that would result in injury due to the proposed action. This approach has been used by the Service in previous analyses on underwater sound (U.S. Fish and Wildlife Service 2008, p. 99).

Captain P.M. Dawson

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*Effect of In-Air Sound from Pile Removal and Installation*

Marbled murrelets may be exposed to in-air sound levels during vibratory pile removal and impact pile driving that could result in masking of communication between foraging pairs. Masking could result in reduced fitness as they delay foraging while they attempt to locate the other individual.

Background in-air sound levels have not been recorded at Naval Base Bremerton. The BE (p. 9) estimates that the industrial shipyard airborne sound levels range from 60 dBA to 90 dBA; no distance is provided for these anticipated sound levels. The Test Pile BA assumed that the in-air sound pressure levels will be 95 dBA re: 20 $\mu$ Pa at 50 ft for vibratory pile driving (NAVFAC 2010, p. 101). Data available from Laughlin (in litt. 2010, p. 2) indicate that in-air sound pressures from vibratory pile driving of 30-inch diameter steel piles ranges from approximately 85 dBA Lmax to 96 dBA Lmax standardized to 50 ft.

No estimates for sound pressure levels associated with pile removal are provided for the proposed project. However, we anticipate that the sound levels generated during pile removal will be less than for installation. Marbled murrelets may be exposed to sound levels associated with pile removal for limited periods of time. However, we do not anticipate that this will result in measureable effects to their behavior. Therefore, we anticipate that effects to marbled murrelets due to pile removal will be insignificant.

Using information available from the Test Pile program at Bangor Naval Base, the distance of masking associated with the impact installation of 24-inch diameter steel piles was calculated to be 42 m (Michael Slater, U.S. Navy, Bangor, Washington, in litt. March 1, 2013). Based on the calculated probability of exposure within 42 m of the pile with monitoring, we do not anticipate marbled murrelets to be exposed to in-air sound pressure levels from impact pile driving that would result in masking of communication.

In summary, with implementation of marbled murrelet monitoring to protocol, we anticipate that it is highly unlikely that marbled murrelets will be exposed to underwater or in-air sound pressures during impact pile driving that would injure them or measurably affect their normal behavior. Therefore, effects due to exposure to high sound levels from impact pile driving are considered discountable. No marbled murrelet monitoring is required during pile removal, and although marbled murrelets may be exposed to in-air sound levels above ambient, we anticipate the effects will be insignificant.

*Effects from Exposure to Contaminants and Sediments*

The proposed action may result in an increased risk of contaminants due to fuel and oil leaks from the use of boats and barges and the removal of creosote-treated piles. Additionally, if contaminants are present in the sediments where the piles are installed and removed, marbled murrelets may be exposed directly through contact or indirectly through ingestion of prey.

Although there is a potential of fuel and oil leaks from the surface water vessels, the risk of leaks or spills is extremely low. We do not anticipate marbled murrelets to be exposed to measurable

Captain P.M. Dawson

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levels of elevated turbidity and exposure to suspended sediments during pile installation and removal. Although contaminants are known to occur within the project area, we do not anticipate marbled murrelets to be exposed to concentrations that may result in measureable effects this species.

Therefore, the risk of marbled murrelet exposure to contaminants and sediment (ingestion or contact) at concentrations that would measurably affect this species is considered insignificant.

#### Effects to Bull Trout

##### *Potential for Exposure*

There are no core populations in close proximity to the proposed action. Additionally, there are no records of bull trout in the freshwater systems on the Kitsap Peninsula and limited observations within the adjacent marine environment. As it is extremely unlikely that bull trout occur within the action area, we consider the direct effects of the proposed action (e.g., exposure to turbidity, contaminants, increased sound pressures) to bull trout to be discountable.

#### Effects to Marbled Murrelet and Bull Trout Prey Resources

Indirect effects to marbled murrelets and bull trout may occur due to impacts to forage fish that occur within the action area. Surf smelt (*Hypomesus pretiosus*), sand lance (*Ammodytes hexapterus*), and Pacific herring (*Clupea pallasii*) individuals are likely present within the area of the proposed action. Most of the shoreline in Sinclair Inlet is armored and the Bremerton Naval shipyard is an industrial waterfront with little or no suitable spawning habitat for marine forage fish. The proposed action will not affect forage fish spawning habitat.

In-water construction is restricted to June 15 to March 1. This will reduce, but not eliminate, potential negative effects to marbled murrelet and bull trout prey. We know of no instances where impact installation of concrete piles has resulted in trauma or physical injury of fish or other organisms. Therefore, we anticipate that forage fish may be disturbed by the proposed in-water work, but no injury will result. Forage fish may also be exposed to contaminants during pile installation and removal. Although contaminants are known to occur within the project area, we do not anticipate that they will expose forage fish to concentrations that may measurably affect these individuals. We do not anticipate that effects to forage fish will be of such a magnitude to measurably affect marbled murrelet or bull trout. Therefore, we anticipate that the effects to marbled murrelet or bull trout via their prey will be insignificant.

#### **Conservation Recommendation**

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

Captain P.M. Dawson

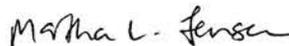
7

1. The Navy should conduct hydroacoustic monitoring and obtain acoustic data (i.e., sound spectrogram) associated with the impact installation and removal of concrete piles. We recommend that you coordinate sound data collection methodology and study design with our office. This data would provide more specific information regarding the sounds associated with Navy projects, the potential effects to federally listed species, and development of appropriate minimization measures.

The Service requests notification of the implementation of any conservation recommendations.

If you have any comments or questions regarding this concurrence or our joint responsibilities under the Endangered Species Act, please contact Nancy Brennan-Dubbs at (360) 753-5835 or Martha Jensen at (360) 753-9000.

Sincerely,



for Ken S. Berg, Manager  
Washington Fish and Wildlife Office

Captain P.M. Dawson

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**LITERATURE CITED**

- Kunz, C. 2013. U.S. Navy, Naval Base Kitsap Bangor, Washington. RE: Preliminary data from Bremerton. Email message to: Nancy Brennan-Dubbs, U.S. Fish and Wildlife Service, Lacey, Washington. March 7, 2013. 11:57 a.m.
- Laughlin, J. 2010. Memo to Sharon Rainsberry: Airborne Noise Measurements (A-weighted and un-weighted) during Vibratory Pile Installation – Technical Memorandum. Washington State Department of Transportation. June 21, 2010.
- NAVFAC. 2010b. Biological assessment for the test pile program, Navy Base Kitsap Bangor waterfront Naval Base Kitsap Bangor. Prepared by Naval Facilities Engineering Command Northwest, Silverdale, WA. August 2010. 144 pp. + appendices.
- Raphael, M.G., J. Baldwin, G.A. Falxa, M.H. Huff, M.M. Lance, S. Miller, S.F. Pearson, C.J. Ralph, C. Strong, and C. Thompson. 2007. Regional population monitoring of the marbled murrelet: field and analytical methods. U.S. Department of Agriculture Forest Service, PNW-GTR-716, Portland, Oregon, May 2007. 70 pp.
- Slater, M. 2013. U.S. Navy, Bangor, Washington. RE: 24 inch impact pile driving, MaMu masking calculations. Email message to: Cindi Kunz, U.S. Navy, Naval Base Kitsap Bangor, Washington. March 1, 2013.
- USFWS. 2008. Biological opinion for United States Navy explosive ordnance disposal training operations, Puget Sound: Whidbey Island, Island County, Washington. Western Washington Fish and Wildlife Office, Lacey, Washington, November 7, 2008. 213 pp.

**From:** [Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32](mailto:Mollerstuen.Eric.W.CIV.PSNS/IMF.Code.106.32)  
**To:** [Hardiman, Michael O CIV NAVFAC NW, PRR41](mailto:Hardiman.Michael.O.CIV.NAVFAC.NW.PRR41); [Beckley, Eric R CIV NAVFAC NW, PRR41](mailto:Beckley.Eric.R.CIV.NAVFAC.NW.PRR41)  
**Subject:** FW: Phonecon for Pier 6 ESA Consultation [NAVBASE Kitsap Bremerton]  
**Date:** Wednesday, March 13, 2013 12:45:28

---

FYI:

-----Original Message-----

From: BrennanDubbs, Nancy [[mailto:nancy\\_brennandubbs@fws.gov](mailto:nancy_brennandubbs@fws.gov)]  
Sent: Wednesday, March 13, 2013 11:48  
To: Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32  
Subject: Re: Phonecon for Pier 6 ESA Consultation [NAVBASE Kitsap Bremerton]

Eric, just heard from Emily. We will be using the info that Mike Slater came up with for the 24 inch steel pile.

Thanks for the responses below.

I will be working on my letter to the Navy - hope to get it to my manager next week for signature.  
Nancy

Nancy Brennan-Dubbs  
Fish and Wildlife Biologist  
Consultation and Conservation Planning Division  
US Fish and Wildlife Service  
510 Desmond Dr. SE Suite 102  
Lacey, Washington 98503  
360-753-5835  
[nancy\\_brennandubbs@fws.gov](mailto:nancy_brennandubbs@fws.gov)

On Tue, Mar 12, 2013 at 2:37 PM, Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32  
<[eric.mollerstuen@navy.mil](mailto:eric.mollerstuen@navy.mil)> wrote:

Hello Nancy,

We have included the 2 hr provision in previous BA's and it exclusion from this project's BA was an oversight on our part. We concur on the following:

"During the marbled murrelet breeding season (April 1 through September 30), in-water work will not begin until 2 hours after sunrise and will end 2 hours before sunset."

Also, I believe you are still waiting on confirmation on the following 3 points:

1. We concur that for impact driving of the 77 piles to be installed where there is potential marbled murrelet exposure, the Navy will adhere to the following timing restrictions.

Summer (April 1 - September 30): 75 days total of pile driving for 90 min/day  
AND  
Winter (October 1 - March 30): 30 days of total pile driving for 90 min/day

2. We commit to marbled murrelet monitoring within 42 m of these 77 piles. Monitor will be stationed on the pier where they can view the entire 42 m radius monitoring zone around the pile being driven.

3. We will provide a marbled murrelet monitoring plan to your office 60 calendar days prior to the start of in-water work.

Were you able to get confirmation from Emily yet? Thanks and let me know if you have any questions.

V/r,  
Eric Mollerstuen  
Puget Sound Naval Shipyard and Intermediate Maintenance Facility  
Environmental, Code 106.32  
(360) 476-9384

-----Original Message-----

From: BrennanDubbs, Nancy [[mailto:nancy\\_brennandubbs@fws.gov](mailto:nancy_brennandubbs@fws.gov)]  
Sent: Thursday, March 07, 2013 13:32  
To: Hardiman, Michael O CIV NAVFAC NW, PRB41  
Cc: Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32; Kunz, Cindi A CIV NAVFAC NW, OP3E22  
Subject: Re: Phonecon for Pier 6 ESA Consultation [NAVBASE Kitsap Bremerton]

Mike and Eric, in reviewing the BA, I noted that it does not include a standard measure we use to minimize effects to marbled murrelets during the breeding season. Would you please include the following as part of your proposed action. Sorry for this oversight, I thought it was already part of the action. Sincerely, Nancy

During the marbled murrelet breeding season (April 1 through September 30), in-water work will not begin until 2 hours after sunrise and will end 2 hours before sunset.

Nancy Brennan-Dubbs  
Fish and Wildlife Biologist  
Consultation and Conservation Planning Division  
US Fish and Wildlife Service  
510 Desmond Dr. SE Suite 102  
Lacey, Washington 98503  
360-753-5835  
[nancy\\_brennandubbs@fws.gov](mailto:nancy_brennandubbs@fws.gov)

On Thu, Mar 7, 2013 at 9:32 AM, BrennanDubbs, Nancy <[nancy\\_brennandubbs@fws.gov](mailto:nancy_brennandubbs@fws.gov)> wrote:

Mike and Eric, I am still waiting for Emily to confirm the use of the 42 m for the proposed action.

I am working on drafting a letter regarding this action, but still need the following from the Navy. The following is based on 42 m vs 66 m for the impact installation of 24 inch piles. Please note that due to the small area of ensonification, the number of days of pile driving has been increased. If we use the 66 m distance, the number of piles that could be driving would be as stated in my Feb 21 email. Once I hear from Emily with confirmation on the distance to use for the concrete piles and receive the information from you below, I will be able to finalize the letter.

Sincerely, Nancy

1. Confirmation that no more than 77 piles would be impact driven within the area of potential marbled murrelet exposure as and not exceed the following.

Summer (April 1 - September 30)

75 days total of pile driving for 90 min/day

AND

Winter (October 1 - March 30)

30 days of total pile driving for 90 min/day

2. Marbled murrelet monitoring to protocol would occur within the 42 m radius of these piles

3. A marbled murrelet monitoring plan will be provided to the Service for review and approval prior to any in-water work occurring at the site. The plan will be provided to the USFWS for review and approval a minimum of 60 days prior to any in-water work occurring to allow for potential modifications to the proposal.

Nancy Brennan-Dubbs  
Fish and Wildlife Biologist  
Consultation and Conservation Planning Division  
US Fish and Wildlife Service  
510 Desmond Dr. SE Suite 102  
Lacey, Washington 98503  
360-753-5835  
nancy\_brennandubbs@fws.gov

On Tue, Feb 26, 2013 at 11:18 AM, BrennanDubbs, Nancy <nancy\_brennandubbs@fws.gov> wrote:

Mike, I left a message for Cindi today regarding the status of the calculations. Yes, I still need them to confirm my assessment.

Additionally, I need the Navy to confirm that they will modify the proposed action to meet the pile driving conditions I provided earlier (number of days/hours per day/season). Also, I need a marbled murrelet monitoring plan from the Navy. If the Navy is unable to provide the plan in the near future, I need a commitment from the Navy that it will be provided to the USFWS for review and approval prior to any in-water work occurring at the site. The plan should be provided to the USFWS for review and approval a minimum of 60 days prior to any in-water work occurring to allow for potential modifications to the proposal.

Additionally, will the Navy conduct any in-air sound measurements for concrete piles? This information would be very helpful for work the Navy proposes in the future at this and other sites. I recommend that you speak to Mike Slater and Emily Teachout of my office (360-753-9583) regarding the information needed.

Sincerely, Nancy

Nancy Brennan-Dubbs  
Fish and Wildlife Biologist  
Consultation and Conservation Planning Division  
US Fish and Wildlife Service

**From:** [BrennanDubbs, Nancy](#)  
**To:** [Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32](#)  
**Subject:** Re: Pier 6 ESA Consultation [NAVBASE Kitsap Bremerton]  
**Date:** Friday, August 09, 2013 11:38:19

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Eric, it does not sound like the proposed change would result in different effects or effects we did not consider. Nancy

Nancy Brennan-Dubbs  
Fish and Wildlife Biologist  
Consultation and Conservation Planning Division  
US Fish and Wildlife Service  
510 Desmond Dr. SE Suite 102  
Lacey, Washington 98503  
360-753-5835  
[nancy\\_brennandubbs@fws.gov](mailto:nancy_brennandubbs@fws.gov)

On Fri, Aug 9, 2013 at 10:39 AM, Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32  
<[eric.mollerstuen@navy.mil](mailto:eric.mollerstuen@navy.mil)> wrote:

Hello Nancy,

We have a slight modification to the schedule of our Pier 6 project. It's looking like construction is not going to start until early 2014 at the soonest. Revised project plan would have the complete project occurring over three consecutive in-water work windows versus the two stated in the attached LOC. However, installation of the 77 piles that we are required to monitor for will still occur over the first two in-water work windows. This change does not alter our "may affect, not likely to adversely affect" determination for murrelets and bull trout. Do you concur?

Btw, we are putting the finishing touches on our murrelet monitoring plan and will be submitting to you shortly.

Thanks,  
Eric Mollerstuen  
Puget Sound Naval Shipyard and Intermediate Maintenance Facility  
Environmental, Code 106.32  
(360) 476-9384

-----Original Message-----

From: BrennanDubbs, Nancy [[mailto:nancy\\_brennandubbs@fws.gov](mailto:nancy_brennandubbs@fws.gov)]  
Sent: Tuesday, March 19, 2013 11:27 AM  
To: Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32  
Subject: Pier 6 ESA Consultation [NAVBASE Kitsap Bremerton]

Eric, just wanted to let you know that I have submitted my letter to my supervisor for her signature. Might be end of next week when you see the final from us (or earlier). Nancy

Nancy Brennan-Dubbs  
Fish and Wildlife Biologist  
Consultation and Conservation Planning Division US Fish and Wildlife Service  
510 Desmond Dr. SE Suite 102  
Lacey, Washington 98503  
360-753-5835

**From:** [BrennanDubbs, Nancy](#)  
**To:** [Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32](#)  
**Subject:** Re: FW: Pier 6 ESA Consultation [NAVBASE Kitsap Bremerton]  
**Date:** Tuesday, August 13, 2013 8:06:11

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Eric, if the piles are the same size as stated in the consultation, I am in agreement with your conclusion. Thanks, Nancy

Nancy Brennan-Dubbs  
Fish and Wildlife Biologist  
Consultation and Conservation Planning Division  
US Fish and Wildlife Service  
510 Desmond Dr. SE Suite 102  
Lacey, Washington 98503  
360-753-5835  
[nancy\\_brennandubbs@fws.gov](mailto:nancy_brennandubbs@fws.gov)

On Tue, Aug 13, 2013 at 7:44 AM, Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32 <[eric.mollerstuen@navy.mil](mailto:eric.mollerstuen@navy.mil)> wrote:

Good morning Nancy,

Apologies for the confusion on the last email string. Corrected details below.

Thanks, Eric

-----Original Message-----

From: Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32  
Sent: Monday, August 12, 2013 3:20 PM  
To: 'BrennanDubbs, Nancy'  
Subject: RE: Pier 6 ESA Consultation [NAVBASE Kitsap Bremerton]

Hello Nancy,

One additional item. The Environmental Assessment for this project lists total # of piles to be installed as 330 while the Section 7 LOC lists the total as 318. 318 is consistent with what we provided you in the BE but we are now trying to make everything consistent with the EA.

We have determined that an increase from 318 to 330 does not alter our NLAA determination. Reason is that the 12 additional piles are located outside of the monitoring area. Within the monitoring area the total # of piles is still 77.

Please let me know if you need any additional information.

V/r,  
Eric Mollerstuen  
Puget Sound Naval Shipyard and Intermediate Maintenance Facility  
Environmental, Code 106.32  
(360) 476-9384

-----Original Message-----

From: BrennanDubbs, Nancy [[mailto:nancy\\_brennandubbs@fws.gov](mailto:nancy_brennandubbs@fws.gov)]  
Sent: Friday, August 09, 2013 11:38 AM  
To: Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32  
Subject: Re: Pier 6 ESA Consultation [NAVBASE Kitsap Bremerton]



**DEPARTMENT OF THE NAVY**  
NAVAL BASE KITSAP  
120 SOUTH DEWEY ST  
BREMERTON, WA 98314-5020

5090  
Ser PRB4/01085  
7 Dec 12

Steven Landino  
Director, Washington State Habitat Office  
National Marine Fisheries Service  
510 Desmond Drive SE, Suite 102  
Lacey, WA 98503

Dear Mr. Landino:

SUBJECT: SECTION 7 INFORMAL CONSULTATION FOR PIER 6 FENDER  
SYSTEM REPAIRS, NAVAL BASE KITSAP BREMERTON,  
WASHINGTON

The Department of the Navy (Navy) proposes to repair the Pier 6 fender system at Naval Base Kitsap Bremerton. The existing Pier 6 fender system is deteriorated and insufficient for berthing large Navy vessels such as aircraft carriers without risk of damaging the pier's structural integrity. The proposed project would remove approximately 380 creosote treated timber fender piles from Sinclair Inlet and replace them with pre-stressed concrete piles.

This letter is to request initiation of informal consultation under the Endangered Species Act. The enclosed biological evaluation (BE) contains the Navy's determination of effect for listed species that may be present in the action area. The BE also contains analysis of effects to Essential Fish Habitat as required by the Magnuson-Stevens Fishery Conservation Management Act. If you have any questions, please contact Mr. Eric Mollerstuen. He can be reached at (360) 476-9384 or eric.mollerstuen@navy.mil.

Sincerely,

A handwritten signature in black ink, appearing to read "F. M. Dawson".

F. M. DAWSON  
Captain, U.S. Navy  
Commanding Officer

Enclosure: 1. Biological Evaluation

Copy to:  
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**DEPARTMENT OF THE NAVY**  
NAVAL BASE KITSAP  
120 SOUTH DEWEY ST  
BREMERTON, WA 98314-5020

5090  
Ser PRB4/01086  
7 Dec 12

Ken S. Berg  
Manager, Washington Fish and Wildlife Office  
U.S. Fish and Wildlife Service  
510 Desmond Drive SE, Suite 102  
Lacey, WA 98503

Dear Mr. Berg:

SUBJECT: SECTION 7 INFORMAL CONSULTATION FOR PIER 6 FENDER  
SYSTEM REPAIRS, NAVAL BASE KITSAP BREMERTON,  
WASHINGTON

The Department of the Navy (Navy) proposes to repair the Pier 6 fender system at Naval Base Kitsap Bremerton. The existing Pier 6 fender system is deteriorated and insufficient for berthing large Navy vessels such as aircraft carriers without risk of damaging the pier's structural integrity. The proposed project would remove approximately 380 creosote treated timber fender piles from Sinclair Inlet and replace them with pre-stressed concrete piles.

This letter is to request initiation of informal consultation under the Endangered Species Act. The enclosed biological evaluation (BE) contains the Navy's determination of effect for listed species that may be present in the action area. The BE also contains analysis of effects to Essential Fish Habitat as required by the Magnuson-Stevens Fishery Conservation Management Act. If you have any questions, please contact Mr. Eric Mollerstuen. He can be reached at (360) 476-9384 or eric.mollerstuen@navy.mil.

Sincerely,

A handwritten signature in black ink, appearing to be "P. M. Dawson", written over a horizontal line.

P. M. DAWSON  
Captain, U.S. Navy  
Commanding Officer

Enclosure: 1. Biological Evaluation

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BIOLOGICAL EVALUATION  
PIER 6 FENDER SYSTEM REPAIRS  
NAVAL BASE KITSAP BREMERTON  
KITSAP COUNTY, WASHINGTON

1. INTRODUCTION

The Department of the Navy (Navy) proposes to repair the Pier 6 fender system at Naval Base (NAVBASE) Kitsap Bremerton. Proposed work is essential to ensure a critical ship maintenance asset is not jeopardized as continued deterioration leaves the pier vulnerable to vessel impacts. Updated species lists were accessed from the websites of the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS). Federally listed species that may occur in the action area are summarized in Table 1. This biological evaluation was prepared to address potential impacts on listed species resulting from the proposed project as required under Section 7(c) of the Endangered Species Act (ESA).

1.1 PROJECT DESCRIPTION

The proposed project replaces deteriorated creosote treated timber fender and reaction piles, steel pipe fender piles, creosote treated timber chocks, wales, steel access ladders, and steel rope guards at Pier 6. Renovation installs new pre-stressed concrete reaction, fender, and corner dolphin piles, galvanized steel wale system, rope guards and ladders. This proposed repair project is planned for two phases over two consecutive in-water work periods. The first phase would focus on the east side of the pier with the west side being completed in phase two.

The proposed project includes:

- Removal of approximately 380 creosote treated timber fender and corner dolphin piles by vibratory extraction.
- Removal of approximately 20 steel pipe fender piles by vibratory extraction.
- Removal of deteriorated creosote timber chocks, wales, steel access ladder, and steel rope guards.
- Installation of approximately 216 pre-stressed concrete fender and corner dolphin piles with an impact hammer.
- Installation of approximately 84 pre-stressed concrete reaction piles with an impact hammer.

- Installation of galvanized steel wale system, rope guards, and access ladders.
- Installation of high density plastic rubbing strips.
- Installation of a cathodic protection system.

1.2 PROJECT LOCATION AND ACTION AREA

The project location and action area is centered at Pier 6 on NAVBASE Kitsap Bremerton [Figure 1]. NAVBASE Kitsap Bremerton is primarily an industrial facility located within the City of Bremerton along approximately two miles of the northern Sinclair Inlet shoreline. The shoreline at the project location is characterized by piers, dry docks, and quay walls that have developed since the facility was established in 1891. Pier 6 is a concrete pier located at the east end of the facility, and is 1320 ft in length by 100 ft in width. Pier 6 is located in water depths ranging from 29 ft mean lower low water (MLLW) at its head near the quay wall to 50 ft MLLW at its end.

2. SPECIES AND CRITICAL HABITAT

Ten ESA listed species have the potential to occur within the action area. No critical habitat for any species has been designated within the action area. Table 1 lists the species that may be present in the vicinity of Pier 6 at NAVBASE Kitsap Bremerton.

**Table 1 Occurrence of Federally Listed Species in the Action Area.**

<i>Species</i>	<i>Regulatory Agency/Status</i>	<i>Critical Habitat</i>
Puget Sound Chinook ESU Salmon ( <i>Oncorhynchus tshawytscha</i> )	NMFS/Threatened	Designated; Not designated on NW Navy installations
Puget Sound Steelhead DPS ( <i>O. mykiss</i> )	NMFS/Threatened	<i>Under development</i>
Southern Resident Killer Whale ( <i>Orcinus orca</i> )	NMFS/Endangered	Designated; Not designated in Sinclair Inlet and NW Navy installations

Steller Sea Lion Eastern DPS ( <i>Eumetopias jubatus</i> )	NMFS/Threatened	Designated; Not designated in Washington State
Humpback Whale ( <i>Megaptera novaeangliae</i> )	NMFS/Endangered	<i>Under development</i>
Georgia Basin/Puget Sound Bocaccio DPS ( <i>Sebastes paucispinis</i> )	NMFS/Endangered	<i>Under development</i>
Georgia Basin/Puget Sound Yelloweye Rockfish DPS ( <i>S. ruberrimus</i> )	NMFS/Threatened	<i>Under development</i>
Georgia Basin/Puget Sound Canary Rockfish DPS ( <i>S. pinniger</i> )	NMFS/Threatened	<i>Under development</i>
Coastal/Puget Sound Bull Trout ( <i>Salvelinus confluentus</i> )	USFWS/Threatened	Designated; Not designated on NW Navy installations
Marbled Murrelet ( <i>Brachyramphus marmoratus</i> )	USFWS/Threatened	Designated, not designated in project area

## 2.2 EFFECT DETERMINATION

The effect of this proposed project within the action area would be temporary noise increases in the vicinity of Pier 6 due to the vibratory removal of piles and the impact driving of new pre-stressed concrete piles. Additionally, pile removal and installation activities may result in minor localized turbidity of the surface waters around the piles. No eelgrass beds will be impacted by the proposed project as there are no eelgrass beds within Sinclair Inlet and all pile replacement will occur in water depths of 29 – 50 feet MLLW. Resulting long-term positive effects will be the removal of approximately 380 creosote treated timber pilings from the marine waters of Sinclair Inlet. The proposed project will have no effect on designated critical habitat as no critical habitat has been designated within the action area.

### *Puget Sound Chinook ESU Salmon*

Although Sinclair Inlet streams do not support native runs of Chinook salmon, and there are no historical records of such runs in the project area, Chinook from other runs may occur in the area during migration. The Washington Department of Fish and

Wildlife (WDFW) performed a two-year capture and release study in 2001 and 2002 to increase understanding of the use of nearshore habitat and food resources by juvenile salmonids in Sinclair Inlet. Hatchery origin juvenile Chinook comprised a majority of salmonids captured in the study. Because not all hatchery juvenile Chinook salmon were distinctly marked in 2001 and 2002, the number of hatchery-produced fish obtained in the samples was thought to be underestimated (Fresh et al. 2006).

Best management practices will be followed for all pile driving. The proposed in-water work would occur during the recommended work window for the project area (June 15 to March 1). This will minimize the effects of noise and other disturbances to juvenile salmon. The project may affect, but is not likely to adversely affect, Puget Sound Chinook salmon.

#### *Puget Sound Steelhead DPS*

Steelhead are found in very small numbers in Sinclair Inlet. Of the 73,615 fish caught during the 2001-2002 Sinclair Inlet juvenile salmonid outmigration study performed by WDFW, only four were Steelhead (Fresh et al. 2006).

Effects will be the same as those for Chinook. The project may affect, but is not likely to adversely affect, Puget Sound Steelhead.

#### *Southern Resident Killer Whale*

Southern Resident killer whales occasionally move into rarely visited areas and inlets, probably in response to locally abundant food sources. In 1997, southern residents moved into Dyes Inlet near Bremerton and spent nearly a month feeding on a salmon run (Wiles 2004).

Killer whales may experience disturbance from construction noise and activity, however, it is unlikely that they will be present in the action area. The project may affect, but is not likely to adversely affect, Southern Resident killer whales.

#### *Steller Sea Lion Eastern DPS*

There are currently no Steller sea lion haul-out sites within Sinclair Inlet and no rookeries within Washington State. This, combined with the fact that fish abundance is only available seasonally within Sinclair Inlet, makes Steller sea lion residence in the area highly unlikely (Jefferies et al. 2000).

In general, Steller sea lions do not migrate but often disperse widely during the nonbreeding season (Loughlin 2002). Steller sea lions are not expected to occur within the action area due to high noise levels from the industrial shipyard as discussed below. An ongoing marine mammal survey within Puget Sound by Washington Department of Fish and Wildlife (WDFW) reported a lone Steller sea lion hauled out on the Navy's floating fence off of NAVBASE Kitsap Bremerton during November 2012 (Lance, M. 2012). Depending on the section, the floating fence occurs approximately 300 to 500 ft from Pier 6.

NAVBASE Kitsap Bremerton is located in an urban setting with marine industrial uses characterized by high airborne and underwater noises. The primary concentration of these noise sources is along the shore and piers. Noise is generated by Navy and non-Navy vessels including tugs, barges, aircraft carriers, submarines, ferry traffic, security boats, and recreational vessels operating in Sinclair Inlet. Depending on the noise-generating activity and distance from those activities, industrial shipyard airborne noise is expected to be between 60 and 90 dBA (WSDOT, 2008).

The high level of noise (underwater and airborne) combined with the high level of marine activity limits the attractiveness of NAVBASE Kitsap Bremerton for marine mammals. Under the Marine Mammal Protection Act, a shutdown zone shall apply to the end of the pier to prevent any potential injury to marine mammals. For this area, the most abundant marine mammals are California sea lions and harbor seals. For impact and vibratory pile installation and removal in this area, monitoring will be conducted within a 10 meter (or as agreed to in the IHA) shutdown zone surrounding each pile. The 10 meter shutdown can be easily monitored by a trained observer from pierside or stationed on the pile driving barge and will prevent injury to any Steller sea lions in the unlikely event they are in the area.

With implementation of the protection measures described above, including "go/no-go" monitoring protocol, the project may affect, but is not likely to adversely affect, Steller sea lions.

#### *Humpback Whale*

Humpback whales were common in inland Washington State waters in the early 1900s; however, there have only been a few sightings in this area since the whales were heavily hunted in the eastern

North Pacific (Scheffer and Slipp 1948; Calambokidis and Steiger 1990; Pinnell and Sandilands 2004). Today, humpback whales occasionally occur in the Puget Sound Study Area but do not remain there for long periods (Everitt et al. 1980; Osborne and Ransom 1988). Calambokidis and Steiger (1990) recorded the movements of at least two humpback whales in southern Puget Sound in June and July 1988.

It is unlikely that humpback whales will be in the action area. This project will have no effect on humpback whales.

*Georgia Basin/Puget Sound Bocaccio DPS*

DeLacy et al. (1972) and Miller and Borton (1980) compiled all available data on Puget Sound fish species distributions and relative number of occurrences through the mid-1970s from literature, fish collections, unpublished log records, and other sources. Though bocaccio was recorded 110 times in these documents, most records were associated with sport catch from the 1970s in Tacoma Narrows and Appletree Cove (near Kingston). The University of Washington Museum Collection has two bocaccio specimens pulled from Port Orchard between the Kitsap Peninsula and Bainbridge Island off of Fletcher Bay. No records occur in Sinclair Inlet. Although there have been no confirmed observations of bocaccio in Puget Sound for approximately 7 years (74 FR 18516), Drake et al. (2008) concluded that it is likely that bocaccio occur in low abundances.

NMFS relied on scientific information outlined by the Biological Review Team (Drake et al. 2008) and Palsson et al. (2008) to outline the limiting factors for rockfish in Puget Sound waters. These stressors included commercial and sport fisheries, habitat disruption (including exotic species), derelict gear, climate changes, water quality (specifically dissolved oxygen), species interactions (including predation and competition), diseases, and genetic changes.

Minor, temporary, and localized effects on water quality (notably small increases in turbidity) may occur during pile driving; however, there would be no associated decrease in dissolved oxygen, or increase in water temperatures. The proposed project would not facilitate the introduction or increase the existing prevalence of non-indigenous species in the action area.

NAVBASE Kitsap Bremerton is currently partnered with the Washington Department of Fish and Wildlife to conduct Rockfish

surveys along the Bremerton waterfront. The results from this survey will assist Navy biologists in identifying potential habitat, implementing conservation plans, and in any future ESA consultations.

The proposed project would not present an increase in the limiting factors for rockfish in Puget Sound. The project may affect, but is not likely to adversely affect, bocaccio.

*Georgia Basin/Puget Sound Yelloweye Rockfish DPS*

Yelloweye rockfish are extremely rare in Puget Sound, Washington. DeLacy et al. (1972) and Miller and Borton (1980) discovered 113 documented yelloweye rockfish records from Puget Sound associated with sport catch. No records occur in Sinclair Inlet (Miller and Borton 1980). Kincaid (1919) reported yelloweye rockfish used to be relatively common in the deep waters of Puget Sound. Due to the moratorium on both sport and commercial fishing for yelloweye rockfish in Sinclair Inlet, the absence of associated recent catch records, and no recent scientific surveys of these waters, the prevalence of yelloweye rockfish in these waters remains unknown. Little is known about their habitat requirements or use in Puget Sound waters (Drake et al. 2008; Palsson et al. 2008).

The effects of the proposed project on yelloweye rockfish would be the same as those described for bocaccio above. The project may affect, but is not likely to adversely affect, yelloweye rockfish.

*Georgia Basin/Puget Sound Canary Rockfish DPS*

Canary rockfish were once considered fairly common in the greater Puget Sound area (Kincaid 1919); however, little is known about their habitat requirements in these waters (Drake et al. 2008; Palsson et al. 2008). DeLacy et al. (1972) and Miller and Borton (1980) documented 114 records of canary rockfish prior to the mid-1970s, with most records attributed to sport catch from the 1960s to 1970s in Tacoma Narrows, Hood Canal, San Juan Islands, Bellingham, and Appletree Cove. No records occur in Sinclair Inlet (Miller and Borton 1980). With the absence of associated catch records, and no recent scientific surveys of these waters, the prevalence of rockfish in these waters remains unknown. Drake et al. (2008) concluded that canary rockfish occur in low and decreasing abundances in Puget Sound.

The effects of the proposed project on canary rockfish would be the same as those described for bocaccio above. The project may affect, but is not likely to adversely affect, canary rockfish.

*Coastal/Puget Sound Bull Trout*

There are no core populations of bull trout that occur in any of the streams that empty into Sinclair Inlet or the entirety of East Kitsap. Bull trout typically prefer colder water temperatures, which are usually associated with snowmelt-fed streams. The lowland streams that drain into Sinclair Inlet are primarily fed by surface runoff and do not meet the optimal conditions necessary for spawning and rearing of bull trout. The two-year survey of salmonid use of Sinclair Inlet found no bull trout occurring in the area (Fresh et al. 2006).

Although streams within Sinclair Inlet are unlikely to support any core populations of bull trout, there is the potential for adult fish from other drainages within the Puget Sound (i.e. Green and Puyallup watersheds) to utilize the littoral zones for foraging. Typically, most anadromous bull trout remain within several miles of the mouth of their natal stream. However, relatively little research has been done on their saltwater migrations (University of Washington, 2002).

Effects will be the same as those for Chinook although there are no reports of bull trout within the action area. The project may affect, but is not likely to adversely affect, Coastal/Puget Sound bull trout.

*Marbled Murrelet*

Marbled murrelets nest and roost in mature and old growth forest areas of western Washington. The majority of Kitsap County, including NAVBASE Kitsap Bremerton and the area surrounding Sinclair Inlet, has been logged several times over the past 150 years and no longer contains old growth forest or large trees necessary for marbled murrelet nesting. The closest documented habitat is on the other side of the Hood Canal in the Olympic National Forest.

The project area and the surrounding shipyard generate loud noises throughout the day, from pulsed and non-pulsed sources. Noise is generated by Navy and non-Navy vessels including tugs, barges, aircraft carriers, submarines, ferry traffic, security boats, and recreational vessels operating in Sinclair Inlet. Other sources include ships maintenance, dry dock activity, and

ship disassembly. Depending on the noise-generating activity and distance from those activities, industrial shipyard airborne noise is expected to be between 60 and 90 dBA.

The project area is in an industrial shipyard, miles from known nesting habitat and where high activity and noise levels limit any potential for foraging. While marbled murrelets can be seen in the South Puget Sound foraging, they have not been identified in the industrial waters surrounding NAVBASE Kitsap at Bremerton. While no marbled murrelets are expected to be in the project area, the following mitigation measures will ensure no impacts if foraging marbled murrelets are seen at end of the pier.

Per discussions between the Navy and USFWS that occurred on November 19, 2012, when impact driving new concrete piles near the end of the pier the Navy will either limit impact driving at to one hour per day, or after one hour, provide a qualified person familiar with marbled murrelets to monitor a 21 meter radius around the pile. The 21 meter radius was obtained from the USFW model and translates to the 202 dB sound exposure limit (SEL) considered to be the auditory injury threshold which is reported as the cumulative amount of exposure for a single pile driving event. The end of the pier that will receive a higher level of protection measures for Marbled Murrelets is defined in Figure 5 and assumes that this section of the pier is adjacent to the most open fetch that foraging murrelets could be expected to approach the action area from. The remaining pier is considered to be encroached upon by adjacent piers, moored ships, industrial activity, and ferry services sufficiently that it provides a highly unlikely route of travel for foraging murrelets. Figure 5 also details the 21 meter monitoring area.

Pile driving will be not begin until a marbled murrelet observer stationed on the edge of the barge clears the area. The observer will immediately halt all pile driving if a marbled murrelet is seen within or approaching the area.

After the marbled murrelet observer gives word that the area is clear, a soft start will be used whereby the force of piling is gradually increased to alert animals in the vicinity to the commencement of the operations. The soft start will be used for all areas of the pier, including interior areas of the shipyard where a marbled murrelet observer is not required.

With implementation of the protection and monitoring measures described above, and the rarity that marbled murrelets would be

present in the action area, the Proposed Action may affect, but is not likely to adversely affect marbled murrelets.

**Table 2 Effects Determination**

<i>Listed Species</i>	<i>Effects Determination</i>
Puget Sound Chinook ESU Salmon	May affect, not likely to adversely affect
Puget Sound Steelhead DPS	May affect, not likely to adversely affect
Southern Resident Killer Whale	May affect, not likely to adversely affect
Steller Sea Lion Eastern DPS	May affect, not likely to adversely affect
Humpback Whale	No effect
Georgia Basin/Puget Sound Bocaccio DPS	May affect, not likely to adversely affect
Georgia Basin/Puget Sound Yelloweye Rockfish DPS	May affect, not likely to adversely affect
Georgia Basin/Puget Sound Canary Rockfish DPS	May affect, not likely to adversely affect
Coastal/Puget Sound Bull Trout	May affect, not likely to adversely affect
Marbled Murrelet	May affect, not likely to adversely affect

### 3. ESSENTIAL FISH HABITAT ASSESSMENT

The action area includes habitats designated as essential fish habitat (EFH) for various life stages of 17 species of groundfish, five coastal pelagic species, and three species of Pacific salmon. The proposed project will not result in excessive levels of organic materials, inorganic nutrient, or heat. The action will not result in physical alterations that could adversely affect water temperature or beach contours. The action will not remove large woody debris, or other natural

beach complexity features, nor will it affect any vegetated shallows. The proposed project will not affect EFH for Pacific salmon, groundfish, and coast pelagic species.

#### 4. MITIGATION

Due to the potential presence of ESA threatened and endangered species in the action area, the following mitigation measures will be observed:

- In-water work will be conducted between June 15 and March 1 to avoid the juvenile salmon migration period in Sinclair Inlet.
- When impact driving new concrete piles at the end of the pier, the Navy will either;
  - Limit impact driving at the end of the pier (Figure 5) to one hour per day, or;
  - After one hour, provide a qualified person familiar with marbled murrelets to monitor a 21 meter radius around the pile at the end of the pier. Pile driving will be suspended if a marbled murrelet is spotted within the specified radius.
- The Navy is applying for an Incidental Harassment Authorization (IHA) under the Marine Mammal Protection Act (MMPA). The IHA will include additional mitigation measures, including a shutdown area that the Navy will implement during pile removal and installation.
- Piles that break during construction will be cut at mudline to avoid disturbing contaminated sediment.
- Removed piles will be cut into four ft lengths and placed in a dumpster for disposal.
- All work will be accomplished so that no debris or deleterious material enters the water.

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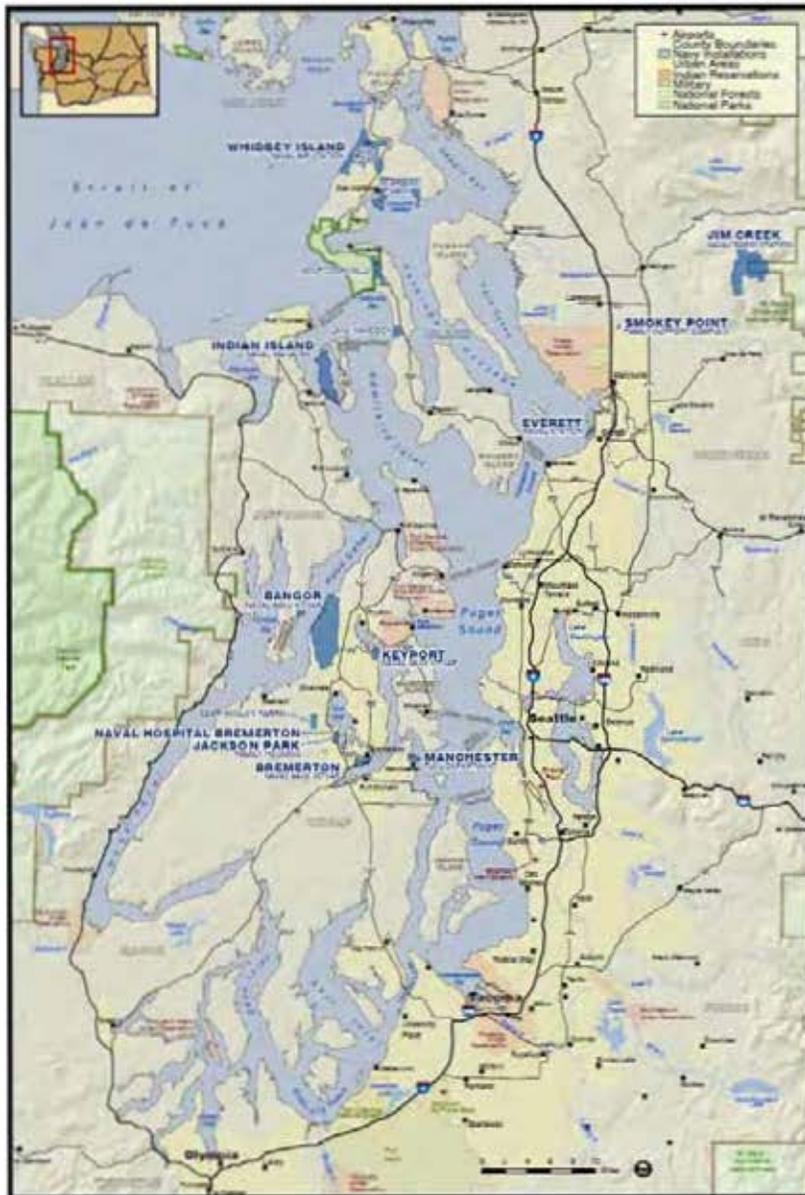


Figure 1 Location

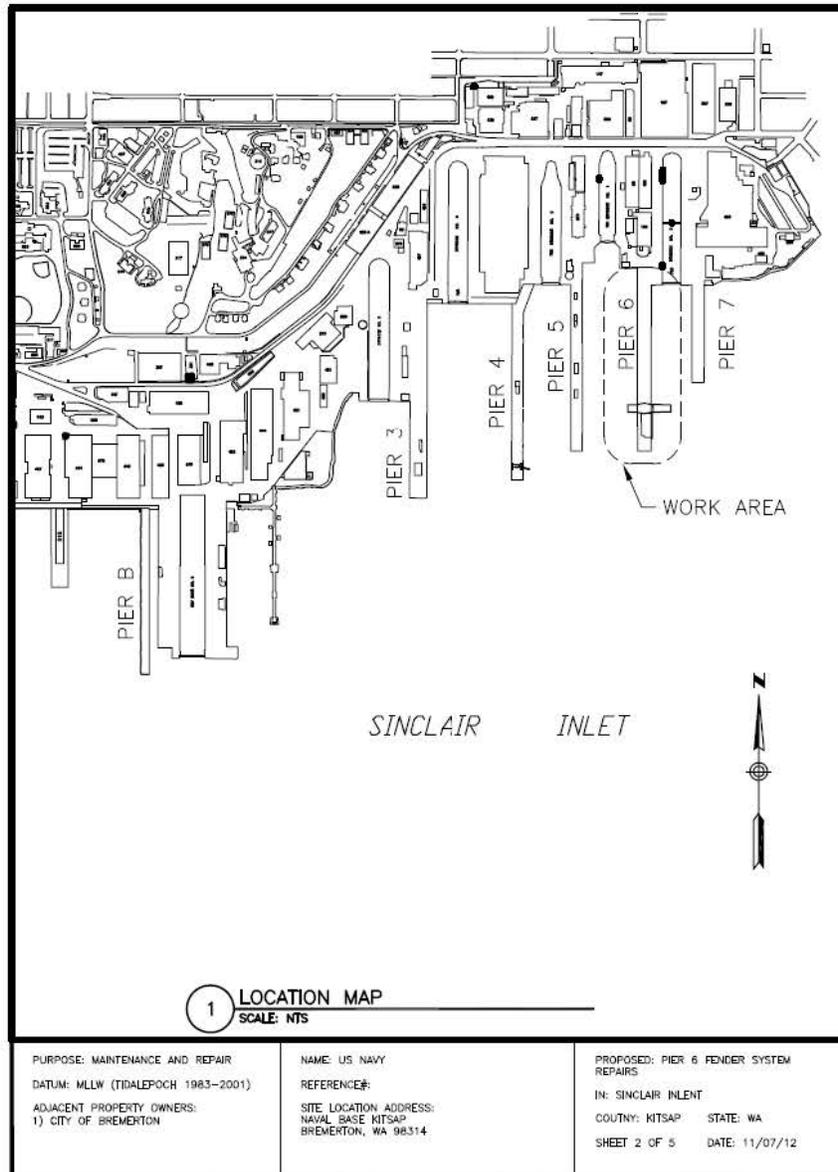


Figure 2 Pier 6 at NAVBASE Kitsap Bremerton

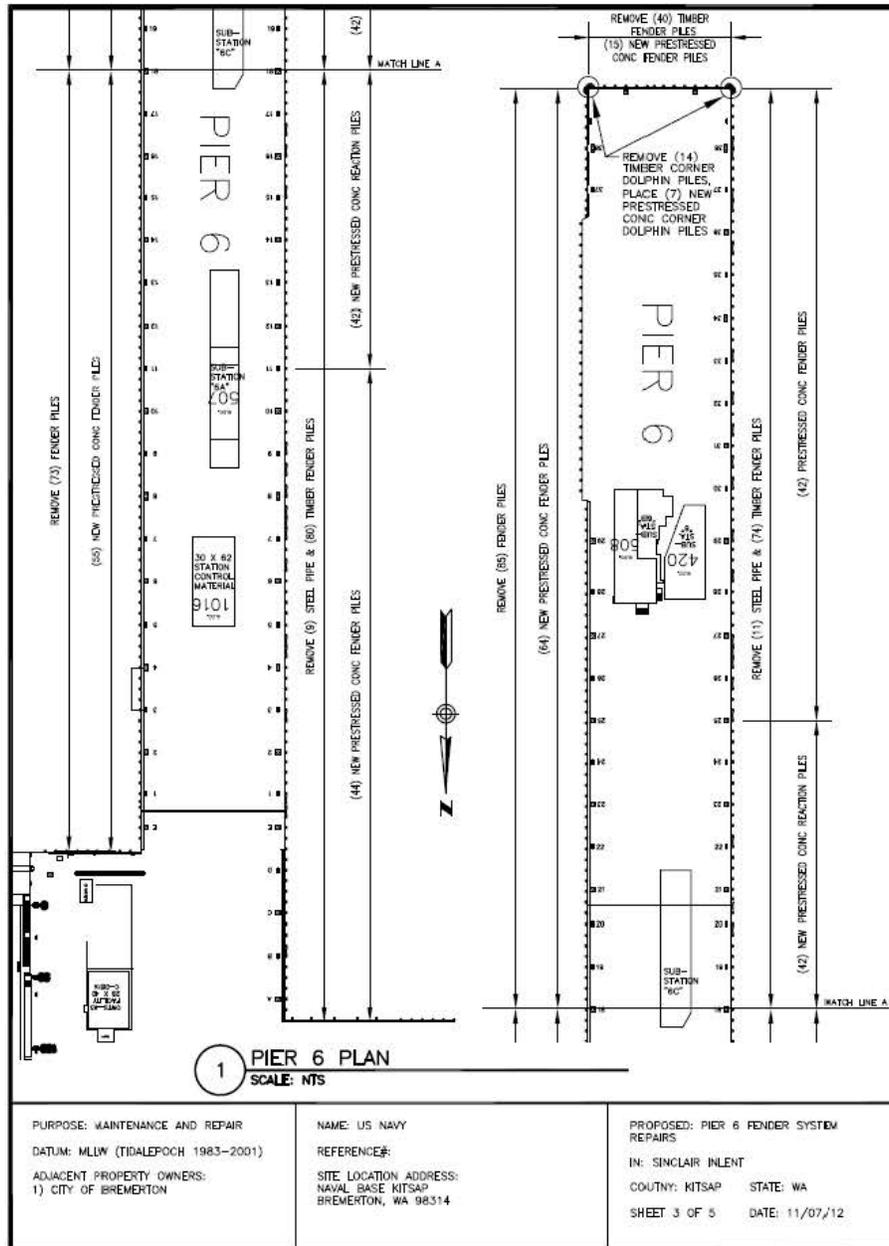


Figure 3 Fender Pile Locations

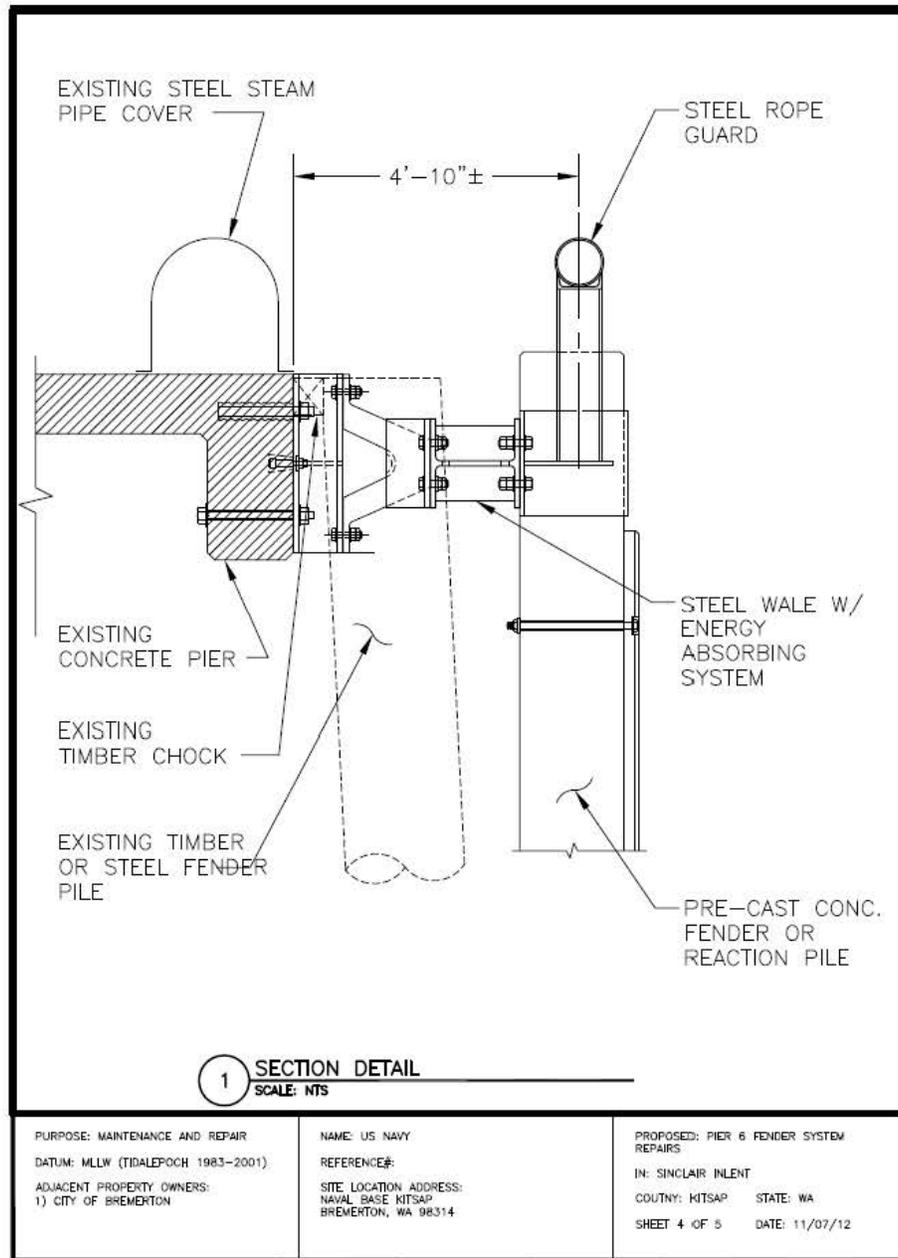


Figure 4 Typical Fender System Detail



Figure 5 Marbled Murrelet Injury Threshold

**Appendix B**  
**Incidental Harassment Authorization**

(To be inserted at the completion of consultation)

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**REQUEST FOR AN INCIDENTAL HARASSMENT AUTHORIZATION  
UNDER THE MARINE MAMMAL PROTECTION ACT  
FOR  
PILE REMOVAL AND REPLACEMENT  
NAVAL BASE KITSAP BREMERTON**



**Submitted to:**

Office of Protected Resources,  
National Marine Fisheries Service,  
National Oceanographic and Atmospheric Administration

**Prepared by:**

Naval Base Kitsap



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## LIST OF ACRONYMS AND ABBREVIATIONS

μPa	.....	microPascal
BMP	.....	best management practices
Caltrans	.....	California Department of Transportation
CFR	.....	Code of Federal Regulations
CV	.....	coefficient of variation
dB	.....	decibel
dB(A)	.....	A-weighted decibel
DON	.....	Department of the Navy
DPS	.....	distinct population segment
ESA	.....	Endangered Species Act
FR	.....	Federal Register
FY	.....	fiscal year
IHA	.....	Incidental Harassment Authorization
Hz	.....	Hertz
kHz	.....	kilohertz
m	.....	meter
MMPA	.....	Marine Mammal Protection Act
N/A	.....	not applicable
NAS	.....	naval air station
NAVBASE	.....	naval base
NMFS	.....	National Marine Fisheries Service
NOAA	.....	National Oceanic and Atmospheric Administration
Pa	.....	Pascal
PSAMP	.....	Puget Sound Ambient Monitoring Program
rms	.....	root mean square
SPL	.....	sound pressure level
TL	.....	transmission loss
U.S.	.....	United States
U.S.C.	.....	United States Code
USFWS	.....	U.S. Fish and Wildlife Service
WDFW	.....	Washington Department of Fish and Wildlife
WSDOT	.....	Washington State Department of Transportation
ZOI	.....	zone of influence

# 1 Introduction and Description of Activities

*A detailed description of the specific activity or class of activities that can be expected to result in incidental taking of marine mammals.*

## 1.1 Introduction

Naval Base (NAVBASE) Kitsap is a U.S. Navy (Navy) base located on the Kitsap Peninsula in Washington State. The Mission of NAVBASE Kitsap is to serve as the home base for the Navy's fleet throughout Puget Sound and to provide base operating services, including support for both surface ships and submarines home ported at Bremerton and Bangor.

The proposed project is a pier maintenance project occurring at NAVBASE Kitsap Bremerton. NAVBASE Kitsap Bremerton is capable of overhauling and repairing all types and sizes of ships while also serving as the homeport for a nuclear aircraft carrier and other Navy vessels. Other significant capabilities include alteration, construction, deactivation, and dry-docking of all types of naval vessels. As part of the Navy's mission, maintaining facilities and readiness is a priority.

The project will occur in marine waters supporting several marine mammal species. Under the Marine Mammal Protection Act (MMPA) of 1972, as amended (16 United States Code [U.S.C.] Section [§] 1371(a)(5)(D)), the Navy is requesting an Incidental Harassment Authorization (IHA), for pile removal and driving activities that are expected to result in the incidental taking of marine mammals by Level B harassment only. The 14 specific items required for this application, as set out by 50 CFR 216.104, Submission of requests, are provided for in chapters 1–14 of this application.

A map of the region of activity is provided in Figure 1-1 and a description of the activities for which the Navy is requesting incidental take authorization is provided in the following sections.

## 1.2 Proposed Action

The Navy is proposing to remove up to 400 deteriorating fender piles at Pier 6 and replace them with up to 330 new fender piles beginning in December 2013. Fender piles are driven into the sea bed around the perimeter of the pier to protect against damage from incoming vessels. Existing deteriorated fender piles are primarily creosote treated timber that would be replaced with pre-stressed concrete piles. Table 1-1 provides pile size, material, numbers and installation method of the piles to be installed or removed at NAVBASE Kitsap Bremerton.

There would be minimal change to the footprint of Pier 6 as replacement fender piles would be installed in approximately the same location as removed piles.

## 1.3 Construction Methods and Descriptions

This section describes the typical methods of pile removal and installation that would be used to accomplish the work included as part of this proposed action.



Figure 1-1. NAVBASE Kitsap Bremerton and other Navy Region Northwest Installations

**TABLE 1-1. NUMBER, TYPE AND SIZE PILES AT PIER 6**

<b>Pile Type</b>	<b>Size</b>	<b>No. Removed</b>	<b>Removal Method</b>	<b>No. Installed</b>	<b>Installation Method</b>
Creosote treated timber fender	12"	380	Vibratory Extraction*	0	N/A
Steel pipe fender	12"	20	Vibratory Extraction	0	N/A
Pre-stressed concrete fender	18"x18"	0	N/A	240	Impact Driving
Pre-stressed concrete reaction	24"x24"	0	N/A	90	Impact Driving
<b>Total:</b>		<b>400</b>		<b>330</b>	
<i>*As contingency, a direct pull or clamshell may be used to remove broken fender piles that cannot be removed with a vibratory hammer</i>					

### 1.3.1 Pile Removal

Vibratory extraction is a common method for removing all pile types. A barge-mounted crane operates from the water adjacent to the pile during removal activities. A vibratory driver is a large mechanical device (5–16 tons) suspended from a crane by a cable and positioned on top of a pile. The pile is then loosened from the sediments by activating the driver and slowly lifting up on the driver with the aid of a crane. Once the pile is released from the sediments, the crane continues to raise the driver and pull the pile from the sediment. The driver is shut off once the end of the pile reaches the mud line and the pile is pulled from the water and placed on a barge. Vibratory extraction is expected to take approximately 5–30 minutes per pile. Sediments attached to the outside of the pile are suspended in the water column until they settle back to the seafloor. The amount of time for these sediments to settle ranges from several seconds to a few hours depending on the sediment type, currents, and weather conditions.

In some cases, complete removal with a vibratory driver is not possible because the pile may break apart from the force of the clamp and the vibration. If piles break or are damaged, a direct pull or clamshell would be used, if practical, to attempt to entirely remove the broken pile. A direct pull involves wrapping broken piles with a cable and pulling them directly from the sediment with a crane. Clamshell removal involves using a set of steel jaws suspended from a crane to grasp pile stubs that have broken below the water line. If the entire pile cannot be removed, the pile would be cut at the mud line to prevent disturbing sediments. Direct pull and clamshell removal do not produce noise that could impact marine mammals.

### 1.3.2 Pile Installation

Concrete replacement piles will be up to 24-inches in diameter and would be installed with an impact hammer to the appropriate tip elevation. Impact hammers have guides that hold the hammer in alignment with the pile while a heavy piston moves up and down striking the top of the pile and driving the pile into the substrate from the downward force of the hammer. To drive the pile, a pile is first moved into position and set into the proper location by placing a choker cable around a pile and lifting it into vertical position with the crane. Once the pile is properly positioned, pile installation can typically take 15–60 minutes depending on conditions (i.e., bedrock, loose soils, etc.) to reach the required tip elevation.

## **1.4 Best Management Practices, Mitigation and Minimization Measures**

The Proposed Action includes best management practices (BMPs) for construction and other measures that will be implemented to minimize or avoid potential environmental impacts. Chapter 11 presents the measures to be implemented to reduce or avoid environmental impacts from the implementation of the proposed action.

General BMPs are routinely used by the Navy during pile repair, replacement, and maintenance activities to avoid and minimize potential environmental impacts. Additional minimization measures have been added to protect ESA-listed species. These additional measures include limiting in-water work to the designated work window, and marine mammal monitoring as described in Chapter 11 of this application.

Best management practices, mitigation and minimization measures are included in construction contract plans and specifications for individual projects and must be agreed upon by the contractor prior to any construction activities. A signed contract represents a legal agreement between the contractor and the Navy. Failure to follow the prescribed BMP mitigation and minimization measures constitutes a contract violation.

## 2 Dates, Duration, and Location of Activities

*The dates and duration of such activity and the specific geographical region where it will occur.*

### 2.1 Dates

Pile removal and replacement for Pier 6 would be conducted over three years beginning on December 1, 2013. Timing restrictions (or “fish windows”) will be complied with to avoid conducting activities when endangered fish are most likely to be present. Timing restrictions are typically imposed by the United States Army Corps of Engineers, the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) and with coordination with the Washington Department of Fish and Wildlife if data indicates that ESA listed species are present.

The approved Army Corps work window for in-water work at NAVBASE Kitsap Bremerton is June 15 to March 1 to avoid the juvenile salmon migration period in Sinclair Inlet. Therefore, this application requests an initial IHA for 3 months covering the in-water work period from December 1, 2013 through March 1, 2014. Additional IHAs will be requested for subsequent years with each IHA to run the duration of the allowable work window; June 15 through March 1

### 2.2 Duration

For the first year it is estimated that 65 total days of pile driving would be required. See table 2-1 for a breakdown by year of vibratory and impact pile driving days. 200 days is a worst-case number of days for pile removal and installation over the course of the entire project which would assume a production rate of approximately 4 piles per day. The actual production rate is expected to be higher resulting in less total days, but this will depend on the location of the work, equipment, equipment failure, and other construction variables. All pile removal and replacement will occur during daylight hours.

**TABLE 2-1. ESTIMATED PILE DRIVING DAYS<sup>1</sup>**

<b>Removal/Installed</b>	<b>Year 1 Pile Driving Days</b>	<b>Year 2 Pile Driving Days</b>	<b>Year 3 Pile Driving Days</b>	<b>Total Pile Driving Days</b>
Vibratory Pile Removal	20	15	30	65
Impact Pile Driving	45	30	60	135
<b>Total Days:</b>	<b>65</b>	<b>45</b>	<b>90</b>	<b>200</b>

<sup>1</sup>Estimated pile driving days are based on a production rate of approximately 4 piles per day

### 2.3 Geographic Region of Activity

NAVBASE Kitsap Bremerton is located on the north side of Sinclair Inlet within the City of Bremerton in Kitsap County (Figure 2-1). The eastern portion of the base is a fenced, high-

security area known as the Controlled Industrial Area. Puget Sound Naval Shipyard and Intermediate Maintenance Facility is the major tenant command of NAVBASE Kitsap Bremerton.

Sinclair Inlet is part of the estuarine system of interconnected waterways and basins known as Puget Sound. As defined in this document, Puget Sound includes the marine waters connecting to the Strait of Juan de Fuca through Admiralty Inlet and Deception Pass (see Figure 1-1 and 2-1). Puget Sound along with the waters surrounding the San Juan Islands and those in the Strait of Juan de Fuca comprise the marine inland waters of Washington State.

Sinclair Inlet connects to the main basin of Puget Sound through Port Washington Narrows and then Agate Pass to the north or Rich Passage to the East. Sinclair Inlet is an estuary of Puget Sound located 16 miles by ferry from the Seattle waterfront, and extending 3.5 miles southwesterly from its connection with the Port Washington Narrows, just east of NAVBASE Kitsap Bremerton. Sinclair Inlet has been significantly modified by development activities. Fill associated with transportation, commercial, and residential development of the NAVBASE Kitsap, the City of Bremerton, and the local ports of Bremerton and Port Orchard has resulted in significant changes to the shoreline. The area surrounding Pier 6 is industrialized, armored and adjacent to railroads and highways. Sinclair Inlet is also the receiving body for the Westside Wastewater Treat Plant (WWTP) located just west of NAVBASE Kitsap Bremerton. Sinclair Inlet is relatively shallow and does not flush fully despite the freshwater stream inputs.

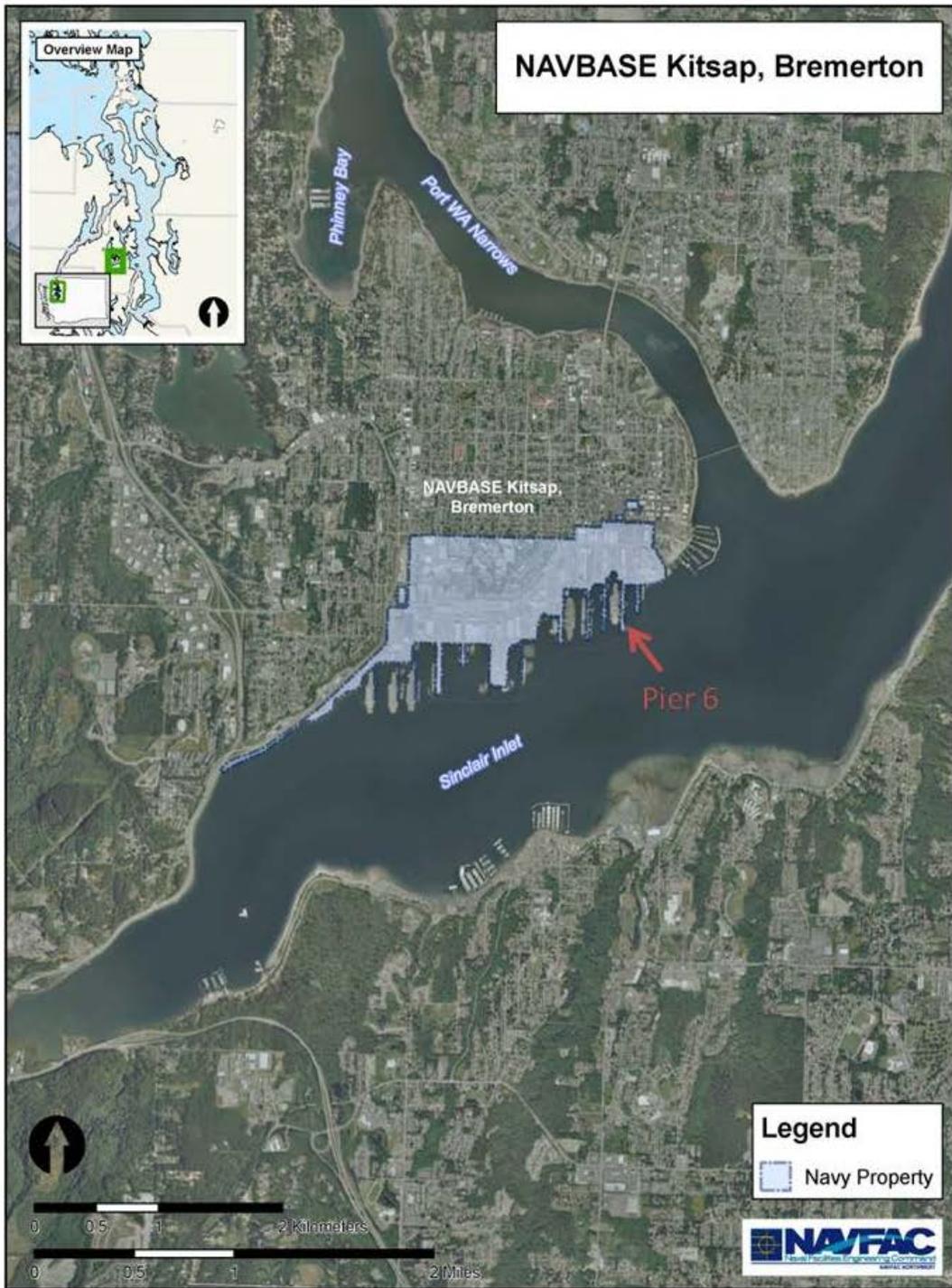


Figure 2-1. Naval Base Kitsap Bremerton

### 3 Marine Mammal Species and Numbers

*The species and numbers of marine mammals likely to be found within the activity area.*

#### 3.1 Species

Six marine mammal species have historically been documented in the waters near NAVBASE Kitsap, Bremerton, but only five of them have a reasonable potential to occur in the project vicinity. These are the harbor seal (*Phoca vitulina*), the California sea lion (*Zalophus californianus*), the Steller sea lion (*Eumetopias jubatus*), the transient killer whale (*Orcinus orca*), and the gray whale (*Eschrichtius robustus*).

Harbor seals are common year-round in the waters of Sinclair Inlet and haulout on log breakwaters at various marinas in Port Orchard (across from NAVBASE Kitsap Bremerton). California sea lions haulout seasonally on the port security barrier (floating fence) at NAVBASE Kitsap Bremerton. Steller sea lions had never been documented at NAVBASE Kitsap Bremerton until November 2012, when one solitary animal was observed hauled out on the port security barrier during a vessel survey (personal communication Lance, 2012). In November 2012, near Manchester (located further east in Rich Passage which connects to Sinclair Inlet) there was a sighting of Steller and California sea lions hauled out on a large temporary floating dock (Navy 2012).

Two types of killer whales, the West Coast transient stock and the Southern Resident stock have historically occurred in the vicinity of Sinclair Inlet, but the Southern Resident presence is extremely rare with the last confirmed sighting being 16 years ago (1997) in Dyes Inlet (Dyes Inlet connects to Sinclair Inlet northeast of NAVBASE Kitsap Bremerton). There was a more recent confirmed Southern Resident occurrence (6 years ago) somewhere along the Washington State Ferries route between Bremerton and Seattle in December of 2007, but the exact location of the sighting is not known. Therefore, due to their rare occurrence in this water body of Puget Sound, the Southern Resident killer whale were not carried forward in the analysis and only the transient killer whale is included in the analysis. There are confirmed sightings of gray whales in Sinclair Inlet, although their occurrence is infrequent.

Table 3-1 lists the marine mammal species most likely to occur in the vicinity of the project, their status, and a qualitative likelihood of encountering one of these species in the project vicinity. Of the five marine mammal species, only the Steller sea lion is listed under the Endangered Species Act (ESA). Section 4 contains detailed information on the species status and management and distribution.

Seven other marine mammal species are rare to extralimital in Sinclair Inlet and the surrounding waters and are unlikely to be exposed to the project activities due to their lack of historic presence. These include: the humpback whale (*Megaptera novaeangliae*), the minke whale (*Balaenoptera acutorostrata*), Pacific white-sided dolphins (*Lagenorhynchus obliquidens*), the harbor porpoise (*Phocoena phocoena*), the Dall's porpoise (*Phocoenoides dalli*), and northern elephant seals (*Mirounga angustirostris*). A review of the sighting reports since 2005 available on Orca Network (Orca Network, 2013) and discussion with the local Navy biologist (Beckley pers. comm. 2013) indicates that there have been no sightings of these species documented in the waters near NAVBASE Kitsap Bremerton or within Sinclair Inlet. Humpback whales, minke whales and harbor porpoises have been sighted in central and south Puget Sound but have not

been documented transiting west through Rich Passage into Sinclair Inlet (Orca Network, 2013). In addition, a small number of Risso's dolphins (*Grampus griseus*) have been documented in Puget Sound in the last few years, but none were near Sinclair Inlet. This species is a coastal species and considered extralimital to Puget Sound. Therefore, exposure of these species is considered discountable and take is not requested for these species.

## **3.2 Numbers**

### **3.2.1 Harbor Seal**

Aerial surveys of harbor seals in Washington inland waters were conducted during the pupping season in 1999 during which time the total numbers of hauled-out seals (including pups) were counted. In 1999, the mean count of harbor seals occurring in Washington's inland waters was 9,550 (CV=0.14) animals. Using a correction factor to account for animals in the water, which are missed during aerial surveys, 14,612 (CV=0.15) harbor seals were estimated in the Washington Inland Waters stock (Carretta et al. 2012). However, because the most recent abundance estimate is greater than 8 years old, there is no current estimate of abundance.

### **3.2.2 California Sea Lion**

The current population estimate for the U.S. stock of California sea lions is 296,750 (Carretta et al. 2012). The entire population cannot be counted because all age and sex classes are not ashore at the same time during field surveys. In lieu of counting all sea lions, pups are counted during the breeding season (because this is the only age class that is ashore in its entirety), and the number of births is estimated from the pup count. The size of the population is then estimated from the number of births and the proportion of pups in the population (Carretta et al. 2012). Approximately 3,000 to 5,000 animals are estimated to move into Washington and British Columbia waters typically starting in September and departing in May for breeding rookeries in California and Mexico (Jeffries et al. 2000). Peak counts of more than 1,000 animals have been made in Puget Sound (Jeffries et al. 2000).

### **3.2.3 Steller Sea Lion**

The Eastern stock was estimated by NMFS in the *Recovery Plan for the Steller Sea Lion* to number between 45,000 to 51,000 animals (NMFS 2008b). This stock has been increasing approximately 3 percent per year over the entire range since the late 1970s (NMFS 2012a). The most recent population estimate for the Eastern stock ranges from 58,334 to 72,223 (Allen and Angliss 2012).

### **3.2.4 Killer Whale [Transient]**

A minimum abundance estimate for the West Coast Transient stock is 243 animals based on photographic data (DFO 2009, as cited in Allen and Angliss, 2012). This estimate is considered conservative and does not include whales from southeastern Alaska and California that are provisionally classified as part of the stock (Allen and Angliss, 2012). Allen and Angliss provide a minimum population estimate for the stock of 354 individuals including animals in Canadian waters. They note this number is conservative and there are no overall estimates of population size.

### **3.2.5 Gray Whale**

A recent abundance estimates for the Eastern North Pacific gray whale stock is approximately 19,000 (Laake et al. 2009). For stock assessment purposes, NMFS currently uses an abundance of 19,126 animals (CV=0.071 (Allen and Angliss 2012)). The eastern population is increasing, despite an unusually large number of gray whales that stranded along the coast from Mexico to Alaska in 1999 and 2000 (Allen and Angliss 2012).

**TABLE 3-1. MARINE MAMMAL SPECIES POTENTIALLY PRESENT IN PROJECT AREA**

<b>Species</b>	<b>Stock(s) Abundance Estimate<sup>1</sup></b>	<b>ESA Status</b>	<b>MMPA Status</b>	<b>Frequency of Occurrence<sup>2</sup></b>
<b>Harbor Seal</b> <i>WA Inland Waters Stock</i>	14,612	-	Non-depleted	Likely
<b>California Sea Lion</b> <i>U.S. Stock</i>	296,750	-	Non-depleted	Seasonal (unlikely in July)
<b>Steller Sea Lion</b> <i>Eastern U.S. Stock/DPS</i>	58,334-72,223	Threatened	Depleted	Seasonal; (unlikely June-September)
<b>Killer Whale</b> <i>West Coast Transient Stock</i>	354	-	Non-depleted	Infrequent
<b>Gray Whale</b> <i>Eastern North Pacific Stock</i>	19,126	-	-	Infrequent

<sup>1</sup>NMFS marine mammal stock assessment reports at: <http://www.nmfs.noaa.gov/pr/sars/species.htm>

<sup>2</sup> Extralimital -There may be a small number of sighting or stranding records, but the area is outside the species range of normal occurrence.

Rare -Few confirmed sightings, or the distribution of the species is near enough to the area that the species could occur there.

Infrequent – Confirmed, but irregular sightings.

Likely -Confirmed and regular sightings of the species in the area year-round.

Seasonal - Confirmed and regular sightings of the species in the area on a seasonal basis.

## 4 Affected Species Status and Distribution

*A description of the status, distribution, and seasonal distribution (when applicable) of the affected species or stocks of marine mammals likely to be affected by such activities.*

Marine mammal species managed by NMFS that potentially occur in the Puget Sound belong to three taxonomic groups: mysticetes (baleen whales), odontocetes (toothed whales, porpoises and dolphins), and pinnipeds (seals and sea lions). (Mysticetes and odontocetes are known collectively as cetaceans.) In the study area, one of these species is federally listed under the ESA—the Steller sea lion. Informal consultation with NMFS under the ESA was completed on December 20, 2012. Harbor seals and California sea lions are the most common in the study area. This section includes information on each species' stock status management, abundance, and distribution (including seasonal information if available). Some of these sections contain direct excerpts from the most current stock assessment reports developed by NMFS.

### 4.1 Harbor Seal

#### 4.1.1 Status and Management

Harbor seals are not listed as depleted under the MMPA and they are not listed under the ESA. For management purposes, differences in mean pupping dates, movement patterns, pollutant loads, and fishery interactions have led to the recognition of three separate harbor seal stocks along the west coast of the continental United States:

1. Inland Waters of Washington State—including Hood Canal, Puget Sound, and the Strait of Juan de Fuca out to Cape Flattery
2. Outer Coast of Oregon and Washington
3. California (Carretta et al. 2012).

Harbor seals occurring in the Study Area belong to the Washington Inland stock. Based on radiotelemetry results, interchange between inland and coastal stock is unlikely (Jeffries et al. 2003).

#### 4.1.2 Distribution

Harbor seals are rarely found more than 12 miles (20 km) from shore and frequently occupy bays, estuaries, and inlets (Baird 2001). Individual harbor seals have been observed several miles upstream in coastal rivers (Baird 2001). An ideal harbor seal habitat includes haulout sites, shelter during the breeding periods, and sufficient food (Bjørge 2002). Haulouts can include intertidal and subtidal rock outcrops, sandbars, sandy beaches, peat banks in salt marshes, and manmade structures such as log booms, docks, and recreational floats (Jeffries et al. 2000). Harbor seals were not thought to make extensive pelagic migrations; however long distance movement of tagged animals in Alaska (108 miles [174 km]), along the U.S. west coast (up to 342 miles [550 km]), and in Washington inland waters (greater than 137 miles [220 km]) have been recorded (Peterson et al. 2012). Harbor seals display strong fidelity to haulout sites.

Harbor seals are the most common, widely distributed marine mammal found in Washington marine waters and are frequently observed in the nearshore marine environment. They occur year-round and breed in Washington. Numerous harbor seal haulouts occur in Washington inland waters (Figure 4-2). Haulouts include intertidal and subtidal rock outcrops, beaches, reefs,

sandbars, log booms, and floats. The number of hauled out harbor seals range from a few to between 100 - 500 individuals (Jeffries et al. 2000).

Pupping seasons vary by geographic region, with pups born in the Strait of Juan de Fuca, San Juan Islands, Admiralty Inlet, and the eastern bays of Puget Sound from June through August; Puget Sound south of Admiralty Inlet from late June through September; and Hood Canal from August through October (NOAA and WDFW 2009).

Harbor seals are expected to occur in Sinclair Inlet and NAVBASE Kitsap Bremerton at all times of the year. No permanent haulout has been identified at NAVBASE Kitsap Bremerton. The nearest known haulouts are along the south side of Sinclair inlet on log breakwaters at several marinas in Port Orchard approximately 1 mile from Pier 6.

## **4.2 California Sea Lion**

### **4.2.1 Status and Management**

California sea lions are not listed as depleted under the MMPA and they are not listed under the ESA. Individuals that may occur in the study area belong to the U.S. stock, the geographic boundary of which begins at the U.S./Mexico border and extends northward into Canada.

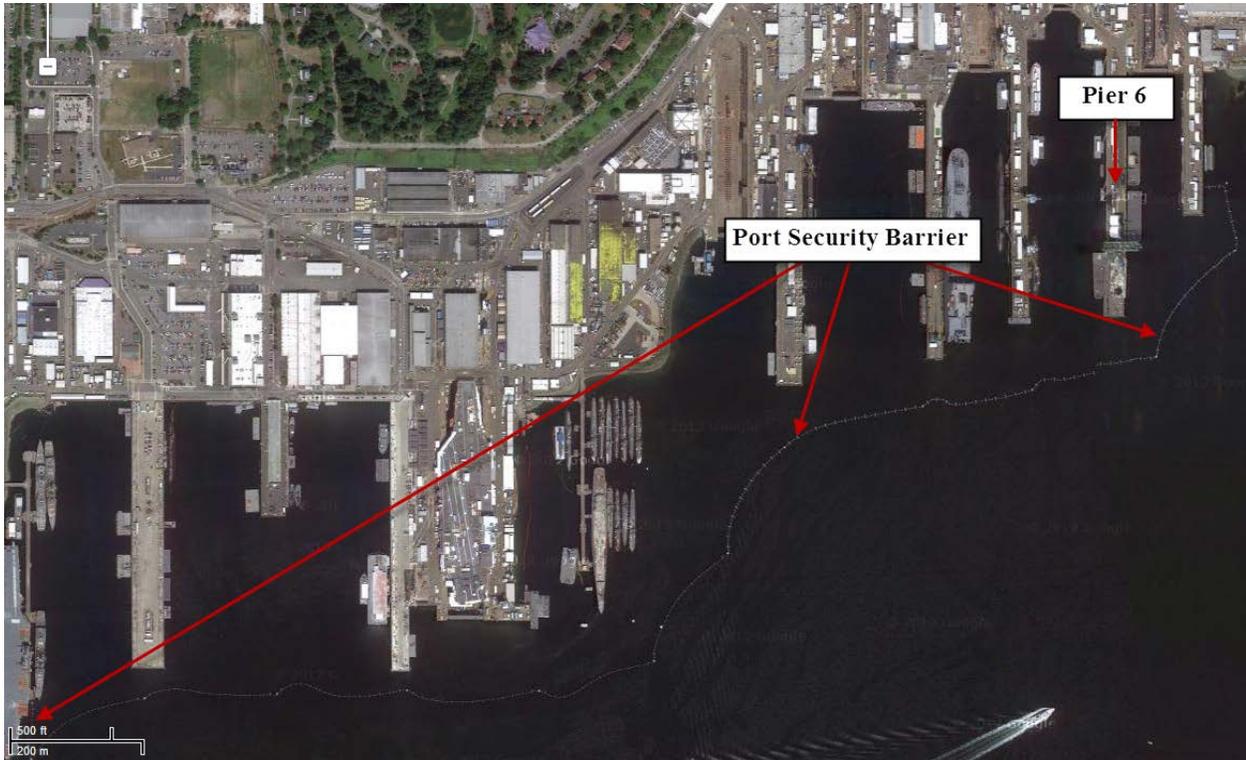
### **4.2.2 Distribution**

During the summer, California sea lions breed on islands from the Gulf of California to the Channel Islands and seldom travel more than about 31 miles (50 km) from the islands. The primary rookeries are located on the California Channel Islands of San Miguel, San Nicolas, Santa Barbara, and San Clemente. Their distribution shifts to the northwest in fall and to the southeast during winter and spring—probably in response to changes in prey availability. In the nonbreeding season, adult and sub adult males migrate northward along the coast to central and northern California, Oregon, Washington, and Vancouver Island. They are occasionally sighted hundreds of miles offshore. Generally, only male California sea lions migrate into northwest waters with females remaining in waters near their breeding rookeries off the coasts of California and Mexico. Females and juveniles tend to stay closer to the rookeries. In Washington, haulout sites are located on man-made structures such as docks, jetties, navigation buoys, and offshore rocks and islands (Jeffries et al. 2000).

Jeffries et al. (2000) and Jeffries (pers. comm. 2012) identified dedicated regular haulout sites used by adult and sub adult California sea lions in Washington inland waters (Figure 4-2). The Navy conducts surveys of sea lions at its installations within Puget Sound. At NAVBASE Kitsap Bremerton, Navy personnel perform marine mammal counts along the floating fence, or Port Security Barrier, that surrounds a majority of the base (Figure 4-1). Between February, 2010 and May, 2012 the maximum number of California sea lions along and hauled out on the Port Security Barrier were 144 individuals counted on November 9, 2011. Zero sea lions were counted on June 22, 2011 (U.S. Navy, 2012). In addition, 50 to 70 California sea lions were observed on floats near Manchester Fuel Depot (approximately 6.5 miles from NAVBASE Kitsap Bremerton) in November 2012 by Navy biologists. Three smaller haulouts are identified in the main basin of Puget Sound (north of Seattle, Seattle, and Tacoma) and California sea lions are found on navigational buoys from south Puget Sound north into Admiralty Inlet (Jeffries et al. 2000; Jeffries pers. comm. 2012) (Figure 4-2).

Occurrence in Puget Sound is typically between September and June with peak abundance between September and May. During summer months (June, July, and August) and associated breeding periods, the inland waters would not be considered a high-use area by California sea lions, as they would be returning to rookeries in California waters.

California sea lions on the Port Security Barrier are expected to be exposed to noise from project activities at NAVBASE Kitsap Bremerton. Exposure would occur primarily from September through the end of the in-water work window in early March.



**Figure 4-1. Port Security Barrier location in Relation to Pier 6**

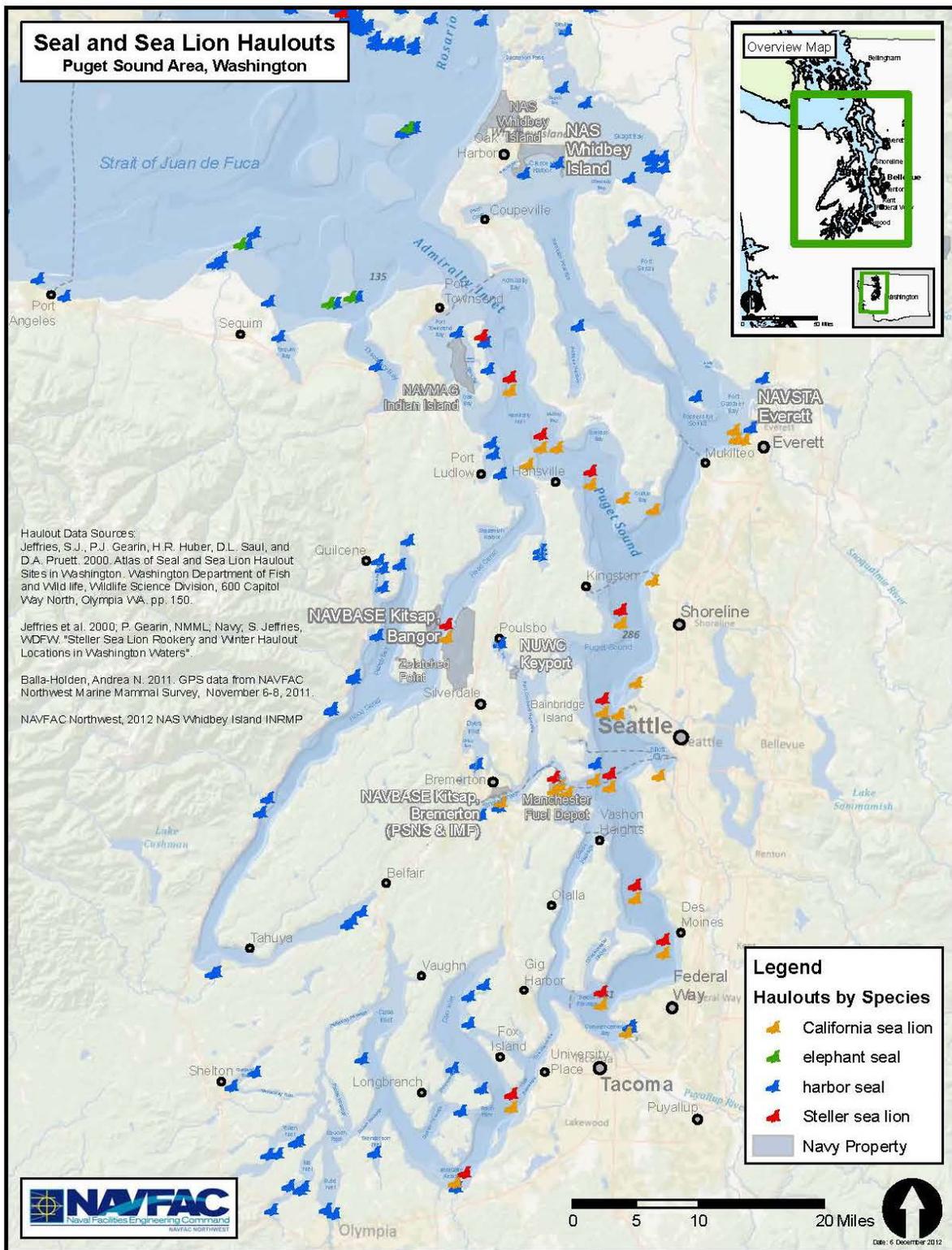


Figure 4-2. Pinniped Haulouts in the Vicinity of the Project

## **4.3 Steller Sea Lion**

### **4.3.1 Status and Management**

Steller sea lions are protected under the MMPA, and the eastern U.S. stock is listed as threatened under the ESA. Individuals that may occur in the study area are of the Eastern DPS (Allen and Angliss 2012). The Eastern stock is stable or increasing throughout the northern portion of its range (Southeast Alaska and British Columbia) and stable or increasing slowly in the central portion of its range (Oregon through northern California) (NMFS 2012a). In April 2012, NMFS proposed the Steller sea lion be removed from listing under the ESA based on its annual rate of increase (77 FR 23209). Critical habitat has been designated for the Steller sea lion (58 FR 45269); however, there is no designated critical habitat for the species in Washington State.

### **4.3.2 Distribution**

Steller sea lions are found along the coasts of Washington, Oregon, and northern California where they occur at rookeries and numerous haulout locations along the coastline (Jeffries et al. 2000; Scordino 2006; NMFS 2012b). Breeding rookeries are located along the Oregon and British Columbia coasts, no breeding rookeries are found in Washington (Jeffries et al. 2000). Male Steller sea lions often disperse widely outside of the breeding season from breeding rookeries in northern California (St. George Reef) and southern Oregon (Rogue Reef), (Scordino, 2006; Wright et al. 2010). Based on mark recapture sighting studies, males migrate back into these Oregon and California locations from winter feeding areas in Washington, British Columbia, and Alaska (Scordino, 2006).

In Washington, Steller sea lions use haulout sites primarily along the outer coast from the Columbia River to Cape Flattery, as well as along the Vancouver Island side of the Strait of Juan de Fuca (Jeffries et al. 2000). Numbers vary seasonally in Washington with peak numbers present during the fall and winter months and a decline in the summer months that corresponds to the breeding season at the Oregon and British Columbia rookeries (approximately late May to early June) (Jeffries et al. 2000). In the Puget Sound, Jeffries (personal communication, August 2012) identified five winter haulout sites used by adult and sub adult Steller sea lions (see Figure 4-2). Numbers of animals observed at all of these sites combined were less than 200 individuals.

By June, most Steller sea lions have left inland waters and returned to their rookeries to mate; however, occasionally sub adult (immature or pre-breeding animals) or nonbreeding adults remain in Puget Sound over the summer (Gearin pers. comm. 2008). A haulout with approximately 30 to 50 individuals (Jeffries pers. comm. 2012) occurs approximately 6.5 miles from the project site near the Manchester Fuel Depot's finger pier. The haulout near Manchester is physically separated by various land masses and waterways from NAVBASE Kitsap Bremerton (Figure 4-2) and therefore is not within a direct line of site of the pile driving activities and construction sounds would not reach these animals. Steller sea lions opportunistically haulout on various navigational buoys from south Puget Sound north into Admiralty Inlet (Jeffries pers. comm. 2012). Usually one or two animals occur on a buoy. The nearest navigational buoy used by Steller sea lions is approximately 8 miles from the project site. Three other haulouts occur in Puget Sound; NAVBASE Kitsap, Bangor in Hood Canal, Marrowstone Island in Admiralty Inlet, and in the southern portion of Puget Sound. These three haulouts are all located more than 30 miles from the project site. However, one Steller sea lion was observed hauled out on the floating security barrier at NAVBASE Kitsap Bremerton in

November 2012 (Lance pers. comm. 2012). No permanent haulout has been identified at NAVBASE Kitsap Bremerton and Steller sea lion presence at NAVBASE Kitsap Bremerton is considered to be rare and seasonal.

#### **4.4 Killer Whale [Transient]**

##### **4.4.1 Status and Management**

Among the genetically distinct assemblages of killer whales in the northeastern Pacific, the West Coast Transient stock occurs from California to southeastern Alaska. Killer whales belonging to the West Coast Transient stock are protected under the MMPA, but not listed under the ESA.

##### **4.4.2 Distribution**

The geographical range of the West Coast Transient stock of killer whales includes waters from California through southeastern Alaska with a preference for coastal waters of southern Alaska and British Columbia (Krahn et al. 2002). Transient killer whales in the Pacific Northwest spend most of their time along the outer coast of British Columbia and Washington, but visit inland waters in search of harbor seals, sea lions, and other prey. Transients may occur in inland waters in any month, but several studies have shown peaks in occurrences—Morton (1990) found bimodal peaks in spring (March) and fall (September to November) for transients on the northeastern coast of British Columbia, and Baird and Dill (1995) found some transient groups frequenting the vicinity of harbor seal haul-outs around southern Vancouver Island during August and September, which is the peak period for pupping through post-weaning of harbor seal pups. However, not all transient groups were seasonal in these studies and their movements appear to be unpredictable.

The number of West Coast Transient killer whales in Washington inland waters at any one time was considered to likely be fewer than 20 individuals (Wiles 2004). Recent research suggests that the transient killer whales use of inland waters from 2004 through 2010 has increased and the trend is likely due to increasing prey abundance (Houghton et al., in review). Many of the West Coast Transients in Washington inland waters have been catalogued by photo identification. However, unlike the Southern Resident stock, re-sighting uniquely identified individuals is less frequent. Sinclair Inlet, where NAVBASE Kitsap Bremerton is located, is a shallow bay located approximately 8 miles through various waterways from the main open waters of the Puget Sound where killer whales most often travel.

West Coast Transient killer whales most often travel in small pods of up to four individuals (Baird and Dill, 1996). Houghton (2012) reported that the group size most often observed in the Salish Sea was four whales for 2004–2010, is larger than the size most often observed from 1987-1993, and that group size appeared to be increasing from 2004–2010. According to Houghton, the most commonly observed group size in Puget Sound (defined as from Admiralty Inlet through South Puget Sound and up to Skagit Bay) from 2004 to 2010 is 6 whales (mode=6, mean=6.88) (Houghton 2012). Occasionally larger groups may occur. Houghton et al. (in review) note that a group of up to 27 animals was observed in Puget Sound in 2010.

Transient killer whales occasionally occur throughout the study area and ZOI. From December 2002 to January 2013, there were two reports of transient killer whales transiting through the area around NAVBASE Kitsap Bremerton. Both of these reports occurred in May (2004 &

2012), which is outside of the proposed work window for this project (Orca Network, 2013). The group size in these two sightings ranged from 5 to 12 (Orca Network, 2013).

## **4.5 Gray Whale**

### **4.5.1 Status and Management**

Gray whales are protected under the MMPA. The Eastern North Pacific stock occurs in the waters of the west coast of the United States. This stock was delisted from the ESA in 1994 and in 1999 a status review recommended the continuation of this stock's classification as nonthreatened. Additionally, some individuals of the Western North Pacific stock have been identified in waters several hundred miles from the project area in the Pacific Ocean, off Vancouver Island, Washington, and off Oregon since 2004 (MMI 2011, Weller et al. 2011, as cited in WDFW 2012).

### **4.5.2 Distribution**

This species makes the longest annual migration of any mammal—between 9,321 and 12,427 miles (15,000 to 20,000 km) roundtrip (Jefferson et al. 2008; Jones and Swartz 2009). The migration connects summer arctic feeding grounds with winter mating and calving regions in temperate and subtropical coastal waters. Winter grounds extend from central California south along Baja California, the Gulf of California, and the mainland coast of Mexico. In the fall, whales start the southward migration from November to late December and mainly follow the coast to Mexico. The trip averages 2 months. The northward migration to the feeding grounds occurs in two phases. The first phase, in late January through March, consists of newly-pregnant females, who go first to maximize feeding time, followed by adult females and males, then juveniles. The second phase, in April through May, consists primarily of mothers and calves that have remained in the breeding area longer allowing calves to strengthen and rapidly increase in size before the northward migration (Jones and Swartz 2009).

Most of the Eastern North Pacific stock summers in the shallow waters of the northern Bering Sea, Chukchi Sea, and western Beaufort Sea (Rice and Wolman 1971), but, according to Calambokidis et al. (2002), a group of a few hundred gray whales known as the Pacific Coast Feeding Group feeds along the Pacific coast between southeastern Alaska and southern California throughout the summer and fall. They typically arrive and depart from these feeding grounds concurrently with the migration to and from the wintering grounds (Calambokidis et al. 2002).

Gray whales have been observed in some, but not all Washington Inland waters in all months of the year (Calambokidis et al. 2010; OrcaNetwork 2013) with most individuals occurring from March through June (Calambokidis et al. -2010). Most whales sighted are part of a small regularly occurring group of 6 to 10 gray whales that use mudflats in the Whidbey Island and the Camano Island area as a springtime feeding area from late March through May (Calambokidis et al. 2009; WDFW 2012). Regular feeding areas are located in Port Susan north of Everett and along northwestern and eastern Whidbey Island, including Crescent Harbor where NAS Whidbey Island Seaplane Base is located (Orca Network 2013). Gray whales feed on benthic invertebrates, including dense aggregations of ghost shrimp and tubeworms (Weitkamp et al. 1992, Richardson 1997). These locations are far outside the ZOI for this project and would not be affected by construction noise.

Gray whales that are not identified with the regularly occurring group in the Whidbey Island and Camano Island area are occasionally sighted in Puget Sound. These whales are not associated with feeding areas and are often emaciated (WDFW 2012) and susceptible to stranding. Sinclair Inlet, where NAVBASE Kitsap Bremerton is located, is approximately 8 miles west through various waterways from the main open waters of Puget Sound where gray whales occur with more frequency. From December 2002 to January 2013, there were four reports of gray whales in the area around NAVBASE Kitsap Bremerton that occurred during the in-water work window months (Orca Network, 2013). Three sightings occurred during the winter of 2008 and 2009 (January, 2008; November, 2008; December 2009) and one stranding occurred in January 2013. The necropsy of the juvenile, male gray whale indicated that it was in poor nutritional health among other issues (Cascadia Research 2013).

## 5 Take Authorization Requested

*The type of incidental taking authorization that is being requested (i.e., takes by harassment only, takes by harassment, injury, and/or death), and the method of incidental taking.*

The Navy is requesting an IHA for the incidental taking (by behavioral disruption) of a specified number of marine mammals, incidental to proposed pile removal and replacement activities at Pier 6 for the one year period starting in December 2013. This taking would occur as a result of noise generated during in-water pile driving activities. The term “take,” as defined in Section 3 (16 U.S.C. § 1362 (13)) of the Marine Mammal Protection Act (MMPA), means “to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal.” “Harassment” was further defined in the 1994 amendments to the MMPA, which provided two levels of harassment: Level A—potential injury and Level B—potential behavioral disruption.

This authorization request considers pile removal and replacement activities outlined in Chapter 1 that are expected to occur in Sinclair Inlet and have the potential to result in the MMPA defined take of marine mammals. This analysis attempts to quantify the number of marine mammals that will be exposed to levels of sound that may result in a take. This is accomplished by mathematically estimating the number of marine mammals that may be exposed to levels of sound that will result in take as defined by behavioral or injury criteria from the pile extraction and driving. Based on this approach, behavioral disruption (Level B harassment) may result from both underwater and airborne sounds produced during pile removal and installation.

The Navy does not anticipate Level A harassment. The reasons for this are two-fold. First, vibratory pile driving used for pile extraction has a relatively low source level (less than 190 dB). Second, pile driving will be either delayed or halted if a marine mammal approaches the shutdown zone. In addition, the results from the Navy’s modeling approach likely result in an overestimation of Level B exposures because assumptions made throughout the species quantification and sound attenuation modeling process, in most cases, give deference to the species (e.g., the highest density within the in-water work window for each marine mammal species, or local sighting information is applied over the entire project timeframe regardless of seasonal distribution of species, the maximum number of pile driving days is assumed, and source levels, in most cases, are assumed to be greater than actual source levels). Chapter 11 provides further details of the impact reduction and minimization measures proposed for this project.

The take estimates for all marine mammal species combined are as follows: no Level A exposures and 19,154 Level B exposures from underwater sounds (18,300 California sea lions and 854 harbor seals). No additional exposures are anticipated from airborne sounds. Chapter 6 contains detailed results of modeled potential exposures to impulsive and non-impulsive sources from pile repair and replacement activities within the project study area.

The Navy is implementing monitoring measures as outlined in Chapter 11 to avoid Level B harassment of ESA-listed Steller sea lions.

## 6 Numbers and Species Taken

*By age, sex, and reproductive condition (if possible), the number of marine mammals (by species) that may be taken by each type of taking, and the number of times such takings by each type of taking are likely to occur.*

### 6.1 Introduction

The methods for estimating the number and types of exposure are described in the sections below beginning with presentation of the threshold criteria, followed by the method for quantifying exposures of marine mammals to sources of energy exceeding those threshold values. Exposure of each species was determined by:

- The potential of each species to be impacted by the acoustic sources as determined by the hearing sensitivity and acoustic criterion for each species.
- The potential presence of each species and their density at each project area.
- The area of impact as estimated by taking into account the source levels, propagation loss, and thresholds at which each acoustic criterion are met.
- Potential exposures were calculated by multiplying the density of each marine mammal species potentially present by the total area potentially impacted each day by the estimated number of days of pile driving.

Assessing whether a sound may disturb or injure a marine mammal involves understanding the characteristics of the acoustic source and the potential effects that sound may have on the physiology and behavior of that marine mammal. Although it is known that sound is important for marine mammal communication, navigation, and foraging (National Research Council 2003, 2005), there are many unknowns in assessing impacts such as the potential interaction of different effects and the significance of responses by marine mammals to sound exposures (Nowacek et al. 2007; Southall et al. 2007). Furthermore, many other factors besides just the received level of sound may affect an animal's reaction, such as the animal's physical condition, prior experience with the sound, and proximity to the source of the sound.

The following sections provide information on the fundamentals of underwater noise and noise sources as they relate to the proposed action.

### 6.2 Fundamentals of Underwater Noise

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water. Sound is generally characterized by several factors, including frequency and intensity. Frequency describes the sound's pitch and is measured in hertz (Hz), while intensity describes the sound's loudness. Due to the wide range of pressure and intensity encountered during measurements of sound, a logarithmic scale is used. In acoustics, the word "level" denotes a sound measurement in decibels. A decibel (dB) expresses the logarithmic strength of a signal relative to a reference. Because the decibel is a logarithmic measure, each increase of 20 dB reflects a ten-fold increase in signal amplitude (whether expressed in terms of pressure or particle motion), i.e., 20 dB means ten times the amplitude, 40 dB means one hundred times the amplitude, 60 dB means one thousand times the amplitude, and so on. Because the decibel is a relative measure, any value expressed in decibels is meaningless without an accompanying

reference. In describing underwater sound pressure, the reference amplitude is usually 1 microPascal ( $\mu\text{Pa}$ ) or  $10^{-6}$  Pascal (Pa), and is expressed as “dB re 1 $\mu\text{Pa}$ .” For in-air sound pressure, the reference amplitude is usually 20  $\mu\text{Pa}$  and is expressed as “dB re 20  $\mu\text{Pa}$ .”

The method commonly used to quantify airborne sounds consists of evaluating all frequencies of a sound according to a weighting system that reflects human hearing, which is less sensitive at low frequencies and extremely high frequencies than at the mid-range frequencies. This is called A-weighting, and the decibel level measured is called the A-weighted sound level (dB(A)). A filtering method that reflects hearing of marine mammals has not yet been developed. Therefore, underwater sound levels are not weighted and measure the entire frequency range of interest. In the case of marine construction work, the frequency range of interest is 10 to 10,000 Hz (Washington Department of Transportation (WSDOT) 2010).

Table 6-1 summarizes commonly used terms to describe underwater sounds. Two common descriptors are the instantaneous peak sound pressure level (SPL) and the root mean square (rms) SPL (dB rms) during the pulse or over a defined averaging period. The peak pressure is the instantaneous maximum or minimum overpressure observed during each pulse or sound event and is presented in Pa or dB referenced to a pressure of 1 microPascal (dB re 1  $\mu\text{Pa}$ ). The rms level is the square root of the energy divided by a defined time period. All underwater sound levels throughout the remainder of this application are presented in dB re 1  $\mu\text{Pa}$  unless otherwise noted.

### **6.3 Description of Noise Sources**

Underwater sound levels are comprised of multiple sources, including physical noise, biological noise, and anthropogenic noise. Physical noise includes waves at the surface, precipitation, earthquakes, ice, and atmospheric noise. Biological noise includes sounds produced by marine mammals, fish, and invertebrates. Anthropogenic noise consists of vessels (small and large), dredging, aircraft over flights, and construction noise. Known noise levels and frequency ranges associated with anthropogenic sources similar to those that would be used for this project are summarized in Table 6-2. Details of each of the sources are described in the following text.

In-water construction activities associated with the proposed project include impact pile driving and vibratory pile extraction. The sounds produced by these activities fall into one of two sound types: pulsed and nonpulsed (defined below). Impact pile driving produces pulsed sounds, while vibratory pile extraction produces nonpulsed (or continuous) sounds. The distinction between these two general sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (e.g., Ward 1997 as cited in Southall et al. 2007).

Pulsed sounds (e.g., explosions, gunshots, sonic booms, seismic airgun pulses, and impact pile driving) are brief, broadband, atonal transients (Harris 1991) and occur either as isolated events or repeated in some succession (Southall et al. 2007). Pulsed sounds are all characterized by a relatively rapid rise from ambient pressure to a maximal pressure value followed by a decay period that may include a period of diminishing, oscillating maximal and minimal pressures (Southall et al. 2007). Pulsed sounds generally have a greater capacity to induce physical injury compared with sounds that lack these features (Southall et al. 2007).

Nonpulse (intermittent or continuous sounds) can be tonal, broadband, or both (Southall et al. 2007). Some nonpulse sounds can be transient signals of short duration, but without the essential

properties of pulses (e.g., rapid rise time) (Southall et al. 2007). Examples of nonpulse sounds include vessels, aircraft, and machinery operations such as drilling, dredging, and vibratory pile driving (Southall et al. 2007). The duration of such sounds, as received at a distance, can be greatly extended in highly reverberant environments.

**TABLE 6-1. DEFINITIONS OF ACOUSTICAL TERMS**

Term	Definition
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for water is 1 microPascal ( $\mu\text{Pa}$ ) and for air is 20 $\mu\text{Pa}$ (approximate threshold of human audibility).
Sound Pressure Level	Sound pressure is the force per unit area, usually expressed in microPascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure. Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	Frequency is expressed in terms of oscillations, or cycles, per second. Cycles per second are commonly referred to as hertz (Hz). Typical human hearing ranges from 20 Hz to 20,000 Hz.
Peak Sound Pressure (unweighted), dB re 1 $\mu\text{Pa}$	Peak sound pressure level is based on the largest absolute value of the instantaneous sound pressure over the frequency range from 20 Hz to 20,000 Hz. This pressure is expressed in this application as dB re 1 $\mu\text{Pa}$ .
Root Mean Square (rms), dB re 1 $\mu\text{Pa}$	The rms level is the square root of the energy divided by a defined time period. For pulses, the rms has been defined as the average of the squared pressures over the time that comprises that portion of waveform containing 90 percent of the sound energy for one impact pile driving impulse. For nonpulsed energy or continuous sound, rms energy represents the average of the squared pressures over the measurement period and is not limited by the 90 percent energy criterion.
Sound Exposure Level, dB re 1 $\mu\text{Pa}^2 \text{ sec}$	Sound exposure level is a measure of energy. Specifically, it is the dB level of the time integral of the squared-instantaneous sound pressure, normalized to a 1-second period. It can be an extremely useful metric for assessing cumulative exposure because it enables sounds of differing duration to be compared in terms of total energy.
Waveforms, $\mu\text{Pa}$ over time	A graphical plot illustrating the time history of positive and negative sound pressure of individual pile strikes shown as a plot of $\mu\text{Pa}$ over time (i.e., seconds).
Frequency Spectra, dB over frequency range	A graphical plot illustrating the frequency content over a given frequency range. Bandwidth is generally defined as linear (narrowband) or logarithmic (broadband) and is stated in frequency (Hz).
A-Weighting Sound Level, dB(A)	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the low and high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective human reactions to noise.
Ambient Noise Level	The background sound level, which is a composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.

**TABLE 6-2. REPRESENTATIVE NOISE LEVELS OF ANTHROPOGENIC SOURCES**

Noise Source	Frequency Range (Hz)	Underwater Noise Level (dB re 1 $\mu$ Pa)	Reference
Small vessels	250–1,000	151 dB rms at 1 m	Richardson et al. 1995
Tug docking gravel barge	200–1,000	149 dB rms at 100 m	Blackwell and Greene 2002
Vibratory driving of 72-inch steel pipe pile	10–1,500	180 dB rms at 10 m	Illingworth and Rodkin 2007
Impact driving of 36-inch steel pipe pile	10–1,500	195 dB rms at 10 m	WSDOT 2007
Impact driving of 66-inch cast-in-steel-shells piles	100–1,500	195 dB rms at 10 m	Reviewed in Hastings and Popper 2005

#### 6.4 Vocalization and Hearing of Marine Mammals

All marine mammals that have been studied can produce sounds and use sounds to forage, orient, detect and respond to predators, and socially interact with others. Measurements of marine mammal sound production and hearing capabilities provide some basis for assessing whether exposure to a particular sound source may affect a marine mammal behaviorally or physiologically. Marine mammal hearing abilities are quantified using live animals either via behavioral audiometry or electrophysiology (see Schusterman 1981; Au 1993; Wartzok and Ketten 1999; Nachtigall et al. 2007). Behavioral audiograms, which are plots of animals' exhibited hearing threshold versus frequency, are obtained from captive, trained live animals using standard testing procedures with appropriate controls, and are considered to be a more accurate representation of a subject's hearing abilities. Behavioral audiograms of marine mammals are difficult to obtain because many species are too large, too rare, and too difficult to acquire and maintain for experiments in captivity. Consequently, our understanding of a species' hearing ability may be based on the behavioral audiogram of a single individual or small group of animals. In addition, captive animals may be exposed to local ambient sounds and other environmental factors that may impact their hearing abilities and may not accurately reflect the hearing abilities of free-swimming animals. For animals not available in captive or stranded settings (including large whales and rare species), estimates of hearing capabilities are made based on physiological structures, vocal characteristics, and extrapolations from related species.

Electrophysiological audiometry measures small electrical voltages produced by neural activity when the auditory system is stimulated by sound. The technique is relatively fast, does not require a conscious response, and is routinely used to assess the hearing of newborn humans. For both methods of evaluating hearing ability, hearing response in relation to frequency is a generalized U-shaped curve or audiogram showing the frequency range of best sensitivity (lowest hearing threshold) and frequencies above and below with higher threshold values.

Direct measurement of hearing sensitivity exists for approximately 25 of the nearly 130 species of marine mammals. Table 6-3 provides a summary of sound production and hearing capabilities for marine mammal species in the study area. For purposes of this analysis, marine mammals are arranged into the following functional hearing groups based on their generalized hearing sensitivities: mid-frequency cetaceans, low-frequency cetaceans, and pinnipeds.

**TABLE 6-3. HEARING AND VOCALIZATION RANGES FOR MARINE MAMMAL FUNCTIONAL HEARING GROUPS AND SPECIES POTENTIALLY WITHIN THE STUDY AREA**

Functional Hearing Group <sup>1</sup>	Functional Hearing Group – Estimated Auditory Bandwidth	Species Represented in Project Area	Vocalization Dominant Frequencies (citation)	Best Hearing Sensitivity Range (citation)
Mid-Frequency Cetaceans	150Hz to 160 kHz <sup>1</sup>	Killer Whale	1.5 to 6 kHz (pulses; Richardson et al. 1995, 35 to 50 kHz (echolocation; Au et al. 2004)	18 to 42 kHz (Szymanski et al. 1999)
Low-Frequency Cetaceans	7 Hz to 22 kHz <sup>1</sup>	Gray Whale	120 Hz to 4 kHz (song; Payne and Payne 1985; 25 Hz to 1.9 kHz (pulses and grunts; Thompson et al. 1986)	No published data
Pinnipeds	In-water: 75 Hz to 75 kHz <sup>1</sup> In-air: 75 Hz to 30 kHz <sup>1</sup>	Harbor Seal	In-water: 250 Hz to 4 kHz (males; Hanggi and Schusterman 1994) In-air: 100 Hz to 1 kHz (males; Richardson et al. 1995)	In-water: 1 to 50 kHz (Southall et al. 2007) In-air: 6 to 16 kHz (Richardson et al. 1995; Wolski et al. 2003)
		Steller Sea Lion	In-air: 150 Hz to 1 kHz (females; Campbell et al. 2002)	In-water: 1-16 kHz (male; Kastelein et al. 2005) 16 to 25 kHz (female; Kastelein et al. 2005) In-air: 2 to 16 kHz (Schusterman 1974; Mulsow & Reichmuth 2008; Mulsow & Reichmuth 2010)
		California Sea Lion	In-water: 500 Hz to 4 kHz (Schusterman et al. 1967) In-air: 250 to 5 kHz	In-water: 1 - 28 kHz (Schusterman et al. 1972) In-air: 4 to 16 kHz (Mulsow et al. 2011a,b)

1. Source: Southall et al. (2007). Pinniped data are primarily from phocid species (true seals).  
Hz = Hertz, kHz = kilohertz

### 6.5 Sound Exposure Criteria and Thresholds

Under the MMPA, NMFS has defined levels of harassment for marine mammals. Level A harassment is defined as, “Any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild.” Level B harassment is defined as, “Any act of pursuit, torment, or annoyance which 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.”

Since 1997, NMFS has used generic sound exposure thresholds to determine when an activity in the ocean that produces sound might result in impacts to a marine mammal such that a take by harassment might occur (NMFS 2005). To date, no studies have been conducted that examine impacts to marine mammals from pile driving sounds from which empirical noise thresholds have been established. Current NMFS practice regarding exposure of marine mammals to high underwater level sounds is that cetaceans and pinnipeds exposed to impulsive sounds  $\geq 180$  and

190 dB rms, respectively, are considered to have been taken by Level A (i.e., injurious) harassment. Level A injury thresholds have not been established for continuous sounds such as vibratory pile driving, but the Navy has applied the threshold values for impulsive sounds to vibratory sound in this analysis (Table 6-4).

Behavioral harassment (Level B) is considered to have occurred when marine mammals are exposed to underwater sounds  $\geq 160$  dB rms for impulse sounds (e.g., impact pile driving) and 120 dB rms for continuous noise (e.g., vibratory pile driving), but below injurious thresholds. Level A (injury) and Level B (disturbance) thresholds are provided in Table 6-4.

As described above for underwater sound injury and harassment thresholds, NMFS uses generic sound exposure thresholds to determine when an activity in the ocean that produces airborne sound might result in impacts to a marine mammal (70 FR 1871). Construction-period airborne noise would have little impact to cetaceans because noise from airborne sources would not transmit as well underwater (Richardson et al. 1995); thus, noise would primarily be a problem for hauled-out pinnipeds near the project locations. The NMFS has identified behavioral harassment threshold criteria for airborne noise generated by pile driving for pinnipeds regulated under the MMPA. Level A injury threshold criteria for airborne noise have not been established. The Level B behavioral harassment threshold for harbor seals is 90 dB rms (unweighted) and for all other pinnipeds is 100 dB rms (unweighted).

**TABLE 6-4. INJURY AND DISTURBANCE THRESHOLDS FOR UNDERWATER AND AIRBORNE SOUNDS**

Marine Mammals	Airborne Marine Construction Criteria (Impact and Vibratory Pile Driving) (re 20 $\mu$ Pa) <sup>1</sup>	Underwater Vibratory Pile Driving Criteria (nonpulsed/continuous sounds) (re 1 $\mu$ Pa)		Underwater Impact Pile Driving Criteria (pulsed sounds) (re 1 $\mu$ Pa)	
	Disturbance Guideline Threshold (Haul-out) <sup>2</sup>	Level A Injury Threshold	Level B Disturbance Threshold	Level A Injury Threshold	Level B Disturbance Threshold
<b>Cetaceans</b> (whales, dolphins, porpoises)	Not applicable	180 dB rms	120 dB rms	180 dB rms	160 dB rms
<b>Pinnipeds</b> (seals, sea lions, walrus, except harbor seal)	100 dB rms (unweighted)	190 dB rms	120 dB rms	190 dB rms	160 dB rms
Harbor seal	90 dB rms (unweighted)	190 dB rms	120 dB rms	190 dB rms	160 dB rms

1. Airborne disturbance thresholds do not specify pile driver type.

2. Sound level at which pinniped haul-out disturbance has been documented. Not an official threshold, but used as a guideline.

### 6.5.1 Limitations of Existing Noise Criteria

The application of the 120 dB rms threshold can sometimes be problematic because this threshold level can be either at or below the ambient noise level of certain locations. As a result, this threshold level is subject to ongoing discussion (NMFS 2009). The National Marine Fisheries Service is developing new thresholds to improve and replace the current generic exposure level thresholds, but the criteria have not been finalized (Southall et al. 2007). The 120 dB rms threshold level for continuous noise originated from research conducted by Malme et al. (1984, 1988) for California gray whale response to continuous industrial sounds such as drilling

operations. (The 120 dB continuous sound threshold should not be confused with the 120 dB pulsed sound criterion established for migrating bowhead whales in the Arctic as a result of research in the Beaufort Sea [Richardson et al. 1995; Miller et al. 1999]).

To date, there is no research or data supporting a response by pinnipeds or odontocetes to continuous sounds from vibratory pile driving as low as the 120 dB threshold. Southall et al. (2007) reviewed studies conducted to document behavioral responses of harbor seals and northern elephant seals to continuous sounds under various conditions, and concluded that those limited studies suggest that exposures between 90 dB and 140 dB rms re 1 $\mu$ Pa generally do not appear to induce strong behavioral responses.

### 6.5.2 Auditory Masking

Natural and artificial sounds can disrupt behavior through auditory masking or interference with a marine mammal's ability to hear other relevant sounds, such as communication and echolocation signals (Wartzok et al. 2003). Masking occurs when both the signal and masking sound have similar frequencies and either overlap or occur very close to each other in time. Noise can only mask a signal if it is within a certain "critical bandwidth" around the signal's frequency and its energy level is similar or higher (Holt 2008). Noise within the critical band of a marine mammal signal will show increased interference with detection of the signal as the level of the noise increases (Wartzok et al. 2003). For example, in delphinid subjects, relevant signals needed to be 17 to 20 dB louder than masking noise at frequencies below 1 kHz in order to be detected and 40 dB greater at approximately 100 kHz (Richardson et al. 1995).

If a masking sound is manmade, it can be potentially harassing (as defined by the MMPA) if it disrupts hearing-dependent behavior such as communications or echolocation. The most intense underwater sounds in the proposed action are those produced by impact pile driving. Given that the energy distribution of pile driving covers a broad frequency spectrum, with greatest amplitude typically from 50 to 1,000 Hz (WSDOT 2011a, b), pile driving sound will be primarily within the lower audible range of the pinniped and cetacean species that could occur in the project area. Some overlap of frequencies used for social signals by the marine mammal species with pile driving frequencies may occur; especially affecting the pinnipeds which use and are more sensitive to lower frequencies than the cetaceans that may occur in the project area (see chapter 4).

Any masking event that could possibly rise to Level B harassment under the MMPA will occur concurrently within the zones of behavioral harassment estimated for vibratory and impact pile driving (see Section 6.6.2, Underwater Noise from Pile Driving) and which are taken into account in the exposure analysis (see Section, 6.8, Estimating Harassment Exposures). Therefore, masking effects are not considered as separately contributing to exposure estimates in this application.

### 6.5.3 Ambient Noise

#### *Underwater Noise*

Underwater ambient noise in Puget Sound is comprised of sounds produced by a number of natural and anthropogenic sources and varies both geographically and temporally. Natural noise sources include wind, waves, precipitation, and biological sources such as shrimp, fish, and cetaceans. These sources produce sound in a wide variety of frequency ranges (Urlick 1983; Richardson et al. 1995) and can vary over both long (days to years) and short (seconds to hours)

time scales. In shallow waters, precipitation may contribute up to 35 dB to the existing sound level, and increases in wind speed of 5 to 10 knots can cause a 5 dB increase in ambient ocean noise between 20 Hz and 100 kHz (Urick 1983).

Human-generated noise is a significant contributor to the ambient acoustic environment at NAVBASE Kitsap Bremerton (Table 6-5). Normal port activities include vessel traffic from aircraft carriers, large ships, submarines, support vessels, and security boats, and loading and maintenance operations, which all generate underwater sound (Urick 1983). Other sources of human-generated underwater sound not specific to the naval installations include sounds from echo sounders on commercial and recreational vessels, industrial ship noise, the adjacent Washington State Ferry Terminal, and noise from recreational boat engines. Ship and small boat noise comes from propellers and other on-board rotating equipment.

**TABLE 6-5. INSTALLATION ACTIVITY LEVELS AND NOISE SOURCES**

Installation	Activity Level	Noise Sources
NAVBASE Kitsap Bremerton	Very high	Shipyards; high traffic and homeport for large ships

At NAVBASE Kitsap Bremerton, anthropogenic noise may dominate the ambient soundscape. In areas with less anthropogenic activity, ambient noise is likely to be dominated by noise from natural sources.

Underwater ambient noise has been recorded and measured only at NAVBASE Kitsap Bangor during previous Navy activities. In 2009, the average broadband (100 Hz–20 kHz) noise level near Marginal Wharf on NAVBASE Kitsap Bangor was 114 dB re 1µPa rms (Slater 2009). Below 300 Hz, noise from industrial activity dominated the spectrum, with a maximum level of 110 dB re 1µPa rms in the 125 Hz band. From 300 Hz to 5 kHz, average received levels ranged between 83 and 99 dB re 1µPa rms. Wind-driven wave noise dominated the background noise between 5 and 10 kHz; above 10 kHz, the sound levels were relatively even at all frequencies.

Similar noise levels were recorded near the NAVBASE Kitsap Bangor project area in 2011. Average noise levels at the Explosives Handling Wharf during the recent Test Pile program ranged from 112.4 dB rms at mid depth to 114.3 dB rms at deep depth. These measurements were made during normal port activities, but did not include noise from construction and pile driving projects. Small-scale geographic variations in ambient noise are to be expected based on land shadowing and other environmental factors, but for analysis purposes, the average noise level at this installation was assumed to be 114 dB re 1 µPa rms.

Ambient noise measurements from NAVBASE Kitsap Bangor are well within the range of levels reported for a number of sites within the greater Puget Sound region (95 – 135 dB re 1 µPa rms; Veirs and Veirs 2006; Carlson et al. 2005). Nearshore measurements near ferry terminals in Puget Sound resulted in median noise levels (50% cumulative distribution function) between 104 and 130 dB re 1 µPa rms (WSDOT 2012). Ambient noise at NAVBASE Kitsap Bremerton is likely to differ from the NAVBASE Kitsap Bangor measurements due to differences in anthropogenic activities and environmental factors. It is reasonable to assume that ambient noise associated with NAVBASE Kitsap Bremerton will be higher due to the higher activity levels, larger vessels, and additional industrial workload. Under normal weather, workload, and traffic

(boat and vehicle) conditions, ambient noise at NAVBASE Kitsap Bremerton is assumed to be below 120 dB re 1  $\mu$ Pa rms.

### *Airborne Noise*

Airborne noise at NAVBASE Kitsap Bremerton is produced by common industrial equipment, including trucks, cranes, compressors, generators, pumps, and other equipment that might typically be employed along industrial waterfronts. Noise is highly variable based on the types and operational states of equipment at the recording location (ex: each wharf may have a different noise environment). For NAVBASE Kitsap Bangor, airborne noise measurements were taken during a two-day period in October 2010 within the waterfront industrial area near the project site. During this period, daytime noise levels ranged from 60 dBA to 104 dBA, with average values of approximately 64 dBA. Evening and nighttime levels ranged from 64 to 96 dBA, with an average level of approximately 64 dBA. Thus, daytime maximum levels were higher than nighttime maximum levels, but average nighttime and daytime levels were similar.

These higher noise levels are produced by a combination of sound sources including heavy trucks, forklifts, cranes, marine vessels, mechanized tools and equipment, and other sound-generating industrial/military activities. Measured levels were comparable to estimated noise levels from literature. Presuming multiple sources of noise may be present at one time, maximum combined levels may be as high as 99 dBA. This estimates that two similar sources combined together will increase noise levels by 3 dB over the level of a single piece of equipment by itself (WSDOT 2007). These maximum noise levels are intermittent in nature and not present at all times. Existing maximum baseline noise conditions at the waterfront during a typical work week are expected to be approximately 99 dBA due to typical truck, forklift, crane, and other industrial activities. Noise levels will vary by time and location, but average ambient noise levels are expected to range from a low of 55 dBA to 99 dBA.

## **6.6 Modeling Noise Impact from Pile Driving**

### **6.6.1 Underwater Sound Propagation**

Pile driving will generate underwater noise that potentially could result in disturbance to marine mammals swimming near the project area. Transmission loss (TL) underwater is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. Transmission loss parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. A standard sound propagation model was used to estimate the range from the pile driving activity to various expected sound pressure levels at the seven project sites in the study area. This model follows a geometric propagation loss based on the distance from the driven pile, resulting in a 4.5 dB reduction in level for each doubling of distance from the source. In this model, the sound pressure level at some distance away from the source (e.g., driven pile) is governed by a measured source level, minus the transmission loss of the energy as it dissipates with distance. The transmission loss equation is:

$$TL = 15 \log_{10} \left( \frac{R_1}{R_2} \right)$$

where  $TL$  is the transmission loss in dB,  $R_1$  is the distance of the modeled SPL from the driven pile, and  $R_2$  is the distance from the driven pile of the initial measurement.

The degree to which underwater noise propagates away from a noise source is dependent on a variety of factors, most notably by the water bathymetry and presence or absence of reflective or absorptive conditions including the sea surface and sediment type. The TL model described above was used to calculate the expected noise propagation from both impact and vibratory pile driving, using representative source levels to estimate the zone of influence (ZOI) or area affected by the noise criteria. Maps showing the extent of a representative ZOI for the study area can be found in Appendix B. At Pier 6, a pile furthest from the shore was chosen to illustrate the maximum ZOI that would be produced from pile driving at the structure.

### 6.6.2 Underwater Noise from Pile Driving

The intensity of pile driving sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity takes place. In order to determine reasonable sound pressure levels from pile driving at NAVBASE Kitsap Bremerton, studies with similar properties to the proposed action were evaluated. Studies which met the following parameters were considered:

- Pile materials: wood, concrete, and steel pipe piles
- Pile driver type: vibratory and impact

Tables 6-6 and 6-7 present representative sound pressure levels from pile driving activities (impact hammer and vibratory driver, respectively) that have occurred in recent years. Due to the similarity of these actions and the Navy’s proposed action, they represent reasonable sound pressure levels that can be anticipated. The sound source level that was produced from the most similar measured source level was used. If a source level for a particular pile was not available the next highest source level was used to produce a conservative estimate of areas above threshold values.

**TABLE 6-6. REPRESENTATIVE SOUND PRESSURE LEVEL FROM CONCRETE PILE DRIVING STUDIES USING IMPACT HAMMERS**

Project	Location	Pile Type	Hammer Type	Water Depth	Distance	Measured Sound Levels (rms)
Berth 22, Port of Oakland <sup>1</sup>	CA	Concrete pile/24-inch	Impact	15m	10 m/33 feet	176 dB re 1 μPa

<sup>1</sup>Compendium of Pile Driving Data report to the California Department of Transportation—Illingworth and Rodkin, Inc. (2007)

**TABLE 6-7. REPRESENTATIVE SOUND PRESSURE LEVELS FROM PILE DRIVING STUDIES USING VIBRATORY HAMMERS**

Project	Location	Pile Type	Hammer Type	Water Depth	Distance	Measured Sound Levels (rms)
Mad River Slough Pipeline <sup>1</sup>	CA	Steel Pipe/13-inch	Vibratory	~5 m	10 m/33 feet	155 dB re 1 μPa
Timber Pile Removal <sup>2</sup>	WA	Wood/12-inch	Vibratory	~10 m	15.8 m/52 feet	150 dB re 1 μPa

<sup>1</sup>Compendium of Pile Driving Data report to the California Department of Transportation—Illingworth & Rodkin, Inc. (2007)  
<sup>2</sup>WSDOT 2011.

All calculated distances to underwater marine mammal noise thresholds are provided in Table 6-8 and ZOI areas are provided in Table 6-9. For the 20 steel piles to be removed, an increased radial distance was calculated. The ZOI areas only include the area encompassed to the extent of the shoreline. Figures illustrating the extent and area of each ZOI for a pile representing the worst-case extent of noise propagation (furthest from the shore) at each installation are presented in Appendix B.

**TABLE 6-8. CALCULATED RADIAL DISTANCE(S) TO UNDERWATER MARINE MAMMAL PILE DRIVING NOISE THRESHOLDS**

Pile Driving Site	Injury Pinnipeds (190 dB RMS)	Injury Cetaceans (180 dB RMS)	Behavioral harassment Cetaceans and Pinnipeds (160 dB RMS)	Behavioral harassment Cetaceans and Pinnipeds (120 dB RMS)
NAVBASE Kitsap Bremerton – Pier 6	1.2 m (impulsive) 0 m (continuous)	5.4 m (impulsive) 0 m (continuous)	117 m	1585 m (2,154 m for steel piles)

**TABLE 6-9. CALCULATED AREA(S) ENCOMPASSED BY UNDERWATER MARINE MAMMAL PILE DRIVING NOISE THRESHOLDS**

Pile Driving Site	Injury Pinnipeds (190 dB RMS)	Injury Cetaceans (180 dB RMS)	Behavioral harassment Cetaceans and Pinnipeds (160 dB RMS)	Behavioral harassment Cetaceans and Pinnipeds (120 dB RMS)
NAVBASE Kitsap Bremerton – Pier 6	4 sq m (impulsive) < 1 sq m (continuous)	92 sq m (impulsive) 15 sq m (continuous)	0.04 sq km	5.04 sq km (7.5 sq km for steel piles)

### 6.6.3 Airborne Sound Propagation

Pile driving can generate airborne noise that could potentially result in disturbance to marine mammals (pinnipeds) that are hauled out or at the water’s surface. As a result, the Navy analyzed the potential for pinnipeds hauled out or swimming at the surface to be exposed to airborne sound pressure levels that could result in Level B behavioral harassment. The appropriate airborne noise thresholds for behavioral harassment for all pinnipeds, except harbor seals, is 100 dB rms re 20 µPa (unweighted) and for harbor seals is 90 dB rms re 20 µPa (unweighted) (see Table 6-3). Construction noise behaves as point-source and, thus, propagates in a spherical manner with a 6 dB decrease in sound pressure level over water (“hard-site” condition) per doubling of distance (WSDOT 2010). A spherical spreading loss model, assuming average atmospheric conditions, was used to estimate the distance to the 100 dB and 90 dB rms re 20 µPa (unweighted) airborne thresholds. The transmission loss equation is given by:

$$TL = 20 \log_{10} \left( \frac{R_1}{R_2} \right)$$

where  $TL$  is the transmission loss in dB,  $R_1$  is the distance of the modeled SPL from the driven pile, and  $R_2$  is the distance from the driven pile of the initial measurement.

The intensity of pile driving sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity takes place. In order to determine reasonable airborne source sound pressure levels, the source level measurements listed in Table 6-10 were used.

**TABLE 6-10. AIRBORNE SOUND PRESSURE LEVELS FROM SIMILAR IN-SITU MONITORED CONSTRUCTION ACTIVITIES**

Project and Location	Pile Size and Type	Installation Method	Water Depth	Measured Sound Pressure Levels
Test Pile Program, NAVBASE Kitsap Bangor, WA	24-inch steel pile	Impact	-	89dB re 20 $\mu$ Pa at 15 meters (50 feet)
Wahkiakum County Ferry Terminal, WA	18-inch steel pile	Vibratory	-	87.5 dB rms re 20 $\mu$ Pa at 15 meters (50 feet)
<b>Sources:</b> Illingworth & Rodkin, Inc., 2012; Laughlin 2010				

No unweighted in-air sound level data is available for concrete piles; Data from similarly sized (24-inch) steel piles was used to represent the 18 or 24-inch concrete piles that will be impact driven during the course of the project. Steel piles generally produce louder source levels during installation than concrete piles; therefore, the steel data would likely overestimate the impacts associated with concrete pile installation. Unweighted in-air measurements of impact driving of a 24-inch steel pile collected during the Test Pile Program was 89 dB re 20  $\mu$ Pa (rms) at 50 ft. (Illingworth & Rodkin, Inc., 2012)).

No unweighted in-air sound level data is available for 12-inch timber and 12-inch steel piles using a vibratory hammer. Airborne data is available for slightly larger (18-inch) steel piles. Unweighted in-air measurements of vibratory driving of 18-inch steel piles collected during the Wahkiakum County Ferry Terminal project averaged 87.5 dB re 20  $\mu$ Pa (rms) at 50 ft. (Laughlin 2010). This data would be representative of the vibratory sounds that are likely to be produced with the smaller 12-inch piles. Steel piles generally produce louder source levels than timber piles; therefore, the steel data would likely overestimate the impacts associated with timber pile removal.

These are conservative estimates as actual pile types differ for this project and would be expected to have lower source level measurements and smaller threshold distances. The distances to the airborne harassment thresholds were calculated with the airborne transmission loss formula presented in section 6.6.3. All calculated distances to marine mammal airborne noise thresholds, as well as the areas encompassed by these threshold distances (also referred to as the ZOIs), are shown in Table 6-11. See Appendix B for figures of the affected area encompassed by the estimated airborne ZOI.

**TABLE 6-11. CALCULATED MAXIMUM DISTANCES IN AIR TO MARINE MAMMAL NOISE THRESHOLDS AND AREAS ENCOMPASSED BY NOISE THRESHOLDS DUE TO PILE DRIVING**

<b>Installation Method</b>	<b>Description</b>	<b>Harbor seal (90 dB rms)</b>	<b>Pinnipeds (seals, sea lions, except harbor seal) (100 dB rms)</b>
Impact	Distance to Threshold	13 meters	5 meters
	Area Encompassed by Threshold	169 sq m	25 sq m
Vibratory	Distance to Threshold	11 meters	4 meters
	Area Encompassed by Threshold	121 sq m	16 sq m

### 6.7 Marine Mammal Species Quantitatively Assessed

The Navy's Marine Species Density Database (NMSDD) is the overarching database for marine mammal densities within Navy operational areas, including NAVBASE Kitsap Bremerton. The Navy has been updating densities in the Northwest region and incorporating them into the NMSDD to support operations and other regional projects. The NMSDD was used to calculate marine mammal densities as presented in Appendix A. The NMSDD uses data from local marine mammal data sets (e.g., Orca Network, state and federal agencies), opinions from state and federal agencies, and survey data from Navy biologists and other agencies. The NMSDD is meant to be a living database, that is continually updated as new information and surveys become available. These densities, in tandem with local observational data, have been used to support pile driving projects throughout the Puget Sound. The Northwest region's NMSDD densities were recently (2012) finalized; the technical report documenting the processes and background data for the densities for the NW region within the NMSDD is still in development. There are currently no density estimates for any Puget Sound population of marine mammals outside of this database. The NMSDD has the ability to list a species density by season. As pile replacement at Pier 6 will occur over multiple seasons (fall to winter), the highest seasonal density by species was carried forward for take analysis.

Incidental take for this project is estimated for each species by using the NMSDD densities within the ZOI during pile removal or driving; and by augmenting these numbers by looking at site specific data and local surveys. This augmentation of presence and numbers is determined by past observations and general abundance at NAVBASE Kitsap Bremerton during the construction window and ensures a more conservative take estimate. For example, the floating port security barrier near the project site is a known pinniped haulout site. Therefore, take estimates were increased above the NMSDD densities to ensure a more conservative estimate. Additionally, all of the pinniped derived abundances assumed that pinnipeds would be both in the water 100 percent of the time during pile driving activities for underwater calculations and out of water 100 percent of the time for the airborne calculations. This approach could be considered conservative because pinnipeds spend a portion of their time hauled out and therefore

are expected to be exposed to less sound than is estimated by this approach since the in-air ZOIs are much smaller than the underwater ZOIs for vibratory extraction.

It is anticipated that all of the marine mammals (not including harbor seals and California sea lions) that enter the ZOI will be exposed to pile driving noise only briefly as they are transiting the area. Harbor seals and California sea lions forage and haulout in or near the Bremerton ZOI and could be exposed multiple times during a project.

## **6.8 Estimated Duration of Pile Driving**

As mentioned previously in Section 2.0, Dates, Duration, and Location of Activity, an average of 4 piles will be driven a day amounting to an estimated 200 days of pile driving over three years. During year one, it is estimated that the duration would be 65 days of pile driving and is the number being used for this application. The estimated number of days includes 20 days of vibratory pile driving and 45 days of impact hammering. However, in terms of actual on the ground work, both types of driving may occur on the same day, though not at the same time, and the total combined work is expected to take 65 days. The actual number of days for year one is expected to be less.

## **6.9 Estimating Harassment Exposures**

The method for calculating potential exposures to impact and vibratory pile driving noise for each threshold were estimated using local marine mammal data sets (e.g., Orca Network, state and federal agencies), opinions from state and federal agencies, and data from Navy biologists. All estimates are conservative and include the following assumptions:

- Each species could be present in the project area each day during construction. The timeframe for takings would be one potential take (Level B harassment exposure) per individual, per 24 hours.
- All pilings installed at each site will have an underwater noise disturbance distance equal to the piling that causes the greatest noise disturbance (i.e., the piling furthest from shore) installed with the method that has the largest ZOI. The largest ZOI will be produced by vibratory driving steel piles. The ZOI for an impact hammer will be encompassed by the larger ZOI from the vibratory driver. The ZOIs for each threshold are not spherical and are truncated by land masses which will dissipate sound pressure waves (WSDOT 2010).
- All pilings installed at each site will have an airborne noise disturbance distance equal to the piling that causes the greatest noise disturbance (i.e., the piling furthest from shore) installed with the method that has the largest ZOI. The largest ZOI will be produced by impact driving. The ZOI for a vibratory hammer will be encompassed by the larger ZOI from the impact driver. Exposures to airborne noise were only calculated for pinnipeds.
- Exposures were based on the estimated work days. Numbers of days were based on an average production rate of 4 pilings per day for fender pile replacement.
- In absence of site specific underwater acoustic propagation modeling, the practical spreading loss model was used to determine the ZOI.
- Using the Navy's NMSDD (Navy 2013), the calculation for marine mammal exposures is estimated by:

- Exposure estimate = (N \* ZOI) \* days of pile driving activity, where: N = density estimate used for each species
- ZOI = noise threshold zone of influence impact area
- Where site specific knowledge or new information is not fully integrated into the NMSDD, or where this information provides a more conservative exposure, the following calculation is used:

$$\text{Exposure estimate} = (N) \times (\text{Total days of pile driving activity})$$

$$N = \text{estimate number of each species in the ZOI}$$

$$\text{Total days of pile driving activity} = 65$$

## 6.10 Exposure Estimates

The exposure estimates presented in Table 6-12 indicate the number of calculated exposures that could result from the one year period of in-water construction at Pier 6. Reporting will provide details of how many actual animals of each species are exposed with the ZOIs to noise levels considered potential behavioral harassment at each location.

These estimates do not differentiate age, sex, or reproductive condition. However, some inferences can be made based on what is known about the life stages of the animals that visit or inhabit the study area.

### 6.10.1 Harbor Seal

While no haulouts for harbor seals exist on NAVBASE Kitsap Bremerton or within the ZOI, haulouts are present year round in the nearby waters of Sinclair Inlet (Beckley pers. Comm. 2013; WDFW 2000). These haulouts are outside of, but adjacent to the Level B ZOIs so exposure is likely if animals move to or from these haulouts during impact or vibratory pile driving activities.

US Navy 2012b and Appendix A contains density information for marine mammal species in the project area. Based on this density, the modeling estimates that two to three harbor seals would be exposed to level B harassment within the ZOI on a daily basis. Using this value, modeled level B exposures is estimated at 130 to 195 individuals (depending on a 5 or 7 sq km ZOI) during the entire project.

The most recent marine mammal survey for this area occurred for construction of the Manette Bridge just north of the ZOI in the Port Washington Narrows. Marine mammal monitoring for this project occurred over multiple years to align with the allowed work windows in the Puget Sound. During the first year of construction an average of 3.7 harbor seals were observed daily (WSDOT 2011C). Daily harbor seal numbers varied greatly over the three year life of the project, and was as high as 59 on October 18, 2011 (WSDOT 2012c). During the most recent year of construction spaced over five months from July 2012 to November 2012, 586 harbor seals were observed (WSDOT 2012b). This amounts to an average of 11 harbor seals a day, though some animals were likely counted multiple times.

For the proposed project at NAVBASE Kitsap Bremerton, 11 harbor seals would be considered as a reasonable average to be seen in one day in the ZOI. This number is considered a conservative estimate, taking into account WSDOT's survey information, incidental sightings, and the potential for the same animal to be observed more than once. This number is multiplied

by the anticipated number of days of pile driving for year one of this project (65 days). The number of days includes an estimate of 20 days of vibratory pile driving and 45 days of impact hammering. However, in terms of actual on the ground work, both types of driving may occur on the same day, though not at the same time, and the total combined work is expected to take 65 days.

Exposure estimate =  $(11) \times 65$  (days of pile driving activity)

715 = Exposure estimate

Based on the Navy's analysis, a maximum estimate of 715 harbor seals of the Washington inland waters stock could be exposed to sound levels considered Level B harassment from underwater sound incidental to pile driving at NAVBASE Kitsap Bremerton. This estimate is higher than the exposure estimate of 130 to 195, based on the density data contained in the NMSDD, as it uses recent nearby survey numbers to deliver a more site specific estimate. Exposures would potentially occur to juveniles, subadults, and adults of any sex within the disturbance ZOIs while pile driving is occurring. Animals could be exposed when traveling, resting, and foraging. No Level A takes are anticipated because of the implementation of monitoring and mitigation measures described in Chapter 11. An estimate of zero exposures to sound levels considered Level B harassment from airborne sounds incidental to pile driving was calculated due to the lack of haulouts and the fact that in-water animals are accounted for in the underwater sound analysis.

### 6.10.2 California Sea Lion

The California sea lion is most common from fall to late spring. US Navy 2013 contains density information for marine mammal species in the project area. Based on this density, the modeling estimates that only one California sea lion would be exposed to level B harassment within the ZOI per day. This would result in 65 Level B harassment exposures over the course of the action for either a 5 or 7 sq km ZOI. However, this species hauls out at NAVBASE Kitsap Bremerton with haulout counts on the floating port security barrier averaging 42 individuals (US Navy 2012a). This average number is based on 24 sea lion surveys conducted from February 2010 through May 2012. Actual values ranged from zero individuals on June 22, 2011 to 144 individuals on November 9, 2011 (US Navy 2012). The haulout is adjacent to Level B ZOIs, so exposure is likely when animals move to or from the haulout during impact or vibratory pile driving activities. Animals could be exposed when traveling, resting, and foraging. Based on the above information regarding California sea lion presence, the Navy estimated that an average of 42 California sea lions of the U.S. stock could be exposed to sound levels considered Level B harassment from underwater sound incidental to pile driving at NAVBASE Kitsap Bremerton on a daily basis. This number is significantly higher than the estimate from the NMSDD of one exposure a day as it takes into account the proximity of the project to the floating port security barrier (Navy 2013). Since only male California sea lions migrate into the study area (Jeffries et al. 2000), all exposures are expected to be to sub-adult or adult males. All animals hauled out were assumed to enter the water each day within the ZOI resulting in one exposure per day for each animal. Therefore, the average haulout count was multiplied by the anticipated number of days of pile driving for year one (65 days). The number of days includes an estimate of 20 days of vibratory pile driving and 45 days of impact hammering. However, in terms of actual on the ground work, both types of driving may occur on the same day, though not at the same time, and the total combined work is expected to take 65 days.

*Exposure estimate = 42 × 65 (days of pile driving activity)*  
*2,730 = Exposure Estimate*

No exposures to sound levels considered Level B harassment from airborne sounds are calculated. However, it is likely California sea lions will be exposed to airborne noise levels at NAVBASE Kitsap Bremerton because a small section of the Port Security barrier floats are near the airborne ZOI, which extends 48 meters from an impact driven pile. Because animals exposed in an airborne ZOI would already be within an underwater ZOI, no additional exposures of California sea lions are requested for airborne disturbance.

Therefore, the Navy is requesting authorization for Level B acoustical harassment take of 2,730 California sea lions. It is assumed that this number will include multiple harassments of the same individuals.

### 6.10.3 Steller Sea Lion

Steller sea lion haulouts are not located within Sinclair Inlet. The nearest documented Steller sea lion haulout occurs approximately 6.5 miles from the project site near the Manchester Fuel Depot's finger pier (Lance pers. comm. 2012). While California sea lions have been observed by Navy biologists with great regularity hauled out along the floating port security barrier surrounding NAVBASE Kitsap Bremerton (US Navy 2012), only one Steller sea lion has been observed on the barrier (Lance pers. comm. 2012). Sinclair Inlet is a muddy inlet without the habitat features and prime haulout areas associated with more attractive areas. In addition, it is thought that the floating port security barrier does not regularly attract Steller sea lions as the pontoons are too small to accommodate anything juvenile Steller sea lions (Beckley pers. comm. 2013).

From this data, and from the on-site Navy biologist's personal notes and observations (Beckley pers. comm. 2013), it is assumed that Steller sea lion occurrence in the waterways in the Bremerton area is rare. These reports are in line with the density data reported in the NMSDD (Navy 2013), from which the modeling estimated no Steller sea lion exposure to Level B acoustical harassment from pile driving. To ensure no Level B acoustical harassment occurs, the Navy will take the following two steps: 1) The Navy will avoid exposure of Steller sea lions to underwater sounds from pile driving by implementing a shut-down procedure if Steller sea lions are in the ZOI (see mitigation measures in chapter 11); 2) The Navy will scan the floating port security barrier before pile driving begins, which is the prime haulout in the ZOI for California sea lions, to ensure no Steller sea lions are hauled out in the area.

Given the rare occurrence of Steller sea lions in the ZOI and the above monitoring procedures, exposure of Steller sea lions to Level B acoustical harassment from pile driving will not occur.

### 6.10.4 Killer Whale [Transient]

Transient killer whales occasionally occur throughout the study area and ZOI. They are typically observed in small groups with an average group size in Puget Sound of six individuals. From December 2002 to January 2013, there were two reports of transient killer whales transiting through the area around NAVBASE Kitsap Bremerton. Both of these reports occurred in May (2004 & 2012), which is outside of the proposed work window for this project (Orca Network, 2013). The group size in these two sightings ranged from 5 to 12 (Orca Network, 2013).

Given this data, it is assumed that transient killer whales occurrence in the waterways in the Bremerton area is infrequent. These reports are in line with the density data reported in the NMSDD (Navy 2013), from which the modeling estimated no killer whale exposure to Level B acoustical harassment from pile driving.

To ensure no Level B acoustical harassment occurs, the Navy will take the following two steps: 1) The Navy will avoid exposure of killer whales to underwater sounds from pile driving by implementing a shut-down procedure if killer whales are in the ZOI (see mitigation measures in chapter 11 and appendices B and C); 2) Prior to the start of pile driving, the Orca Network and/or Center for Whale Research will be contacted to find out the location of the nearest killer whale sightings. As the appearance of Killer Whales in the narrow south sound waterways is considered rare, their presence becomes a newsworthy event and is quickly reported by many to the Orca Network. Previous and ongoing monitoring of these networks for Navy testing and training activities has proven to be an important tool for monitoring these species throughout the Puget Sound.

Given the rare occurrence of transient killer whales in the ZOI and the above monitoring procedures, exposure of transient killer whales to Level B acoustical harassment from pile driving is unlikely to occur.

#### 6.10.5 Gray Whale

Most gray whales in Puget Sound utilize the feeding areas in northern Puget Sound around Whidbey Island in the spring and summer with a few individuals occurring year-round. Individuals or pairs occasionally enter central and southern Puget Sound primarily in March through May. The majority of in-water work will occur when gray whales are less likely to be present.

From December 2002 to January 2013, there were four reports of gray whales in the area around NAVBASE Kitsap Bremerton that occurred during the in-water work window months. These reports consist of multiple sightings from members of the public reported to Cascadia Research and the Orca Network (Orca Network, 2013) during the winter of 2008 and 2009 (January, 2008; November, 2008; December 2009) and one stranding that occurred in January of 2013 (Cascadia Research Collective, 2013) near the west end of NAVBASE Kitsap Bremerton. Each sighting appeared to be of a lone gray whale attempting to feed in the vicinity of Sinclair Inlet and Port Washington Narrows over a matter of days and then leaving the area. Preliminary report of the January 2013 stranding event indicated that the gray whale was in poor nutritional condition and exhibited signs of severe injuries caused by a killer whale attack. There is an average of six gray whales that die and strand in Washington each year with three occurring in 2012 (only one of these three was in the Puget Sound). These reports are in-line with the NMSDD which estimated no gray whale exposure to Level B acoustical harassment from pile driving (Navy 2013).

Given this data, it is assumed that gray whales occurrence in the waterways in the Bremerton area is extralimital to rare. To ensure no Level B acoustical harassment occurs, the Navy will take the following two steps: 1) The Navy will avoid exposure of gray whales to underwater sounds from pile driving by implementing a shut-down procedure if gray whales are in the ZOI (see mitigation measures in chapter 11); 2) Prior to the start of pile driving, the Orca Network and/or Center for Whale Research will be contacted to find out the location of the nearest marine mammal sightings.

Given the rare occurrence of gray killer whales in the ZOI and the above monitoring procedures, exposure of gray whales to Level B acoustical harassment from pile driving will not occur.

**TABLE 6-12. TOTAL UNDERWATER LEVEL B EXPOSURE ESTIMATES BY SPECIES AT NAVBASE KITSAP BREMERTON**

Species	Exposure Estimate
Harbor seal <sup>1</sup>	<b>715</b>
California sea lion <sup>2</sup>	<b>2,730</b>
Steller sea lion	<b>0</b>
Transient killer whale	<b>0</b>
Gray whale	<b>0</b>
<b>Total Estimated Exposures 3,120</b>	
<sup>1</sup> Modeled Level B exposures were 130 for an area of 5 sq km and 195 for an area of 7 sq km. Exposures were adjusted to reflect actual sighting reports. <sup>2</sup> Modeled Level B exposures were 65 for both 5 and 7 sq km. Exposures were adjusted to reflect number of animals hauled out.	

## 7 Impacts to Marine Mammal Species or Stocks

*The anticipated impact of the activity upon the species or stock of marine mammals*

### 7.1 Potential Effects of Pile Driving on Marine Mammals

#### 7.1.1 Potential Effects Resulting from Underwater Noise

The effects of pile driving on marine mammals are dependent on several factors, including the species, size of the animal, and proximity to the source; the depth, intensity, and duration of the pile driving sound; the depth of the water column; the substrate of the habitat; the distance between the pile and the animal; and the sound propagation properties of the environment. Impacts to marine mammals from pile driving activities are expected to result primarily from acoustic pathways. As such, the degree of effect is intrinsically related to the received level and duration of the sound exposure, which are in turn influenced by the distance between the animal and the source. The farther away from the source, the less intense the exposure should be. The substrate and depth of the habitat affect the sound propagation properties of the environment. Shallow environments are typically more structurally complex, which leads to rapid sound attenuation. In addition, substrates that are soft (i.e., sand) will absorb or attenuate the sound more readily than hard substrates (rock) which may reflect the acoustic wave. Soft porous substrates will also likely require less time to drive the pile, and possibly less forceful equipment, which would ultimately decrease the intensity of the acoustic source.

Impacts to marine species are expected to be the result of physiological responses to both the type and strength of the acoustic signature (Viada et al. 2008). Behavioral impacts are also expected, though the type and severity of these effects are more difficult to define due to limited studies addressing the behavioral effects of impulsive sounds on marine mammals. Potential effects from impulsive sound sources can range from brief acoustic effects such as behavioral disturbance, tactile perception, physical discomfort, slight injury of the internal organs, and the auditory system to the death of the animal (Yelverton et al. 1973; O'Keefe and Young 1984; Ketten 1995).

#### *Physiological Responses*

Direct tissue responses to impact/impulsive sound stimulation may range from mechanical vibration or compression with no resulting injury to tissue trauma (injury). Because the ears are the most sensitive organ to pressure, they are the organs most sensitive to injury (Ketten 2000). Sound-related trauma can be lethal or sub-lethal. Lethal impacts are those that result in immediate death or serious debilitation in or near an intense source (Ketten 1995). Sub-lethal damage to the ear from a pressure wave can rupture the tympanum, fracture the ossicles, and damage the cochlea; cause hemorrhage, and cause leakage of cerebrospinal fluid into the middle ear (Ketten 2000). Sub-lethal impacts also include hearing loss, which is caused by exposure to perceptible sounds. Moderate injury implies partial hearing loss. Permanent hearing loss (also called permanent threshold shift or PTS) can occur when the hair cells of the ear are damaged by a very loud event, as well as by prolonged exposure to noise. Instances of temporary threshold shifts and/or auditory fatigue are well documented in marine mammal literature as being one of the primary avenues of acoustic impact. Temporary loss of hearing sensitivity has been documented in controlled settings using captive marine mammals exposed to strong sound exposure levels at various frequencies (Ridgway et al. 1997; Kastak et al. 1999; Finneran et al.

2005). While injuries to other sensitive organs are possible, they are less likely since pile driving impacts are almost entirely acoustically mediated, versus explosive sounds which also include a shock wave that can result in damage. No Level A harassment is expected because of the mitigation measures outlined in chapter 11 and the conservative modeling assumptions discussed in chapter 6.

### *Behavioral Responses*

Behavioral responses to sound can be highly variable. For each potential behavioral change, the magnitude of the change ultimately determines the severity of the response. A number of factors may influence an animal's response to noise, including its previous experience, its auditory sensitivity, its biological and social status (including age and sex), and its behavioral state and activity at the time of exposure. Habituation occurs when an animal's response to a stimulus wanes with repeated exposure, usually in the absence of unpleasant associated events (Wartzok et al. 2003). Animals are most likely to habituate to sounds that are predictable and unvarying. The opposite process is sensitization—when an unpleasant experience leads to subsequent responses, often in the form of avoidance, at a lower level of exposure. Behavioral state or differences in individual tolerance levels may affect the type of response as well. For example, animals that are resting may show greater behavioral change in response to disturbing noise levels than animals that are highly motivated to remain in an area for feeding (Richardson et al. 1995; National Research Council 2003; Wartzok et al. 2003). Indicators of disturbance may include sudden changes in the animal's behavior or avoidance of the affected area. A marine mammal may show signs that it is startled by the noise and/or it may swim away from the sound source and avoid the area. Increased swimming speed, increased surfacing time, and cessation of foraging in the affected area would indicate disturbance or discomfort. Pinnipeds may increase their haulout time, possibly to avoid in-water disturbance.

Controlled experiments with captive marine mammals showed pronounced behavioral reactions, including avoidance of loud sound sources (Ridgway et al. 1997; Finneran et al. 2003). Observed responses of wild marine mammals to loud pulsed sound sources (typically seismic guns or acoustic harassment devices and including pile driving) have been varied, but often consist of avoidance behavior or other behavioral changes suggesting discomfort (Morton and Symonds 2002; also see reviews in Gordon et al. 2003; Wartzok et al. 2003; and Nowacek et al. 2007). Some studies of acoustic harassment and acoustic deterrence devices have found habituation in resident populations of seals and harbor porpoises (see review in Southall et al. 2007). Blackwell et al. (2004) found that ringed seals exposed to underwater pile driving sounds in the 153–160 dB rms range tolerated this noise level and did not seem unwilling to dive. One individual was as close as 63 meters from the pile driving. Responses of two pinniped species to impact pile driving at the San Francisco-Oakland Bay Bridge East Span Seismic Safety Project were mixed (Caltrans 2001; Thorson and Reyff 2006; Thorson 2010). Harbor seals were observed in the water at distances of approximately 400–500 meters from the pile driving activity and exhibited no alarm responses, although several showed alert reactions, and none of the seals appeared to remain in the area. One of these harbor seals was even seen to swim to within 150 meters of the pile driving barge during pile driving. Several sea lions, however, were observed at distances of 500–1,000 meters swimming rapidly and porpoising away from pile driving activities. The reasons for these differences are not known, although Kastak and Schusterman (1998) reported that sea lions are more sensitive than harbor seals to underwater noise at low frequencies.

Studies of marine mammal responses to continuous noise, such as vibratory pile installation, are limited. Marine mammal monitoring at the Port of Anchorage marine terminal redevelopment project found no response by marine mammals swimming within the threshold distances to noise impacts from construction activities including pile driving (both impact hammer and vibratory driving) (Integrated Concepts and Research Corporation 2009). Most marine mammals observed during the two lengthy construction seasons were beluga whales while harbor seals, harbor porpoises, and Steller sea lions were observed in smaller numbers. Background noise levels at this port are typically at 125 dB rms re 1 micropascal.

A comprehensive review of acoustic and behavioral responses to noise exposure by Nowacek et al. (2007) concluded that one of the most common behavioral responses is displacement. To assess the significance of displacements, it is necessary to know the areas to which the animals relocate, the quality of that habitat, and the duration of the displacement in the event that they return to the pre-disturbance area. Short-term displacement may not be of great concern unless the disturbance happens repeatedly. Similarly, long-term displacement may not be of concern if adequate replacement habitat is available.

Marine mammals encountering pile driving operations would likely avoid affected areas in which they experience noise-related discomfort, limiting their ability to forage or rest there. As described in the section above, individual responses to pile driving noise are expected to be variable. Some individuals may occupy the project area during pile driving without apparent discomfort, but others may be displaced with undetermined long-term effects. Avoidance of the affected area during pile driving operations would reduce the likelihood of injury impacts, but would also reduce access to foraging areas. Noise-related disturbance may also inhibit some marine mammals from transiting the area. Given the duration of the project there is a potential for displacement of marine mammals from the affected area due to these behavioral disturbances during the in-water construction season. However, habituation may occur resulting in a decrease in the severity of response. Since pile driving will only occur during daylight hours, marine mammals transiting the project area or foraging or resting in the project area at night will not be affected. Effects of pile driving activities will be experienced by individual marine mammals, but will not cause population-level impacts or affect the continued survival of the species.

### 7.1.2 Potential Effects Resulting from Airborne Noise

Marine mammals that occur in the study area could be exposed to airborne sounds associated with pile driving that have the potential to cause behavioral harassment, depending on their distance from pile driving activities. Airborne pile driving noises are expected to have very little impact to cetaceans because noise from atmospheric sources does not transmit well through the air-water interface (Richardson et al. 1995), consequently, cetaceans are not expected to be exposed to airborne sounds that will result in harassment as defined under the MMPA. Airborne noise will primarily be an issue for pinnipeds that are swimming or hauled out in the study area within the range of impact as defined by the acoustic criteria discussed in chapter 6. Most likely, airborne sound will cause behavioral responses similar to those discussed above in relation to underwater noise. For instance, anthropogenic sound could cause hauled-out pinnipeds to exhibit changes in their normal behavior, such as reduction in vocalizations, or cause them to temporarily abandon their usual or preferred locations and move farther from the noise source. Pinnipeds swimming in the vicinity of pile driving may avoid or withdraw from the area, or may show increased alertness or alarm (e.g., heading out of the water, and looking around). However, studies of ringed seals by Blackwell et al. (2004) and Moulton et al. (2005) indicate a tolerance

or lack of response to unweighted airborne sounds as high as 112 peak decibels and 96 dB rms, which suggests that habituation occurred.

Based on these observations, marine mammals in the impact zones may exhibit temporary behavioral reactions to airborne pile driving noise. These exposures may have a temporary effect on individual or groups of animals, but this level of exposure is very unlikely to result in population-level impacts.

## **7.2 Conclusions Regarding Impacts to Species or Stocks**

Individual marine mammals may be exposed to sound pressure levels during pile driving operations at each of the installations, which may result in Level B behavioral harassment. Any marine mammals that are exposed (harassed) may change their normal behavior patterns (i.e., swimming speed, foraging habits, etc.) or be temporarily displaced from the area of construction. Any exposures will likely have only a minor effect on individuals and no effect on the population. The sound generated from vibratory pile driving is nonpulsed (e.g., continuous), which is not known to cause injury to marine mammals. Mitigation is expected to avoid most potential adverse underwater impacts to marine mammals from impact pile driving. Nevertheless, some exposure is unavoidable. The expected level of unavoidable exposure (defined as acoustic harassment) is presented in chapter 6. This level of effect is not anticipated to have any adverse impact to population recruitment, survival, or recovery.

## 8 Impact to Subsistence Use

*The anticipated impact of the activity on the availability of the species or stock of marine mammals for subsistence uses.*

### 8.1 Subsistence Harvests by Northwest Treaty Indian Tribes

Historically, Pacific Northwest treaty Indian tribes were known to utilize (hunt) several species of marine mammals including, but not limited to: harbor seals, Steller sea lions, northern fur seals, gray whales, and humpback whales (Norberg pers. comm. 2007). Recently, several Pacific Northwest treaty Indian tribes have promulgated tribal regulations allowing tribal members to exercise treaty rights for subsistence harvest of California sea lions and harbor seals (Carretta et al. 2007). The Makah Indian Tribe (Makah) has specifically passed hunting regulations for gray whales (Norberg pers. comm. 2007). However, the directed take of marine mammals (not just gray whales) for ceremonial and/or subsistence purposes was enjoined by the Ninth Circuit Court of Appeals in a ruling against the Makah in 2002, 2003, and 2004 (Norberg pers. comm. 2007; NMFS 2008c). The issues surrounding the Makah gray whale hunt (in addition to the hunt for marine mammals in general) is currently in litigation or not yet clarified in recent court decisions (Wright 2007, personal communication). These issues also require National Environmental Policy Act and MMPA compliance, which has not yet been completed. Presently, there are no known active ceremonial and/or subsistence hunts for marine mammals in Puget Sound or the San Juan Islands.

### 8.2 Summary

Potential impacts resulting from the proposed action will be limited to individuals of marine mammal species located in the marine waters near NAVBASE Kitsap Bremerton and will be limited to Level B harassment. Therefore, no impacts to the availability of species or stocks for subsistence use were found.

## 9 Impacts to the Marine Mammal Habitat and the Likelihood of Restoration

*The anticipated impact of the activity upon the habitat of the marine mammal populations, and the likelihood of restoration of the affected habitat.*

Impacts to habitat from the project are expected to be temporary and include increased human activity and noise levels, impacts to water quality, and changes in prey availability near the individual project sites. Impacts are not likely to result in permanent impacts to habitats used directly by marine mammals.

### 9.1 Effects from Human Activity and Noise

Existing human activity and underwater noise levels, primarily due to industrial activity and small vessel traffic, could increase slightly as the result of the Pier 6 fender pile repair project. Marine mammals in the study area encounter vessel traffic associated with both Navy and non-navy activities. At Navy installations, vessels are used in day-to-day activities including security along the waterfront. Several studies have linked vessels with behavioral changes in killer whales in Pacific Northwest inland waters (Kruse 1991; Kriete 2002; Williams et al. 2002; Bain et al. 2006), although it is not well understood whether the presence and activity of the vessels, the vessel noise produced, or a combination of these factors produces the changes. The probability and significance of vessel and marine mammal interactions is dependent upon several factors including numbers, types, and speeds of vessels; the regularity, duration, and spatial extent of activities; and the presence/absence and density of marine mammals.

Behavioral changes in response to vessel presence include avoidance reactions, alarm/startle responses, temporary abandonment of haulouts by pinnipeds, and other behavioral and stress-related changes (such as altered swimming speed, direction of travel, resting behavior, vocalizations, diving activity, and respiration rate) (Watkins 1986; Würsig et al 1998; Terhune and Verboom 1999; Foote et al. 2004; Mocklin 2005; Bejder et al. 2006; Nowacek et al. 2007). Some dolphin species approach vessels and are observed bow riding or jumping in the wake of vessels (Norris and Prescott 1961; Shane et al 1986; Würsig et al. 1998; Ritter 2002). In other cases neutral behavior (i.e., no obvious avoidance or attraction) has been reported (review in Nowacek et al. 2007). Little is known about the biological importance of changes in marine mammal behavior under prolonged or repeated exposure to high levels of vessel traffic, such as increased energetic expenditure or chronic stress, which can produce adverse hormonal or nervous system effects (Reeder and Kramer 2005).

During construction activities, additional vessels may operate in the project area, but will operate at low speeds within the relatively limited construction zone and access routes during the in-water construction period. The presence of vessels is not expected to rise to the level of take or harassment as defined under the MMPA.

Additional noise could be generated by barge-mounted equipment, such as cranes and generators, but this noise will typically not exceed existing underwater noise levels resulting from existing routine waterfront operations. While the increase may change the quality of the habitat, is not expected to exceed the Level A or B harassment thresholds and impacts to marine mammals from these noise sources is expected to be negligible.

## **9.2 Effects on Water Quality**

Some degree of localized reduction in water quality will occur as a result of in-water construction activities. Most of this effect will occur during the installation and removal of piles from the substrate when bottom sediments are disturbed. Effects to turbidity are expected to be short-term and minimal. Turbidity will return to normal levels within a short time after completion of the proposed action. No direct effects to marine mammals are expected from turbidity impacts.

Removal of the existing timber fender piles at Pier 6 will result in the removal of 380 creosote-treated piles 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 timber 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).

## **9.3 Impacts on Potential Prey (Fish)**

Pile replacement will impact marine habitats used by fish. Marine habitats used by fish species that occur in the study area include nearshore intertidal and subtidal habitats, including piles used for structure and cover. The greatest impact to prey species during pile repair and replacement will result from behavioral disturbance due to pile driving noise. Secondary impacts include benthic habitat displacement, re-suspension of sediments, and injury from underwater noise. The prey base for the most common marine mammal species (harbor seal and California sea lion) in the project area includes a wide variety of small fish such as Pacific hake, Pacific herring, and salmonids. Steller sea lions in the vicinity of the project area probably consume pelagic and bottom fish. Transient killer whales in the Puget Sound prey on pinnipeds, primarily harbor seals.

### **9.3.1 Underwater Noise Effects on Fish**

The greatest impact to marine fish during construction will occur during impact pile driving because pile driving will exceed the established underwater noise thresholds for both behavior and injury for fish.

During pile driving, the associated underwater noise levels will have the potential to cause injury and will result in behavioral responses, including project area avoidance. Sound during impact pile driving will be detected above the average background noise levels at locations near the various installations with a direct acoustic path (e.g., line-of-sight from the driven pile to the receiver location).

Fish within the 150 dB received level range may display a startle response during initial stages of pile driving and will likely avoid the immediate project vicinity during pile driving and other construction activities. However, field observation investigations of Puget Sound salmonid behavior, when occurring near pile driving projects (Feist 1991; Feist et al. 1996), found little evidence that normally nearshore migrating salmonids move farther offshore to avoid the general project area. In fact, some studies indicate that construction site behavioral responses, including

site avoidance, may be as strongly tied to visual stimuli as to underwater sound (Feist 1991; Feist et al. 1996; Ruggerone et al. 2008). Therefore, it is possible that salmonids, and likely other species, may alter their normal behaviors including startle response and avoidance of the immediate project site.

Thus, prey availability for marine mammal predators within an undetermined portion of the areas near the affected installations could be reduced. The duration of fish avoidance of this area after pile driving stops is unknown, but a rapid return to normal distribution and behavior is anticipated. Any behavioral avoidance by fish of the disturbed area will still leave significantly large areas of marine mammal foraging habitat in Puget Sound and other nearby areas. Some adverse effects on marine mammal prey are possible, but do not rise to the level of MMPA take.

### **9.3.2 Effects on Fish Habitats/Abundance**

Pile repair and replacement activities will adversely affect some habitat conditions for marine fish, including forage fish, in the project area. Positioning and anchoring the construction barges and removing/driving piles will locally increase turbidity, disturb benthic habitats, and disturb forage fish in the immediate project vicinity. Additionally, removal of marine vegetation attached to piles will occur. Construction will bury benthic organisms with limited mobility under sediment. Increased turbidity will make it difficult for predators to locate prey. All of these actions will be temporary with sediments settling back soon after the cessation of activities, and will be localized to the immediate project area around piles. Foraging and refuge habitat quality for prey species will be temporarily degraded over a localized area. The effect is expected to be insignificant to the forage base for marine mammals. Affected area is expected to recover quickly and no new overwater structures are being built that will permanently degrade or alter habitat.

Impacts to salmonid and forage fish populations, including, ESA-listed species, will be minimized by adhering to the in-water work period designated for each installation. These work periods are designated when out-migrating juvenile salmonids are least likely to occur. Some habitat degradation is expected during construction, but the impacts to fish species will be temporary and localized. Moreover, the numbers of marine mammals affected by impacts to prey populations will be small; therefore, the impact will be insignificant in the context of marine mammal populations.

## **9.4 Likelihood of Habitat Restoration**

All impacts to marine mammal habitat are expected to be limited to the duration of pile extraction and installation during the in-water work window each year. In-water activities associated with the proposed action are not likely to have a permanent, adverse effect on any marine habitat or population of fish species.

## **10 Impacts to Marine Mammals from Loss or Modification of Habitat**

*The anticipated impact of the loss or modification of the habitat on the marine mammal populations involved.*

The proposed activity is not expected to have any habitat-related effects that could cause significant or long-term consequences for individual or populations of marine mammals because all activities will be temporary and all piles removed or replaced are within the existing footprint and part of the existing Pier 6. This project will not alter the footprint of Pier 6. Information provided in chapter 9 indicates there may be temporary impacts, but those impacts will be limited to the immediate area surrounding the structures being repaired. Impacts will cease upon the completion of pile removal and replacement activities.

## 11 Means of Effecting the Least Practicable Adverse Impacts

*The availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks, their habitat, and on their availability for subsistence uses, paying particular attention to rookeries, mating grounds, and areas of similar significance.*

The Navy will employ the Best Management Practices (BMPs), mitigation and minimization measures listed in this section to avoid and minimize impacts to marine mammals, their habitats, and forage species. Best management practices, mitigation and minimization measures are included in construction contract plans and specifications for individual projects. A signed contract represents a legal agreement between the contractor and the Navy. Failure to follow the prescribed BMP mitigation and minimization measures constitutes a contract violation. Measures would be dependent on location, timing, and construction methods.

### 11.1 General Construction Best Management Practices

- The Navy would adhere to performance conditions imposed as part of the Rivers and Harbors Act, Section 10 Permit issued by the Corps of Engineers. No in-water work would be conducted until the Corps authorization process has been completed.
- The construction contractor is responsible for preparation of an environmental protection plan. The plan will be submitted and implemented prior to the commencement of any construction activities and is a binding component of the overall contract. The plan identifies construction elements and recognizes spill sources at the site. The plan outlines BMPs, response actions in the event of a spill or release, and notification and reporting procedures. The plan also outlines contractor management elements such as personnel responsibilities, project site security, site inspections, and training.
- No petroleum products, fresh cement, lime, fresh concrete, chemicals, or other toxic or harmful materials will be allowed to enter surface waters.
- Wash water resulting from wash-down of equipment or work areas will be contained for proper disposal and will not be discharged unless authorized.
- Equipment that enters surface waters will be maintained to prevent any visible sheen from petroleum products.
- No oil, fuels, or chemicals will be discharged to surface waters, or onto land where there is a potential for re-entry into surface waters to occur. Fuel hoses, oil drums, oil or fuel transfer valves, fittings, etc. will be checked regularly for leaks and will be maintained and stored properly to prevent spills.
- No cleaning solvents or chemicals used for tools or equipment cleaning will be discharged to ground or surface waters.
- Construction materials will not be stored where high tides, wave action, or upland runoff could cause materials to enter surface waters.
- Barge operations will be restricted to tidal elevations adequate to prevent grounding of a barge.

## 11.2 Pile Repair, Removal, and Installation Best Management Practices

### *Creosote Pile Removal*

- Oil-absorbent materials will be used in the event of a spill if any oil product is observed in the water.
- All creosote-treated material will be cut into 4 foot lengths to preclude further use as piling and disposed of in a landfill.
- Creosote-treated timber piles will be replaced with noncreosote treated piles.

### *General*

- Removed piles will be contained on a barge. If a barge is not utilized, piles may be stored in a containment area near the construction site.
- If piles break or are damaged, a chain would be used, if practical, to attempt to entirely remove the broken pile. If the entire pile cannot be removed, the pile would be cut at the mud line using a pneumatic underwater chainsaw to prevent disturbing contaminated sediment.
- Any floating debris generated during installation will be retrieved.
- Whenever activities that generate sawdust, drill tailings, or wood chips from treated timbers are conducted, tarps or other containment material will be used to prevent debris from entering the water.

## 11.3 Timing Restrictions

- To minimize the number of fish exposed to underwater noise and other construction disturbance, in-water work will occur during the following in-water work window when ESA-listed salmonids are least likely to be present.
  - NAVBASE Kitsap Bremerton: June 15–March 1. The in-water work period for this project during the first year of this project would be from December 1, 2013 through March 1, 2014.
- All in-water construction activities will occur during daylight hours (sunrise to sunset). Sunrise and sunset are to be determined based on the National Oceanic and Atmospheric Administration (NOAA) data which can be found at <http://www.srrb.noaa.gov/highlights/sunrise/sunrise.html>.

## 11.4 Additional Minimization Measures for Marine Mammals

The following mitigation measures will be implemented during pile driving to avoid marine mammal exposure to Level A injurious noise levels generated from impact pile driving and to reduce to the lowest extent practicable exposure to Level B disturbance noise levels.

### 11.4.1 Coordination

- The Navy will conduct briefings between construction supervisors and crews, the marine mammal monitoring team, and Navy staff prior to the start of all pile driving activity in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures.

### 11.4.2 Soft Start

The objective of a soft-start is to provide a warning and/or give animals in close proximity to pile driving a chance to leave the area prior to a driver operating at full capacity, thereby exposing fewer animals to loud underwater and airborne sounds.

- A soft start procedure will be used at the beginning of each day's impact pile driving or any time prior to impact pile driving when pile driving (either impact or vibratory) has ceased for more than 30 minutes.
- For impact pile driving, the following soft-start procedures will be conducted:
  - o The contractor will provide an initial set of strikes from the impact hammer at reduced energy, followed by a 30-second waiting period, then two subsequent sets. (The reduced energy of an individual hammer cannot be quantified because they vary by individual drivers. Also, the number of strikes will vary at reduced energy because raising the hammer at less than full power and then releasing it results in the hammer "bouncing" as it strikes the pile resulting in multiple "strikes").

### 11.4.3 Visual Monitoring and Shutdown Procedures

A marine mammal monitoring plan is presented in Appendix C and must be approved by NMFS prior to commencement of project activities at NAVBASE Kitsap Bremerton. The plan includes the following:

- For all impact and vibratory pile driving, a shutdown and disturbance zone will be monitored.
  - o Monitoring will take place from 15 minutes prior to initiation through 30 minutes post-completion of pile driving.
  - o The shutdown zone will include all areas where the underwater sound pressure levels are anticipated to equal or exceed the Level A (injury) criteria for marine mammals (180 dB isopleth for cetaceans; 190 dB isopleth for pinnipeds). The shutdown zone will always be a minimum of 10 meters (33 feet) to prevent injury from physical interaction of marine mammals with construction equipment (See Appendix B for a map of the shutdown zone).
  - o The disturbance zone will include all areas where the underwater or airborne sound pressure levels are anticipated to equal or exceed the Level B (disturbance) criteria for marine mammals (160 dB re 1  $\mu$ Pa for impact pile driving, 120 dB re 1  $\mu$ Pa for vibratory extraction).
- Visual monitoring will be conducted by qualified, trained marine mammal observers (hereafter "observer"). An observer has prior training and experience conducting marine mammal monitoring or surveys, and who has the ability to identify marine mammal species and describe relevant behaviors that may occur in proximity to in-water construction activities.
- Trained observers will be placed at the best vantage points practicable (from the construction barges, on shore, or pier side) to monitor for marine mammals and implement shutdown/delay procedures when applicable by calling for the shutdown to the hammer operator.

- If the shutdown zone is obscured by fog or poor lighting conditions, pile driving will not be initiated until the entire shutdown zone is visible.
- Prior to the start of pile driving, the shutdown zone will be monitored for 15 minutes to ensure that the shutdown zone is clear of marine mammals. Pile driving will only commence once observers have declared the shutdown zone clear of marine mammals.
- If a cetacean or Steller sea lion approaches or enters the disturbance zone during pile driving, work will be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the disturbance zone or 15 minutes have passed without re-detection of the animal.
- During vibratory pile removal the disturbance zone will be a 1,600 meter arc around the source (2,154 meters for the 20 steel piles). Due to the extreme area of this zone, the contractor will have a mammal observer patrolling the 1,600 meter disturbance zone by boat. This zone is considered a realistic area for visual monitoring for both vibratory extraction of steel and wood piles due to the limited number of steel piles and high number of wood piles.
- If a harbor seal or California sea lion is observed in the disturbance zone, but not approaching or entering the shutdown zone, a “take” will be recorded and the work will be allowed to proceed without cessation. Marine mammal behavior will be monitored and documented.
- If a marine mammal approaches or enters a shutdown zone during impact or vibratory pile driving, work will be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or 15 minutes have passed without re-detection of the animal.

#### 11.4.4 Data Collection

NMFS requires that at a minimum, the following information be collected on the sighting forms:

- Date and time that pile removal and/or installation begins and ends
- Construction activities occurring during each observation period
- Weather parameters (e.g. percent cover, visibility)
- Water conditions (e.g. sea state, tidal state [incoming, outgoing, slack, low, and high])
- Species, numbers, and, if possible, sex and age class of marine mammals
- Marine mammal behavior patterns observed, including bearing and direction of travel, and, if possible, the correlation to sound pressure levels
- Distance from pile removal and/or installation activities to marine mammals and distance from the marine mammal to the observation point
- Locations of all marine mammal observations
- Other human activity in the area.

The Navy will note in behavioral observations, to the extent practicable, if an animal has remained in the area during construction activities. Therefore, it may be possible to identify if the same animal or a different individuals are being taken.

### Acoustic Monitoring

The Navy will conduct acoustic monitoring during vibratory removal of woodpiles and impact hammer installation of concrete piles relative to background levels. The monitoring will include underwater and airborne sounds measurements from pile removal and installation.

The acoustic monitoring includes:

- Conduct acoustic monitoring on a minimum of 10 concrete piles driven via impact hammer and 10 wood piles removed via vibratory extraction. Note that of the approximate 400 piles to be removed via vibratory hammer, only 20 are steel fender piles. The rest are timber piles. It is expected that acoustic monitoring of vibratory pile removal will occur for timber piles only. However, if during monitoring activities a steel pile is encountered the Navy will perform acoustic monitoring of the extraction of that pile as part of the twenty piles monitored.
- For underwater recordings, a single 3-hydrophone system with the ability to measure SPLs will be placed for collection of source levels at approximately 10 meters from the pile being worked.
- For airborne recordings, reference recordings will be attempted at approximately 50 feet (15.2 meters) from the source via a stationary microphone. However, other distances may be utilized to obtain better data if the signal cannot be isolated clearly due to other sound sources (e.g. generators, industrial shipyard work).
- Each hydrophone (underwater) and microphone (airborne) will be calibrated prior to the start of the action and will be checked at the beginning of each day of monitoring activity.
- Environmental data will be collected including but not limited to: wind speed and direction, wave height, water depth, precipitation, and type and location of in-water construction activities, as well other factors that could contribute to influencing the airborne and underwater sound levels (e.g. aircraft, boats, etc.);
- The construction contractor will supply the Navy and monitoring personnel with an estimate of the substrate condition, hammer model and size, hammer energy settings and any changes to those settings during the piles being monitored.
- For acoustically monitored piles, post-analysis of the sound level signals will include the average, minimum, and maximum RMS value for each pile monitored. If possible acoustic monitoring will provide similar information for the peak metric as well.

#### 11.4.5 Mitigation Effectiveness

All observers utilized for mitigation activities will be experienced with training in marine mammal detection and behavior. Due to their specialized training, the Navy expects that visual

mitigation will be highly effective. The observers will be positioned in locations, which provide the best vantage point(s) for monitoring. This will probably be an elevated position in order to provide a better range of viewing angles. In addition, the small radius of the shutdown zone makes the likelihood of detecting a marine mammal in this zone extremely high. A reporting plan will be forward to NMFS as described in section 13.

## 12 Effects on Arctic Subsistence Hunting and Plan of Cooperation

*Where the proposed activity would take place in or near a traditional Arctic subsistence hunting area and/or may affect the availability of a species or stock of marine mammal for Arctic subsistence uses, the applicant must submit either a plan of cooperation or information that identifies what measures have been taken and/or will be taken to minimize any adverse effects on the availability of marine mammals for subsistence uses. A plan must include the following:*

- (i) A statement that the applicant has notified and provided the affected subsistence community with a draft plan of cooperation*
- (ii) A schedule for meeting with the affected subsistence communities to discuss proposed activities and to resolve potential conflicts regarding any aspects of either the operation or the plan of cooperation*
- (iii) A description of what measures the applicant has taken and/or will take to ensure that proposed activities will not interfere with subsistence whaling or sealing*
- (iv) What plans the applicant has to continue to meet with the affected communities, both prior to and while conducting activity, to resolve conflicts and to notify the communities of any changes in the operation.*

Subsistence use is the traditional exploitation of marine mammals by native peoples for their own consumption. Based on the discussions in chapter 8, proposed activities will produce no adverse effects on the availability of species or stocks for subsistence use. No species in the region of activity are associated with subsistence hunting, therefore no effect will occur to Arctic subsistence hunting.

## 13 Monitoring and Reporting Efforts

*The suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species, the level of taking, or impacts on populations of marine mammals that are expected to be present while conducting activities and the suggested means of minimizing burdens by coordinating such reporting requirements with other schemes already applicable to persons conducting such activity. Monitoring plans should include a description of the survey techniques that will be used to determine the movement and activity of marine mammals near the activity site(s) including migration and other habitat uses, such as feeding.*

### 13.1 Monitoring Plans

The Navy has developed a detailed marine mammal monitoring plan (see Appendix C) and it will be submitted for approval from NMFS prior to the issuance of the MMPA permit. All aspects of the monitoring plan will be fully implemented. Components of the monitoring plan are also described in section 11.4.

### 13.2 Reporting

- At the completion of in-water work for which there has been active monitoring in accordance with this plan, the Navy will provide a draft monitoring report to NMFS within 45 calendar days. In addition, the Navy will submit a draft monitoring report at least 60 days prior to the issuance of any subsequent IHA for continuation of this project. Final reports will be prepared and submitted to the NMFS within 30 days following receipt of comments on the draft reports from the NMFS. If no comments are received from NMFS, the draft report will be considered to be the final report. At a minimum, the report shall include:
  - General data:
    - Date and time of activities.
    - Water conditions (e.g., sea-state, tidal state).
    - Weather conditions (e.g., percent cover, visibility).
  - Pre-activity observational survey-specific data:
    - Dates and time survey is initiated and terminated.
    - Description of any observable marine mammal behavior in the immediate area during monitoring.
    - If possible, the correlation to underwater sound levels occurring at the time of the observable behavior.
    - Actions performed to minimize impacts to marine mammals.
  - During-activity observational survey-specific data:
    - Description of any observable marine mammal behavior within monitoring zones or in the immediate area surrounding the monitoring zones, including the following:

- Distance from animal to pile driving sound source
  - Reason why/why not shutdown implemented
  - If a shutdown was implemented, behavioral reactions noted and if they occurred before or after implementation of the shutdown
  - If a shutdown is implemented, the distance from animal to sound source at the time of the shutdown
  - Behavioral reactions noted during soft starts prior to impact driving and if they occurred before or after implementation of the soft start
  - Distance to the animal from the sound source during soft start
- Post-activity observational survey-specific data:
    - Results, which include the detections of marine mammals, species and numbers observed, sighting rates and distances, behavioral reactions within and outside of safety zones.
    - A refined take estimate based on the number of marine mammals observed during the course of construction.

## 14 Research Efforts

*Suggested means of learning of, encouraging, and coordinating research opportunities, plans, and activities relating to reducing such incidental taking and evaluating its effects.*

To minimize the likelihood that impacts will occur to the species, stocks, and subsistence use of marine mammals, all construction activities will be conducted in accordance with all federal, state, and local regulations and minimization measures in Chapter 11 will be implemented to protect marine mammals. The Navy will coordinate all activities with the relevant federal and state agencies. These include, but are not limited to: the NMFS, USFWS, United States Coast Guard, United States Army Corps of Engineers, and WDFW.

The United States (U.S.) Department of the Navy (Navy) is one of the world's leading organizations in assessing the effects of human activities on the marine environment including marine mammals. Navy scientists work cooperatively with other government researchers and scientists, universities, industry, and non-governmental conservation organizations in collecting, evaluating, and modeling information on marine resources. They also develop approaches to ensure that these resources are minimally impacted by existing and future Navy activities.

The Navy will share field data and behavioral observations on all marine mammals that occur in the project area with NMFS and other agencies upon request. Results of the monitoring effort will be provided to NMFS in summary reports (section 13.2). The Navy strives to be a world leader in marine species research and has provided more than \$100 million over the past five years to universities, research institutions, federal laboratories, private companies, and independent researchers around the world to increase the understanding of marine species physiology and behavior with several projects ongoing in Washington.

The Navy sponsors 70 percent of all U.S. research concerning the effects of human-generated sound on marine mammals and 50 percent of such research conducted worldwide. Major topics of Navy-supported research include the following:

- Gaining a better understanding of marine species distribution and important habitat areas
- Developing methods to detect and monitor marine species before and during training
- Understanding the effects of sound on marine mammals
- Developing tools to model and estimate potential effects of sound.

The Navy has sponsored several workshops and ongoing surveys to evaluate the current state of knowledge and potential for future acoustic monitoring of marine mammals. The workshops brought together acoustic experts and marine biologists from the Navy and outside research organizations to present data and information on current acoustic monitoring research efforts and to evaluate the potential for incorporating similar technology and methods into Navy activities.

The following Puget Sound marine mammal monitoring activities and contracted studies are being conducted by the Navy outside of and in addition to the Navy's commitments to the NMFS under existing permits. In order to better understand marine mammal presence and habitat use in the Puget Sound Region, the Navy has funded and coordinated four major efforts:

- 1) Pinniped haulout surveys at specific Naval Installations;
- 2) Opportunistic vessel density surveys adjacent to specific Naval Installations;

- 3) Aerial surveys of pinniped haulouts in the greater Puget Sound and Strait of Juan de Fuca area;
- 4) Aerial surveys of cetaceans in Puget Sound (Admiralty Inlet and south)

More detailed information is provided below:

- 1) **Puget Sound Pinniped Surveys:** Biologists located at NBK Bremerton, Bangor and NAVSTA Everett have been conducting counts of sea lions hauled out on Navy assets (e.g. submarines) and on floating security fences. In the case of NBK Bangor and NAVSTA Everett, these counts are conducted daily (excluding weekends) and involve identifying the sea lions to species and counting the numbers hauled out on floating security fences. For NBK Bremerton sea lion counts are collected during a monthly water quality sampling program. This information has shown seasonal use of each site, as well as trends in the number of animals using the fence. Currently, there are efforts underway to increase the frequency of the surveys at NBK Bremerton and expand to additional Navy areas such as Manchester, Whidbey Island, and Indian Island.
- 2) **Marine Mammal Vessel Surveys in Hood Canal and Dabob Bay:** The Navy conducted an opportunistic marine mammal density survey in Hood Canal and Dabob Bay during September and October 2011 and again in October 2012. In the Hood Canal, the surveys followed a double saw-tooth pattern to achieve uniform coverage of the entire NBK Bangor waterfront. Transects generally covered the area from Hazel Point on the south end of the Toandos Peninsula to Thorndyke Bay. Surveys in the adjacent Dabob Bay followed a slightly different pattern and generally followed more closely to the shoreline while completing a circular route through the Bay. A large exclusion zone surrounding a Navy ship moored temporarily in Dabob Bay made it difficult to perform zigzag transects across the bay; therefore, early attempts at surveys in Dabob did not follow a zigzag pattern, and switching to this survey pattern later in the project would have made density information collected during early “loop pattern” surveys incompatible with later data. Therefore, this loop pattern was followed during all subsequent baseline surveys in the bay. These surveys had a dual purpose of collecting marine mammal and marbled murrelet (bird species) data, and shoreline surveys tended to yield more marbled murrelet sightings.
- 3) **Aerial Pinniped Haulout Surveys:** In addition to the work conducted by Navy biologists described above, the Navy has funded and contracted the WDFW to conduct aerial surveys of pinniped haulouts in all of Puget Sound and the Strait of Juan de Fuca out to Cape Flattery. NMFS NWR funded the San Juan Islands Region. Together, this information will be used to revise and update the 2000 Atlas of Seal and Seal Lion Haulouts in Washington State. The surveys have begun and will continue over the next year (till spring 2014). The survey area does not cover the outer coast of Washington at this time, only the inland waters.
- 4) **Aerial Cetacean Surveys:** In addition to the survey work for pinnipeds, the Navy has contracted aerial surveys of cetaceans in Puget Sound in order to better understand seasonality and distribution with the goal of improved density values. These surveys will begin later this year (2013) and the frequency is still being established.

Overall, the Navy will continue to research and contribute to university/external research to improve the state of the science regarding marine species biology and acoustic effects. These efforts include monitoring programs, data sharing with NMFS from research and development efforts, and future research as previously described.

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**Appendix A. Density Estimates of Marine Mammals at NAVBASE Kitsap Bremerton**

**TABLE A-1. MAXIMUM MARINE MAMMAL DENSITIES ESTIMATES FOR NAVBASE KITSAP BREMERTON (#/KM<sup>2</sup>)**

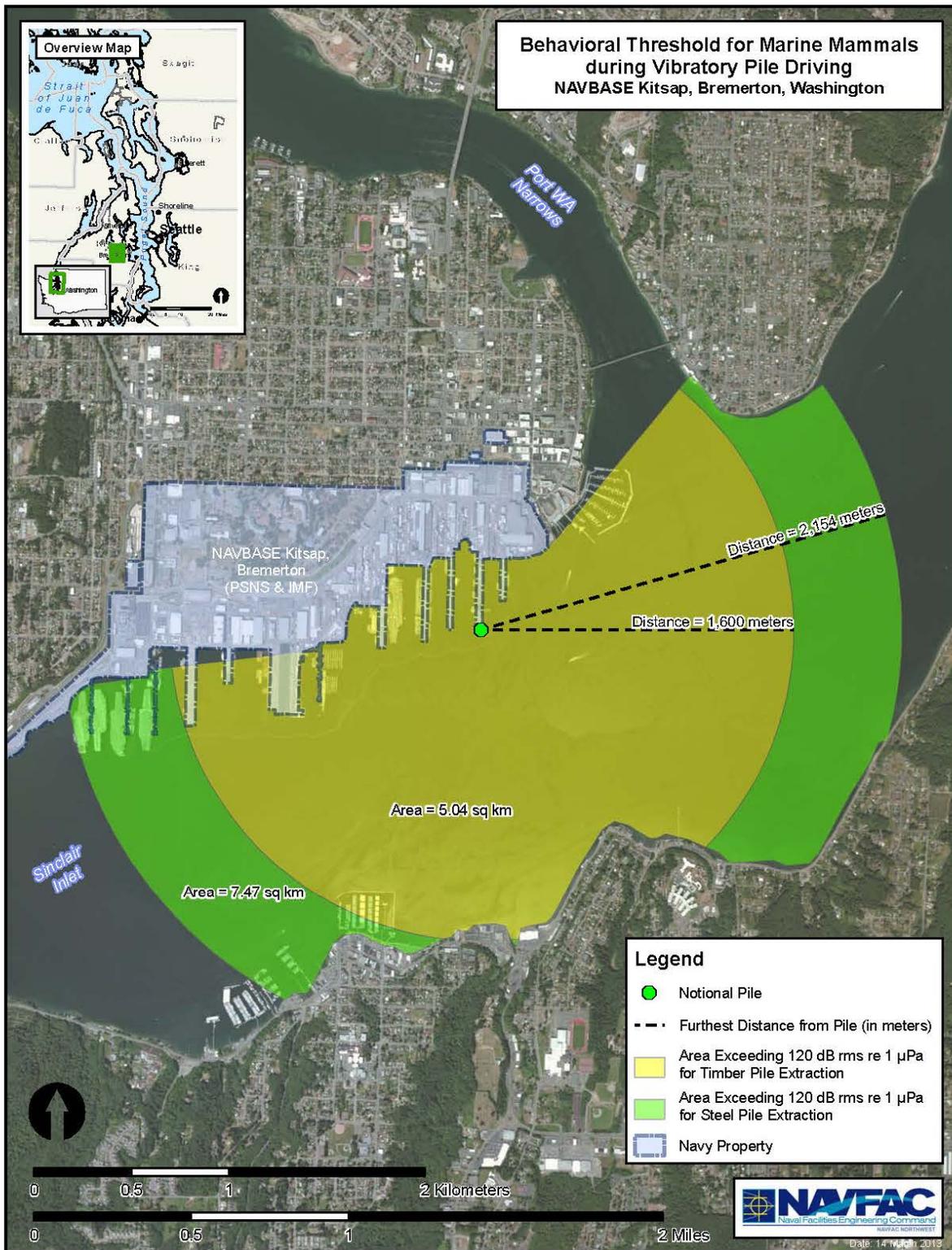
<b>Species</b>	<b>Densities (Sinclair Inlet)</b>
<b>Harbor seal (with haulout factor applied)</b>	<b>0.4267</b>
<b>California sea lion</b>	<b>0.13</b>
<b>Steller sea lion</b>	<b>0.037</b>
<b>Transient killer whale</b>	<b>0.002373</b>
<b>Gray whale</b>	<b>0.00051</b>

Source: U.S. Department of the Navy. (2013). 3rd and 7th Fleet Navy Marine Species Density Database and NAVFAC Pacific Technical Report (Draft). 2013. Naval Facilities Engineering Command Pacific, Pearl Harbor, HI.

**Appendix B. Zone Of Influence Maps at Naval Base Kitsap Bremerton**



Figure B-1. Areas Exceeding the Behavioral and Injury Thresholds for Marine Mammals during Impact Pile Driving for a Representative Pile at NAVBASE Kitsap Bremerton



**Figure B-2. Behavioral Threshold for Marine Mammals during Vibratory Pile Removal at NAVBASE Kitsap Bremerton**

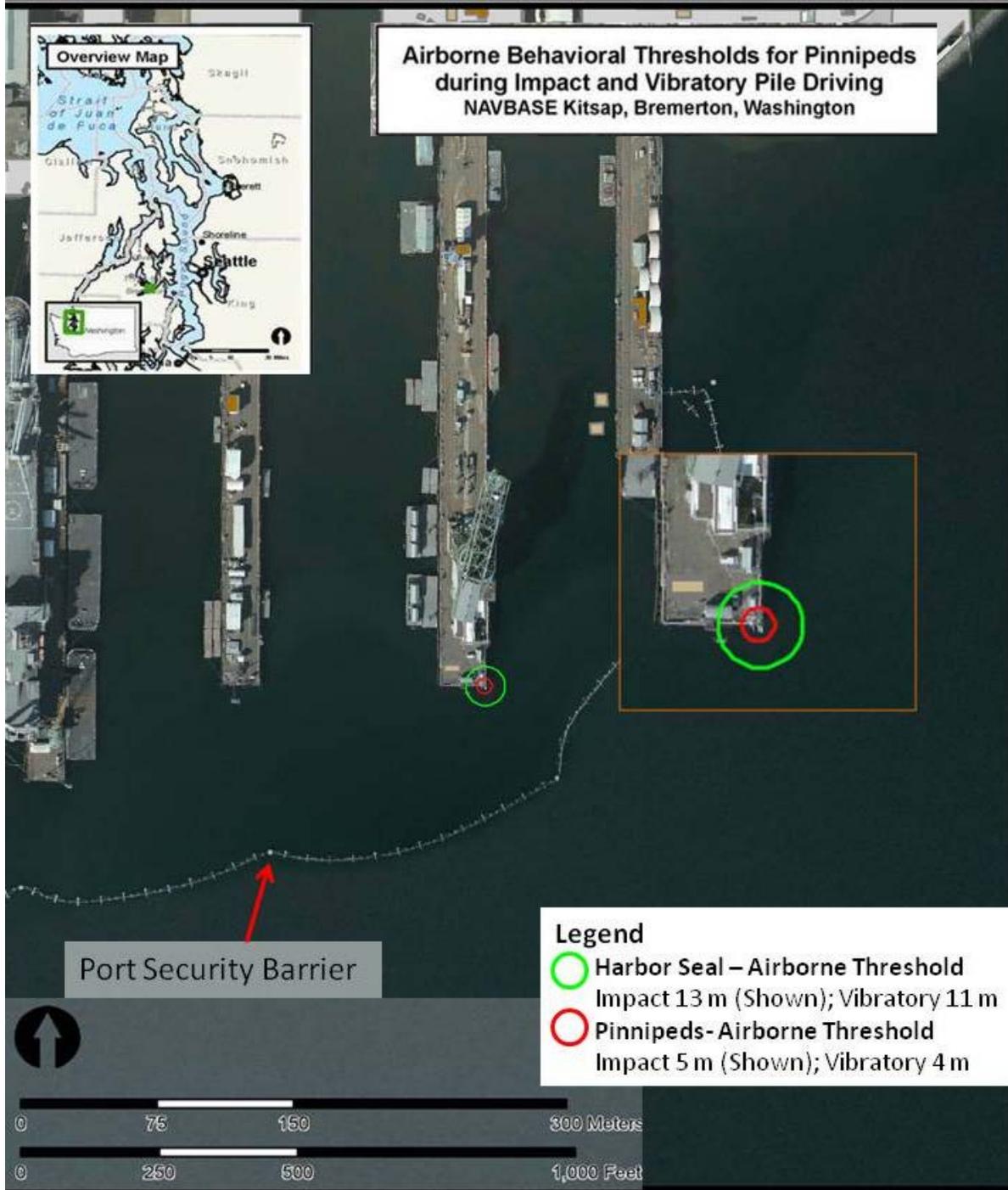


Figure B-3. Airborne Behavioral Thresholds for Pinnipeds during Impact Pile Driving and Vibratory Pile Removal at NAVBASE Kitsap Bremerton

## **Appendix C. Marine Mammal Monitoring Plan**

**NAVBASE Kitsap Bremerton**  
**Pier 6 Pile Replacement Project**  
**Marine Mammal Monitoring Plan**

June 2013

In accordance with the NAVBASE Kitsap Pier 6 Incidental Harassment Authorization Request, marine mammal monitoring will be implemented during this project. Qualified marine mammal observers 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.

This project includes vibratory removal of 380 creosote treated pilings, 20 steel fender piles and impact pile driving of 330 concrete piling that will occur over three years. For impact pile driving there will be a small acoustic injury zone (SL sounds are greater than 180 dB). For vibratory pile removal and driving, no injury will occur (SL sounds are less than 180 dB), and so will result in a Level B acoustical harassment ZOI only. This zone is calculated to extend to the 120 dB (nonpulse) isopleth for vibratory pile removal. However, land is intersected before this extent is reached directly south, at a maximum of 1,600 meters and to the east at 1,700 meters (Figure 1). For impact driving of concrete piles, the zone of Level B acoustical harassment is much smaller, at 117 meters (Figure 2).

The Navy or their contractor will conduct briefings between the construction supervisors and the crew and marine mammal observer(s) prior to the start of pile-driving activity, marine mammal monitoring protocol and operational procedures.

Prior to the start of pile driving on any day, the Orca Network and/or Center for Whale Research will be contacted and/or data reviewed to find out the location of the nearest marine mammal sightings. The Orca Sightings Network consists of a list of over 600 (and growing) residents, scientists, and government agency personnel in the U.S. and Canada. ‘Sightings’ information collected by the Orca Network includes detection by hydrophone. With this level of coordination in the region of activity, the Navy will be able to get real-time information on the presence or absence of whales before starting any pile removal or driving.

**Monitoring to Estimate Take Levels for California Sea Lions and Harbor Seals**

The Navy proposes the following Marine Mammal Monitoring Plan in order to estimate project Level B acoustical harassment take levels in the ZOI:

- To verify the required monitoring distance, the vibratory Level B acoustical harassment ZOI will be determined by using a range finder or hand-held global positioning system device.
- The vibratory Level B acoustical harassment ZOI will be monitored for the presence of marine mammals 15 minutes before, during, and 30 minutes after any pile removal or driving activity.
- Monitoring will be continuous unless the contractor takes a significant (30 minutes or greater) break-then the 15 minutes before, during, and 30 minutes monitoring sequence will begin again.

- If marine mammals are observed, their location within the ZOI, and their reaction (if any) to pile-driving activities will be documented.
- During vibratory pile removal, four land-based biologists will monitor the area including two at the pier work site, one at the eastern extent of the ZOI in the Manette neighborhood of Bremerton, and one at the southern extent of the ZOI near the Annapolis ferry landing in Port Orchard. Additionally, one boat with a biologist will travel through the monitoring area (Figure 1). This zone is considered a realistic area for visual monitoring for vibratory extraction of both steel and wood piles due to the limited number of steel piles and high number of wood piles.
- During impact hammering, one land-based-biologists will monitor the area from the pier work site (Figure 2).
- A shutdown zone of 10 meters will be implemented surrounding each pile for vibratory and impact hammering to ensure no physical impacts occur.
- If a marine mammal approaches or enters a shutdown zone during impact or vibratory pile driving, work will be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or 15 minutes have passed without re-detection of the animal.

### **Monitoring to Comply with Killer Whales, Grey Whales and Steller Sea Lions**

The Navy proposes the following Marine Mammal Monitoring Plan in order to ensure no takes to killer whales, grey whales, and Steller sea lions in the ZOI:

- During vibratory pile removal, four land-based biologists will monitor the area including two at the pier work site, one at the eastern extent of the ZOI in the Manette neighborhood of Bremerton, and one at the southern extent of the ZOI near the Annapolis ferry landing in Port Orchard. Additionally, one boat with a biologist will travel through the monitoring area (Figure 1) completing an entire loop approximately every 30 minutes. If any killer whales, grey whales (or any cetacean), or Steller sea lions are observed, pile removal will not begin. This zone is considered a realistic area for visual monitoring for vibratory extraction of both steel and wood piles due to the limited number of steel piles and high number of wood piles.
- During impact hammering, one land-based-biologist will monitor the area from the pier work site. If any killer whales, grey whales, or Steller sea lions are observed, pile removal will not begin.
- If any killer whales, grey whales, or Steller sea lion approaches or enters the disturbance zone during pile driving, work will be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the disturbance zone or 15 minutes have passed without re-detection of the animal.

### **Minimum Qualifications for Marine Mammal Observers**

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; dates and times when marine mammals were present at or within the defined shut-down safety or Level B acoustical harassment ZOI; dates and times when in water construction activities were suspended to avoid injury from impact pile driving; etc.

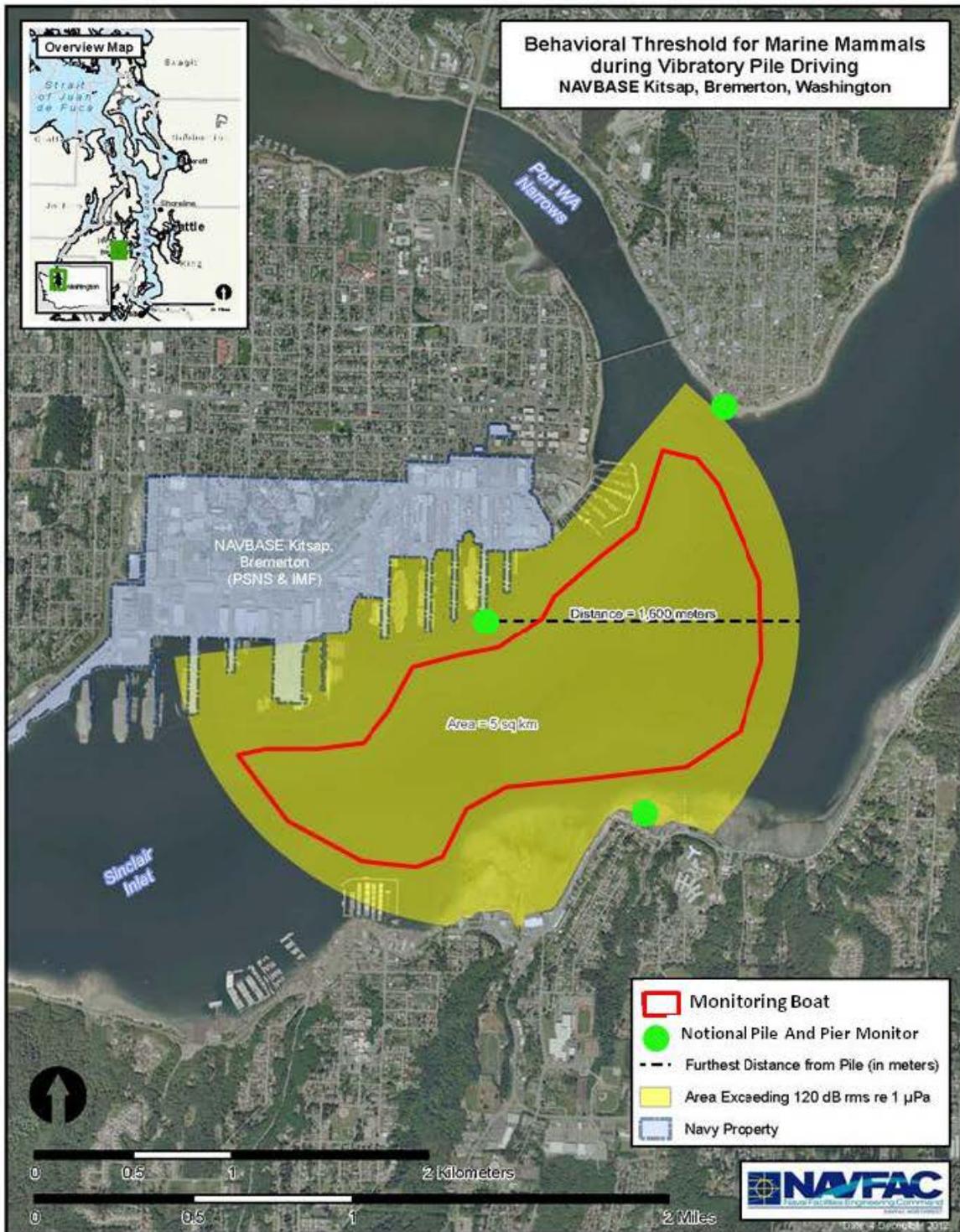


Figure 1.



Figure 2.

## **Appendix C Cultural Resources**

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Allyson Brooks Ph.D., Director  
State Historic Preservation Officer

February 19, 2013

Capt. P. M. Dawson  
Commanding Officer  
Naval Base Kitsap  
120 South Dewey St.  
Bremerton, WA 98314-5020

Attn: Eric Mollerstuen

In future correspondence please refer to:

Log: 021913-16-USN

Property: Naval Base Kitsap Bremerton / Puget Sound Naval Shipyard NHL

Re: Fender System Repair at Pier 6

Dear Capt. Dawson:

Thank you for contacting the Washington State Department of Archaeology and Historic Preservation (DAHP). The above referenced project has been reviewed on behalf of the State Historic Preservation Officer under provisions of Section 106 of the National Historic Preservation Act of 1966 (as amended) and 36 CFR Part 800. My review is based upon documentation contained in your communication as well as a letter from our office dated May 17, 2010 regarding temporary fender pile replacement.

First, I agree with the Area of Potential Effect (APE) as described in your consultation letter. I also concur that the proposed fender pile replacement will have "NO ADVERSE EFFECT" on Pier 6, a contributing property to the Puget Sound Naval Shipyard National Historic Landmark District. If additional information on the project becomes available, or if any archaeological resources are uncovered during construction, please halt work in the area of discovery and contact the appropriate Native American Tribes and DAHP for further consultation.

Thank you for the opportunity to review and comment. If you have any questions, please contact me.

Sincerely,

Nicholas Vann  
Historical Architect  
(360) 586-3079  
Nicholas.Vann@dahp.wa.gov

cc: Hank Florence, NPS



**From:** [Vann, Nicholas \(DAHP\)](#)  
**To:** [Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32](#)  
**Subject:** Re: Fender System Repair at Pier 6, Naval Base Kitsap Bremerton  
**Date:** Monday, August 12, 2013 18:01:28

---

Eric,

Thanks for the update. Our concurrence remains unchanged, as well.

Best,  
Nick

-----  
Nicholas Vann  
DAHP Historical Architect  
c (360) 628-2170

On Aug 12, 2013, at 4:29 PM, "Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32"  
<[eric.mollerstuen@navy.mil](mailto:eric.mollerstuen@navy.mil)> wrote:

> Hello Nick,  
>  
> We have some additional information on the subject project [Log # 021913-16-USN]. The  
Environmental Assessment for this project lists total # of new concrete piles to be installed as 330 while  
our original Section 106 letter to DAHP lists the total as 300 [216+84].  
>  
> 330 is the correct # of new piles. The change in new piles does not alter our determination that this  
undertaking will not adversely affect historic properties or those contributing to the NHL.  
>  
> Please let me know if you need any additional information.  
>  
> V/r,  
> Eric Mollerstuen  
> Puget Sound Naval Shipyard and Intermediate Maintenance Facility  
> Environmental, Code 106.32  
> (360) 476-9384  
>  
>  
>  
> -----Original Message-----  
> From: Vann, Nicholas (DAHP) [<mailto:nicholas.vann@dahp.wa.gov>]  
> Sent: Tuesday, February 19, 2013 1:44 PM  
> To: Mollerstuen, Eric W, CIV PSNS/IMF, Code 106.32  
> Cc: Hank Florence  
> Subject: Fender System Repair at Pier 6, Naval Base Kitsap Bremerton  
>  
> Eric:  
>  
>  
>  
> Please see attached letter of concurrence regarding fender pile replacement at Pier 6. Please let me  
know if you have any questions.  
>  
>  
>  
> Best,  
>



DEPARTMENT OF THE NAVY  
NAVAL BASE KITSAP  
126 SOUTH DEWEY ST  
BREMERTON, WA 98314-5020

5090  
Ser PRB4/00072  
25 Jan 13

Dr. Allyson Erooks, PhD  
Washington State Historic Preservation Officer  
Department of Archaeology & Historic Preservation  
P.O. Box 48343  
Olympia, WA 98504-8343

Dear Dr. Brocks:

SUBJECT: FENDER SYSTEM REPAIR AT PIER 6, NAVAL BASE KITSAP  
BREMERTON

Naval Base (NAVBASE) Kitsap is initiating consultation in accordance with Section 106 of the National Historic Preservation Act as amended and 36 Code of Regulations (CFR) Part 800 for a proposed undertaking at NAVBASE Kitsap Bremerton that repairs the Pier 6 fender system. The Area of Potential Effect (APE) for this undertaking is the footprint of Pier 6.

The principle purpose of the fender system is to prevent Navy vessels and the pier from being damaged during vessel mooring or berthing. The existing Pier 6 fender system is deteriorated and insufficient for berthing large Navy vessels such as aircraft carriers without risk of damaging the pier's structural integrity. The proposed undertaking replaces deteriorated creosote treated timber fender and reaction piles, steel pipe fender piles, creosote treated timber chocks, wales, steel access ladders, and steel rope guards at Pier 6. Renovation installs new pre-stressed concrete reaction, fender, and corner dolphin piles, galvanized steel wale system, rope guards and ladders. The proposed undertaking is essential to ensure a critical ship maintenance asset is not jeopardized as continued deterioration leaves the pier vulnerable to vessel impacts. This work is identical to prior projects that repaired the fender systems for Piers 3 and 7 at NAVBASE Kitsap Bremerton.

The proposed project includes:

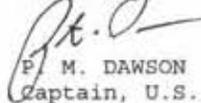
- Removal of approximately 380 creosote treated timber fender and corner dolphin piles.
- Removal of approximately 20 steel pipe fender piles.

- 
- Removal of deteriorated creosote timber chocks, wales, steel access ladder, and steel rope guards.
  - Installation of approximately 216 pre-stressed concrete fender and corner dolphin piles.
  - Installation of approximately 84 pre-stressed concrete reaction piles.
  - Installation of galvanized steel wale system, rope guards, and access ladders.
  - Installation of high density plastic rubbing strips.
  - Installation of a cathodic protection system.

Pier 6 is a contributing property to the Puget Sound Naval Shipyard National Historic Landmark (NHL) district and played an important role in the repair effort during World War II (WWII). Pier 6's most striking feature is the 250-ton hammerhead crane located near the end of the pier. This undertaking will repair the structural integrity of Pier 6 so that it can continue to be utilized for ship berthing and repair work.

NAVBASE Kitsap has determined that this undertaking will not adversely affect historic properties or those contributing to the NHL. We look forward to receiving your concurrence with our defining of the APE and finding of effect within 30 days of receipt of this letter. If you have any questions, please contact Mr. Eric Mollerstuen at telephone number (360) 476-9384 or email [eric.mollerstuen@navy.mil](mailto:eric.mollerstuen@navy.mil).

Sincerely,



P. M. DAWSON  
Captain, U.S. Navy  
Commanding Officer

Enclosure (1) Map

Enclosure (2) Historic Property Inventory Forms

Enclosure (3) Photographs and Project Drawings



**PSNS**  
INVENTORY

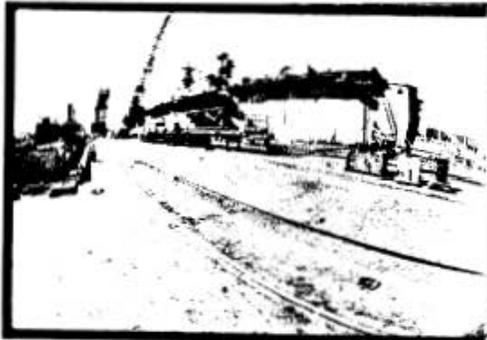
**HISTORIC SURVEY  
PUGET SOUND  
NAVAL SHIPYARD**

Facility No. 716
------------------------

NAME OF STRUCTURE PIER # 6  
 Construction Date 1926 Alterations/Additions  
 Uses: Original Pier # 6 (Remod- 26,27,41,46,47,52,58,60,61,  
 WWII Pier # 6 65,67,71,75,76)  
 Present Pier # 6

DESIGNED BY NAVY YARD PUGET SOUND DATE 1925

DESCRIPTION: Condition Good Altered No Original Site Yes



Structure 716 is Pier # 6, measuring 1320 feet in length and 100 feet in width. Constructed in 1926, the pier is a concrete deck on pilings. The concrete deck is paved with asphalt paving. The major feature of the pier is crane number 28, a 250 ton stationary crane.

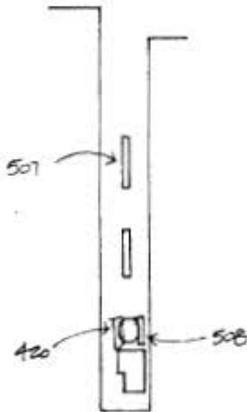
Occupying the pier are a number of buildings constructed of various materials.

Building 420 is a power plant with cast-in-place concrete walls.

Building 508 is a concrete and metal shed.

Building 839 is a large multi-story metal building constructed in 1968.

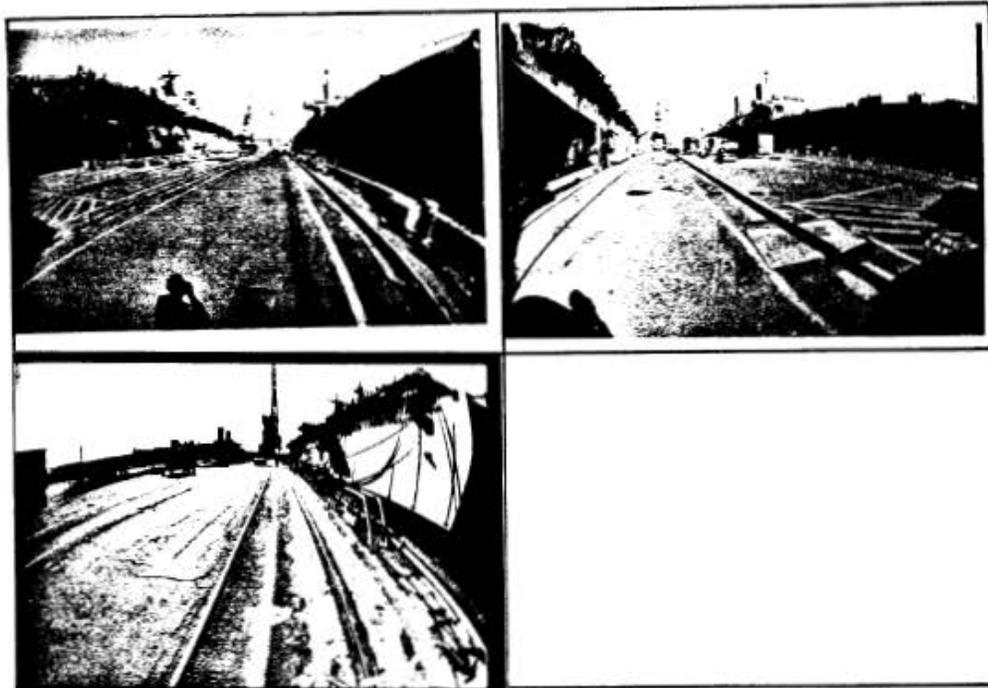
Building 507 is a concrete structure with applied walls of CMU and chain link fenced transformer areas. The building has a slightly pitched membrane roof.



SIGNIFICANCE: Period 1922-1949 Area of Significance Repair  
1. x 2. 3. 4.

Pier #6 (Facility 716) was completed in 1926. It is located south of Facility 106 between Drydock #1 and #3. The pier is served by heavy crane rails, each side, and by railroad track, and, therefore, is an integral part of the repair facilities served by the crane and rail distribution system of the industrial yard. The 250 ton hammerhead crane (Facility 709), the symbol of Puget Sound Naval Shipyard, is located near the end of pier #6. The pier was designed by Navy Yard Puget Sound in 1925 under the direction of Public Works Officer Capt. W. H. Allen.

Although the photographic record of the use of any of the piers is limited, and the use of the hammerhead crane is also not documented, Pier #6 is one of the major repair and refitting piers  
 (cont)



NEGATIVE NO.

SP85-00992  
Bldg. #716

VIEW NORTH

VIEW NORTH

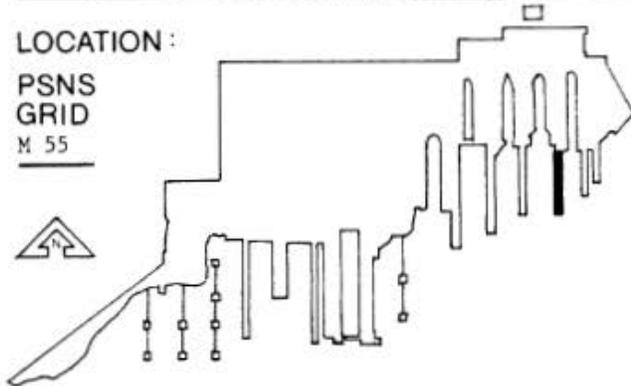
VIEW SOUTH

Facility No.

716

LOCATION:

PSNS  
GRID  
M 55

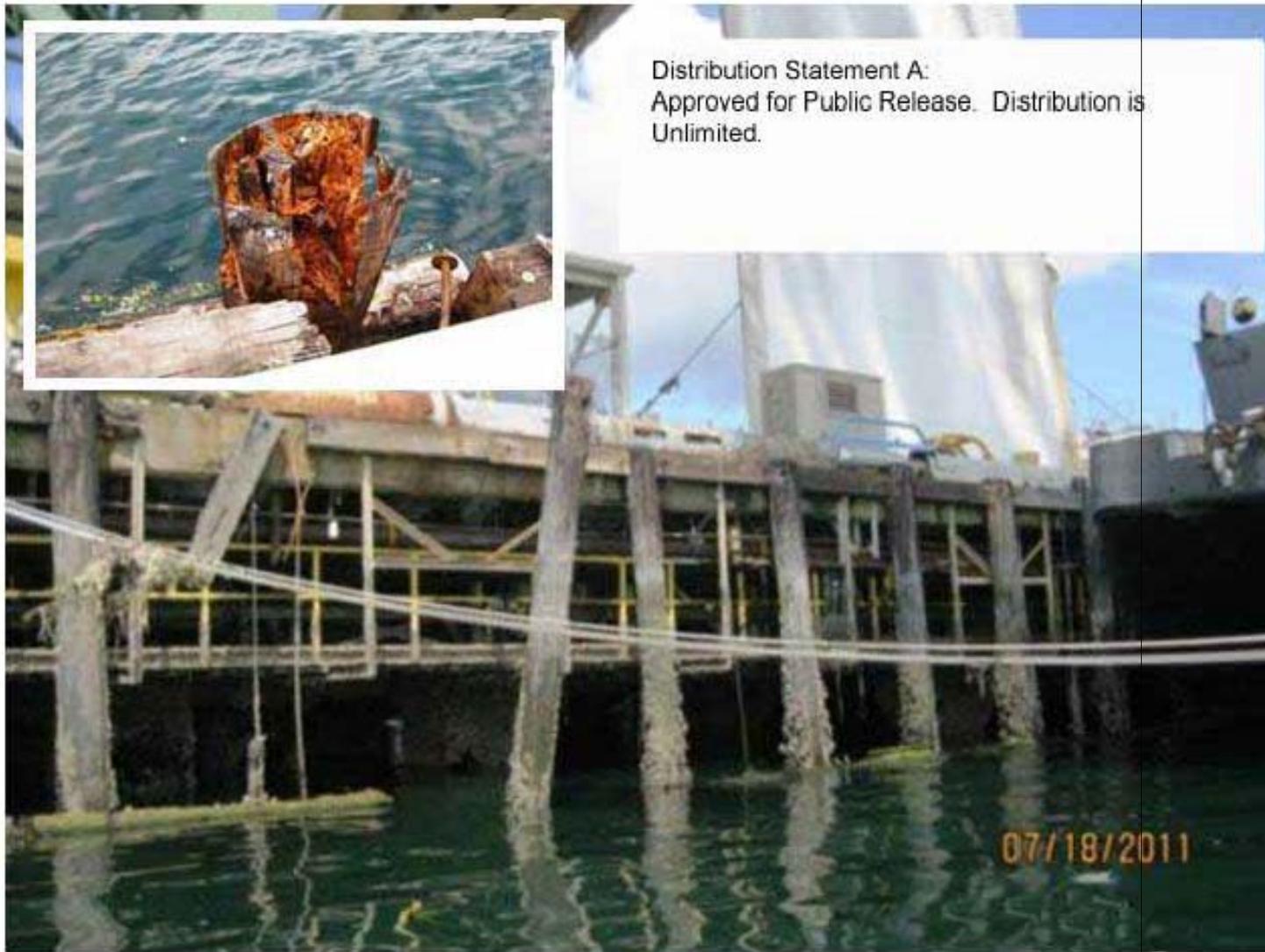


UTM Zone	Easting	Northing
10	527895	5267180

Quadrangle Bremerton West  
scale 1:24,000

**CONTINUATION of SIGNIFICANCE**

of the yard. The photographic record indicates that the USS Tennessee (battleship) was moored at the pier in 1937, the USS California and USS New Mexico (battleships) were moored at the pier in the late 1930s, and the USS Saratoga (aircraft carrier) was moored at the pier in 1939. It is believed that the USS Pennsylvania (battleship) was moored at the pier in 1945. The pier is presumed to have played an important role in the repair of capital ships during WWII, and most likely was one of the most important facilities for dockside repair of the capital ships damaged in Pearl Harbor.



*Figure 1 Detail of Deteriorated Fender Piles at Pier 6*

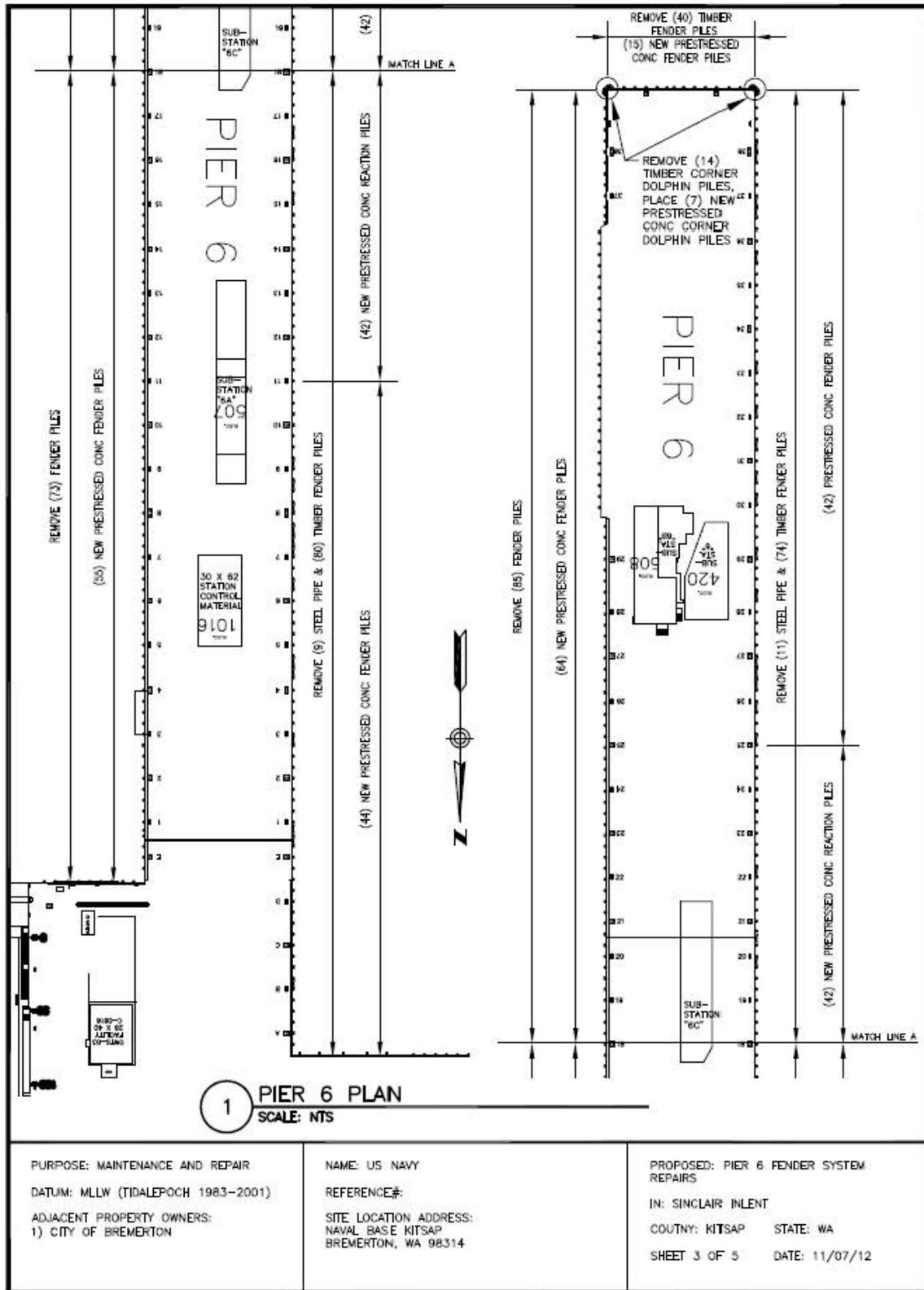


Figure 2 Fender Pile Locations

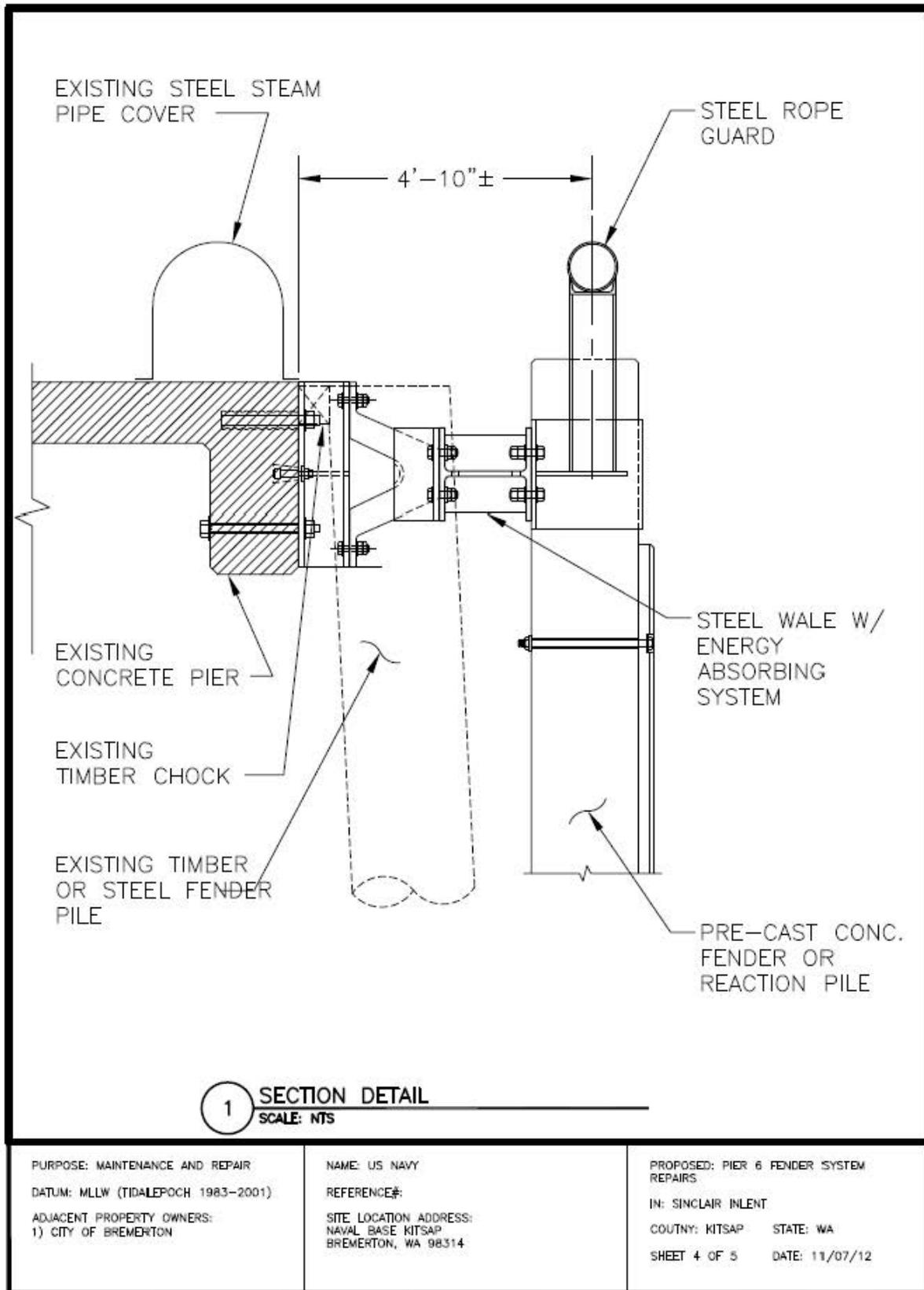


Figure 3 Typical Fender System Detail

**Appendix D**  
**Government to Government Consultations**

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DEPARTMENT OF THE NAVY  
NAVAL BASE KITSAP  
120 SOUTH DEWEY ST  
BREMERTON, WA 98314-5020

5090  
Ser PRB4/01023  
20 NOV 12

The Honorable Leonard Forsman, Chairman  
The Suquamish Tribe  
P. O. Box 498  
Suquamish, WA 98392

Dear Chairman Forsman:

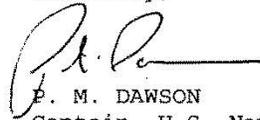
Thank you for meeting on October 31, 2012 to discuss several proposed projects at Naval Base Kitsap. I appreciate the time and energy the Tribe committed to the meeting and the valuable input you provided.

In our meeting the Navy presented information on the following projects: Pier B Mitigation, Jackson Park Public Private Venture, Electromagnetic Measurement Range, Service Pier Barge Moorage, Relocation of Floats to Delta Pier, Swimmer Net Test, Land Water Interface, Service Pier Extension, and Pile Repair and Replacement Program.

Enclosed are our notes of the meeting including responses to questions and comments. If you feel we've mischaracterized any issues or omitted any critical comments, please let me or my staff know.

Please do not hesitate to contact me or my staff if you have any questions on these or other topics. I can be reached at 360-627-4000 (work) 360-340-6543 (cell), or peter.m.dawson@navy.mil. My Environmental Director, Mr. Greg Leicht can be reached at 360-315-5411 (work), 360-649-1623 (cell), or gregory.leicht@navy.mil.

Sincerely,

  
P. M. DAWSON  
Captain, U.S. Navy  
Commanding Officer

- Enclosures:
1. Meeting Notes from Naval Base Kitsap - Suquamish Tribe Government-to-Government meeting on 31 October August 2012
  2. Presentation Slides from Naval Base Kitsap - Suquamish Tribe Government-to-Government meeting on 31 October 2012



**DEPARTMENT OF THE NAVY**  
NAVAL BASE KITSAP  
120 SOUTH DEWEY ST  
BREMERTON, WA 98314-5020

5090  
PRB4/00036  
14 Jan 13

The Honorable Leonard Forsman, Chairman  
The Suquamish Tribe  
P. O. Box 498  
Suquamish, WA 98392

Dear Chairman Forsman:

Thank you for meeting on December 14, 2012 to discuss several proposed projects at Naval Base Kitsap. I appreciate the time and energy the Tribe committed to the meeting and the valuable input you provided.

Our meeting was preceded by a dedication of the Elwood Point Interpretative Display. The Navy appreciates the history the Suquamish Tribe has for the Elwood Point area, and I personally appreciate the time you and tribal artisans spent making the display such a wonderful success.

In our meeting the Navy presented information on the following projects: Pier B Mitigation, Pier 6 Fender Pile Replacement and Culvert Replacement at Railroad Milepost 28.24. The Tribe presented information on the Dickerson Creek railroad culvert and marine mammals on the Bremerton Port Security Barriers.

Enclosed are our notes of the meeting including responses to questions and comments. If you feel we've mischaracterized any issues or omitted any critical comments, please let me or my staff know.

Please do not hesitate to contact me or my staff if you have any questions on these or other topics. I can be reached at (360)627-4000 (work), (360)340-6543 (cell), or peter.m.dawson@navy.mil. My Environmental Director, Mr. Greg Leicht, can be reached at (360)315-5411 (work), (360)649-1623 (cell), or gregory.leicht@navy.mil.

Sincerely,

A handwritten signature in black ink, appearing to be "P. M. Dawson".

P. M. DAWSON  
Captain, U.S. Navy  
Commanding Officer

- Enclosures: 1. Meeting Notes from Naval Base Kitsap - Suquamish Tribe Government-to-Government meeting on 14 December 2012  
2. Presentation Slides from Naval Base Kitsap - Suquamish Tribe Government-to-Government meeting on 14 December 2012

## **Appendix E Public Involvement**

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DEPARTMENT OF DEFENSE  
DEPARTMENT OF THE NAVY  
NOTICE OF AVAILABILITY FOR PUBLIC REVIEW  
ON A PILE REPLACEMENT PROJECT AT  
NAVAL BASE KITSAP BREMERTON,  
BREMERTON, WASHINGTON

The U.S. Navy invites the public to comment on a draft Environmental Assessment for a pile replacement project proposed in Sinclair Inlet at Naval Base (NAVBASE) Kitsap Bremerton.

The Navy is proposing to remove and replace approximately 400 deteriorated fender piles at Pier 6 at NAVBASE Kitsap Bremerton over a three-year period. The Proposed Action would remove approximately 380 creosote treated timber piles and 20 steel piles and replace them with approximately 330 prestressed concrete piles.

The purpose of the Proposed Action is to maintain the existing Pier 6 in working condition and to ensure structural integrity.

Construction is planned to begin in the winter of 2013 and is planned to be completed in the winter of 2016.

The Navy is accepting written comments on the Pier 6 Pile Replacement draft Environmental Assessment from May 27 through June 10, 2013. All written comments must be postmarked by June 10, 2013 to be considered during the public review period.

Please address written comments to: Naval Facilities Engineering Command Northwest, ATTN: Eric Beckley, 467 W St, 4th Floor, Bremerton, WA 98314 or send an email to [eric.beckley@navy.mil](mailto:eric.beckley@navy.mil).

For media queries, please contact Leslie Yuen-ger at [leslie.yuenger@navy.mil](mailto:leslie.yuenger@navy.mil)

A copy of this Environmental Assessment is available at:  
[https://portal.navfac.navy.mil/portal/page/portal/navfac/NAVFAC\\_WW\\_PP/NAVFAC\\_EFANW\\_PP](https://portal.navfac.navy.mil/portal/page/portal/navfac/NAVFAC_WW_PP/NAVFAC_EFANW_PP)  
May 27, 28, 29, 2013.....Ad#20133568

## **NAVY RESPONSE TO PUBLIC COMMENTS ON THE PIER 6 PILE REPLACEMENT EA**

The Navy received one comment letter from a private citizen during the draft EA public review period. A summary of comments received, as well as the Navy's responses, is provided below.

**Comment 1:** The Navy should use more environmentally friendly and more durable products for the construction of piles, similar to the lumber made from recycled plastic frequently used in constructing decks and park benches.

**Response:** Piles constructed from recycled plastics, often called polymeric piles are used in different applications throughout the Navy. Currently at NAVBASE Kitsap Bremerton, polymeric piles are used along the quay wall to prevent damage from small vessels. At Pier 6 the need to protect the pier from the frequent movement of large vessels of varying design requires the use of more stable prestressed concrete piles. Concrete piles are considered an environmentally preferred alternative to the current creosote piles which are known to leach toxic material.