Request for an
Incidental Harassment Authorization

Under the
Marine Mammal Protection Act

Bremerton Ferry Terminal Wingwalls Replacement Project

October 2012

Submitted To:
National Marine Fisheries Service
Office of Protected Resources
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Abbreviations and Acronyms

BMP	best management practices
CA-OR-WA	California-Oregon-Washington
CFR	Code of Federal Regulations
dB	decibels
DPS	Distinct Population Segment
Ecology	Washington State Department of Ecology
ESA	Endangered Species Act
FR	Federal Register
HPA	Hydraulic Project Approval
Hz	hertz
IHA	Incidental Harassment Authorization
IWC	International Whaling Commission
kHz	kilohertz
kJ	kilojoules(s)
km	kilometer(s)
m	meters
Makah	Makah Indian Tribe
MLLW	Mean Low-Low Water
MHHW	Mean High-High Water
MM	mitigation measure
MMPA	Marine Mammal Protection Act of 1972
NMFS	National Marine Fisheries Service
NMML	National Marine Mammal Laboratory
NOAA	National Oceanographic Atmospheric Administration
NOAA Fisheries	National Oceanic Atmospheric Administration/National Marine Fisheries Service
NTU	nephelometric turbidity units
OHW	ordinary high water
PBR	Potential Biological Removal

PSAMP	Puget Sound Ambient Monitoring Program
RCW	Revised Code of Washington
RL	Received Level
RMS	root mean square
SAR	Stock Assessment Report
SEL	Sound Exposure Level
SL	Source Level
SPCC	Spill Prevention, Control, and Countermeasures Plan
SPL	Sound Pressure Level
TL	Transmission Loss
TTS	Temporary Threshold Shift
μPa	micro-Pascals
UHMW	Ultra High Molecular Weight
USFWS	United States Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation
WSF	Washington State Department of Transportation Ferries Division
ZOI	Zone of Influence

1.0 Description of the Activity

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

The Washington State Department of Transportation (WSDOT) Ferries Division (WSF) operates and maintains 19 ferry terminals and one maintenance facility, all of which are located in either Puget Sound or the San Juan Islands (Georgia Basin) (Figure 1-1). Since its creation in 1951, WSF has become the largest ferry system in the United States (U.S.), operating 28 vessels on 10 routes (Figure 1-1) with over 500 sailings each day.

Figure 1-1 Washington State Ferry System Route Map

To improve, maintain, and preserve the terminals, WSF conducts construction, repair and maintenance activities as part of its regular operations. One of these projects is the replacement of wingwall structures at the Bremerton ferry terminal, and is the subject of this Incidental Harassment Authorization (IHA) request. The proposed projects will occur in marine waters that support several marine mammal species. The Marine Mammal Protection Act of 1972 (MMPA) prohibits the taking of marine mammals, which is defined as to "harass, hunt, capture or kill, or attempt to harass, hunt, capture or kill," except under certain situations. Section 101 (a)(5)(D) allows for the issuance of an IHA, provided an activity results in negligible impacts on marine mammals and would not adversely affect subsistence use of these animals.

The project's timing and duration and specific types of activities (such as pile driving) may result in the incidental taking by acoustical harassment (Level B take) of marine mammals protected under the MMPA. WSDOT/WSF is requesting an IHA for the six marine mammal species (harbor seal, California sea lion, Steller sea lion, killer whale, gray whale, humpback whale) that may occur in the vicinity of the projects.

1.2 Project Purpose and Need

Wingwalls (Figure 1-2/1-3) are structures that protect the vehicle transfer span from direct vessel impact, and help guide and hold the vessel in position when the ferry is docked. There are two types of wingwalls common at WSF ferry terminals: timber and steel. Timber wingwalls (Figures 1-4) are older structures, typically constructed of creosote treated pilings lashed together by galvanized steel rope, and reinforced as needed with 13” plastic/steel core piles. The current timber wingwalls at the Bremerton terminal are near the end of their design life, and must be replaced with steel wingwalls to ensure safe and reliable functioning of the terminal.

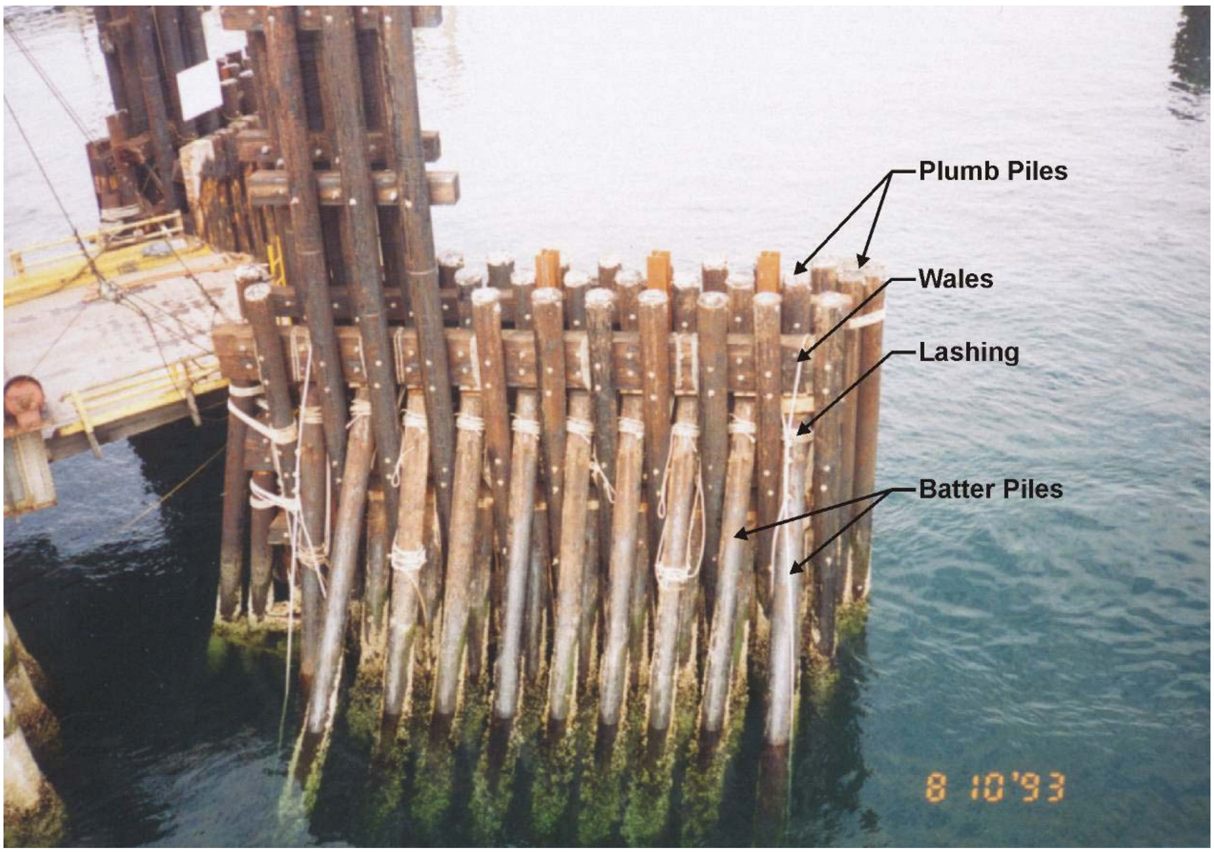

Figure 1-2 Typical timber wingwall – back side

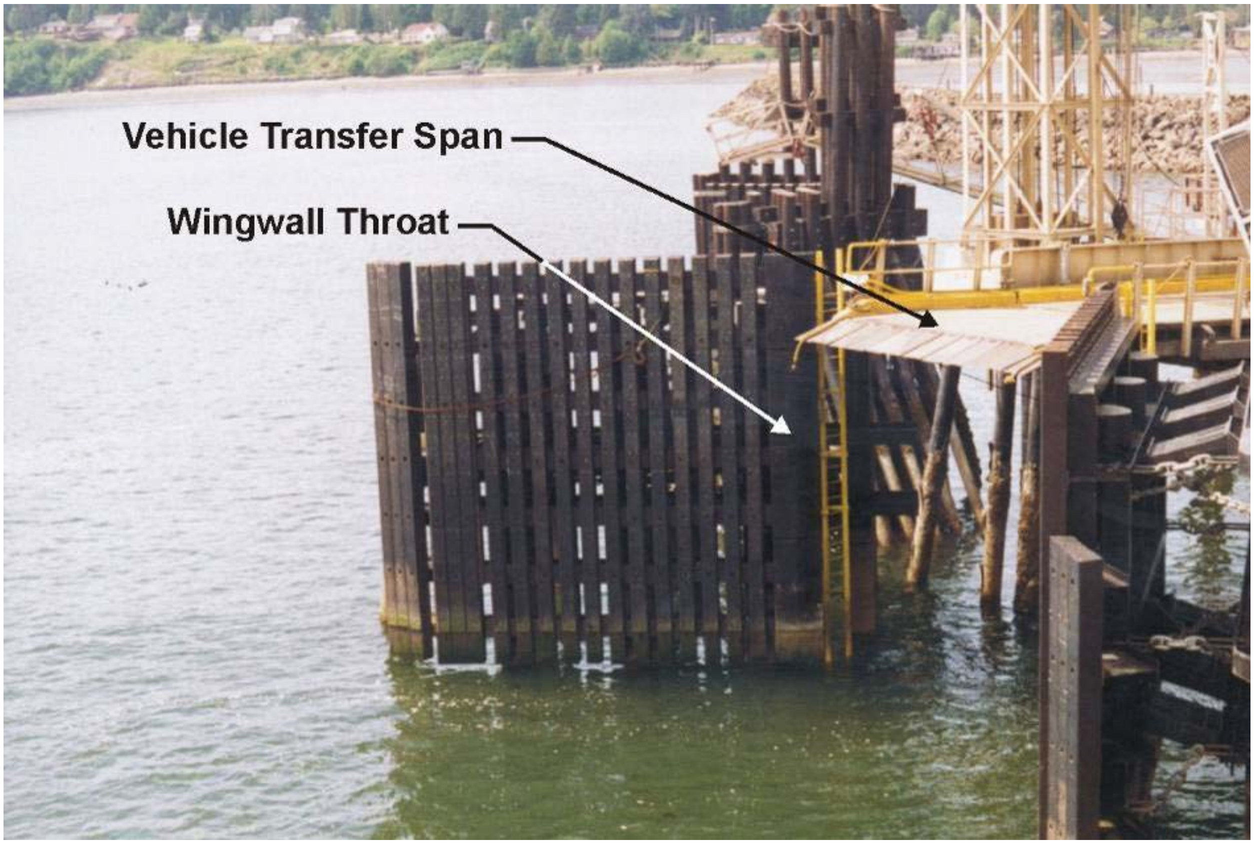

Figure 1-3 Typical timber wingwall face

Steel wingwalls (Figure 1-4) are designed similarly to timber wingwalls in that they contain two rows of plumb piling and one row of batter piling or a third row of plumb piling. A rubber fender between the first and second rows of plumb piling absorbs much of the energy and returns the front row to its original vertical position after an impact. The second row of plumb piling is driven deeper into the sediment and braced with batter piling to minimize movement of the structure. Both pile rows are welded together with horizontal I-beams to which rubbing timbers are attached faced with UHMW plastic, which acts as a rub surface for the ferry. They are designed for a 25-year life span.

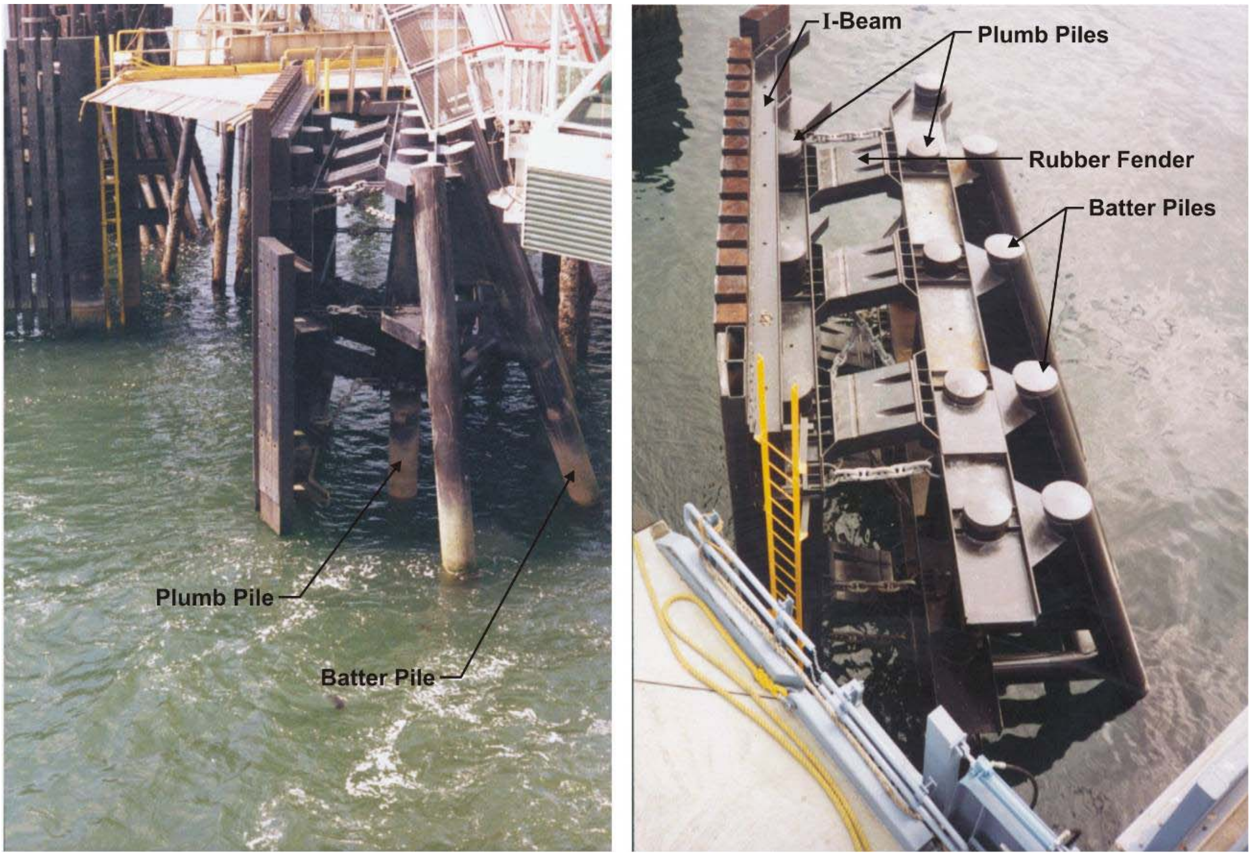

Figure 1-4 Typical Steel Wingwalls

1.3 Project Setting and Land Use

The Bremerton Ferry Terminal, serving State Route 304, is located in Bremerton, Kitsap County, Washington. The terminal is located in Section 24, Township 24 North, Range 1 East, and is adjacent to Sinclair Inlet and Puget Sound (Figure 1-5). Land use in the area is a mix of residential, business and local parks. The Puget Sound Naval Shipyard is located to the immediate west of the ferry terminal, and the Bremerton Marina to the east. The city of Port Orchard is across from Bremerton

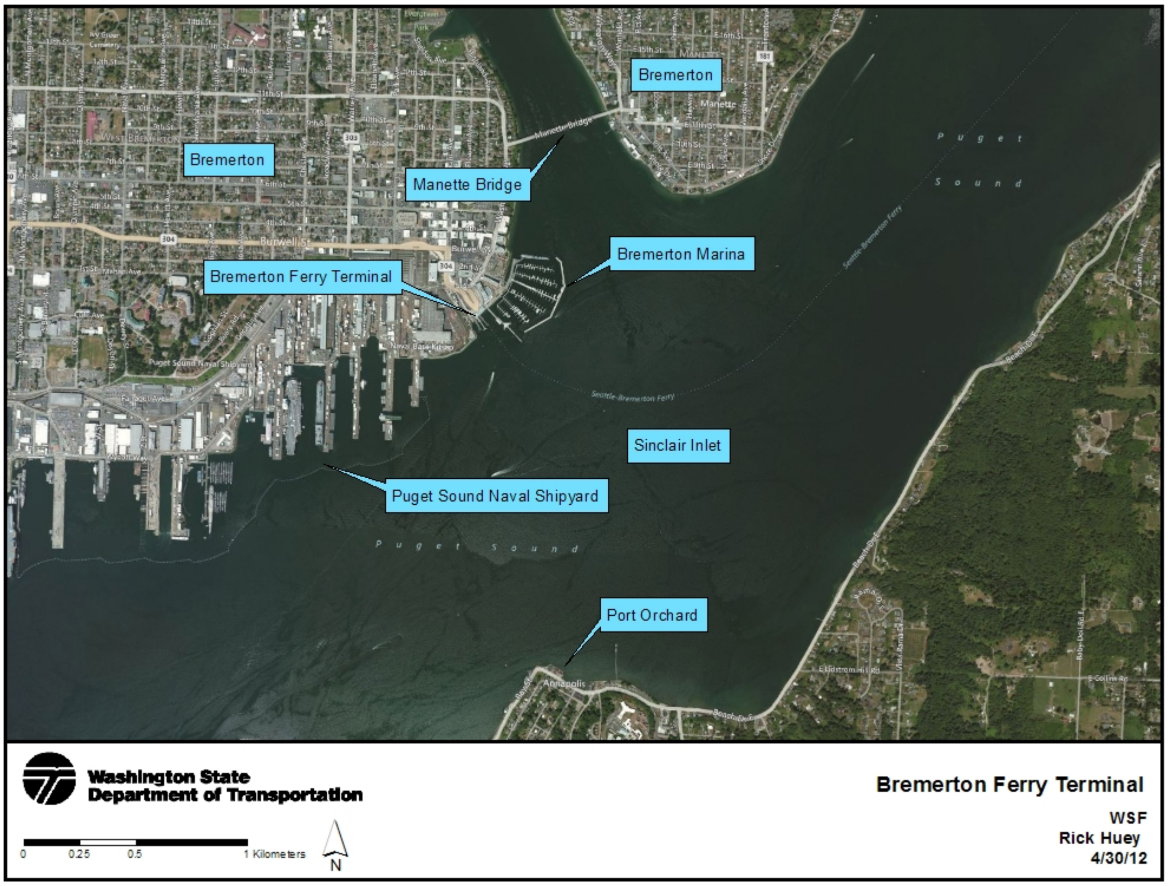

Figure 1-5 Bremerton Ferry Terminal Location

1.4 Project description

The project at the Bremerton Ferry Terminal is to replace the existing Slip 2 timber wingwalls with new standard steel design wingwalls (Figure 1-6/1-7) (Appendix A: Project Sheets).

Figure 1-6 Bremerton Ferry Terminal Wingwalls Replacement front view

Figure 1-7 Bremerton Ferry Terminal Wingwalls Replacement back view

The existing structures each have approximately 56 - 12" diameter creosote-treated timber piles, for a total of 112 timber piles. Each wingwall will be removed as a unit. The wingwall will be cut, lifted with a crane and placed on a barge. Remaining piles will then be removed using either a vibratory hammer or direct pull with a cable. A clamshell excavator will be used only if necessary.

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

In-water construction is planned to take place between September 2013 and February 2014. The on-site work will last approximately 8 weeks with actual pile removal and driving activities taking place over 11 days. All work at the Bremerton terminal will occur in water depths between -16 and -26 feet MLLW.

1.4.1 Construction Sequence

The following construction activities are anticipated:

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

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

1.5 Project Elements

The proposed project has two elements involving noise production that may impact marine mammals:

1. **Vibratory Hammer, Direct Pull and Clamshell Removal:** remove 112 timber piles.
2. **Vibratory Hammer Installation:** install 20 steel piles for the new wingwalls.

Each element is discussed separately below.

1.5.1 Vibratory Hammer Removal

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

Once unseated, the crane will continue to raise the hammer and pull the pile from the sediment. When the pile is released from the sediment, the vibratory hammer is disengaged and the pile is pulled from the water and placed on a barge for transfer upland. Figure 1-8 shows a timber pile being removed with a vibratory hammer. Vibratory removal will take approximately 10 to 15 minutes per pile, depending on sediment conditions.

The piling will be loaded onto the barge or into a container and disposed of offsite in accordance with State of Washington Administrative Code (WAC) 173-304 Minimum Functional Standards for Solid Waste Handling and mitigation measures in Section 11.0, Mitigation Measures, of this document.

Figure 1-8 Vibratory Hammer Removing a Timber Wingwall Pile

1.5.2 Direct Pull and Clamshell Removal

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

1.5.3 Vibratory Hammer Installation

Vibratory hammers are commonly used in steel pile installation where sediments allow and involve the same vibratory hammer used in pile extraction. The pile is placed into position using a choker and crane, and then vibrated between 1,200 and 2,400 vibrations per minute (Figure 1-9). The vibrations liquefy the sediment surrounding the pile allowing it to penetrate to the required seating depth. The type of vibratory hammer that will be used for the project will likely be an APE 400 King Kong (or equivalent) with a drive force of 361 tons.

Figure 1-9 Vibratory Hammer Driving a Steel Wingwall Pile

1.6 Sound Levels

1.6.1 Reference Underwater Vibratory Sound Source Levels

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

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

Based on in-water measurements at the WSF Friday Harbor Ferry Terminal, vibratory pile driving of a 24-inch steel pile generated 162 dB RMS measured at 10 meters (Laughlin 2010a).

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

1.6.2 Background Noise

Background noise is the sound level absent of the proposed activity (pile removal/driving in this case) while ambient sound levels are absent of human activity (NMFS 2009). Various factors contribute to background noise levels in marine waters: ship traffic, fishing boat depth sounders, waves, wind, rainfall, current fluctuations, chemical composition and biological sound sources (e.g., marine mammals, fish, shrimp) (Carr et al. 2006). It is important to compare background noise levels to the National Oceanic and Atmospheric Administration (NOAA) threshold levels designed to protect marine mammals to determine the zone of influence for noise sources.

For example, 120 dB_{RMS} is the threshold value for Level B acoustical harassment of marine mammals exposed to continuous noise sources (vibratory pile removal/driving noise). However, if background noise levels exceed 120 dB_{RMS}, for example 130 dB_{RMS}, then animals would not be exposed to "harassment level" sounds at less than 130 dB_{RMS} as those sounds no longer dominate; they are essentially part of the background. In this example, the 130 dB_{RMS} isopleth becomes the new project threshold for Level B take of marine mammals.

No in-water background noise data is available for the Bremerton terminal area, therefore no adjustments of the threshold for continuous noise sources will be made.

1.6.3 Underwater Transmission Loss

Underwater transmission loss has been described by Burgess et al. (2005):

> As sound propagates away from its source, several factors act to change its amplitude. These factors include the spreading of the sound over a wider area (spreading loss), losses to friction between water or sediment particles that vibrate with the passing sound wave (absorption), scattering and reflections from boundaries and objects in the sound's path, and constructive and destructive interference with one or more reflections of the sound off the surface or seafloor. The sound level that one would actually measure at any given distance from the source includes all these effects, and is called the received level. Received levels differ in dimensions from source levels, and the two cannot be directly compared. Received levels of underwater sound are usually presented in dB re 1 micro-Pascal (µPa), whereas the idealized source level at a distance of 1 m from the source is presented in dB re 1 µPa-m. The sum of all propagation and loss effects on a signal is called the transmission loss.

Transmission loss (TL) is characterized by the following equation:

$$TL = B*\log_{10}(R) + C*R$$

Where **B** represents the logarithmic (predominantly spreading) loss, **C** the linear (scattering and absorption) loss, and **R** the range from the source in meters.

Transmission-loss parameters vary with frequency, temperature, sea conditions, source depth, receiver depth, water depth, water chemistry, and bottom composition and topography. Logarithmic loss **B** is typically between 10 dB (10 Log R cylindrical spreading) and 20 dB (20 Log R spherical spreading). Linear loss **C** has several physical components, including absorption in seawater, absorption in the sub-bottom, scattering from inhomogeneities in the water column and from surface and bottom roughness, and (for RMS levels of transient pulses) temporal pulse-spreading (Greeneridge 2007). Linear loss is also a function of frequency and is less a factor in the lower frequencies in which pile driving sounds dominate. Further, linear loss is site-specific, which is why there is no generally accepted **C** value for estimating linear loss in the broadband.

NMFS has requested that the 15 Log R practical (or semi-cylindrical) spreading model, without considering for linear loss, be used to estimate distances to marine mammal noise thresholds.

1.6.4 Airborne Reference Sound Source Levels

While in-air sounds are not applicable to cetaceans, they are to pinnipeds, especially harbor seals when hauled out. Loud noises can cause hauled out seals to panic back into the water, leading to disturbance and possible injury to stampeded pups.

No unweighted in-air source level data is available for 13-inch timber pile removal, or for 24-inch vibratory pile driving. Unweighted in-air measurements of vibratory driving of a 30-inch steel pile collected during the 2010 Keystone Ferry Terminal Wingwalls Replacement Project ranged from 95-97.8 @ 50 ft. (Laughlin 2010b). Removal of 13-inch pile and driving of 24-inch pile in-air noise levels will be conservatively assumed to be the same as 30-inch pile driving.

1.6.5 Attenuation to NMFS Thresholds

NMFS has established disturbance and injury noise thresholds for marine mammals (Table 1-1). Determining the area(s) exceeding each threshold level (the zone of influence [ZOI]) is necessary to estimate the number of animals for the Level B acoustical harassment take request, and to establish a monitoring area. For the project in this application, there will be no impact pile driving. There is no Level A take during these projects, because the vibratory pile removal and driving source levels to not exceed the injury thresholds.

Table 1-1 Marine Mammal Injury and Disturbance Thresholds for Underwater and Airborne Noise

Marine Mammals	Airborne Noise from Marine Construction Activity Level at which Pinniped Haul-out Disturbance has been Documented	Vibratory Pile Driving Disturbance Threshold	Impact Pile Driving Disturbance Threshold	Injury Threshold
Cetaceans	N/A	120 dB_{RMS}	160 dB_{RMS}	180 dB_{RMS}
Pinnipeds	90 dB_{RMS} (unweighted) for harbor seals 100 dB_{RMS} (unweighted) for all other pinnipeds re: 20 µPa	120 dB_{RMS}	160 dB_{RMS}	190 dB_{RMS}

1.6.5.1 Vibratory Pile Driving (Underwater Noise)

If no site-specific in-water noise attenuation data is available, then the NOAA practical spreading model is used to determine the distances at which the vibratory pile removal or driving source levels are expected to attenuate down to the 120 dB RMS threshold. The NOAA practical spreading model distances are provided below:

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

Land mass is intersected before the extent of vibratory pile driving is reached, at a maximum of 4.7 km (2.9 miles). The ZOI for the Bremerton terminal is shown in Figure 1-10.

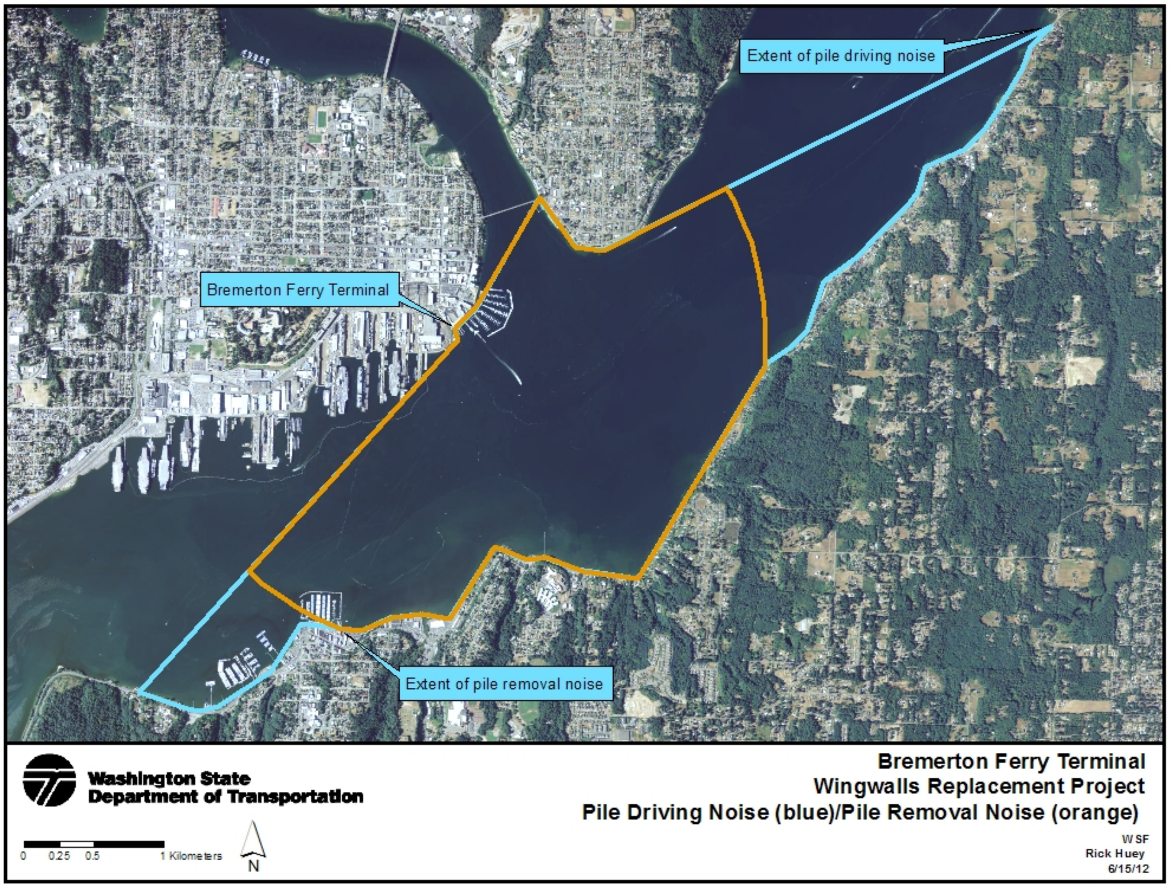

Figure 1-10 Bremerton Ferry Terminal Vibratory Hammer ZOI (120 dB threshold)

1.6.5.2 Pile Driving (Airborne Noise)

NMFS has established an in-air noise disturbance threshold of 90 dB_{RMS} (unweighted) for harbor seals, and 100 dB_{RMS} (unweighted) for all other pinnipeds.

No unweighted in-air data is available for 13-inch pile removal, or for 24- or 36-inch steel vibratory pile driving. Unweighted in-air measurements of vibratory driving of a 30-inch steel pile collected during the 2010 Keystone Ferry Terminal Wingwalls Replacement Project ranged from 95-97.8 @ 50 ft. (Laughlin 2010b). Removal of 13-inch pile and driving of 24-inch pile in-air noise levels will be conservatively assumed to be the same as 30-inch pile driving.

Using a conservative measurement of 97.8 @ 50 ft., and attenuating at 6 dBA per doubling distance overwater, in-air noise from vibratory pile removal and driving will attenuate to the 90 dB_{RMS} threshold within approximately 37 m/123ft, and the 100 dB_{RMS} threshold within approximately 12 m/39ft (Figure 1-11).

The closest documented California and Steller sea lion haul out sites near the Bremerton terminal are the Orchard Rocks near Manchester (6.5 miles E). Therefore, in-air disturbance will be limited to those animals moving through the immediate terminal area, within 12 m/39 ft of vibratory pile removal and driving.

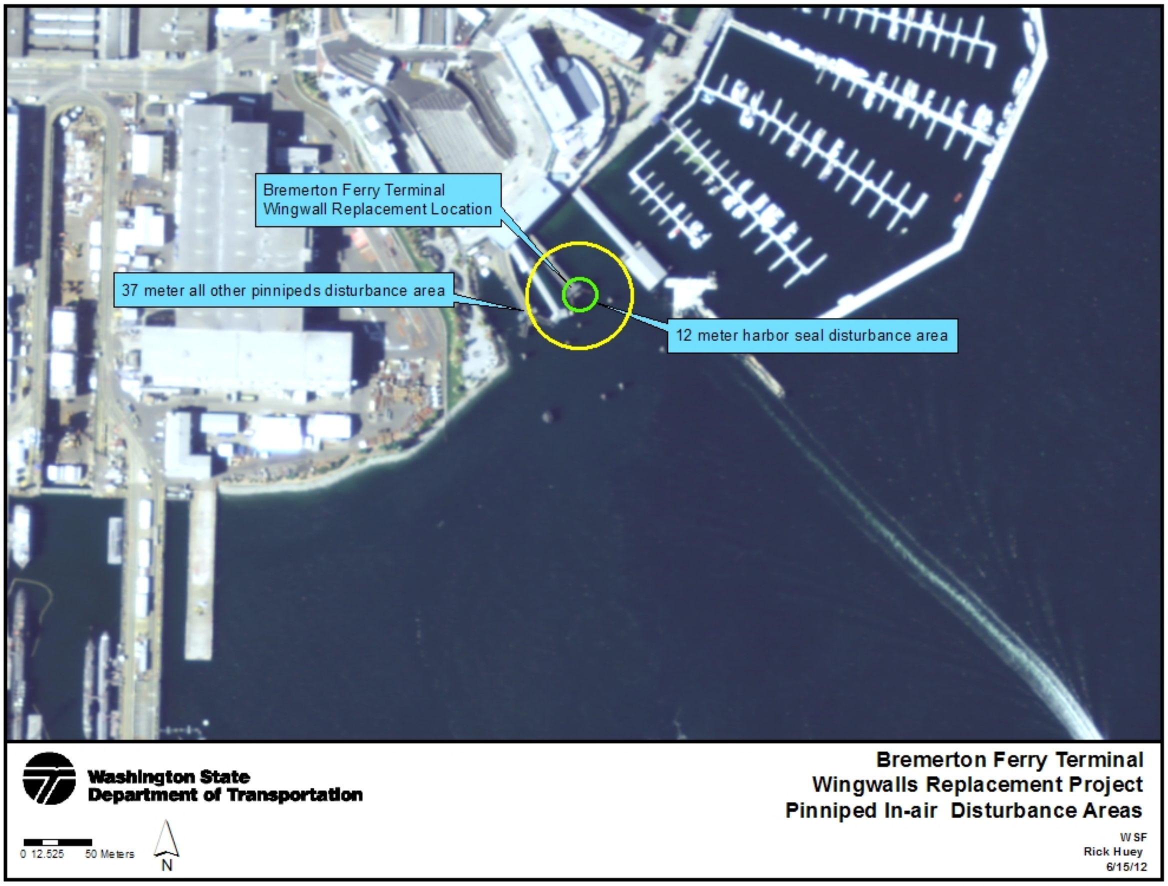

Figure 1-11 Pinniped In-air Disturbance Areas

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2.0 Dates, Duration, and Region of Activity

The date(s) and duration of such activity and the specific geographical region where it will occur.

2.1 Dates

Due to NMFS and the U.S. Fish and Wildlife Service (USFWS) in-water work timing restrictions to protect ESA-listed salmonids, planned WSF in-water construction is limited each year to July 16 through February 15. For this project, in-water construction is planned to take place between September 1, 2013 and February 15, 2014.

2.2 Duration

The number of days it will take to remove and install the pilings largely depends on the condition of the piles being removed and the difficulty in penetrating the substrate during pile installation. Duration estimates of each of the pile driving elements follow:

- The daily construction window for pile removal or driving will begin no sooner than 30 minutes after sunrise to allow for initial marine mammal monitoring, and will end at sunset (or soon after), when visibility decreases to the point that effective marine mammal monitoring is not possible.

- Vibratory pile removal of the existing timber piles will take approximately 10 to 15 minutes per pile. Vibratory removal will take less time than driving, because piles are vibrated to loosen them from the soil, then pulled out with the vibratory hammer turned off. Assuming the worst case of 15 minutes per pile (with no direct pull or clamshell removal), removal of 112 piles will take 28 hours over four days of pile removal (Table 2).

- Vibratory pile driving of the steel piles will take approximately 20 minutes per pile, with three to five piles installed per day. Assuming 20 minutes per pile, and three piles per day, driving of 20 piles will take 6 hours 45 minutes over seven days.

- The total worst-case time for pile removal is four days, and seven days for pile installation. The actual number of pile-removal/driving days is expected to be less (Table 2-1).

Table 2-1 Worst Case Pile Removal and Driving for the Bremerton Wingwalls Dolphin Replacement Project

Removal/Installed	Maximum Number of Piles	Time	Days
Vibratory Pile Removal	112	28 hrs.	4
Vibratory Pile Installation	20	6.75 hrs.	7

2.3 Region of Activity

The proposed activities will occur at the Bremerton Ferry Terminal located in Bremerton, Washington (see Figures 1-1 and 1-5).

3.0 Species and Numbers of Marine Mammals in Area

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

Section 3.0 has been combined with Section 4.0 for ease reading due. Section 3.0 requires a discussion of the species and numbers of marine mammals in the area. Section 4.0 requires a discussion of the status and distribution of the stock(s) and specifically:

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.

Each requested topic in Section 4.0 (status, distribution, and seasonal distribution [if known]) has been clearly marked as a subheading in Section 3.0 for ease of finding relevant information while consolidating the species-specific information into one place to avoid searching for information between similar chapters.

3.1 Species Present

Six species of marine mammals may be found in the Bremerton Ferry Terminal area (Table 3-1).

Table 3-1 Marine Mammal Species Potentially Present in Region of Activity

Species	ESA Status	MMPA Status	Timing of Occurrence	Frequency of Occurrence
Harbor Seal	Not listed	Non-depleted	Year-round	Common
California Sea Lion	Not listed	Non-depleted	August-April	Common
Steller Sea Lion	Threatened	Depleted	August-April	Rare
Killer Whale Southern Resident	Endangered	Depleted	September - May	Infrequent
Killer Whale Transient	Not listed	Depleted	September - May	Rare
Gray Whale	Delisted	Unclassified	January-May	Occasional
Humpback Whale	Endangered	Depleted	September-May	Rare

3.2 Pinnipeds

There are three species of pinnipeds that may be found in the Bremerton Ferry Terminal area: harbor seal (*Phoca vitulina richardsi*), California sea lion (*Zalophus californianus*) and Steller sea lion (*Eumetopias jubatus*). Harbor seals are the most common and only pinniped that breeds and remains in Puget Sound year-round.

3.2.1 Harbor Seal

Harbor seals are members of the true seal family (Phocidae). For management purposes, differences in mean pupping date (Temte 1986), movement patterns (Jeffries 1985; Brown 1988), pollutant loads (Calambokidis et al. 1985), and fishery interactions have led to the recognition of three separate harbor seal stocks along the west coast of the continental U.S. (Boveng 1988). The three distinct stocks are: 1) inland waters of Washington State (including Hood Canal, Puget Sound, Georgia Basin and the Strait of Juan de Fuca out to Cape Flattery), 2) outer coast of Oregon and Washington, and 3) California (Carretta et al. 2007a).

Pupping seasons vary by geographic region. For the southern Puget Sound region, pups are born from late June through September (WDFW 2012a). After October 1 all pups in the inland waters of Washington are weaned.

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

3.2.1.1 Numbers

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

The nearest documented harbor seal haulout site to the Bremerton ferry terminal is 8.5 km north and west (shoreline distance) (Figure 3-1). The number of harbor seals using the haulout is less than 100 (WDFW 2000).

From July 2006 to January 2007, a consultant completed 10 at-sea surveys in preparation for replacement of the WSDOT Manette Bridge, located in Bremerton. Marine mammals were recorded during these surveys: 29 harbor seals were observed in an area approximately the same as the Bremerton wingwalls project ZOI (Figure 3-2) (USDA 2007). Seals observed outside of the Bremerton ZOI were subtracted from the total observed (36) during this project. According to the dates on harbor seal observation tags in Figure 3-2, the most seals seen in any one day is two (given that two tags cover others, the dates may be the same underneath).

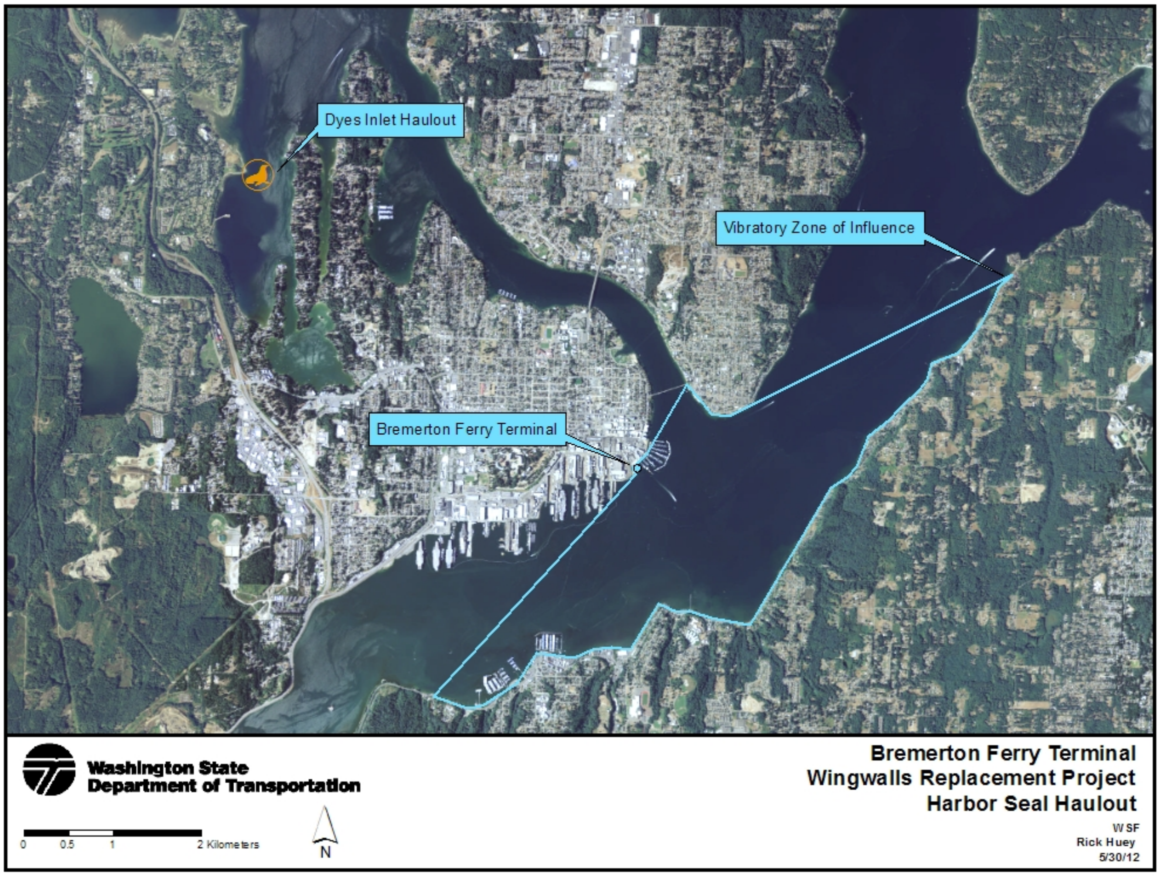

Figure 3-1 Bremerton Area Seal Haulout Site

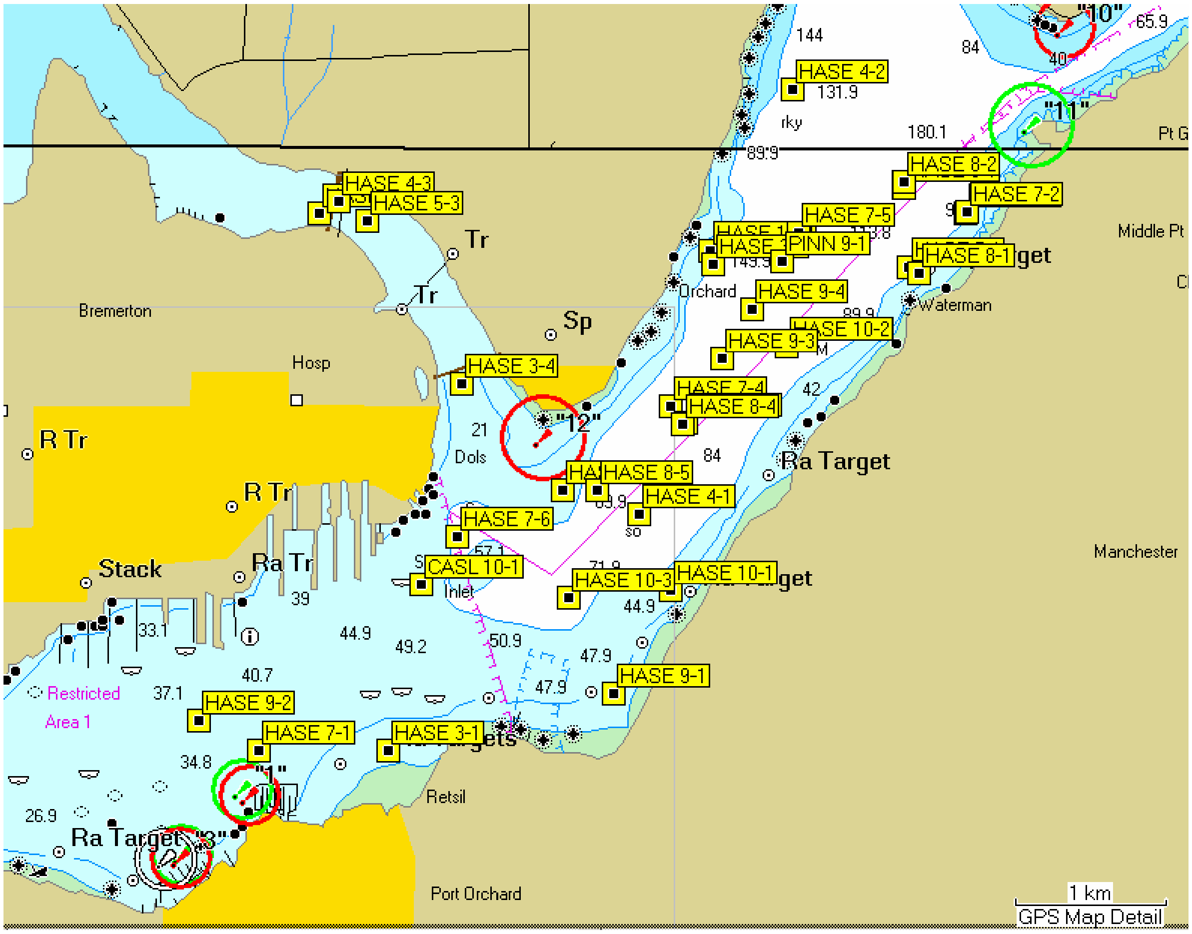

Figure 3-2 2006/2007 Manette Bridge Harbor Seal (HASE) and California Sea Lion (CASL) Observations (note: red and green circles mark navigation features and hazards)

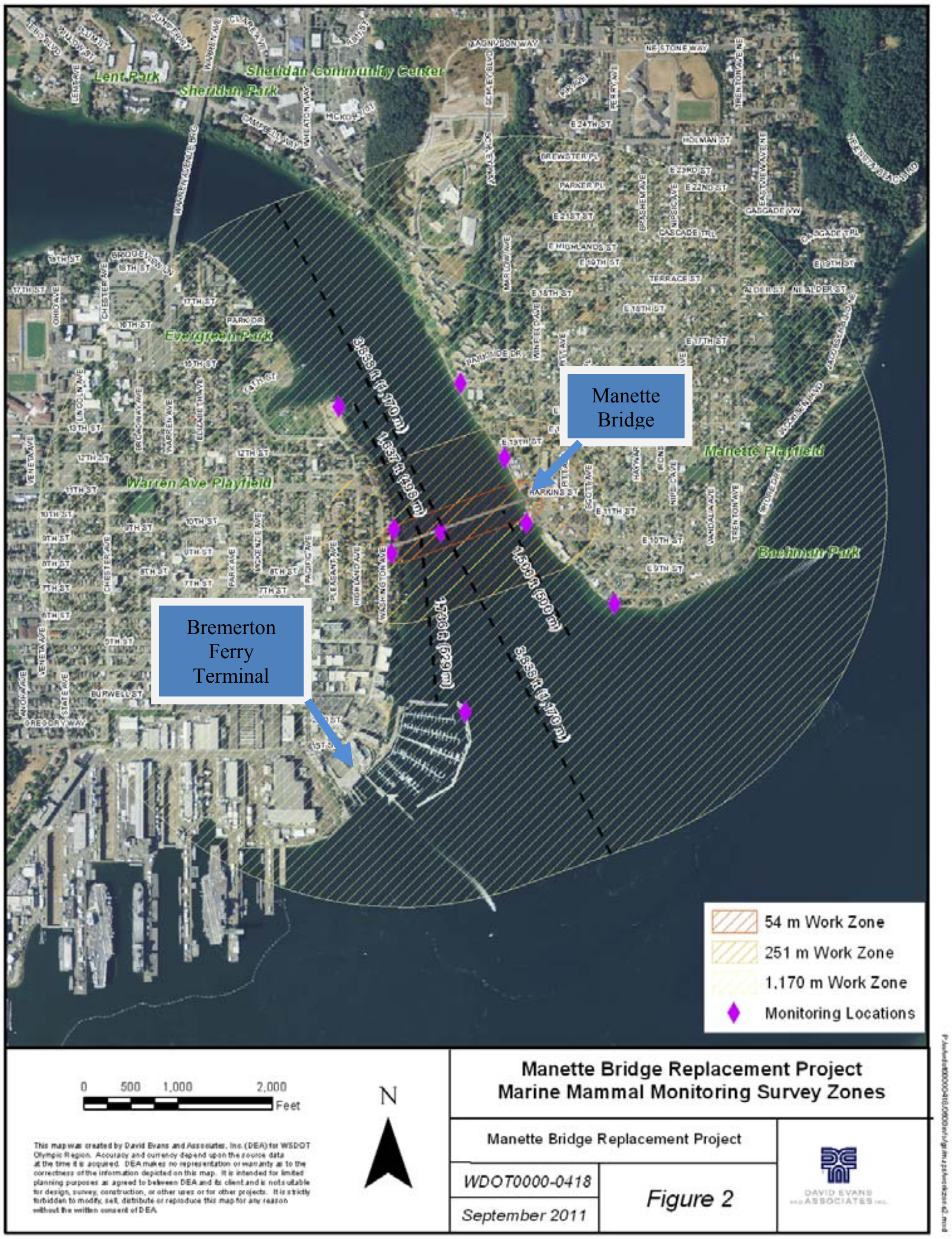

Figure 3-3 Manette Bridge Marine Mammal Monitoring Survey Zones

From August 2010 to January 2012, marine mammal monitoring was implemented during construction of the Manette Bridge (Figure 3-3). Counts were conducted only during pile removal/driving days, not every day of the month. Counts were recorded in blocks of working days (not counts per day). The highest number of harbor seals observed was 93 over three days (10/18-20, 2011) (Table 3-2). The highest number observed during one day was 59 (10/18/2011). It was assumed that these included multiple observations of the same animal by different observers (David Evans & Assoc. Inc. 2011a/b).

Table 3-2 Manette Bridge Harbor Seal Counts
(*Proposed in-water work window months highlighted*)

	2010	2011	2012
August	99	*	*
September	64	*	*
October	12	93	*
November	9	8	*
December	7	**	*
January	*	3	13
February	*	**	*

**no count that month*
***count went over parts of two months*

According to the NMFS National Stranding Database, there were 41 confirmed harbor seal strandings in the Bremerton and Port Orchard area from April 1990 to September 2010 in the September-February work window scheduled for this project (NMFS 2012).

3.2.1.2 Status

Harbor seals are not "depleted" under the MMPA or listed as "threatened" or "endangered" under the ESA. Because there is no current estimate of minimum abundance, a potential biological removal (PBR) cannot be calculated for this stock. The previous estimate of PBR was 771 (Carretta et al. 2009). Human-caused mortality relative to PBR is unknown, but it is considered to be small relative to the stock size. The Washington Inland Waters stock of harbor seals is not classified as a "strategic" stock. The stock is also considered within its Optimum Sustainable Population level (Jeffries et al. 2003).

3.2.1.3 Distribution

Harbor seals are the most numerous marine mammal species in Puget Sound. Harbor seals are non-migratory; their local movements are associated with such factors as tides, weather, season, food availability and reproduction (Scheffer and Slipp 1948; Fisher 1952; Bigg 1969, 1981). They are not known to make extensive pelagic migrations, although some long-distance movements of tagged animals in Alaska (174 km) and along the U.S. west coast (up to 550 km) have been recorded (Pitcher and McAllister 1981; Brown and Mate 1983; Herder 1983).

Harbor seals haul out on rocks, reefs and beaches, and feed in marine, estuarine and occasionally fresh waters. Harbor seals display strong fidelity for haulout sites (Pitcher and Calkins 1979; Pitcher and McAllister 1981). The nearest documented harbor seal haulout site to the Bremerton ferry terminal is 8.5 km north and west (shoreline distance) (Figure 3-3). The level of use of this haulout during the fall and winter is unknown, but is expected to be much less as air temperatures become colder than water temperatures resulting in seals in general hauling out less (H. Huber pers. comm. 2010). Harbor seals may also use other undocumented haulout sites in the area.

3.2.2 California Sea Lion

California sea lions (*Zalophus californianus*) are members of the family Otariidae or eared seals (sea lions and fur seals). The breeding areas of the California sea lion are on islands located in southern California, western Baja California and the Gulf of California (Carretta et al. 2007b). Washington California sea lions occur within the geographic boundaries of the U.S. stock, which begins at the U.S./Mexico border and extends northward into Canada

3.2.2.1 Numbers

The U.S. stock was estimated at 296,750 in the 2011 Stock Assessment Report (SAR) and may be at carrying capacity, although more data are needed to verify that determination (Carretta et al. 2007a). Some 3,000 to 5,000 animals are estimated to move into northwest waters (both Washington and British Columbia) during the fall (September) and remain until the late spring (May) when most return to breeding rookeries in California and Mexico (Jeffries et al. 2000; J. Calambokidis pers. comm. 2008). Peak counts of over 1,000 animals have been made in Puget Sound (Jeffries et al. 2000).

The closest documented California sea lion haulout site to the Bremerton Ferry Terminal is the Puget Sound Naval Shipyard security barrier, located approximately 435 m/1,427 ft. SW of the ferry terminal (Figure 3-4). The next closest documented California sea lion haulout sites to the Bremerton Ferry Terminal are navigation buoys and net pens in Rich Passage, approximately nine and ten km east of the terminal (Figure 3-5) (WDFW 2000).

From July 2006 to January 2007, a consultant completed 10 at-sea surveys in preparation for replacement of the WSDOT Manette Bridge that is located in Bremerton. Marine mammals were recorded during these surveys: two California sea lions (one unconfirmed) were observed (Figure 3-2) (USDA 2007).

From August 2010 to February 2011, marine mammal monitoring was implemented during construction of the Manette Bridge (Figure 3-3). Counts were conducted only during pile removal/driving days, not every day of the month. Counts were recorded in blocks of working days (not counts per day). The highest number of California sea lions observed was 21 (September) over six days, an average of 3.5/day (Table 3-3) (David Evans & Assoc. Inc. 2011a/b).

The Bremerton Puget Sound Naval Shipyard (PSNS) is located to the west of the Bremerton Ferry Terminal (Figure 3-4). Since November 2010, PSNS personnel have been conducting monthly counts of the number of sea lions that use the security barrier floats as a haulout. As of June 13, 2012, the highest count has been 144 observed during one day in November 2011 (Table 3-4). All are believed to be California sea lions. No Steller sea lions have been observed using the security barrier float haulout to date (U.S. Navy 2012b).

According to the NMFS National Stranding Database, there were 5 confirmed California sea lion strandings in the Bremerton and Port Orchard area from April 1990-September 2010 in the September-February work window scheduled for this project (NMFS 2012).

Table 3-3 Manette Bridge California Sea Lion Counts
(*Proposed in-water work window months highlighted*)

	2010	2011	2012
August	4	*	*
September	21	*	*
October	21	6	*
November	13	9	*
December	4	**	*
January	*	4	7
February	*	0	*

**no count that month*
***count went over parts of two months*

Table 3-4 PSNS California Sea Lion Counts
(*Proposed in-water work window months highlighted*)

	2010	2011	2012
July	*	1	**
August	*	18	**
September	*	72	**
October	*	111	**
November	84	144	**
December	126	125	**
January	*	44	17
February	*	*	34
March	27	15	9
April	*	14	3
May	*	12	18
June	*	0	2

*no sampling/or no count reported
**pending

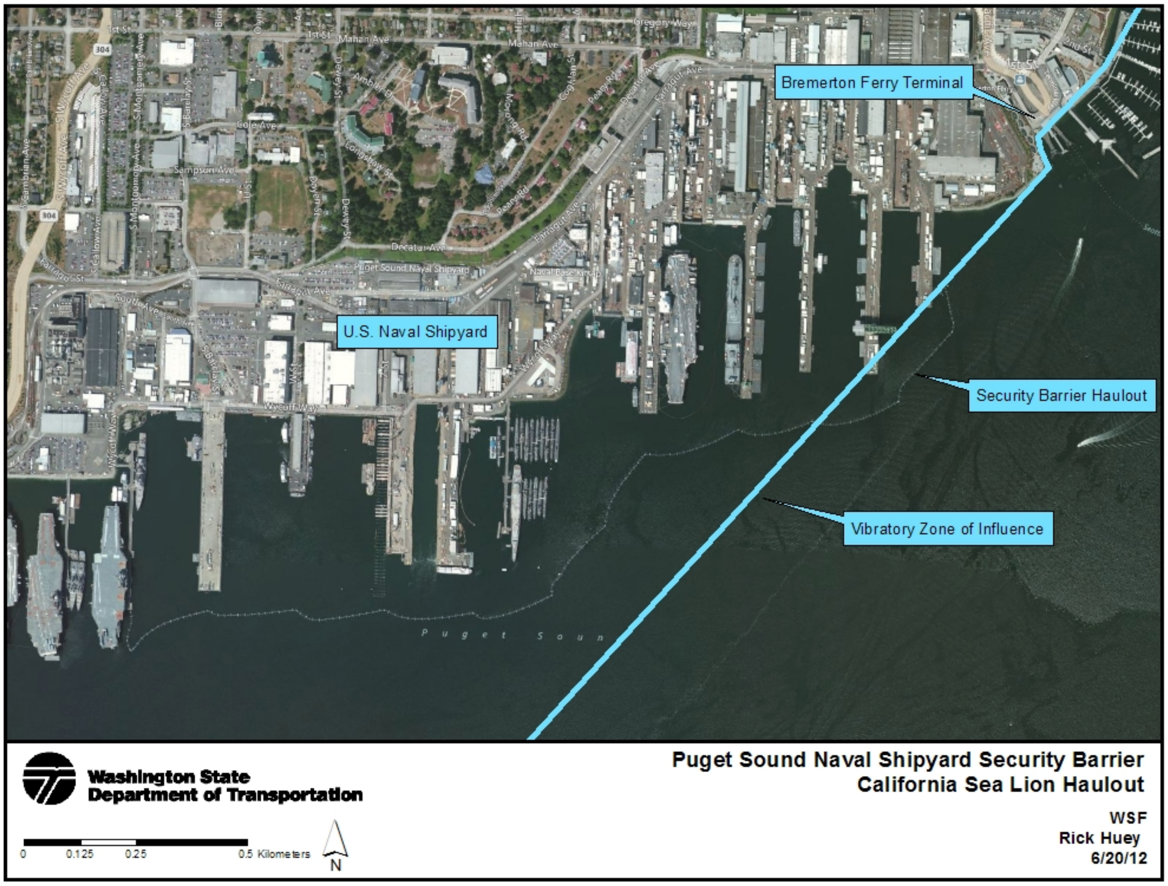

Figure 3-4 PSNS Security Barrier California Sea Lion Haulout

3.2.2.2 Status

California sea lions are not listed as endangered or threatened under the ESA or as depleted under the MMPA. They are not considered a strategic stock under the MMPA, because total human-caused mortality, although unknown, is likely to be well less than the PBR (9,200) (NMFS 2011a).

3.2.2.3 Distribution

California sea lions breed on islands off Baja Mexico and southern California with primarily males migrating north to feed in the northern waters (Everitt et al. 1980). Females remain in the waters near their breeding rookeries off California and Mexico. All age classes of males are seasonally present in Washington waters (WDFW 2000).

California sea lions were unknown in Puget Sound until approximately 1979 (Steiger and Calambokidis 1986). Everitt et al. (1980) reported the initial occurrence of large numbers at Port Gardner, Everett (northern Puget Sound) in the spring of 1979. The number of California sea lions using the Everett haulout number around 1,000. This haulout remains the largest in the state for sea lions in general and for California sea lions specifically (P. Gearin pers. comm. 2008). Similar sightings and increases in numbers were documented throughout the region after the initial sighting in 1979 (Steiger and Calambokidis 1986), including urbanized areas such as Elliot Bay near Seattle and heavily used areas of central Puget Sound (P. Gearin et al. 1986). In Washington, California sea lions use haulout sites within all inland water regions (WDFW 2000). The movement of California sea lions into Puget Sound could be an expansion in range of a growing population (Steiger and Calambokidis 1986).

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

The closest documented California sea lion haulout site to the Bremerton Ferry Terminal is the Puget Sound Naval Shipyard security barrier, located approximately 435 m/1,427 ft. SW of the ferry terminal (Figure 3-4). The next closest documented California sea lion haulout sites to the Bremerton Ferry Terminal are navigation buoys and net pens in Rich Passage, approximately nine and ten km east of the terminal (Figure 3-5) (WDFW 2000).

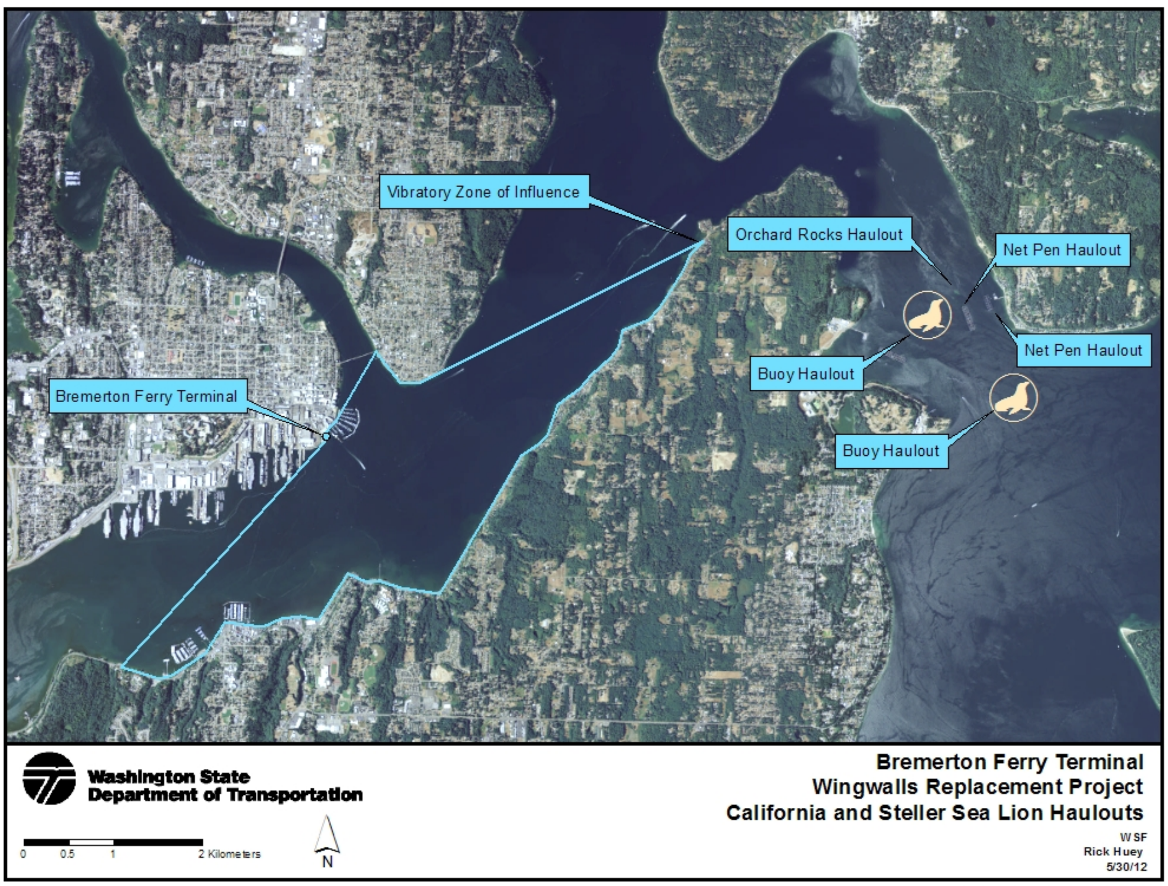

Figure 3-5 Bremerton Area California and Steller Sea Lion Haulout Sites

3.2.3 Steller Sea Lion

Steller sea lions comprise two recognized management stocks (eastern and western), separated at 144º W longitude (Loughlin 1997). Only the eastern stock is considered in this application because the western stock occurs outside of the geographic area under consideration. Breeding rookeries for the eastern stock are located along the California, Oregon, British Columbia, and southeast Alaska coasts, but not along the Washington coast or in inland Washington waters (Angliss and Outlaw 2007). Steller sea lions primarily use haulout sites on the outer coast of Washington and in the Strait of Juan de Fuca along Vancouver Island in British Columbia. Only sub-adults or non-breeding adults may be found in the inland waters of Washington (Pitcher et al. 2007; P. Gearin pers. comm. 2008).

3.2.3.1 Numbers

The eastern stock of Steller sea lions is estimated to be between 58,334 and 72,223 individuals based on 2006 through 2009 pup counts (NMFS 2011b). The most recent estimate for Washington state (including the outer coast) is 651 individuals (non-pups only) (Pitcher et al. 2007). However, recent estimates are that 1,000 to 2,000 individuals enter the Strait of Juan de Fuca during the fall and winter months (Jeffries pers. comm. 2008b).

Steller sea lion numbers in Washington State decline during the summer months, which correspond to the breeding season at Oregon and British Columbia rookeries (approximately late May to early June) and peak during the fall and winter months (WDFW 2000). A few Steller sea lions can be observed year-round in Puget Sound although most of the breeding age animals return to rookeries in the spring and summer (P. Gearin pers. comm. 2008).

3.2.3.2 Status

Steller sea lions were listed as threatened range-wide under the ESA on November 26, 1990 (55 FR 49204). After division into two stocks, the western stock was listed as endangered under the ESA on May 4, 1997 and the eastern stock remained classified as threatened (62 FR 24345). In 2006 the NMFS Steller sea lion recovery team proposed removal of the eastern stock from listing under the ESA based on its annual rate of increase of approximately 3% since the mid-1970s.

On August 27, 1993, NMFS published a final rule designating critical habitat for the Steller sea lion. No critical habitat has been designated in Washington (NMFS 1993). Critical habitat is associated with breeding and haulout areas in Alaska, California, and Oregon (NMFS 1993).

Steller sea lions are listed as depleted under the MMPA. Both stocks are classified as strategic. The PBR for this stock is 2,378 animals (NMFS 2011b).

3.2.3.3 Distribution

Adult Steller sea lions congregate at rookeries in Oregon, California, and British Columbia for pupping and breeding from late May to early June (Gisiner 1985). Rookeries are usually located on beaches of relatively remote islands, often in areas exposed to wind and waves, where access by humans and other mammalian predators is difficult (WDFW 1993).

For Washington inland waters, Steller sea lion abundances vary seasonally with a minimum estimate of 1,000 to 2000 individuals present or passing through the Strait of Juan de Fuca in fall and winter months (S. Jeffries pers. comm. 2008b). However, the number of haulout sites has increased in recent years. The nearest documented Steller sea lion haulout site to the Bremerton ferry terminal are the Orchard Rocks in Rich Passage, approximately nine and ten km east of the terminal (Figure 3-5)(WDFW 2000) (Kitsap Transit 2012).

From July 2006 to January 2007, a consultant completed 10 at-sea surveys in preparation for replacement of the WSDOT Manette Bridge that is located in Bremerton. Marine mammals were recorded during these surveys: no Stellar sea lions were observed (Figure 3-2)(USDA 2007).

From August 2010 to February 2011, marine mammal monitoring was implemented during construction of the Manette Bridge (Figure 3-3). No Stellar sea lions were observed (David Evans & Assoc. Inc. 2011).

3.3 Cetaceans

Three cetacean species may be present in the Bremerton terminal area; killer whale, gray whale and humpback whale.

3.3.1 Killer Whale

The killer whale (*Orcinus orca)* is the largest member of the dolphin family (Delphinidae) and occurs in most marine waters of the world (Rice 1998 as cited in NMFS 2008a). Killer whales are distinct among all cetaceans with their black-and-white coloration with characteristic gray or white saddle patches behind the dorsal fin and white eye patches. Killer whales live in family groups called pods, are highly social, and communicate with a highly developed acoustic sensory system that is also used to navigate and find prey (Ford 1989; Ford et al. 2000). Vocal communication is particularly advanced in killer whales and is an essential element of the species social structure (Wiles 2004; Krahn et al. 2004).

Two sympatric ecotypes of killer whales are found within the activity area: transient and resident. These types vary in diet, distribution, acoustic calls, behavior, morphology and coloration (Baird 2000 as cited in NMFS 2008a; Ford et al. 2000). The ranges of transient and resident killer whales overlap; however, little interaction and high reproductive isolation occurs among the two ecotypes (Barrett-Lennard 2000; Barrett-Lennard and Ellis 2001; Hoelzel et al. 2002 as cited in NMFS 2008a). Resident killer whales are primarily piscivorous, whereas transients primarily feed on marine mammals, especially harbor seals (Baird and Dill 1996). Resident killer whales also tend to occur in larger (10 to 60 individuals), stable family groups known as pods, whereas transients occur in smaller (less than 10 individuals), less structured pods.

One stock of transient killer whale, the West Coast Transient stock, occurs in Washington State. This stock ranges from southern California to southeast Alaska and is distinguished from two other Eastern North Pacific transient stocks that occur further north, the AT1 and the "Gulf of Alaska transient stocks. This separation was based on variations in acoustic calls and genetic distinctness (Angliss and Outlaw 2007). West Coast transients primarily forage on harbor seals (Ford and Ellis 1999), but other species such as porpoises and sea lions are also taken (NMFS 2008a).

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

The Southern Residents live in three family groups known as the J, K and L pods. The entire Southern Resident population has been annually recorded since 1973 (Krahn et al. 2004). Individual whales are identified through photographs of unique saddle patch and dorsal fin markings. Each Southern Resident pod has a distinctive dialect of vocalizations (Ford 1989) and calls can travel 10 miles or more underwater. The southern residents forage primarily on salmon, with Chinook salmon considered the major prey in the Puget Sound region in late spring through the fall. Other identified prey included chum salmon, other salmonids, herring, and rockfish (NMFS 2008a).

Killer whales are mid-frequency cetaceans (Southall et al. 2007) with an estimated auditory bandwidth of 50 Hz to 100 kHz and peak sensitivity around 15 kHz (73 FR 41318). Killer whale hearing is well developed for the species' complex underwater communication structure. However, Southern Residents are highly vocal while Transients limit their use of vocalization and may travel silently (apparently to avoid being detected by marine mammal prey; Deecke et al. 2005 as cited in 73 FR 41318).

Small population numbers make Southern Residents vulnerable to inbreeding depression and catastrophic events such as disease or a major oil spill. Ongoing threats to Southern Residents include declining prey resources, environmental contaminants, noise and physical disturbance (Krahn et al. 2004; Wiles 2004). In Washington's inland waters, high levels of noise disturbance and potential behavior disruption are due to recreational boating traffic, private and commercial whale watching boats and commercial vessel traffic (Wiles 2004). Other potential noise disturbance includes high output military sonar equipment and marine construction. Noise effects may include altered prey movements and foraging efficiency, masking of whale calls, and temporary hearing impairment (Krahn et al. 2004).

3.3.1.1 Numbers

West Coast Transient Stock

The West Coast Transient stock, which includes individuals from California to southeastern Alaska, was estimated to have a minimum number of 354 (NMFS 2010b).

Trends in abundance for the West Coast Transients were unavailable in the most recent stock assessment report (Angliss and Outlaw 2007). Human-caused mortality and serious injury are estimated to be zero animals per year and do not exceed the population's biological removal rate, which is estimated at 3.5 animals (NMFS 2010b).

Southern Resident Stock

The Southern Resident stock was first recorded in a 1974 census, at which time the population comprised 71 whales. This population peaked at 97 animals in 1996, declined to 79 by 2001 (Center for Whale Research 2011), and then increased to 89 animals by 2006 (Carretta et al. 2007a). As of October 2012, the population collectively numbers 85 individuals: J pod has 25 members, K pod has 20 members, and L pod has 40 members (Whale Museum 2012b).

The Southern Resident stock has declined in the past 10 years due to a decrease in birth rates and an increase in mortalities, especially among the L pod (Krahn et al. 2004). There are a limited number of reproductive-age Southern Resident males, and several females of reproductive age are not having calves. Three major threats were identified in the ESA listing: reduced quantity and quality of prey; persistent pollutants that could cause immune or reproductive system dysfunction; and effects from vessels and sound (NMFS 2008a). Other threats identified were demographics, small population size, and vulnerability to oil spills. Previously, declines in the Southern Resident population were due to shooting by fishermen, whalers, sealers and sportsmen largely due to their interference with fisheries (Wiles 2004) and the aquarium trade, which is estimated to have taken a significant number of animals from 1967 to 1973 (Ford et al. 1995).

The estimated annual level of human-caused mortality and serious injury is 0.2 animals per year, which exceeds the PBR of 0.17 animals and reflects a vessel strike of one animal every 5 years (NMFS 2011).

3.3.1.2 Status

Killer whales are protected under the MMPA of 1972. The West Coast Transient stock is not designated as depleted under the MMPA or listed as "threatened or "endangered" under the ESA. Because the estimated level of human-caused mortality and serious injury (zero animals per year) does not exceed the PBR rate (3.5), the stock is not classified as strategic.

The Southern Resident stock was declared depleted under the MMPA in May 2003 (68 FR 31980). At that time, NMFS announced preparation of a conservation plan to restore the stock to its optimal sustainable population. On November 18, 2005, the Southern Resident stock was listed as an endangered distinct population segment (DPS) under the ESA (70 FR 69903). On November 29, 2006, NMFS published a final rule designating critical habitat for the Southern

Resident killer whale DPS. Both Puget Sound and the San Juan Islands are designated as core areas of critical habitat under the ESA, but areas less than 20 feet deep relative to extreme high water are not designated as critical habitat (71 FR 69054). A final recovery plan for southern residents was published in January of 2008 (NMFS 2008a).

In Washington State, killer whales were listed as a state candidate species in 2000. In April 2004, the State upgraded their status to a state endangered species.

3.3.1.3 Distribution

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

West Coast Transient Stock

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

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

Southern Resident Stock

Southern Residents are documented in coastal waters ranging from central California to the Queen Charlotte Islands, British Columbia (NMFS 2008a). They occur in all inland marine waters within the activity area (Figure 3-6). While in the activity area, resident killer whales generally spend more time in deeper water and only occasionally enter water less than 15 feet deep (Baird 2000). Distribution is strongly associated with areas of greatest salmon abundance, with heaviest foraging activity occurring over deep open water and in areas characterized by high-relief underwater topography, such as subsurface canyons, seamounts, ridges, and steep slopes (Wiles 2004).

3.3.1.4 Seasonal Distribution

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

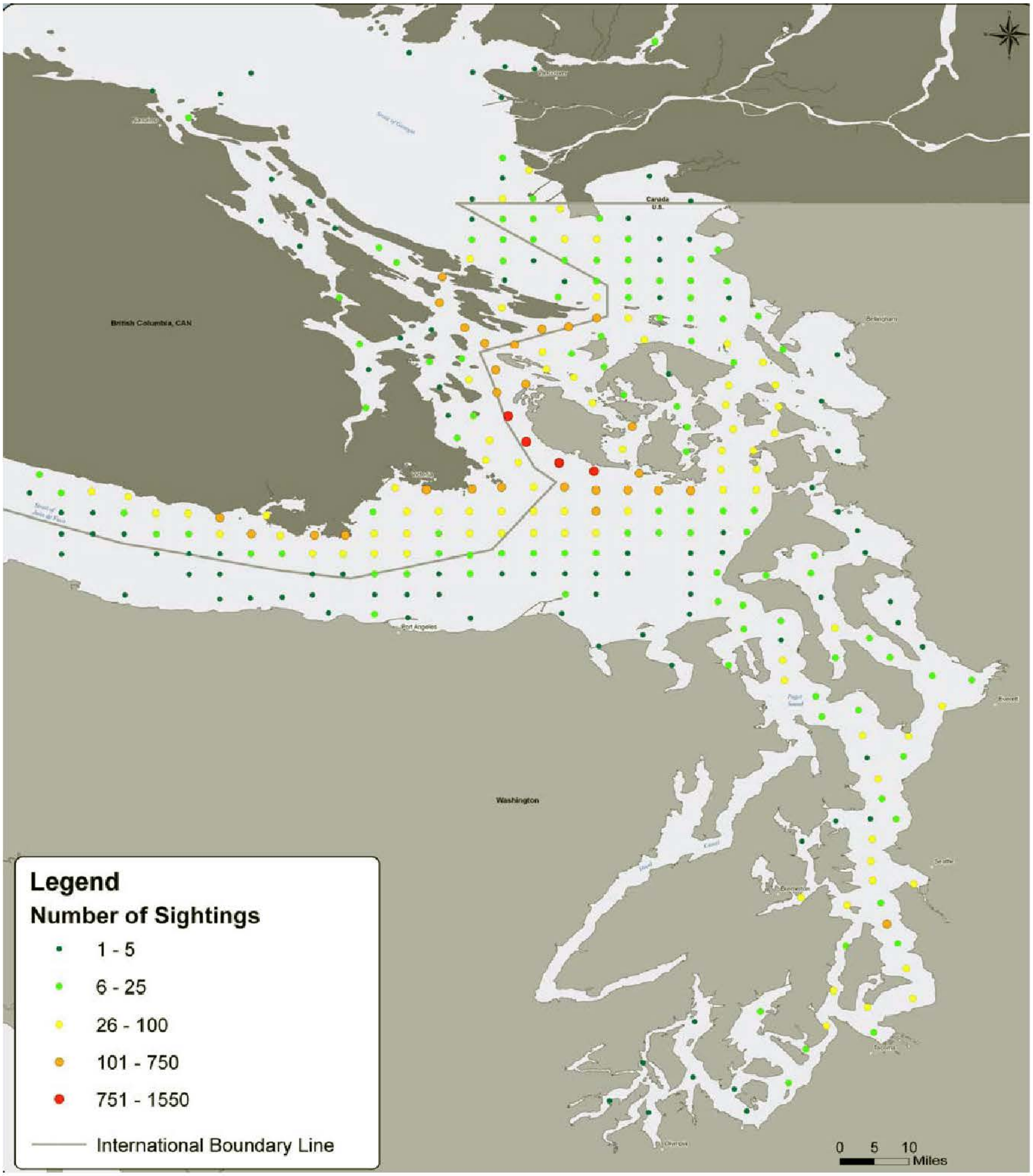

Figure from the Recovery Plan for Southern Resident Killer Whales (NMFS 2008).

Figure 3-5 Distribution of Southern Resident killer whale sightings (groups) 1990-2005

Spring/Summer Distribution

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

Fall/Winter Distribution

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

Under contract with the NMFS, the Friday Harbor Whale Museum keeps a database of verified marine mammal sightings (whale days) by location quadrants. Whale sightings, or ‘whale days’ do not indicate sightings of individual animals. Instead, sightings can be any number of animals. Between 1990 and 2008, in the September to February window proposed for the Bremerton project, an average of 2.9 SR killer whale sightings/month were annually reported for Quad 411 (which encompasses the Bremerton action area) (Table 3-5)(NMFS 2012b).

Between September 2009 and February 2012, there was one unconfirmed report of a single SR killer whale in the Bremerton action area (January 2009) during the proposed in-water work window for this project (Table 3-5) (Orca Network 2012b). Based on this information, the possibility of encountering killer whales during the Bremerton project is low to medium, depending on the actual work month.

Table 3-5 SR killer whale sightings near Bremerton terminal 1990-2012
(*Proposed in-water work window months highlighted*)

Month	Quad 411
September	1
October	12
November	14
December	3
January	1 (unconfirmed)
February	1
March	2
April	0
May	2
June	0
July	0
August	0

NMFS 2012b/Orca Network 2012

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

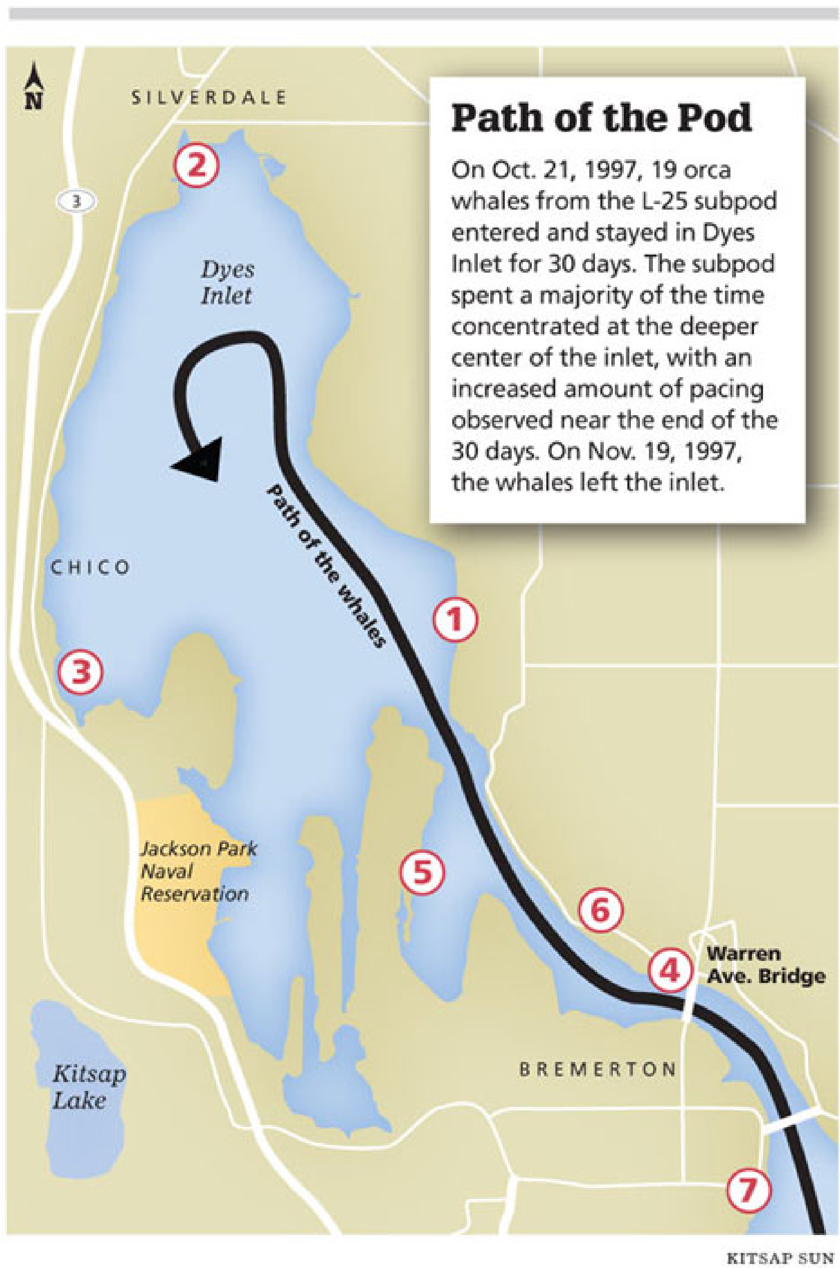

Figure 3-6 L Pod in Dyes Inlet 1997

3.3.2 Gray Whale

Gray whales are members of baleen whales (Mysticete). The North Pacific gray whale (*Eschrichtius robustus*) stock is divided into two distinct geographically isolated stocks: eastern and western "Korean". Individuals in this region are part of the Eastern North Pacific stock. The majority of the Eastern North Pacific population spends summers feeding in the Bering and Chukchi Seas, but some individuals have been reported summering in waters off the coast of British Columbia, Southeast Alaska, Washington, Oregon and California (Rice et al. 1984; Angliss and Outlaw 2007). Gray whales migrate in the fall, south along the coast of North America to Baja California, Mexico to calve (Rice et al. 1981.) Gray whales are recorded in Washington waters during feeding migrations between late spring and autumn with occasional sightings during winter months (Calambokidis et al. 1994, 2002; Orca Network 2011).

Baleen whales are low-frequency cetaceans. No direct measurements of auditory capacity have been conducted for these large whales, but hearing sensitivity has been estimated from various studies or observations of behavioral responses, vocalization frequencies used most, body size, ambient noise levels, and cochlear morphometry. A generalized auditory bandwidth of 7 Hz to 22 kHz has been estimated for all baleen whales (Southall et al. 2007).

3.3.2.1 Numbers

Early in the 20th century, it is believed that commercial hunting for gray whales reduced population numbers to below 2,000 individuals (Calambokidis and Baird 1994). After listing of the species under the ESA in 1970, the number of gray whales increased dramatically resulting in their delisting in 1994. Population surveys since the delisting estimate that the population fluctuates at or just below the carrying capacity of the species (~26,000 individuals) (Rugh et al. 1999; Calambokidis et al. 1994; Angliss and Outlaw 2007).

The minimum population estimate of the Eastern North Pacific stock is 18,017 (NMFS 2011d). Within Washington waters, gray whale sightings reported to Cascadia Research and the Whale Museum between 1990 and 1993 totaled over 1,100 (Calambokidis et al. 1994). Abundance estimates calculated for the small regional area between Oregon and southern Vancouver Island, including the San Juan Area and Puget Sound, suggest there were 137 to 153 individual gray whales from 2001 through 2003 (Calambokidis et al. 2004b). Forty-eight individual gray whales were observed in Puget Sound and Hood Canal in 2004 and 2005 (Calambokidis 2007).

3.3.2.2 Status

The Eastern North Pacific stock of gray whales was removed from listing under the ESA in 1994 after a 5-year review by NOAA Fisheries. In 2001 NOAA Fisheries received a petition to relist the stock under the ESA, but it was determined that there was not sufficient information to warrant the petition (Angliss and Outlaw 2007). Since delisting under the ESA, the stock has not been reclassified under the MMPA. The PBR for this stock is 360 animals per year (NMFS 2011d).

3.3.2.3 Distribution

Gray whales migrate within 5 to 43 km of the coast of Washington during their annual north/south migrations (Green et al. 1995). Gray whales migrate south to Baja California where they calve in November and December, and then migrate north to Alaska from March through May (Rice et al. 1984; Rugh et al. 2001) to summer and feed. A very few gray whales are observed in Washington inland waters between the months of September and January, with peak numbers of individuals from March through May (J. Calambokidis pers. comm. 2007). Peak months of gray whale observations in the area of activity occur outside the proposed work window of September through February (Table 3-6). The average tenure within Washington inland waters is 47 days and the longest stay was 112 days (J. Calambokidis pers. comm. 2007).

Although typically seen during their annual migrations on the outer coast, a regular group of gray whales annually comes into the inland waters at Saratoga Passage and Port Susan from March through May to feed on ghost shrimp (Weitkamp et al. 1992; J. Calambokidis pers. comm. 2006). During this time frame they are also seen in the Strait of Juan de Fuca, the San Juan Islands, and areas of Puget Sound, lthough the observations in Puget Sound are highly variable between years (Calambokidis et al. 1994).

Between December 2002 and May 2012, there were three reports of gray whale in the Bremerton area during the proposed in-water work window months for this project: January 8 and 10, 2008 (likely the same individual); November 28-29, 2008; and December 2-6, 2009 (Orca Network 2012b). There were also two reports of gray whale stranding, one on May 3, 2005 at the US Navy Puget Sound Naval Shipyard to the west of the Bremerton terminal (Cascadia 2005), and one on a beach in the Bremerton area on July 27, 2011 (Table 3-6). Typically 4-6 gray whales strand every year in Washington State (Cascadia 2011).

Table 3-6 Gray Whale Observations December 2002 to May 2012

Month	Sightings
September	1
October	0
November	1
December	1
January	0
February	0
March	0
April	0
May	1*
June	0
July	1*
August	0

Orca Network 2012b/*Cascadia 2005/2012 (strandings)

3.3.3 Humpback Whale

Humpback whales (*Megaptera novaeangliae*) are wide-ranging baleen whales that can be found virtually worldwide. They summer in temperate and polar waters for feeding, and winter in tropical waters for mating and calving. Humpbacks are vulnerable to whaling due to their tendency to feed in near shore areas. Recent studies have indicated that there are three distinct stocks of humpback whale in the North Pacific: California-Oregon-Washington (formerly Eastern North Pacific), Central North Pacific and Western North Pacific (NMFS 2011e).

The California-Oregon-Washington (CA-OR-WA) stock calve and mate in coastal Central America and Mexico and migrate up the coast from California to southern British Columbia in the summer and fall to feed (NMFS 1991; Marine Mammal Commission 2003; Carretta et al. 2007a). Although infrequent, interchange between the other two stocks and the Eastern North Pacific stock occurs in breeding areas (Carretta et al. 2007a). Few Eastern North Pacific stock humpback whales are seen in Puget Sound, but more frequent sightings occur in the Strait of Juan de Fuca and near the San Juan Islands. Most sightings are in spring and summer. Humpback whales feed on krill, small shrimp-like crustaceans and various kinds of small fish.

Like other baleen whales, humpback whales are low-frequency cetaceans. Information on hearing bandwidths for baleen whales is presented under gray whales (Section 3.3.2).

3.3.3.1 Numbers

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

3.3.3.2 Status

As a result of commercial whaling, humpback whales were listed as "endangered" under the Endangered Species Conservation Act of 1969. This protection was transferred to the Endangered Species Act (ESA) in 1973. The species is still listed as “endangered”, and consequently the stock is automatically considered as a "depleted" and "strategic" stock under the MMPA. A recovery plan was adopted in 1991. The PBR for this stock is 11.3 animals per year (NMFS 2011).

3.3.3.3 Distribution

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

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

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4.0 Status and Distribution of Affected Species or Stocks

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.

This section has been combined with Section 3.0. Each required topic (status, distribution, and seasonally distribution) has been clearly marked as a subheading in Section 3.0 for ease of finding relevant information.

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5.0 Type of Incidental 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 MMPA defines "harassment" as:

> any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment] (50 C.F.R, Part 216, Subpart A, Section 216.3-Definitions).

Level A is the more severe form of harassment because it may result in injury or death, whereas Level B only results in disturbance *without* the potential for injury (B. Norberg pers. comm. 2007a).

5.1 Incidental Take Authorization Request

Under Section 101 (a)(5)(D) of the MMPA, WSF requests an IHA from September 1, 2013 through February 15, 2014 for Level B incidental take (behavioral harassment) of the marine mammals described within this application during the wingwall replacement project at the Bremerton Ferry Terminal. Specifically, the requested authorization is for incidental harassment of any marine mammal that might enter the 120 dB ZOI during active vibratory hammer activity.

The scheduled pile-driving activities discussed in this application will occur between September 1, 2013 and February 15, 2014.

5.2 Method of Incidental Taking

The method of incidental take is Level B acoustical harassment of any marine mammal occurring within the 120 dB isopleth during vibratory pile removal or driving.

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6.0 Number of Marine Mammals that May Be Affected

By age, sex, and reproductive condition (if possible), the number of marine mammals (by species) that may be taken by each type of taking identified in [Section 5], and the number of times such takings by each type of taking are likely to occur.

This section summarizes potential incidental take of marine mammals during construction activities from WSF's anticipated projects described in Section 1.2 of this IHA. Section 6.2 describes the methods used to calculate potential incidental take for each marine mammal species. Section 6.4 provides the number of marine mammals by species for which take authorization is requested.

Due to the vibratory pile removal and driving source levels, this IHA application will incidentally take by Level B acoustical harassment small numbers of harbor seals, California sea lions, Steller sea lions, killer whales, gray whales and humpback whales.

With the exception of harbor seals and California sea lions, it is anticipated that all of the marine mammals that enter a Level B acoustical harassment ZOI will be exposed to pile driving noise only briefly as they are transiting the area. Only harbor seals and California sea lions are expected to forage and haulout in the Bremerton ZOI with any frequency and could be exposed multiple times during a project.

6.1 Estimated Duration of Pile Driving

As mentioned previously in Section 2.0, Dates, Duration, and Region of Activity, a worst-case scenario for the Bremerton ferry terminal project assumes that it may take four days to remove the existing piles and seven days to install the new piles (Table 2-1). The maximum total number of hours of pile removal activity is about 28 hours, and pile-driving activity is about 6.75 hours (averaging about 3.2 hours of active pile removal/driving for each construction day).

The actual number of hours for both projects is expected to be less.

6.2 Estimated Zones of Influence

Distances to the various NMFS thresholds for Level B (harassment) take for vibratory pile removal and driving were estimated and presented in Section 1.6.6, Attenuation to NMFS Thresholds. The Bremerton ZOI was calculated from these distances (Figure 1-10). To simplify estimated incidental takes, the vibratory pile removal zone is conservatively assumed to be the same as the vibratory pile driving zone.

- The distance to the 120 dB contour Level B acoustical harassment threshold due to vibratory pile driving for the Bremerton ferry terminal project extends a maximum of 4.7 km (2.9 miles) before land is intersected. The ZOI will be monitored during construction to estimate actual harassment take of marine mammals.

Airborne noises can affect pinnipeds, especially resting seals hauled out on rocks or sand spits. The airborne 90 dB Level B threshold for hauled out harbor seals was estimated at 37 m, and the airborne 100 dB Level B threshold for all other pinnipeds is estimated at 12 m (Figure 1-11).

The nearest known harbor seal haulout site to the Bremerton ferry terminal is 8.5 km north and west (shoreline distance) (Figure 3-3). The nearest documented California and Steller sea lion haulout sites to the Bremerton ferry terminal are navigation buoys in Rich Passage, approximately 9 and 10 km east of the terminal (Figure 3-4). The Puget Sound Naval Shipyard security barrier California sea lion haulout is located approximately 435 m/1,427 ft. SW of the ferry terminal (Figure 3-5).

In-air noise from this project will not reach to haulout sites, but harbor seals swimming on the surface through the 37 m zone, and other pinnipeds swimming on the surface through the 12 m zone during vibratory pile removal or driving may be temporarily disturbed.

6.3 Estimated Incidental Takes

Incidental take is estimated for each species by estimating the likelihood of a marine mammal being present within a ZOI during active pile removal or driving. Expected marine mammal presence is determined by past observations and general abundance near the Bremerton Ferry Terminal during the construction window. Typically, potential take is estimated by multiplying the area of the ZOI by the local animal density. This provides an estimate of the number of animals that might occupy the ZOI at any given moment. However, there are no density estimates for any Puget Sound population of marine mammal. As a result, the take requests were estimated using local marine mammal data sets (e.g., Orca Network, state and federal agencies), opinions from state and federal agencies, and observations from Navy biologists. All estimates are conservative.

6.3.1 Harbor Seal

The nearest known harbor seal haulout site to the Bremerton ferry terminal is 8.5 km north and west (shoreline distance) (Figure 3-1). The number of harbor seals using the haulout is less than 100 (WDFW 2000). The level of use of this haulout during the fall and winter is unknown, but is expected to be much less as air temperatures become colder than water temperatures resulting in seals in general hauling out less (H. Huber pers. comm. 2010). Harbor seals may also use docks, beaches and other haulouts in the area.

During most of the year, all age and sex classes are expected to forage in Sinclair Inlet. For the southern Puget Sound region, pups are born from late June through September (WDFW 2012a).

According to the NMFS National Stranding Database, there were 41 confirmed harbor seal strandings in the Bremerton and Port Orchard area from April 1990-September 2010 in the September-February work window scheduled for this project (NMFS 2012).

From July 2006-January 2007, a consultant completed 10 (one day) at-sea surveys in preparation for replacement of the WSDOT Manette Bridge that is located in Bremerton. A single boat with two observers completed transects that recorded marine mammals; 32 harbor seals (3.2/day) were observed at the surface in an area approximately the same as the Bremerton wingwalls project ZOI (Figure 3-2) (USDA 2007).

From August 2010 to January 2012, marine mammal monitoring was implemented during construction of the Manette Bridge (Figure 3-2). The highest number of harbor seals observed was 93 over three days (10/18-20, 2011). The highest number observed during one day was 59 (10/18/2011). It was assumed that these include multiple observations of the same animal by different observers (David Evans & Assoc. Inc. 2011a/b).

For the Bremerton terminal project, the total number of pile driving hours is estimated to not exceed 35 hours over 11 days (Table 2-1). For the exposure estimate, it will be conservatively assumed that the highest count of harbor seals observed during the Manette Bridge monitoring (59) were unique individuals, and will be foraging within the ZOI and be exposed multiple times during the project.

The calculation for marine mammal exposures is estimated by:

Exposure estimate = N * 11 days of pile driving activity, where:

N = # of animals (59)

Exposure estimate = 5931 * 11 days = 649

Therefore, WSF is requesting authorization for Level B acoustical harassment of 649 harbor seals. It is assumed that this number will include multiple harassments of the same individual(s).

6.3.2 California Sea Lion

California sea lions are sighted and haul out throughout the Sinclair Inlet area at all times of the year. However, abundances peak in the late fall and winter, which coincides with proposed periods of project activity. The PSNS security barrier floats have been used by California sea lions at least since November 2010, when PSNS personnel began recorded observations (Figure 3-5). There are no other documented California sea lion haulout sites within the ZOI.

According to the NMFS National Stranding Database, there were 5 confirmed California sea lion strandings in the Bremerton and Port Orchard area from April 1990-September 2010 in the September-February work window scheduled for this project (NMFS 2012).

From July 2006-January 2007, a consultant completed 10 at-sea surveys in preparation for replacement of the WSDOT Manette Bridge that is located in Bremerton. Marine mammals were recorded during these surveys: two California sea lions (one unconfirmed) were observed (Figure 3-2) (USDA 2007).

From August 2010 to February 2011, marine mammal monitoring was implemented during construction of the Manette Bridge (Figure 3-3). The highest number of California sea lions observed was 21 (September) over six days, an average of 3.5/day (Table 3-3) (David Evans & Assoc. Inc. 2011a/b).

Since November 2010, PSNS personnel have been counting the number of sea lions that use the security barrier floats as a haulout. As of June 13, 2012, the highest count has been 144 observed during one day in November 2011 (Table 3-4). All are believed to be California sea lions. No Steller sea lions have been observed using the security barrier float haulout to date (U.S. Navy 2012b).

For the Bremerton wingwalls project, the total number of pile driving hours is estimated to not exceed 35 hours over 11 days (Table 2-1). It is assumed that the most conservative number of California sea lions may be present (144), and will be foraging within the ZOI and be exposed multiple times during the project.

The calculation for marine mammal exposures is estimated by:

Exposure estimate = N * 11 days of pile driving activity, where:

N = # of animals (144)

Exposure estimate = 144 animals * 11 days = 1,584

Therefore, WSF is requesting authorization for Level B acoustical harassment take of 1,584 California sea lions. It is assumed that this number will include multiple harassments of the same individual(s).

6.3.3 Steller Sea Lion

There are no documented Steller sea lion haulouts within the project ZOI, though foraging Steller sea lions may enter the zone. The nearest documented Steller sea lion haulout site to the Bremerton ferry terminal are the Orchard Rocks in Rich Passage, approximately nine and ten km east of the terminal (Figure 3-4)(WDFW 2000) (Kitsap Transit 2012).

There is no data available on the number of Steller sea lions that use the Orchard Rocks. However, up to 12 Steller sea lions have been observed using the Craven Rock haulout off of Marrowstone Island in northern Puget Sound. Steller sea lions are more common and occur in greater numbers in northern Puget Sound, so it will be assumed that up to 6 individuals may use Orchard Rocks (WSF 2010).

The calculation for marine mammal exposures is estimated by:

Exposure estimate = N * 11 days of pile driving activity, where:

N = # of animals (6)

Exposure estimate = 6 * 11 days = 66

Therefore, WSF is requesting authorization for Level B acoustical harassment take of 65 Steller sea lions. It is assumed that this number could include multiple harassments of the same individual(s).

6.3.4 Killer Whale

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

Between 1990 and 2008, in the September to February window proposed for the Bremerton project, an average of 2.9 SR killer whale sightings/month were annually reported for Quad 411 (which encompasses the Bremerton ZOI), with the high of 14 sightings in November (Table 3-5) (NMFS 2012b). Whale sightings, or 'whale days' do not indicate sightings of individual animals. The J pod (pod size 25) is most likely to appear in the lower Puget Sound during the fall and winter. It will be assumed that up to 25 J pod SR killer whale individuals could enter the Bremerton ZOI.

Based on this data, it is assumed that up to 38 killer whales (12 transient/25 SR) may enter the Bremerton ZOI. The MMPA provides for incidental take of 'small numbers', which has been defined by NMFS as no more than 20% of the species stock. Given that the Southern Resident stock consists of 84 individuals, incidental take can be granted for only 16 individuals (20% of the SRKW stock) (Guan, S. 2012). It is assumed that if killer whales enter the ZOI, they will not remain for 11 days, but may be present in the ZOI for 2 days as the transit in and out of the area.

The calculation for killer whale exposures is estimated by:

Exposure estimate = N * 2 days of pile driving activity, where:

N = # of animals (20 - 12 transient/8 SRKW)

Exposure estimate = 20 * 2 days = 40

Therefore, WSF is requesting authorization for Level B acoustical harassment take of 40 killer whales (24 transient/16 SRKW). It is assumed that this number could include multiple harassments of the same individual(s).

6.3.5 Gray Whale

Between December 2002 and May 2012, there were three reports of gray whale in the Bremerton area during the proposed in-water work window months for this project: January 8 and 10, 2008 (likely the same individual); November 28-29, 2008; and December 2-6, 2009 (Orca Network 2012b). There were also two reports of gray whale stranding, one on May 3, 2005 at the US Navy Puget Sound Naval Shipyard to the west of the Bremerton terminal (Cascadia 2005), and one on a beach in the Bremerton area on July 27, 2011(Cascadia 2011) (Table 3-6).

Based on this data, it is conservatively assumed that up to 2 gray whales may enter the Bremerton ZOI. It is assumed that if gray whales enter the ZOI, they will not remain for 11 days, but may be present in the ZOI for up to 4 days as they forage in the area.

The calculation for gray whale exposures is estimated by:

Exposure estimate = N * 4 days of pile driving activity, where:

N = # of animals (2)

Exposure estimate = 2 * 4 days = 8

Therefore, WSF is requesting authorization for Level B acoustical harassment take of 8 gray whales. It is assumed that this number could include multiple harassments of the same individual(s).

6.3.6 Humpback Whale

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

Based on this data, it is conservatively assumed that up to 2 humpback whales may enter the Bremerton ZOI. It is assumed that if humpback whales enter the ZOI, they will not remain for 11 days, but may be present in the ZOI for up to 4 days as they forage in the area.

The calculation for humpback whale exposures is estimated by:

Exposure estimate = N * 4 days of pile driving activity, where:

N = # of animals (2)

Exposure estimate = 2 * 4 days = 8

Therefore, WSF is requesting authorization for Level B acoustical harassment take of 8 humpback whales. It is assumed that this number could include multiple harassments of the same individual(s).

6.4 Number of Takes for Which Authorization is Requested

The total number of takes for which for Level B acoustical harassment take authorization is requested is presented in the table below:

Table 6-1 Level B Acoustical Harassment Take Requests

Species	Take Request
Harbor Seal	**649**
California Sea Lion	**1,584**
Steller Sea Lion	**66**
Killer Whale	**40**
Gray Whale	**8**
Humpback Whale	**8**
Total	**2,355**

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7.0 Anticipated Impact on Species or Stocks

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

7.1 Introduction

For the Bremerton terminal wingwalls project, the total number of pile driving hours is estimated to not exceed 35 hours over 11 days (Table 2-2). These activities generate sounds that exceed thresholds considered disturbing (Level B) to local marine mammals.

WSF is requesting authorization for Level B acoustical harassment take of 649harbor seals, 1,584 California sea lions, 66 Steller sea lions, 76 killer whales, 8 gray whales and 8 humpback whales (Table 6-1). These numbers in relation to the overall stock size of each species, and the effect that Level B acoustical harassment could have to individual recruitment or survival within each stock of marine mammal, are discussed in further detail below.

7.2 Harbor Seal

The harbor seal population in the inland Washington waters is stable at approximately 14,612 individuals and is considered within its Optimum Sustainable Population level (Jeffries et al. 2003). This application requests incidental taking by Level B acoustical harassment of up to 649 harbor seals. Although the estimate assumes multiple take of a few individuals (not single takes of 649 individuals) the requested number of takes represents only 4.4 percent of the inland Washington waters stock (14,612).

If incidental takes occur, it is only expected to result in short-term changes in behavior and potential temporary hearing threshold shift (TTS). These takes would be unlikely to have any impact on stock recruitment or survival and therefore, would have a negligible impact on the U.S. stock.

7.3 California Sea Lion

The U.S. stock was estimated at 296,750 in the 2011 Stock Assessment Report (SAR) and may be at carrying capacity, although more data are needed to verify that determination (Carretta et al. 2007a). This application requests incidental taking by Level B acoustical harassment of up to 1,841 California sea lions (or 0.53 percent of the stock).

If incidental takes occur, it is only expected to result in short-term changes in behavior and potential temporary hearing threshold shift (TTS). These takes would be unlikely to have any impact on stock recruitment or survival and therefore, would have a negligible impact on the U.S. stock.

7.4 Steller Sea Lion

The eastern stock of Steller sea lions is estimated to be between 58,334 and 72,223 individuals based on 2006 through 2009 pup counts (NMFS 2011b). An estimated 1,000 to 2,000 Steller sea lions enter the Strait of Juan de Fuca during the fall months, with some number passing through Admiralty Inlet into Puget Sound (Jeffries pers. comm. 2008b). This application requests incidental taking by Level B acoustical harassment of up to 66 Steller sea lions, which represents 3.25 to 6.5 percent of the regional stock, but only 0.1 to 0.09 percent of the stock as a whole.

If incidental takes occur, it is are only expected to result in short-term changes in behavior and potential temporary hearing threshold shift (TTS). These incidental takes would be unlikely to have any impact on stock recruitment or survival and therefore, would have a negligible impact on the stock.

7.5 Killer Whale

The West Coast Transient stock, which includes individuals from California to southeastern Alaska, was estimated to have a minimum number of 354 (NMFS 2010b). As of June 2012, the SR killer whale population collectively numbers 85 individuals (Whale Museum 2012b).

This application requests incidental taking by Level B acoustical harassment of up to 40 killer whale (24 transients/16 SRKW). This represents 6.8 percent of the transient stock, and 20percent of the Southern Resident stock.

If incidental takes occur, it is only expected to result in short-term changes in behavior and potential temporary hearing threshold shift (TTS). These incidental takes would be unlikely to have any impact on stock recruitment or survival and therefore, would have a negligible impact on the stock.

7.6 Gray Whale

The North Pacific Gray whale stock is estimated at 26,000 individuals (Rugh et al. 1999; Calambokidis et al. 1994; Angliss and Outlaw 2007). Regional estimates that include the San Puget Sound and Sinclair Inlet estimate up to 153 individuals (Calambokidis et al. 2004b).

This application requests incidental taking by Level B acoustical harassment of up to 8 gray whales, which represents 5.2 percent of the regional population, but only 0.03 percent of the stock.

If incidental takes occur, it is only expected to result in short-term changes in behavior and potential temporary hearing threshold shift (TTS). These incidental takes would be unlikely to have any impact on stock recruitment or survival and therefore, would have a negligible impact on the stock.

7.7 Humpback Whale

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

This application requests incidental taking by Level B acoustical harassment of up to 8 humpback whales, which represents 0.39 percent of the stock.

If incidental takes occur, it is only expected to result in short-term changes in behavior and potential temporary hearing threshold shift (TTS). These incidental takes would be unlikely to have any impact on stock recruitment or survival and therefore, would have a negligible impact on the stock.

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8.0 Anticipated Impact on Subsistence

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

8.1 Subsistence Harvests by Northwest Treaty Indian Tribes

Historically, Pacific Northwest Native American tribes were known to hunt several species of marine mammals including, but not limited to harbor seals, Steller sea lions, northern fur seals, gray whales and humpback whales. More recently, several Pacific Northwest Native American tribes have promulgated tribal regulations allowing tribal members to exercise treaty rights for subsistence harvest of harbor seals and California sea lions (Carretta et al. 2007a). The Makah Indian Tribe (Makah) has specifically passed hunting regulations for gray whales. 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 rulings against the Makah in 2002, 2003, and 2004 (B. Norberg pers. comm. 2007b; NMFS 2007). Currently, there are no authorized ceremonial and/or subsistence hunts for marine mammals in Puget Sound or the San Juan Islands (B. Norberg pers. comm. 2007b) with the possible exception of some coastal tribes who may allow a small number of directed take for subsistence purposes.

8.1.1 Harbor Seals

Tribal subsistence takes of this stock may occur, but no data on recent takes are available (NMFS 2011c).

No impacts on the availability of the species or stocks to the Pacific Northwest treaty tribes are expected as a result of the proposed project.

8.1.2 California Sea Lions

Current estimates of annual subsistence take are zero to two animals per year (NMFS 2007a).

No impacts on the availability of the species or stock to the Pacific Northwest treaty tribes are expected as a result of the proposed project.

8.1.3 Gray Whales

The Makah ceased whaling in the 1920s after commercial whaling decimated the Eastern North Pacific gray whale population (NMFS 2007b). On June 16, 1994, gray whales were removed from the endangered species list after a determination that the population has “recovered to near its estimated original population size and is neither in danger of extinction throughout all or a significant portion of its range, nor likely to again become endangered within the foreseeable future throughout all or a significant portion of its range” (59 FR 31094). On May 5, 1995, the Makah formally notified the U.S. Government of its interest in resuming treaty ceremonial and subsistence harvest of Eastern North Pacific gray whales, asking the Department of Commerce to represent them in seeking approval from the International Whaling Commission (IWC) for an annual quota (NMFS 2007). On October 18, 1997, the IWC approved an aboriginal subsistence quota of 620 Eastern North Pacific gray whales (with an annual cap of 140) for the Russian Checotah people and the Makah (Angliss and Outlaw 2007; NMFS 2007). The Makah successfully hunted one Eastern North Pacific gray whale on May 17, 1999 (NMFS 2005a).

Whaling by the Makah was halted on December 20, 2002, when the Ninth Circuit Court of Appeals ruled that an environmental impact statement rather than an environmental assessment should have been prepared under the National Environmental Protection Act and that the Makah must comply with the process prescribed in the MMPA for authorizing take of marine mammals otherwise prohibited by a moratorium. This was further upheld by rulings in 2003 and 2004 (NMFS 2007). At a 2007 meeting of the IWC (59th Annual Meeting in Anchorage, Alaska), an aboriginal subsistence quota for gray whales was again approved for natives in Russia and 20 whales (four per year for 5 years) for the Makah, but under the Ninth Circuit Court ruling the Makah must first obtain a waiver of the MMPA take moratorium before harvesting under their IWC quota (Norberg pers. comm. 2007b). In February 2005, NMFS received a request from the Makah for a waiver of the MMPA take moratorium to resume limited hunting of Eastern North Pacific gray whales. A draft environmental impact statement to examine the alternatives for a decision to approve or deny the waiver was released for public comment on May 9, 2008, but to date, no final ruling has been made and the future of the Makah whale hunt remains in limbo.

However, any future hunts by the Makah would occur along the outer coast of Washington, not in the Puget Sound/Sinclair Inlet area. Therefore, the proposed activities would not interfere with any future hunt.

9.0 Anticipated Impact on Habitat

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

9.1 Introduction

Construction activities will have temporary impacts on marine mammal habitat by through increases in-air noise and in-water sound pressure levels from pile removal and driving. Other potential temporary changes are water quality (primarily through increases in turbidity levels) and prey species distribution. Best management practices (BMPs) and minimization practices used by WSF to minimize potential environmental effects from project activities are outlined in Section 11 Mitigation Measures.

9.2 In-air Noise Disturbance to Haulouts

In-air noise from vibratory pile removal and driving is estimated to reach the behavioral threshold at 37 m for harbor seals and 12 m for all other pinnipeds. No haulout sites are within the in-air disturbance threshold distances. Therefore, no disturbance to hauled-out pinnipeds is expected, but in-air noise may disturb pinnipeds while surfacing when swimming within the threshold distances. In-air noise from non-pile driving construction activities is not expected to cause in-air disturbance to pinnipeds, because the Bremerton ferry terminal is currently subject to similar existing levels of in-air noise from ferry, boat, road and other noise sources.

9.3 Underwater Noise Disturbance

NMFS is currently using an in-water noise disturbance threshold of 120 dB_{RMS} for pinnipeds and cetaceans for continuous noise sources. The distance to the Level B acoustical harassment thresholds is described in Section 2, Dates, Duration and Region of Activity.

There are several short-term and long-term effects from noise exposure that may occur to marine mammals, including impaired foraging efficiency and its potential effects on movements of prey, harmful physiological conditions, energetic expenditures and temporary or permanent hearing threshold shifts due to chronic stress from noise (Southall et al. 2007). The majority of the research on underwater noise impacts on whales is associated with vessel and navy sonar disturbances and does not often address impacts from pile driving. The NMFS (2008a) states that the threshold levels at which anthropogenic noise becomes harmful to killer whales are poorly understood. Because whale occurrence is transient near the Bremerton ferry terminal, in-water noise impacts are localized and of short duration, and vibratory pile driving produces only potential Level B harassment, any impact on individual whales will be limited.

9.4 Water and Sediment Quality

Short-term turbidity is a water quality effect of most in-water work, pile removal and driving. WSF must comply with state water quality standards during these operations by limiting the extent of turbidity to the immediate project area.

Roni and Weitkamp (1996) monitored water quality parameters during a pier replacement project in Manchester, Washington. The study measured water quality before, during and after pile removal and driving. The study found that construction activity at the site had “little or no effect on dissolved oxygen, water temperature and salinity”, and turbidity (measured in nephelometric turbidity units [NTU]) at all depths nearest the construction activity was typically less than 1 NTU higher than stations farther from the project area throughout construction.

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

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

Removal of the timber wingwalls at the Bremerton ferry terminal will result in 112 creosote-treated piles (100 tons) removed from the marine environment. This will result in the potential, temporary and localized sediment re-suspension of some of the contaminants associated with creosote, such as polycyclic aromatic hydrocarbons. However, the actual removal of the creosote-treated wood piles from the marine environment will result in a long-term improvement in water and sediment quality, meeting the goals of WSF’s Creosote Removal Initiative started in 2000. 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).

9.5 Passage Obstructions

Pile removal and installation operations at the Bremerton ferry terminal will not obstruct movements of marine mammals. The operations at Bremerton will occur within 70 m of the shoreline leaving 2 km of Sinclair Inlet for marine mammals to pass. Further, a construction barge will be used to remove and install the pilings. In a previous concurrence letter for the Vashon Island Dolphin Replacement Project (August 4, 2008), NMFS stated the following:

> Vessels associated with any project are primarily tug/barges, which are slow moving, follow a predictable course, do not target whales, and should be easily detected by whales when in transit. Vessel strikes are extremely unlikely and any potential encounters with Southern Residents [killer whales] are expected to be sporadic and transitory in nature.

Similarly, vessel strikes are unlikely for the proposed project.

9.6 Conclusions Regarding Impacts on Habitat

The most likely effects on marine mammal habitat from the proposed project are temporary, short duration noise and water quality effects. The direct loss of habitat available to marine mammals during construction due to noise, water quality impacts and construction activity is expected to be minimal. All whale species utilizing habitat near the terminal will be transiting the terminal area.

For the most part, any adverse effects on prey species during project construction will be short term. Given the large numbers of fish and other prey species in Sinclair Inlet, the short-term nature of effects on fish species and the mitigation measures to protect salmonids during construction (use of a vibratory hammer, BMPs, operating outside the fish window), the proposed project is not expected to have measurable effects on the distribution or abundance of potential marine mammal prey species.

Long-term water quality improvements in the Sinclair Inlet will result from WSF's replacement of creosote-treated timber structures with steel pilings. Because many of the marine mammal species potentially present are at the top of the food chain and have a long life expectancy, bioaccumulation of toxins is of high concern. Removal of creosote from the aquatic environment will have a beneficial effect on marine mammals.

Passage is not expected to be obstructed as a result of the proposed project. Any temporary obstruction due to barge placement will be localized and limited in duration, and a traveling barge is too slow to strike marine mammals.

10.0 Anticipated Impact of Loss or Modification of Habitat

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

The proposed project will occur within the existing Bremerton ferry terminal operational footprint and is not expected to result in a significant permanent loss or modification of habitat for marine mammals or their food sources. The most likely effects on marine mammal habitat for the proposed project are temporary, short duration in-water noise, prey (fish) disturbance, and water quality effects. The direct loss of habitat available to marine mammals during construction due to noise, water quality impacts and construction activity is expected to be minimal. These temporary impacts have been discussed in detail in Section 9.0, Anticipated Impact on Habitat.

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11.0 Mitigation Measures

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.

WSF activities are subject to federal, state and local permit regulations. WSF has developed and routinely uses the best guidance available (e.g., BMPs and mitigation measures [MMs]) to avoid and minimize (to the greatest extent possible) impacts on the environment, ESA species, designated critical habitats and species protected under the MMPA.

The MMs will be employed during all pile removal and installation activities at the Bremerton ferry terminal. The language in each MM is included in the Contract Plans and Specifications and must be agreed upon by the contractor prior to any construction activities. Upon signing the contract, it becomes a legal agreement between the Contractor and WSF. Failure to follow the prescribed MMs is a contract violation.

General MMs used for all construction practices are listed first (Section 11.1, All Construction Activities), followed by specific MMs for pile related activities (Section 11.2, Pile Removal and Installation). The MMs listed under Section 11.1 apply to different activities and are, therefore, listed additional times where appropriate. Specific MMs have been developed to reduce the potential for harassment to marine mammals; these are described beginning in Section 11.2.3.

11.1 All Construction Activities

All WSF construction is performed in accordance with the current WSDOT Standard Specifications for Road, Bridge, and Municipal Construction. Special Provisions contained in preservation and repair contracts are used in conjunction with, and supersede, any conflicting provisions of the Standard Specifications.

- All construction equipment will comply with applicable equipment noise standards of the U.S. Environmental Protection Agency, and all construction equipment will have noise control devices no less effective than those provided on the original equipment.
- WSF policy and construction administration practice is to have a WSF inspector on site during construction. The role of the inspector is to ensure contract compliance. The inspector and the contractor each have a copy of the Contract Plans and Specifications on site and are aware of all requirements. The inspector is also trained in environmental provisions and compliance.
- The contractor will be advised that eelgrass beds are protected under state and federal law. When work will occur near eelgrass beds, WSF will provide plan sheets showing eelgrass boundaries to the contractor. The contractor shall exercise extreme caution when working in the area indicated on the plans as “Eelgrass Beds.” The contractor shall adhere to the following restrictions during the life of the contract.

- The contractor shall not:
-
  - Place derrick spuds or anchors in the area designated as "Eelgrass."
  - Shade the eelgrass beds for a period of time greater than 3 consecutive days during the growing season (generally March through September).
  - Allow debris or any type of fuel, solvent, or lubricant in the water.
  - Perform activities which could cause significant levels of sediment to contaminate the eelgrass beds.
  - Conduct activities that may cause scouring of sediments within the eelgrass beds or other types of sediment transfer out of or into the eelgrass beds.
  - Any damage to eelgrass beds or substrates supporting eelgrass beds that results from a contractor's operations will be repaired at the contractor's expense.
- WSF will obtain Hydraulic Project Approval (HPA) from WDFW as appropriate and the contractor will follow the conditions of the HPA. HPA requirements are listed in the contract specifications for the contractor to agree to prior to construction, and the HPA is attached to the contract such that conditions of the HPA are made part of the contract.
- The contractor shall be responsible for the preparation of a Spill Prevention, Control and Countermeasures (SPCC) plan to be used for the duration of the project. The plan shall be submitted to the Project Engineer prior to the commencement of any construction activities. A copy of the plan with any updates will be maintained at the work site by the contractor.
  - The SPCC plan shall identify construction planning elements and recognize potential spill sources at the site. The SPCC plan shall outline BMPs, responsive actions in the event of a spill or release and identify notification and reporting procedures. The SPCC plan shall also outline contractor management elements such as personnel responsibilities, project site security, site inspections and training.
  - The SPCC will outline what measures shall be taken by the contractor to prevent the release or spread of hazardous materials, either found on site and encountered during construction but not identified in contract documents, or any hazardous materials that the contractor stores, uses, or generates on the construction site during construction activities. These items include, but are not limited to gasoline, oils and chemicals. Hazardous materials are defined in Revised Code of Washington (RCW) 70.105.010 under "hazardous substance."
  - The contractor shall maintain, at the job site, the applicable spill response equipment and material designated in the SPCC plan.
  - The contractor shall regularly check fuel hoses, oil drums, oil or fuel transfers valves, fittings, etc. for leaks, and shall maintain and store materials properly to prevent spills.

- No petroleum products, fresh cement, lime or concrete, chemicals, or other toxic or deleterious materials shall be allowed to enter surface waters.
- WSF will comply with water quality restrictions imposed by Ecology (Chapter 173-201A WAC), which specify a mixing zone beyond which water quality standards cannot be exceeded. Compliance with Ecology’s standards is intended to ensure that fish and aquatic life are being protected to the extent feasible and practicable.
- Wash water resulting from washdown of equipment or work areas shall be contained for proper disposal, and shall not be discharged into state waters unless authorized through a state discharge permit.
- Equipment that enters the surface water shall be maintained to prevent any visible sheen from petroleum products appearing on the water.
- There shall be no discharge of oil, fuels, or chemicals to surface waters, or onto land where there is a potential for reentry into surface waters.
- No cleaning solvents or chemicals used for tools or equipment cleaning shall be discharged to ground or surface waters.
- The contractor shall regularly check fuel hoses, oil drums, oil or fuel transfer valves, fittings, etc. for leaks, and shall maintain and store materials properly to prevent spills.
- Projects and associated construction activities will be designed so potential impacts on species and habitat are avoided and minimized to the extent practicable.

11.1.1 Timing Windows

Timing restrictions are used to avoid in-water work when ESA-listed salmonids are most likely to be present. The combined work window for in-water work for the Bremerton ferry terminal is July 16 through February 15. Actual construction activities are planned to take place from September 1, 2013 and February 15, 2014.

11.2 Pile Removal and Installation

Specific to pile removal and installation, the following mitigation measures are proposed by WSF to reduce impacts on marine mammals to the lowest extent practicable.

11.2.1 Pile Removal

MMs to be employed during pile removal include:

- The vibratory hammer method will be used to remove timber piles to minimize noise levels.
- Marine mammal monitoring during vibratory pile removal will be employed for the Level B ZOI (see Section 11.2.3, Marine Mammal Monitoring).
- A containment boom surrounding the work area will be used during creosote-treated pile removal to contain and collect any floating debris and sheen, provided that the boom does not interfere with operations. The contractor will also retrieve any debris generated during construction and properly disposed of at an approved upland location.
- The contractor will have oil-absorbent materials on site to be used in the event of a spill if any oil product is observed in the water.

- All creosote-treated material, pile stubs, and associated sediments will be disposed of by the contractor in a landfill which meets the liner and leachate standards of the Minimum Functional Standards, Chapter 173-304 WAC. The contractor will provide receipts of disposal to the WSF Project Engineer. Both waste facilities that accept creosote waste in Washington State dispose of the piling in a landfill where they are buried.
- Removed piles, stubs and associated sediments (if any) shall be contained on a barge. If piles are placed directly on the barge and not in a container, the storage area shall consist of a row of hay or straw bales, or filter fabric, placed around the perimeter of the barge.
- Excess or waste materials will not be disposed of or abandoned waterward of ordinary high water (OHW) or allowed to enter waters of the state, as per WAC 220-110-070. Waste materials will be disposed of in a landfill. Hazardous waste and treated wood waste will be disposed of by the contractor in a landfill which meets the liner and leachate standards of the Minimum Functional Standards, Chapter 173-304 WAC.
- Pilings that break or are already broken below the waterline may be removed by wrapping the piles with a cable or chain and pulling them directly from the sediment with a crane. If this is not possible, they will be removed with a clamshell bucket. To minimize disturbance to bottom sediments and splintering of piling, the contractor will use the minimum size bucket required to pull out piling based on pile depth and substrate. The clamshell bucket will be emptied of piling and debris on a contained barge before it is lowered into the water. If the bucket contains only sediment, the bucket will remain closed and be lowered to the mudline and opened to redeposit the sediment. In some cases (depending on access, location, etc.), piles may be cut below the mudline and the resulting hole backfilled with clean sediment.
- Demolition and construction materials shall not be stored where high tides, wave action, or upland runoff can cause materials to enter surface waters.

11.2.2 Pile Installation

MMs to be employed during pile installation include:

- The vibratory hammer method will be used to install steel piles to minimize noise levels.
- Marine mammal monitoring during vibratory pile installation will be employed for the Level B ZOI (see Section 11.2.3, Marine Mammal Monitoring).
- Excess or waste materials will not be disposed of or abandoned waterward of OHW/MHHW or allowed to enter waters of the state, as per WAC 220-110-070. Waste materials will be disposed of in a landfill. Hazardous waste and treated wood waste will be disposed of by the contractor in a landfill which meets the liner and leachate standards of the Minimum Functional Standards, Chapter 173-304 WAC.
- WSF will comply with water quality restrictions imposed by Ecology (Chapter 173-201A WAC), which specifies a mixing zone beyond which water quality standards cannot be exceeded. Compliance with Ecology's standards is intended to ensure that fish and aquatic life are being protected to the extent feasible and practical.
- Creosote-treated timber piling shall be replaced with hollow steel piling.
- The contractor will be required to retrieve any floating debris generated during construction. 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. Retrieved debris will be disposed of at an upland disposal site. Debris will be disposed of upland.
- Whenever activities that generate sawdust, drill tailings, or wood chips from treated timbers are conducted, tarps or other containment material shall be used to prevent debris from entering the water. If tarps cannot be used (because of the location or type of structure), a containment boom will be placed around the work area to capture debris and cuttings.
- Excess or waste materials will not be disposed of or abandoned waterward of OHW/MHHW or allowed to enter waters of the state.
- Demolition and construction materials shall not be stored where high tides, wave action, or upland runoff can cause materials to enter surface waters.

11.2.3 Marine Mammal Monitoring

11.2.3.1 Coordination

WSF 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, the Orca Network and/or Center for Whale Research will be contacted 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 are called or emailed into the Orca Network and immediately distributed to other sighting networks including: the Northwest Fisheries Science Center of NOAA Fisheries, the Center for Whale Research, Cascadia Research, the Whale Museum Hotline and the British Columbia Sightings Network.

'Sightings' information collected by the Orca Network includes detection by hydrophone. The SeaSound Remote Sensing Network is a system of interconnected hydrophones installed in the marine environment of Haro Strait (west side of San Juan Island) to study orca communication, in-water noise, bottomfish ecology and local climatic conditions. A hydrophone at the Port Townsend Marine Science Center measures average in-water sound levels and automatically detects unusual sounds. These passive acoustic devices allow researchers to hear when different marine mammals come into the region. This acoustic network, combined with the volunteer (incidental) visual sighting network allows researchers to document presence and location of various marine mammal species.

With this level of coordination in the region of activity, WSF will be able to get real-time information on the presence or absence of whales before starting any pile removal or driving.

11.2.3.2 Visual Monitoring

WSF has developed a monitoring plan that will collect sighting data for each distinct marine mammal species observed during pile removal and driving activities. Monitoring for marine mammal presence will take place 30 minutes before, during and 20 minutes after pile driving.

Marine mammal behavior, overall numbers of individuals observed, frequency of observation and the time corresponding to the daily tidal cycle will also be included. Qualified marine mammal observers will be present on site during pile removal and driving. A monitoring plan is provided in Appendix B.

11.2.3.3 Soft Start

Soft start requires contractors to initiate noise from vibratory hammers for 15 seconds at reduced energy followed by a 1-minute waiting period. The procedure will be repeated two additional times. Each day, WSF will use the soft-start technique at the beginning of pile removal or driving, or if pile removal or driving has ceased for more than one hour.

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12.0 Arctic Subsistence Uses, 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 an/or will take to ensure that proposed activities will not interfere with subsistence whaling or sealing; and

(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.

This section is not applicable. The proposed activities will take place in Washington State, specifically in Puget Sound/Sinclair Inlet. No activities will take place in or near a traditional Arctic subsistence hunting area.

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13.0 Monitoring and Reporting Plan

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 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 would 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 Plan

WSF has developed a marine mammal monitoring plan for this project. The monitoring plan is detailed in Section 11.2.3, Marine Mammal Monitoring, and provided in Appendix B.

13.2 Reporting Plan

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

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

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14.0 Coordinating Research to Reduce and Evaluate Incidental Take

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

In-water noise generated by vibratory pile driving at the Bremerton ferry terminal is the primary issue of concern relative to local marine mammals. WSF has conducted research on sound propagation from vibratory hammers, and plans on continuing that research to provide data for future ferry terminal projects.

WSF plans to coordinate with local marine mammal sighting networks (Orca Network and/or the Center for Whale Research) to gather information on the location of whales prior to initiating pile removal or driving. Marine mammal monitoring will be conducted to collect information on presence of marine mammals within the ZOI for this project.

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Appendix A
Sheets

Appendix B

Marine Mammal Monitoring Plan

Bremerton Ferry Terminal
Wingwalls Replacement Project
Marine Mammal Monitoring Plan

November 19, 2012

In accordance with the October 2012, Washington State Ferries Bremerton Ferry Terminal Wingwalls Replacement Project 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 13-inch piling, and vibratory pile driving of 24- and 30-inch hollow steel piling.

- 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 and driving. However, land is intersected before this extent is reached (except for vibratory pile removal), at a maximum of 4.7 km (2.9 miles) (Figure 1).

Monitoring to Estimate Take Levels

WSF 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 20 minutes before, during, and 30 minutes after any pile removal or driving activity.
- Monitoring will be continuous unless the contractor takes a significant break-then the 20 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 and driving, one land-based biologist will monitor the area from the terminal work site, and one boat will travel through the monitoring area (Figure 2).

Monitoring to Comply with SRKW Take Levels

WSF proposes the following Marine Mammal Monitoring Plan in order to comply with SRKW Level B acoustical harassment take levels in the ZOI:

- If a group of SRKW that exceeds the 20% take level (16 individuals) approaches the ZOI during pile driving or removal, work will be paused until the group exits the ZOI to avoid exceeding the take limit.

- If take is verified for 16 SRKW individuals (20% of stock) during the project, and pile driving or removal is not yet complete, and more SRKW individuals approach the ZOI, work will be paused until the group exits the ZOI to avoid exceeding the 20% take level.

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 (Bachelors 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.

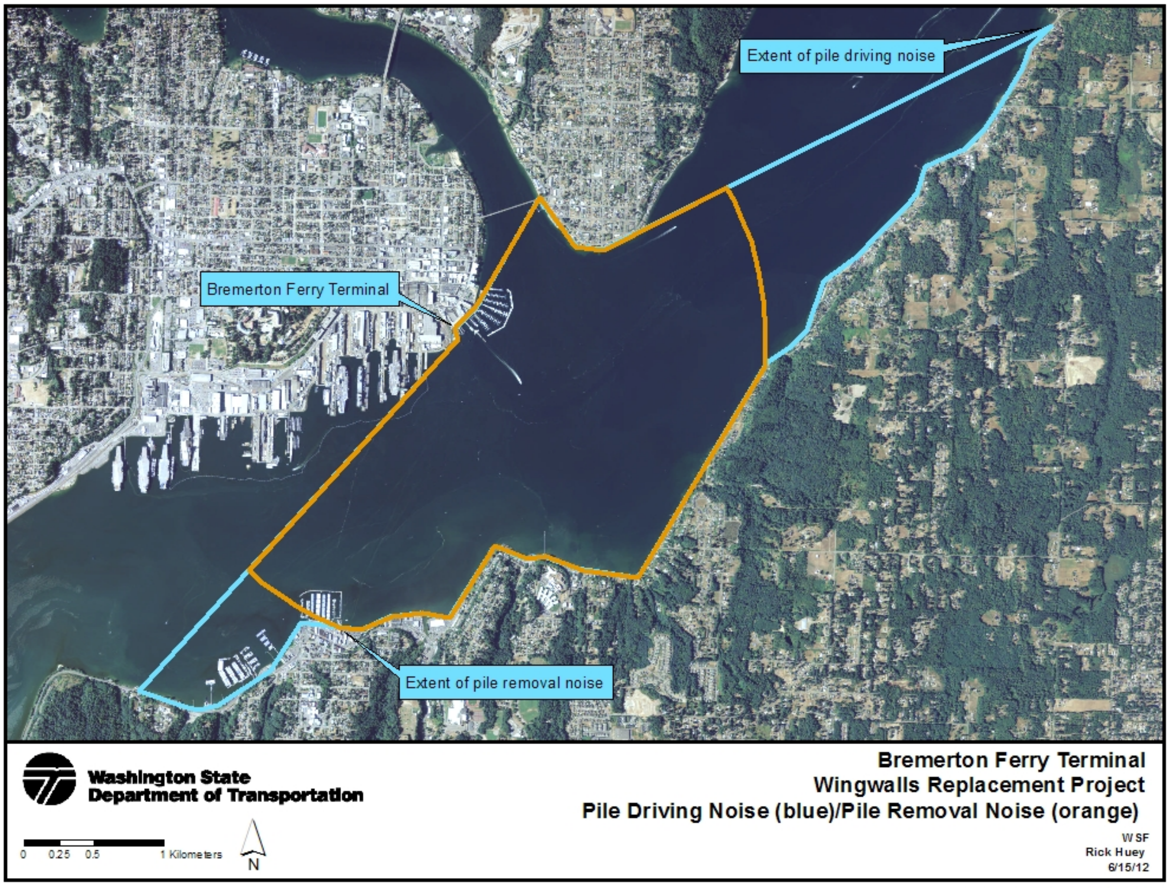

Figure 1 – Bremerton Wingwalls Replacement Vibratory ZOI

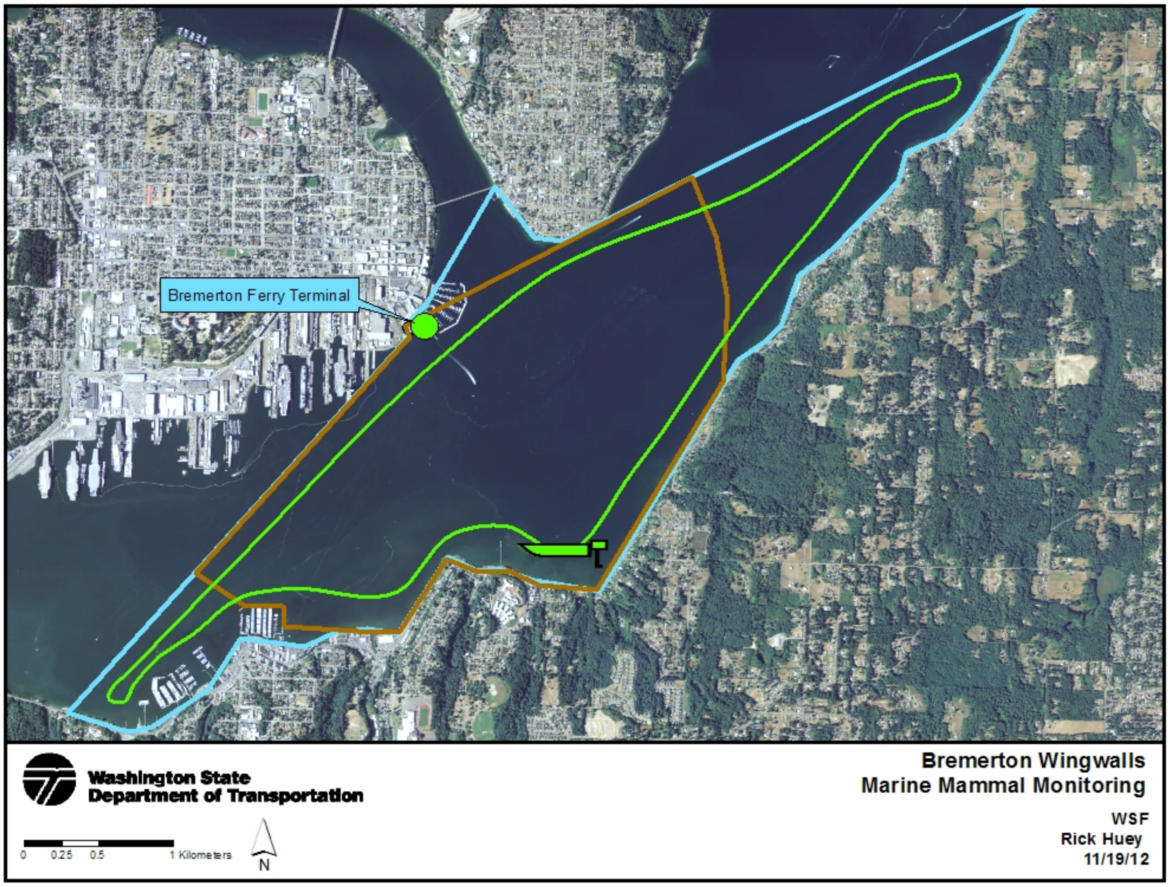

Figure 2 – Bremerton Wingwalls Replacement Monitoring