Request for an Incidental Harassment Authorization Under the Marine Mammal Protection Act

Washington State Department of Transportation Ferries Division

Coupeville Timber Towers Preservation Project

May 8, 2015

Washington State Ferries

Washington State Department of Transportation

Submitted To:

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Cover: Steller Sea Lions near eastern shore of Marrowstone Island, November 21, 2010. *(Photo by N. Baker).*

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Abbreviations and Acronyms

BMP	best management practices
CA-OR-WA	California-Oregon-Washington
CDF	Cumulative Distribution Function
dB	decibels
DPS	Distinct Population Segment
Ecology	Washington State Department of Ecology
ESA	Endangered Species Act
HPA	Hydraulic Project Approval
IHA	Incidental Harassment Authorization
IWC	International Whaling Commission
km	kilometer(s)
m	meters
Makah	Makah Indian Tribe
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
PSAMP	Puget Sound Ambient Monitoring Program
RCW	Revised Code of Washington
RMS	root mean square
SAR	Stock Assessment Report
SPCC	Spill Prevention, Control, and Countermeasures Plan
SRKW	Southern Resident killer whale
USFWS	United States Fish and Wildlife Service
WAC	Washington Administrative Code
WSDOT	Washington State Department of Transportation
WSF	Washington State Department of Transportation Ferries Division
ZOE	Zone of Exclusion
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 (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. The Coupeville Towers Project will preserve the safe and efficient functioning of the Coupeville Ferry Terminal, located on Whidbey Island, WA (Figure 1-2). The proposed project will occur in marine waters that support 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 216 102(a) allows for the issuance of an Incidental Harassment Authorization (IHA), provided an activity results in negligible impacts on small numbers of marine mammals and will not adversely affect subsistence use of these animals.

The project's timing and duration and specific types of activities (pile removal and 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 11 species of marine mammal that may occur in the vicinity of the project.

Figure 1-2 Vicinity Map

1.2 Proposed Project

WSF plans to upgrade the existing transfer span towers at the Coupeville Ferry Terminal. The towers are shown in Figure 1-3 (green arrows). Completion of the entire project will occur in one in-water work season (see Section 1.4).

Figure 1-3 Coupeville Transfer Span Towers

1.3 Project Setting and Land Use

The Coupeville Ferry Terminal is located on Whidbey Island, Island County, Washington. The terminal is located in Section 22, Township 31 North, Range 1 East, and is located in Keystone Harbor, tributary to Admiralty Inlet (Figure 1-2). Land use in the area is a mix of parks, residential and farming.

1.4 Project Description

The transfer span towers and headframe house the cable and weight system that raises and lowers the transfer span to adjust to the tides, allowing for vehicle traffic to enter and exit the ferry vessel (see Appendix A – Project Sheets 1 and 2). The towers need to be upgraded to due to scour from ferry vessel props that are reducing pile embedment. The project will be completed in one in-water work window. Work will take place from a barge containing a derrick, crane and other necessary equipment.

Eight 24-inch diameter hollow steel piles will be installed to support the towers, and concrete caps will be installed on top of the towers in order to support the headframe that houses the pulleys for the transfer span cables. Five to seven 12-inch timber piles will be removed to allow room for the new steel piles to be installed. The remaining tower timber piles will remain in place to help support the structure. Up to 6 temporary 24-inch diameter hollow steel piles will be installed to support the transfer span and towers cable systems during construction.

For this project, all permanent and temporary steel piles will be installed with an impact hammer, instead of the normal practice of using a vibratory hammer and then proofing permanent piles to establish weight-bearing capacity.

There are two reasons for this approach, geotechnical information and monitoring area size. Recent geotechnical studies indicate that the ground in Keystone Harbor is very hard at depth. During the 2010 Keystone (renamed Coupeville) Ferry Terminal Wingwalls project, it was difficult during vibratory driving of steel piles to reach the required tip depths. Several piles never reached the required depth, though the overall structure requirements were met. Therefore, vibratory driving (followed by proofing of the permanent piles) may have limited value in reducing impacting duration. In addition, two of the temporary piles will support the weight of the transfer span, and need to be driven deep enough to be stable. It may not be possible to achieve this with a vibratory hammer.

The second reason is that the use of a vibratory hammer creates a 31 km/19 mile long/140 sq. km/54 square mile vibratory zone of influence (ZOI) (Figure 1-6). If there are delays due to inability to monitor the ZOI (reduced visibility and rough water), then the two day terminal closure would be put at risk. The closure will be scheduled for specific dates so that it can be communicated to terminal users and reservation holders. If those dates shift days before the project, communicating the change would be very difficult. Therefore, eliminating vibratory hammer installation will reduce that risk.

Temporary steel piles will be removed with a vibratory hammer, as the terminal will be able to reopen even if there are some delays to their removal, due to the inability to monitor because of reduced visibility or rough water.

Timber piles will be removed with a vibratory hammer or by direct pull using a chain wrapped around the pile. The crane operator will take measures to reduce turbidity, such as vibrating the pile slightly to break the bond between the pile and surrounding soil, and removing the pile slowly; or if using direct pull, keep the rate at which piles are removed low enough to meet regulatory turbidity limit requirements. If piles are so deteriorated they cannot be removed using

either the vibratory or direct pull method, the operator will use a clamshell to pull the piles from below the mudline. All work will occur in water depths between -10 and -20 feet mean lower-low water.

Construction Sequence

The following construction sequence is anticipated:

- Remove timber piles
- Install temporary steel piles
- Install permanent steel piles
- Install concrete caps
- Transfer headframe to new pile caps
- Remove temporary piles

Durations

The number of days it will take to complete the project depends on the difficulty in removing and installing piles. Only one vibratory or impact hammer will be in operation at a time. Durations are conservative, and the actual amount of time to remove and install will likely be less. Duration estimates are:

- Vibratory removal of timber piles will take approximately 30 minutes per pile, with 5-7 piles removed over two days.
- Impact driving of each temporary 24-inch steel pile will take approximately 15 minutes, (approximately 700 strikes per pile), with up to 6 piles installed over 4-6 days. Temporary piles do not need to be impacted as deep as permanent piles, therefore the duration is shorter.
- Impact driving of each permanent 24-inch steel pile will take approximately 30 minutes, (approximately 1,400 strikes per pile), with 8 piles installed over 4-6 days.
- Vibratory removal of each temporary 24-inch steel pile will take approximately 30 minutes, with up to 6 piles removed over 2 days.

A summary is provided in Table 1-1:

Table 1-1 Partial Trestle Rebuild Pile Summary

Size	Install or Remove/ Pile Type	Number of Piles	Hammer Noise Type	Duration (Minutes per Pile)	Duration (Hours)	Duration (Days)
12-inch	Remove timber (existing)	5-7	Vibratory	30	3.5	2
24-inch	Install steel (temporary)	6	Impact	15	1.5	2
24-inch	Install steel (permanent)	8	Impact	30	4	2
24-inch	Remove steel (temporary)	6	Vibratory	30	3	2
Totals		5-7 existing removed 6 temporary installed/removed 8 permanent installed			12	8

1.5 Project Elements

The noise produced by the proposed vibratory hammer pile removal, and impact hammer installation may harass or harm marine mammals. Direct pull and clamshell removal are not expected to exceed noise levels that would harass or harm marine mammals. These methods are described below.

1.5.1 Vibratory Hammer Removal

Vibratory hammer extraction is a common method for removing timber and steel piling. A vibratory hammer is suspended by cable from a crane and 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 continues to raise the hammer and pulls 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 1-4 shows a timber pile being removed with a vibratory hammer.

1.5.2 Direct Pull and Clamshell Removal

Older timber pilings are prone to breaking at the mudline because of damage from marine borers and vessel impacts. 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, as it will produce temporary, localized turbidity impacts. Turbidity will be kept within required regulatory limits. Direct pull and clamshell removal do not produce noise that could impact marine mammals.

Figure 1-4 Vibratory Hammer Removing a Timber Wingwall Pile

1.5.3 Impact Hammer Installation

Impact hammers can be used to install plastic/steel core, wood, concrete, or steel piles. An impact hammer is a steel device that works like a piston. Impact hammers are usually large, though small impact hammers are used to install small diameter plastic/steel core piles. Impact hammers have guides (called a lead) that hold the hammer in alignment with the pile while a heavy piston moves up and down, striking the top of the pile, and drives it into the substrate from the downward force of the hammer on the top of the pile.

To drive the pile, the pile is first moved into position and set in the proper location using a choker cable or vibratory hammer. Once the pile is set in place, pile installation with an impact hammer can take less than 15 minutes under good conditions, to over an hour under poor conditions (such as glacial till and bedrock, or exceptionally loose material in which the pile repeatedly moves out of position). Figure 2-4 shows a pile being driven with an impact hammer.

Figure 1-5 Impact Hammer Driving a Steel Pile

1.6 Sound Levels

1.6.1 Reference Underwater Vibratory and Impact Sound Source Levels

The project includes vibratory removal of 12-inch timber piles, and impact hammer installation of 24-inch steel piles, and vibratory hammer removal of 24-inch steel piles.

Based on in-water measurements at the WSF Port Townsend Ferry Terminal (WSDOT 2011a), removal of 12-inch timber piles generated 149 to 152 decibels (dB) root mean square (RMS) with an overall average value of 150 dB_{RMS} measured at 16 meters. A worst-case noise level for vibratory removal of 12-inch timber piles will be 152 dB_{RMS} at 16 meters.

Based on in-water measurements at the WSF Port Townsend Ferry terminal, impact pile driving of 24-inch steel piles ranged from 172 to185 dB_{RMS} measured at 10 meters during the use of a bubble curtain (WSDOT 2014a). A bubble curtain will be used to attenuate steel pile impact driving noise during this project. A worst-case noise level for impact driving of 24-inch steel piles will be 185 dB_{RMS} at 10 meters.

Data for vibratory removal of 24-inch temporary steel piles is not available, so it shall be conservatively assumed to be the same as vibratory driving. Based on in-water measurements at the WSF Keystone Ferry Terminal (now renamed Coupeville), vibratory driving of 24-inch steel piles ranged from 164 to 176 dB_{RMS} with an overall average value of 171 dB_{RMS}. Distances from hydrophone to pile ranged between 6 and 11 meters (WSDOT 2010a). A worst-case noise level for vibratory removal of 24-inch steel piles will be 176 dB_{RMS} at 6 meters.

1.6.2 Underwater Background Noise

Underwater background noise is the sound level absent of the proposed activity (pile removal and driving) 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). Background noise levels are compared to the National Marine Fisheries Service (NMFS) threshold levels designed to protect marine mammals, in order to determine the zone of influence (ZOI) 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 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.

In-water background noise data taken within the functional hearing group of relevant species is available for the Coupeville Ferry Terminal (WSDOT 2014b). However, background is below the 120 dB_{RMS} threshold, therefore ZOIs will be determined by the threshold.

1.6.3 Airborne Reference Sound Source Levels

No unweighted in-air source level data is available for 12-inch timber vibratory pile removal or 24-inch vibratory pile driving.

Unweighted in-air measurements of vibratory driving of a 30-inch steel pile collected during the 2010 WSF Coupeville Ferry Terminal Wingwalls Replacement Project ranged from 95-97.8 dB_{RMS} at 50 feet (WSDOT 2010b). Vibratory removal of 12-inch timber piles and vibratory driving of 24-inch timber piles will be conservatively assumed to be the same as 30-inch vibratory pile driving.

1.6.4 Attenuation to NMFS Thresholds

NMFS has established disturbance and injury noise thresholds for marine mammals (Table 1-2). Determining the area(s) exceeding each threshold level is necessary to estimate the number of animals for the Level B acoustical harassment take request, and to establish a monitoring area.

Table 1-2 Marine Mammal Injury and Disturbance Thresholds for Airborne and Underwater

Marine Mammals	Airborne Noise from Marine Construction Activity Level at which Pinniped Haulout Disturbance has been Documented	Vibratory Pile Removal/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}

1.6.4.1 Vibratory Pile Removal (Underwater Noise)

The National Oceanographic Atmospheric Administration (NOAA) practical spreading model (sound transmission loss of 4.5dB per doubling distance) was used to determine the distance where underwater sound will attenuate to the 120 dB_{RMS} threshold. Using the NOAA practical spreading loss model, the ZOIs are calculated below and shown in Figure 1-5:

- 152 dB_{RMS} at 16 m (12-inch timber vibratory pile removal) = ~2.3 km/1.4 miles (6.4 sq. km/2.5 sq. miles)
- 176 dB_{RMS} at 6 m (24-inch steel vibratory pile removal) = ~32 km/20 miles (land is reached at ~31 km/19 miles) (140 sq. km/54 sq. miles)

The vibratory pile removal source level does not exceed the injury thresholds. During the project, in-water measurements of vibratory pile removal and driving may be taken to determine if the vibratory ZOIs need to be modified.

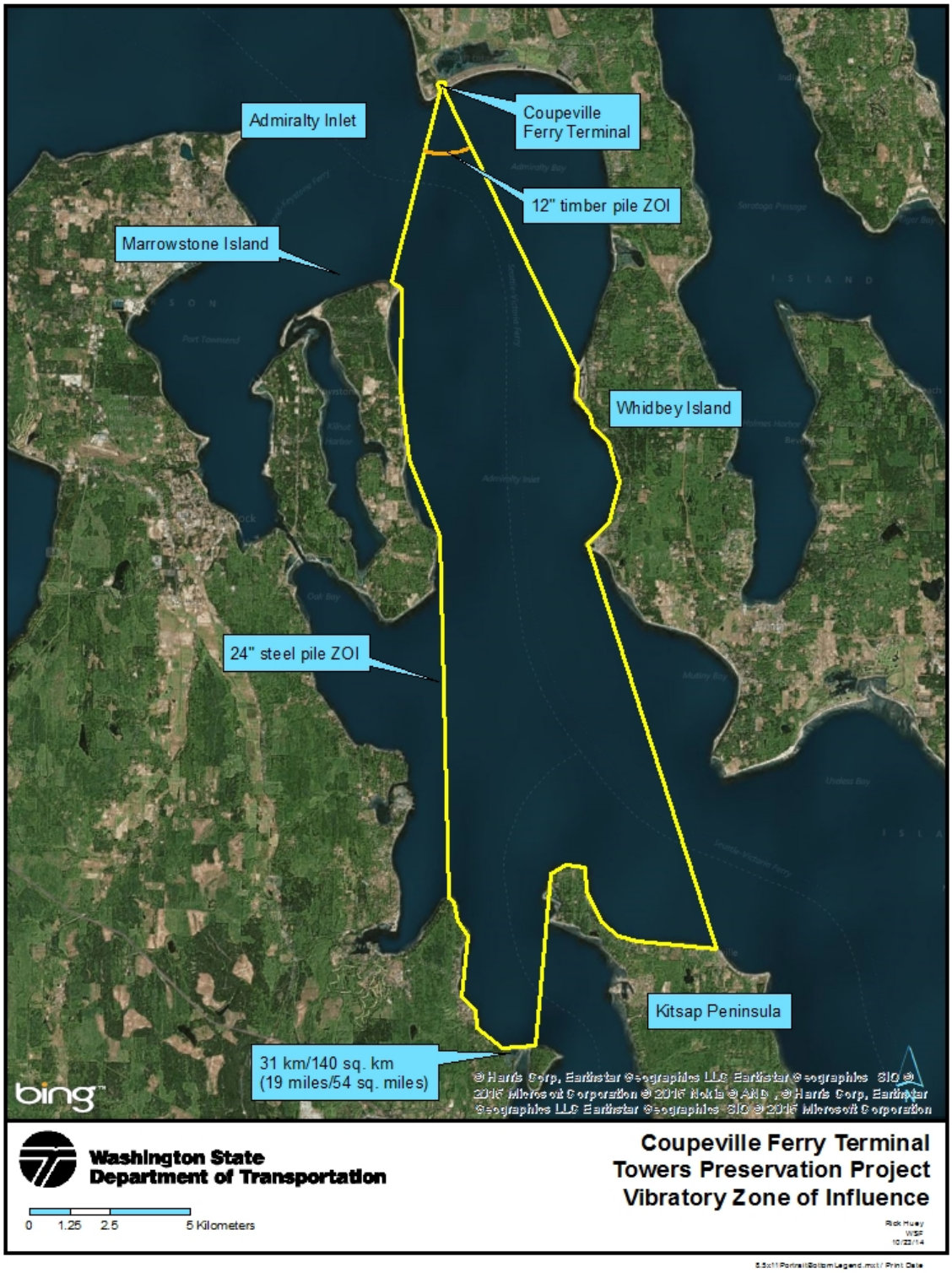

Figure 1-6 Vibratory ZOIs

1.6.4.2 Impact Pile Driving (Underwater Noise)

Using 185 dB_{RMS} at 10 m for 24-inch impact pile driving and the practical spreading loss model, the distances to the thresholds are calculated below and shown in Figure 1-7:

- the 190 dBRMS pinniped injury threshold is reached within 5 m/15 ft.
- the 180 dBRMS cetacean injury threshold is reached within 22 m/72 ft.
- the 160 dBRMS harassment threshold is reached within 464 m/1,523 ft. (1.5 sq. km/0.6 sq. miles)

The more conservative cetacean injury zone (22 m/72 ft.) will be used to set the 24-inch steel Zone of Exclusion (ZOE). The 24-inch steel impact ZOE and ZOI are shown in Figure 1-7 for one representative pile.

During the project, in-water measurements of impact pile driving will be taken to determine if the impact ZOI/ZOEs needs to be modified.

1.6.4.3 Summary of Underwater Threshold Distances/Areas

Table 1-3 Distances/Areas to Injury and Disturbance Thresholds

Pile Driving Method	Distance to 190 dB (m)	Distance to 180 dB (m)	Distance to 160 dB (m)	Distance to 120 dB (km)	ZOI size (km^2)
Vibratory pile removal (12-in timber)	NA	NA	NA	2.3	6.4
Vibratory pile removal (24-in steel)	NA	NA	NA	32	140
Impact driving (24-in steel pile)	5	22	464	NA	1.5

1.6.4.4 Safety Zone/Zone of Exclusion

The purpose of the safety zone/Zone of Exclusion (ZOE) is to ensure that noise-generating activities are shut down before Level A (injury) take occurs from cetaceans entering a 180 dB ZOE or a pinniped entering a 190 dB ZOE while impact pile driving is active.

During any impact hammering, a 22 m/71 ft. radius ZOE will be fully monitored and impact hammering will shut down at the approach of any marine mammal to this zone (see Section 11.2.4 Marine Mammal Monitoring).

There is no Level A take during vibratory hammer use, because source energy levels do not exceed the 180 dB cetacean or the 190 dB pinniped injury thresholds.

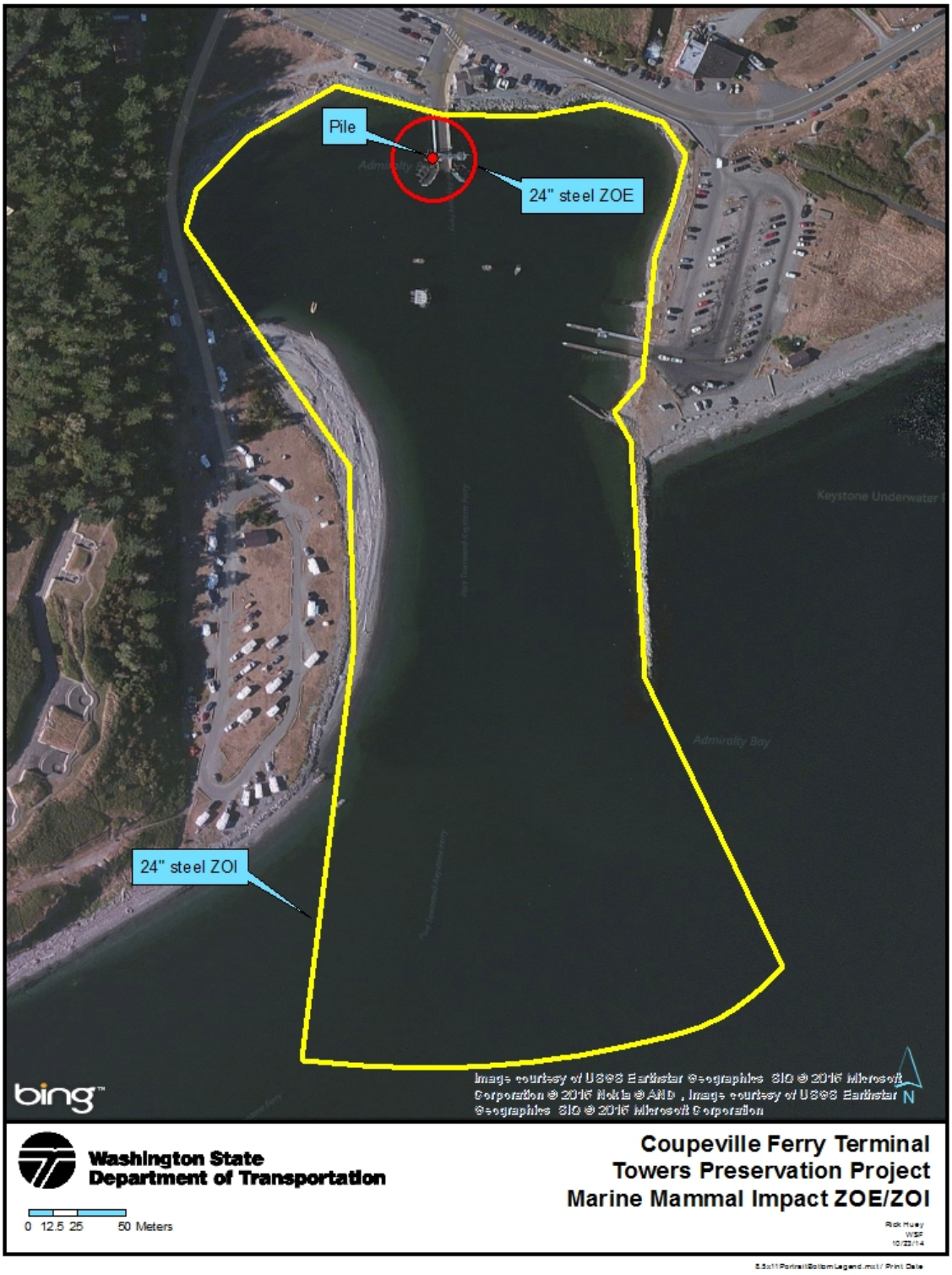

Figure 1-7 Impact ZOI/ZOE

1.6.4.5 Airborne Noise

NMFS has established an in-air noise disturbance threshold of 90 dBRMS (unweighted) for harbor seals, and 100 dBRMS (unweighted) for all other pinnipeds (sea lions).

Using a conservative measurement of 98 dBRMS at 50 feet for 12-inch timber vibratory removal, and 24-inch steel vibratory and impact pile driving, and attenuating at 6 dBA per doubling distance overwater, in-air noise from pile removal and driving will attenuate to the 90 dBRMS harbor seal threshold within approximately 126 feet/38 meters, and to the 100 dBRMS sea lion threshold within approximately 40 feet/12 meters (Figure 1-8).

The closest documented harbor seal haulout is the Rat Island/Kilisut Harbor Spit haulout in Port Townsend Bay, 5.5 miles southwest. The closest documented California sea lion haulout is a channel marker buoy located off Whidbey Island's Bush Point, 9 miles south. The closest documented Steller sea lion haulout is Craven Rock haulout, east of Marrowstone Island 5.5 miles south of the ferry terminal (Figure 3-1).

In-air disturbance will be limited to those pinnipeds moving on the surface through the immediate pier area, within approximately 126 feet/38 meters and 40 feet/12 meters of pile removal and driving (Figure 1-8).

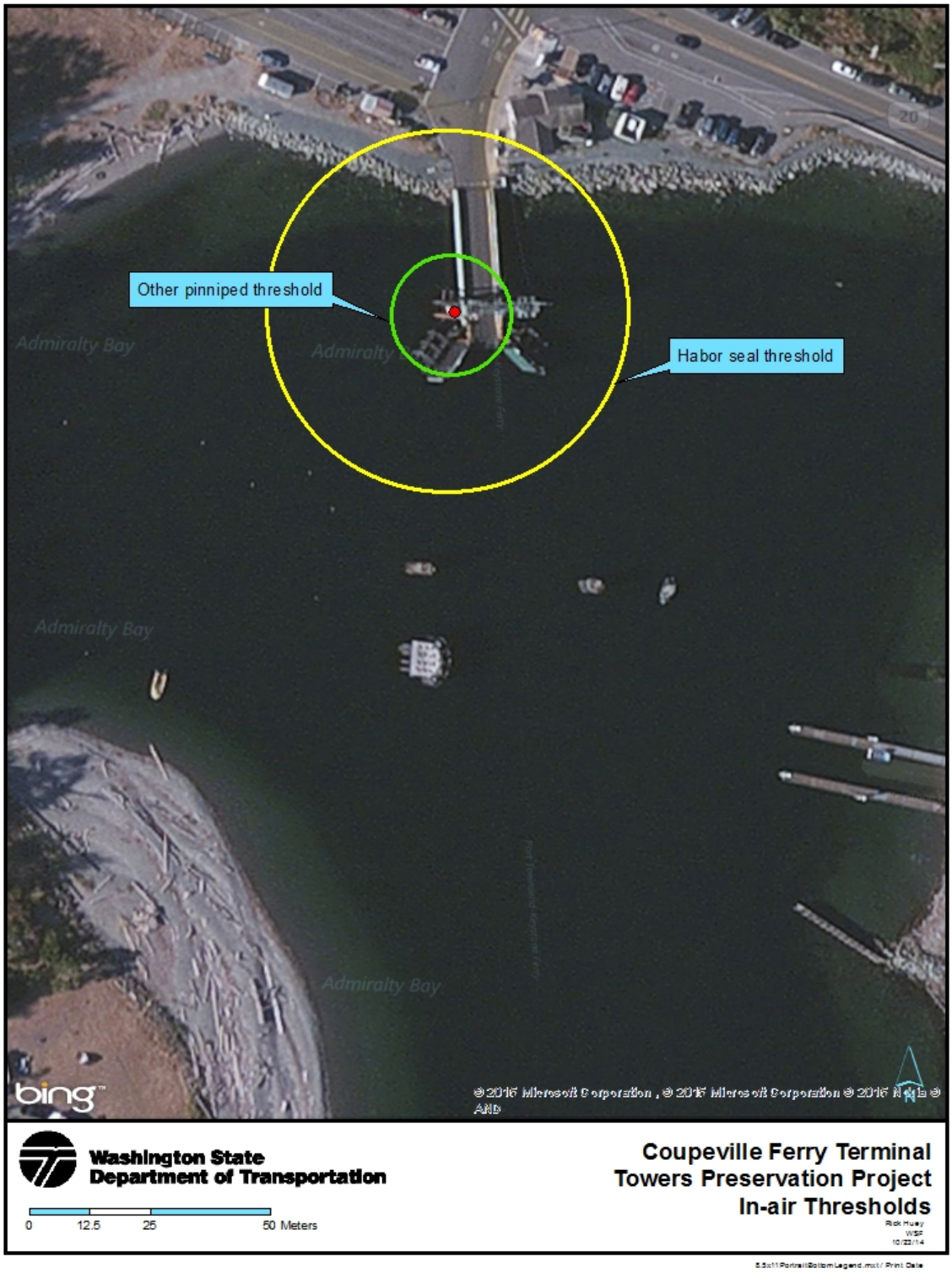

Figure 1-8 In-air Threshold Areas

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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

The project is scheduled for construction in the fall/winter of 2016/17. Due to NMFS, U.S. Fish and Wildlife Service (USFWS), and Washington State Department of Fish and Wildlife (WDFW) in-water work timing restrictions to protect salmonids listed under the Endangered Species Act (ESA), planned WSF in-water construction is limited each year to July 15 through February 15. This project will be constructed in the September 1 to February 15 timeframe.

2.2 Duration

- The daily construction window for pile removal and driving will begin no sooner than 30 minutes after sunrise to allow for initial marine mammal monitoring, and will end 30 minutes prior to sunset to allow for post-pile removal and driving marine mammal monitoring.
- Vibratory timber pile removal will take approximately 15 to 30 minutes per pile. Assuming the worst case of 30 minutes per pile (with no direct pull or clamshell removal), removal of 7 piles will take an estimated 210 minutes/3.5 hours over 2 days of pile removal (Table 2-1).
- Impact pile driving of 6 temporary steel piles will take approximately 15 minutes per pile, or 90 minutes/1.5 hours over 2 days.
- Impact pile driving of 8 permanent steel piles will take approximately 30 minutes per pile, or 240 minutes/4 hours over 2 days.
- Vibratory pile removal of 6 temporary steel piles will take approximately 30 minutes per pile, or 180 minutes/3 hours over 2 days.
- It is likely that the actual hours of vibratory pile removal, and impact driving will be less.

Table 2-1 Worst Case Pile Durations

Pile Type/Method	Number of Piles	Minutes	Hours	Days
Vibratory Timber Removal	7	210	3.5	2
Temporary Steel Impact Driving	6	90	1.5	2
Permanent Steel Impact Driving	8	240	4	2
Vibratory Steel Removal	6	180	3	2
Total	27	720	12	8*

*Both vibratory and impact driving of permanent steel piles will take place over a total of 6 days.

2.3 Region of Activity

The proposed activities will occur at the Coupeville Ferry Terminal, located on Whidbey Island, Washington (see Figures 1-1, 1-2 and 1-6).

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3.0 Species and Numbers of Marine Mammals in Area

This section is a combination of items 3 and 4 from NOAA's list of information required for an incidental take authorization. It provides:

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

It also describes the ESA and MMPA status for each species. Possible ESA status designations include:

- Threatened: "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."
- Endangered: "any species which is in danger of extinction throughout all or a significant portion of its range."
- Proposed: *candidate species* that were found to warrant listing as either threatened or endangered and are officially proposed as such in a *Federal Register* notice.
- Delisted: No longer listed under the ESA.
- Unlisted: Not currently listed under the ESA.

Possible MMPA status designations include:

- Strategic: a marine mammal stock for which the level of direct human-caused mortality exceeds the potential biological removal level; which, based on the best available scientific information, is declining and is likely to be listed as a threatened species under the ESA within the foreseeable future; or which is listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA.
- Depleted: the Secretary, after consultation with the Marine Mammal Commission and the Committee of Scientific Advisors on Marine Mammals established under MMPA title II, determines that a species or population stock is below its optimum sustainable population; a State, to which authority for the conservation and management of a species or population stock is transferred under section 109, determines that such species or stock is below its optimum sustainable population; or a species or population stock is listed as a threatened or endangered species under the ESA.
- Non-depleted: a species or population stock is at or above its optimum sustainable population (NMFS 2013a).

3.1 Species Present

Eleven marine mammal species may be found in the Coupeville 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	Unlisted	Non-depleted	Year-round	Common
California Sea Lion	Unlisted	Non-depleted	September-April	Occasional
Steller Sea Lion	Delisted	Strategic/Depleted	October-May	Common
Northern Elephant Seal	Unlisted	Non-depleted	Year-round	Rare
Harbor Porpoise	Unlisted	Non-depleted	Year-round	Common
Dall's Porpoise	Unlisted	Non-depleted	Year-round (more common in winter)	Occasional
Pacific White-sided Dolphin	Unlisted	Non-depleted	Spring-Fall	Rare
Killer Whale Southern Resident	Endangered	Strategic/Depleted	Year-round (more common in fall/winter)	Occasional
Killer Whale Transient	Unlisted	Strategic/Depleted	Year-round	Occasional
Gray Whale	Delisted	Non-depleted	March-February	Occasional
Humpback Whale	Endangered	Strategic/Depleted	April-February	Occasional
Minke Whale	Unlisted	Non-depleted	Year-round	Rare

3.2 The Whale Museum Marine Mammal Sightings Data

The Whale Museum (TWM), located in Friday Harbor, San Juan Island, has the most extensive marine mammal sighting database for the Salish Sea (Georgia Basin/Strait of San Juan de Fuca/Puget Sound). WSF requested that TWM analyze sightings data for the project area for the years 2009 to 2013, in the September to February timeframe scheduled for this project.

In the analysis of sightings data, multiple reports of marine mammals in the same region on the same day may possibly be the same individuals; therefore 'whale days' is used for SRKW sightings, and 'sighting days' is used for other marine mammals, rather than the number of sightings. A whale/sighting day is any day an SRKW/marine mammal is reported in a given area, regardless of the number of times they were reported that day.

Sightings data are assigned to a geographic quadrant, which are grid cells roughly 4.6 kilometers by 4.6 kilometers that were developed for reporting SRKW sightings before GPS units were readily available. Figure 3-1 shows the quadrants in the Coupeville area, including the quadrants of interest for the project. The ZOI (in yellow) intersects with eight quadrants: 387-390, 392-395 and 445.

As sightings are opportunistic and SRKW can travel large distances in a day (~100 miles), it is important to analyze data across a region, rather than just single quadrants.

The primary area of interest in the analysis are the ZOI quadrants; however, since the project will be conducted in 'Area 2: Puget Sound' of the designated SRKW critical habitat, it is appropriate to include analyses at that geographic scale. Since there is a good chance that whales will be missed within a specific quadrant, a larger area is analyzed as well for comparison to the single quadrants.

Furthermore, it is likely that most sightings occurring in Puget Sound involved SRKW entering from Admiralty Inlet and through the project ZOI, as reports of SRKW travelling through Deception Pass are rare. We also included the areas directly to the south of the quadrants in question as the whales would have had to pass through the quadrants of concern to reach more southerly areas. This area was called 'Hood Canal'.

Because other marine mammals (to a lesser degree than whales), can also travel across multiple quadrants, a conservative analysis approach similar to the one described for SRKW was also taken. It should be noted that data for marine mammals other than SRKW, gray, humpback and Transient killer whales (such as pinnipeds, porpoise and minke) are collected in an opportunistic fashion. Pinnipeds and porpoise are probably present in the ZOI close to 365 days per year. The sightings data should be considered an absolute minimum number of sightings for those species in the area (TWM 2014).

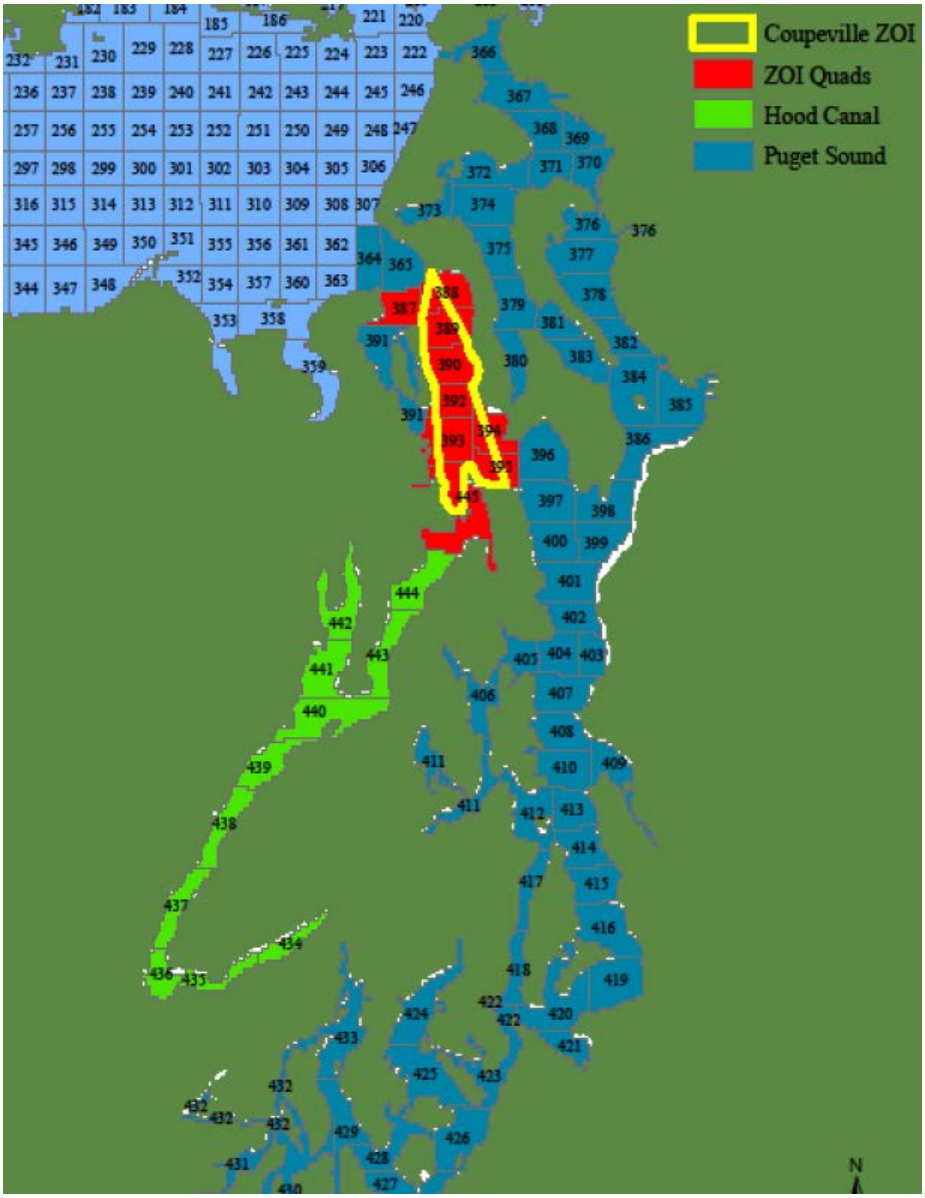

Figure 3-1 ZOI + Area Quads

3.3 Pinnipeds

There are four species of pinnipeds that may be found in the Region of Activity: harbor seal (*Phoca vitulina richardsi*), Northern Elephant seal (*Mirounga angustirostris*), California sea lion (*Zalophus californianus*) and Steller sea lion (*Eumetopias jubatus*).

3.3.1 Harbor Seal

There are three stocks in Washington's inland waters, the Hood Canal, Northern Inland Waters, and Southern Puget Sound stocks. Seals belonging to the Northern Inland Waters Stock are present at the project site (Figure 3-2). Pupping seasons vary by geographic region. For the northern Puget Sound region, pups are born from late June through August (WDFW 2012). After October 1 all pups in the inland waters of Washington are weaned. Of the pinniped species that commonly occur within the region of activity, harbor seals are the most common and the only pinniped that breeds and remains in the inland marine waters of Washington year-round (Calambokidis and Baird 1994).

Figure 3-2 Harbor Seal (and Marbled murrelet with fish in mouth in background)
(Photo by Kelly McAllister, WSDOT, 7/12/2013)

3.3.1.1 Numbers

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). According to the 2014 Stock Assessment Report (SAR), the most recent estimate for the Washington Northern Inland Waters Stock is 11,036 (NMFS 2014a). No minimum population estimate is available. However, there are an estimated 32,000 harbor seals in Washington today, and their population appears to have stabilized (Jeffries 2013), so the estimate of 11,036 may be low.

3.3.1.2 Status

The Washington Inland Waters stock of harbor seals is "non-depleted" under the MMPA and "unlisted" under the ESA.

3.3.1.3 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 1944; 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 closest documented harbor seal haulout is the Rat Island/Kilisut Harbor Spit haulout in Port Townsend Bay, 5.5 miles southwest (Figure 3-3). Harbor seals may also haulout in small numbers on undocumented sites in the area, such as beaches.

Project-specific Observations

During the 2010 WSF Keystone Wingwalls project, marine mammal monitoring was implemented for the same vibratory hammer ZOI that will be present for elements of this project. Over 21 days of monitoring from three positions within the vibratory ZOI, at least 11 harbor seals were observed (WSF 2010a).

For the years 2009 to 2014, in the September to February timeframe scheduled for this project, The Whale Museum reported zero sightings days for harbor seals in the Coupeville 24" steel vibratory hammer ZOI quadrants (TWM 2014). It should be noted that pinnipeds are not reported at the same rate as large cetaceans, and harbor seals are likely present 365 days a year in Puget Sound.

In 2009, the Orca Network monitored for marine mammals in October/November from Admiralty Head (immediately north of Keystone Harbor), in preparation for a proposed Admiralty Inlet tidal energy project. Over 43 days of monitoring, 259 harbor seals were observed, with a maximum count of 32 observed in one day (Orca Network 2009). It is likely that individual harbor seals were counted more than once.

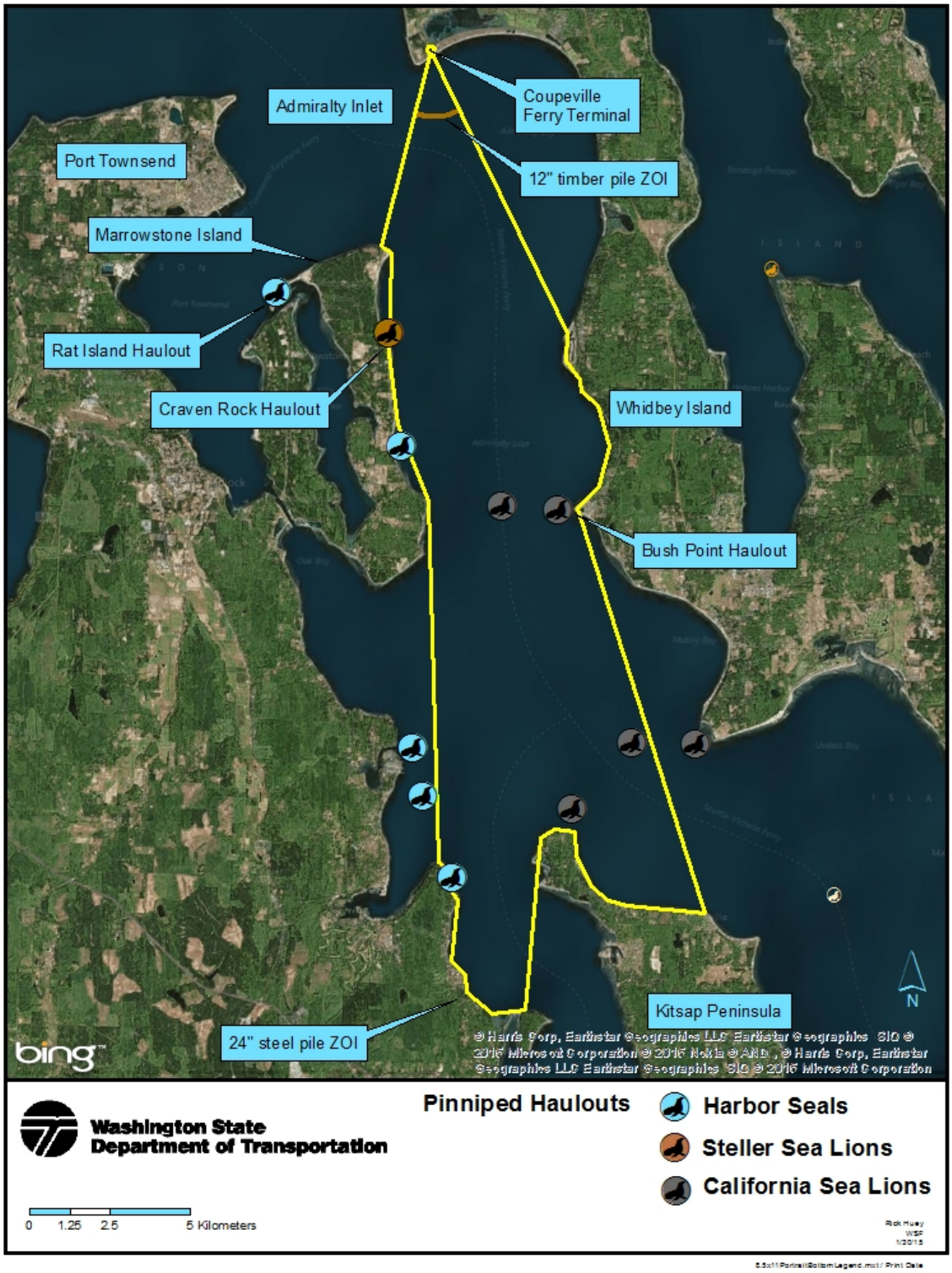

Figure 3-3 Coupeville Area Pinniped Haulout Sites

According to the NMFS National Stranding Database (2012-2014), there were 30 confirmed harbor seal strandings in the vicinity of the 24" steel vibratory hammer ZOI for this project (NMFS 2015a).

3.3.2 Northern Elephant Seal

The California breeding stock of Northern Elephant seal may be present near the project site.

3.3.2.1 Numbers

The California stock of Northern Elephant seal minimum population size is estimated very conservatively as 74,913 (NMFS 2007a). In Puget Sound and the Strait of San Juan de Fuca, 10-15 Northern Elephant seal pups are born each year on Whidbey, Protection, and Smith Islands, Dungeness Spit and Race Rocks. The population in the Salish Sea appears to be rising (Orca Network 2015b). Using a multiplier of 3.5 (NMFS 2007a) with the maximum pup count of 15, the Salish Sea population could be as large as 53 individuals.

3.3.2.2 Status

The California breeding stock of Northern Elephant sea lions is not ESA listed, and not considered a "depleted" or "strategic" stock under the MMPA (NMFS 2007).

3.3.2.3 Distribution

Northern elephant seals breed and give birth in California (U.S.) and Baja California (Mexico), primarily on offshore islands, from December to March. Males feed near the eastern Aleutian Islands and in the Gulf of Alaska, and females feed further south, south of 45^{o}N. Adults return to land between March and August to molt, with males returning later than females. Adults return to their feeding areas again between their spring/summer molting and their winter breeding seasons (NMFS 2007).

The closest documented Northern Elephant seal haulouts are Protection Island (12 miles NW of the ferry terminal), and Minor and Smith Islands (13.5 miles N) (Figure 3-4).

Elephant seals also use area beaches as haulouts, such as "Ellie" the Elephant seal who has been coming to a south Whidbey beach to rest while molting each spring for several years, and now has a pup (Figure 3-5). Observed on March 20, 2015, this is the first Elephant seal pup observed in the stranding region (Island, Skagit & N. Snohomish County) (Orca Network 2015b).

Male Elephant seals have also been observed in Puget Sound, as far south as Vashon Island (Miller 2015). The male in Figure 3-6 was observed on March 20, 2015, near Shoreline, WA, approximately 36 miles SE of the Coupeville ferry terminal (Orca Network 2015).

Figure 3-4 Coupeville Area Northern Elephant Seal Haulout Sites

Figure 3-5 'Ellie' and pup on Whidbey Island Beach

Figure 3-6 Male Elephant Seal near Shoreline, WA *(photo by Dave Davenport)*

Project-specific Observations

During the 2010 WSF Keystone Wingwalls project, over 21 days of monitoring from three positions within the vibratory ZOI, zero Northern Elephant sea lions were observed (WSF 2010A).

For the years 2009 to 2014, in the September to February timeframe scheduled for this project, The Whale Museum reported zero sightings days for Northern Elephant seals in the Coupeville 24" steel vibratory hammer ZOI quadrants, and one in Puget Sound (TWM 2014). It should be noted that pinnipeds are not reported at the same rate as large cetaceans.

In 2009, the Orca Network monitored for marine mammals in October/November from Admiralty Head (immediately north of Keystone Harbor), in preparation for a proposed Admiralty Inlet tidal energy project. Over 43 days of monitoring, zero Northern Elephant seals were observed, though a number of sightings were unidentified sea lions (Orca Network 2009).

According to the NMFS National Stranding Database (2012-2014), there were zero confirmed Northern Elephant seal strandings in the vicinity of the 24" steel vibratory hammer ZOI for this project (NMFS 2015a).

3.3.3 California Sea Lion

Washington California sea lions (Figure 3-7) are part of the U.S. stock, which begins at the U.S./Mexico border and extends northward into Canada.

Figure 3-7 California Sea Lion *(photo by Alaska Fisheries Science Center, NMFS)*

3.3.3.1 Numbers

The U.S. stock was estimated at 296,750 and may be at carrying capacity, although more data are needed to verify that determination (NMFS 2011a). The minimum population estimate is 153,337. 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).

3.3.3.2 Status

The U.S. stock of California sea lions is "non-depleted" under the MMPA, and "unlisted" under the ESA.

3.3.3.1 Distribution

California sea lions breed on islands off Baja Mexico and southern California with primarily males migrating 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 (fall to spring) in Washington waters (WDFW 2000).

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

California sea lions 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 at that time numbered around 1,000. 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).

The closest documented California sea lion haulout is a channel marker buoy located off Whidbey Island's Bush Point, 9 miles south (Figure 3-3).

Project-specific Observations

During the 2010 WSF Keystone Wingwalls project, over 21 days of monitoring from three positions within the vibratory ZOI, zero California sea lions were observed (WSF 2010A).

For the years 2009 to 2014, in the September to February timeframe scheduled for this project, The Whale Museum reported zero sightings days for California sea lions in the Coupeville 24" steel vibratory hammer ZOI quadrants, and 9 in Puget Sound (TWM 2014). It should be noted that pinnipeds are not reported at the same rate as large cetaceans, and California sea lions are likely present 365 days a year in Puget Sound.

In 2009, the Orca Network monitored for marine mammals in October/November from Admiralty Head (immediately north of Keystone Harbor), in preparation for a proposed Admiralty Inlet tidal energy project. Over 43 days of monitoring, zero California sea lions were observed (Orca Network 2009).

According to the NMFS National Stranding Database (2012-2014), there was one confirmed California sea lion stranding in the vicinity of the 24" steel vibratory hammer ZOI for this project (NMFS 2015a).

3.3.4 Steller Sea Lion

The Eastern stock of Steller sea lion may be present near the project site (Figure 3-8).

Figure 3-8 **Steller Sea Lions near eastern shore of Marrowstone Island**
(Photo by N. Baker, 11/21/2010)

3.3.4.1 Numbers

The eastern stock of Steller sea lions is estimated to be 63,160 individuals, with a minimum U.S. population estimate of 63,160, and a Washington minimum population estimate of 1,749 (NMFS 2013c). 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).

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).

3.3.4.2 Status

The eastern stock of Steller sea lions are "depleted/strategic" under the MMPA and were "delisted" under the ESA on November 4, 2013 (78 FR 66140). 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. Critical habitat is associated with breeding and haulout areas in Alaska, California, and Oregon (55 FR 49204).

3.3.4.3 Distribution

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). 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).

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). However, the number of inland waters haulout sites has increased in recent years.

The closest documented Steller sea lion haulout is Craven Rock haulout, east of Marrowstone Island 5.5 miles SW of the ferry terminal (Figure 3-3). The haulout is generally occupied from October through May, which overlaps with the in-water work window.

Project-specific Observations

During the 2010 WSF Keystone Wingwalls project, over 21 days of monitoring from three positions within the vibratory ZOI, 26 Steller sea lions were observed (WSF 2010a). It is likely that single individuals were counted more than once.

During the 2010 WSF Port Townsend Dolphins project, monitoring for ESA listed marine mammals was implemented from positions that observed a portion of the Coupeville 24" steel vibratory hammer ZOI. Over three days of monitoring, 22 Steller sea lions were observed WSF 2010b). It was likely that individual Steller sea lions were counted more than once.

For the years 2009 to 2014, in the September to February timeframe scheduled for this project, The Whale Museum reported 9 sightings days for Steller sea lions in the Coupeville 24" steel vibratory hammer ZOI quadrants (TWM 2014). It should be noted that pinnipeds are not reported at the same rate as large cetaceans, and Steller sea lions are likely present in the area from October to May.

In 2009, the Orca Network monitored for marine mammals in October/November from Admiralty Head (immediately north of Keystone Harbor), in preparation for a proposed Admiralty Inlet tidal energy project. Over 43 days of monitoring, 188 Steller sea lions were observed, with a maximum count of 41 observed in one day (Orca Network 2009). It was likely that individual Steller sea lions were counted more than once.

According to the NMFS National Stranding Database (2012-2014), there were zero confirmed Steller sea lion strandings in the vicinity of the 24" steel vibratory hammer ZOI quadrants for this project (NMFS 2015a).

3.4 Cetaceans

Seven cetacean species may be present in the Coupeville ferry terminal area; harbor porpoise, Dall's porpoise, Pacific White-sided dolphin, killer whale (Southern Resident and Transient), gray whale, humpback whale and minke whale.

3.4.1 Harbor Porpoise

The Washington Inland Waters Stock of harbor porpoise may be found near the project site (Figure 3-9). The Washington Inland Waters Stock occurs in waters east of Cape Flattery (Strait of Juan de Fuca, San Juan Island Region and Puget Sound). Harbor porpoise are high-frequency hearing range cetaceans (Southall et. al. 2007).

Figure 3-9 Harbor Porpoise *(photo by Steve Gnam, Pacific Biodiversity Institute)*

3.4.1.1 Numbers

The Washington Inland Waters Stock mean abundance estimate based on 2002 and 2003 aerial surveys conducted in the Strait of Juan de Fuca, San Juan Islands, Gulf Islands, and Strait of Georgia is 10,682 harbor porpoises (NMFS 2011b).

No harbor porpoise were observed within Puget Sound proper during comprehensive harbor porpoise surveys (Osmek et al. 1994) or Puget Sound Ambient Monitoring Program (PSAMP) surveys conducted in the 1990s (WDFW 2008). Declines were attributed to gill-net fishing, increased vessel activity, contaminants, and competition with Dall's porpoise.

However, populations appear to be rebounding with increased sightings in central Puget Sound (Carretta et al. 2007b) and southern Puget Sound (D. Nysewander pers. comm. 2008; WDFW 2008). Recent boat surveys of the main basin indicate that at least several hundred and possibly as many as low thousands of harbor porpoise are now present. While the reasons for this recolonization are unclear, it is possible that changing conditions outside of Puget Sound, as evidenced by a tripling of the population in the adjacent waters of the Strait of Juan de Fuca and San Juan Islands since the early 1990s, and the recent higher number of harbor porpoise mortalities in coastal waters of Oregon and Washington, may have played a role in encouraging harbor porpoise to explore and shift into areas like Puget Sound (Hanson, et. al. 2011).

3.4.1.2 Status

The Washington Inland Waters Stock of harbor porpoise is "non-depleted" under MMPA, and "unlisted" under the ESA.

3.4.1.3 Distribution

Harbor porpoises are common in the Strait of Juan de Fuca and south into Admiralty Inlet, especially during the winter, and are becoming more common south of Admiralty Inlet.

Little information exists on harbor porpoise movements and stock structure near the Coupeville ferry terminal area, although it is suspected that in some areas harbor porpoises migrate (based on seasonal shifts in distribution). For instance Hall (2004; pers. comm. 2008) found harbor porpoises off Canada's southern Vancouver Island to peak during late summer, while the Washington State Department of Fish and Wildlife's (WDFW) Puget Sound Ambient Monitoring Program (PSAMP) data show peaks in Washington waters to occur during the winter.

Hall (2004) found that the frequency of sighting of harbor porpoises decreased with increasing depth beyond 150 m with the highest numbers observed at water depths ranging from 61 to 100 m. Although harbor porpoises have been spotted in deep water, they tend to remain in shallower shelf waters (<150 m) where they are most often observed in small groups of one to eight animals (Baird 2003). Water depths within the Coupeville project 24" ZOI range from 0-184 m, with the majority of the ZOI between 54-90 m deep.

Project-specific Observations

During the 2010 WSF Keystone Wingwalls project, over 21 days of monitoring from three positions within the vibratory ZOI, two harbor porpoise were observed (WSF 2010A).

During the 2010 WSF Port Townsend Dolphins project, monitoring for ESA listed marine mammals was implemented from positions that observed a portion of the Coupeville 24" steel vibratory hammer ZOI. Over three days of monitoring, groups of harbor porpoise as large as 50 individuals were observed (WSF 2010b).

For the years 2009 to 2014, in the September to February timeframe scheduled for this project, The Whale Museum reported 8 sightings days for harbor porpoise in the Coupeville 24" steel vibratory hammer ZOI, and 16 in Puget Sound (TWM 2014). It should be noted that small cetaceans are not reported at the same rate as large cetaceans.

In 2009, the Orca Network monitored for marine mammals in October/November from Admiralty Head (immediately north of Keystone Harbor), in preparation for a proposed Admiralty Inlet tidal energy project. Over 43 days of monitoring, 160 harbor porpoise (from single individuals to a group of 20), with a maximum count of 55 observed in one day (Orca Network 2009).

According to the NMFS National Stranding Database (2012-2014), there were 15 confirmed harbor porpoise strandings in the vicinity of the 24" steel vibratory hammer ZOI quadrants for this project (NMFS 2015a).

3.4.2 Dall's Porpoise

The California, Oregon, and Washington Stock of Dall's porpoise may be found near the project site (Figure 3-10). Dall's porpoise are high-frequency hearing range cetaceans (Southall et. al. 2007).

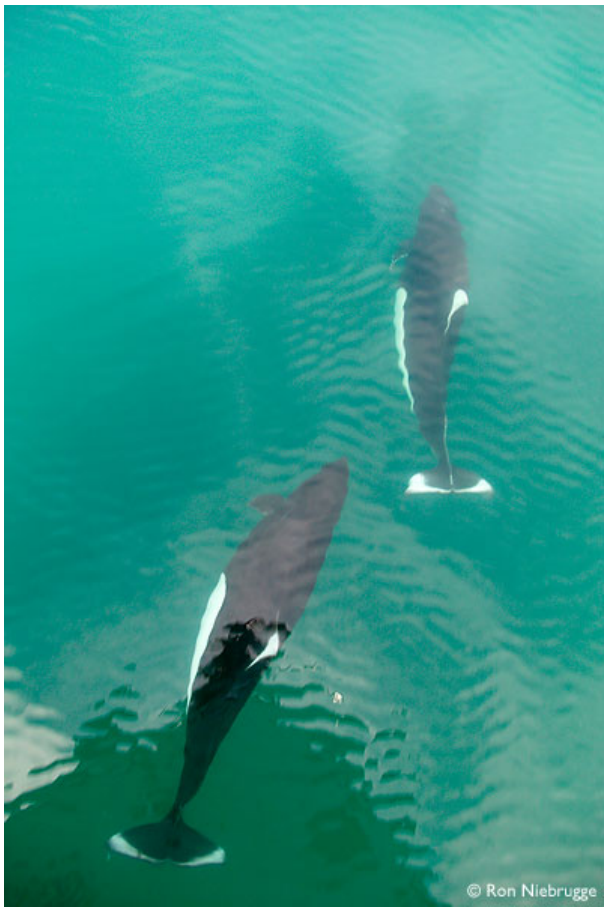

Figure 3-10 Dall's Porpoise

3.4.2.1 Numbers

The most recent estimate of Dall's porpoise stock abundance is 42,000, based on 2005 and 2008 summer/autumn vessel-based line transect surveys of California, Oregon, and Washington waters (NMFS 2011c). Within the inland waters of Washington and British Columbia, this species is most abundant in the Strait of Juan de Fuca east to the San Juan Islands. The most recent

Washington's inland waters estimate is 900 animals (Calambokidis et al. 1997), though sightings have become rarer since then (Kitsap Sun 2013). Prior to the 1940s, Dall's porpoises were not reported in Puget Sound.

3.4.2.2 Status

The California, Oregon, and Washington Stock of Dall's porpoise is "non-depleted" under the MMPA, and "unlisted" under the ESA.

3.4.2.3 Distribution

Dall's porpoises are migratory and appear to have predictable seasonal movements driven by changes in oceanographic conditions (Green et al. 1992, 1993), and are most abundant in Puget Sound during the winter (Nysewander et al. 2005; WDFW 2008). Despite their migrations, Dall's porpoises occur in all areas of inland Washington at all times of year (Calambokidis pers. comm. 2006), but with different distributions throughout Puget Sound from winter to summer. The average winter group size is three animals (WDFW 2008).

Project-specific Observations

During the 2010 WSF Keystone Wingwalls project, over 21 days of monitoring from three positions within the vibratory ZOI, one Dall's porpoise was observed (WSF 2010A).

During the 2010 WSF Port Townsend Dolphins project, monitoring for ESA listed marine mammals was implemented from positions that observed a portion of the Coupeville 24" steel vibratory hammer ZOI. Over three days of monitoring, zero Dall's porpoise were observed (WSF 2010b).

For the years 2009 to 2014, in the September to February timeframe scheduled for this project, The Whale Museum reported 2 sightings days for Dall's porpoise in the Coupeville 24" steel vibratory hammer ZOI quadrants, and 11 in Puget Sound (TWM 2014). It should be noted that small cetaceans are not reported at the same rate as large cetaceans.

In 2009, the Orca Network monitored for marine mammals in October/November from Admiralty Head (immediately north of Keystone Harbor), in preparation for a proposed Admiralty Inlet tidal energy project. Over 3 days of monitoring, one confirmed harbor/Dall's hybrid porpoise was observed (Orca Network 2009).

According to the NMFS National Stranding Database (2012-2014), there were zero Dall's porpoise strandings in the vicinity of the 24" steel vibratory hammer ZOI quadrants for this project (NMFS 2015a).

3.4.3 Pacific White-sided Dolphin

The California, Oregon, and Washington Northern and Southern Stock of Pacific White-sided dolphins may be found near the project site (Figure 3-11). Pacific White-sided dolphins are mid-frequency hearing range cetaceans (Southall et. al. 2007).

Figure 3-11 Pacific White-sided Dolphin

3.4.3.1 Numbers

The most recent estimate of Pacific White-sided dolphin stock abundance is 29,930 (NMFS 2014b). Within the inland waters of Washington and British Columbia, this species is most abundant in the Strait of Juan de Fuca east to the San Juan Islands. There is no Washington's inland waters population estimate. Groups of more than 150 have been observed near Victoria, British Columbia (Strait of Juan de Fuca), and they are becoming more common in northern Puget Sound waters (Seattle PI 2014). Single individuals have been observed in Southern Puget Sound (Orca Network 2014).

3.4.3.2 Status

The California, Oregon, and Washington Northern and Southern Stock of Pacific White-sided dolphin is "non-depleted" under the MMPA, and "unlisted" under the ESA.

3.4.3.3 Distribution

Pacific White-sided dolphins are endemic to temperate waters of the North Pacific Ocean, and common both on the high seas and along the continental margins. Off the U.S. west coast, Pacific White-sided dolphins occur primarily in shelf and slope waters. Sighting patterns from aerial and shipboard surveys conducted in California, Oregon and Washington suggest seasonal

north-south movements, with animals found primarily off California during the colder water months and shifting northward into Oregon and Washington as water temperatures increase in late spring and summer (NMFS 2014b).

Project-specific Observations

During the 2010 WSF Keystone Wingwalls project, over 21 days of monitoring from three positions within the vibratory ZOI, zero Pacific White-sided dolphins were observed (WSF 2010A).

During the 2010 WSF Port Townsend Dolphins project, monitoring for ESA listed marine mammals was implemented from positions that observed a portion of the Coupeville 24" steel vibratory hammer ZOI. Over three days of monitoring, zero Pacific White-sided dolphins were observed (WSF 2010b).

For the years 2009 to 2014, in the September to February timeframe scheduled for this project, The Whale Museum reported zero sightings days for Pacific White-sided dolphin in the Coupeville 24" steel vibratory hammer ZOI quadrants, and 3 in Puget Sound (TWM 2014). It should be noted that small cetaceans are not reported at the same rate as large cetaceans.

In 2009, the Orca Network monitored for marine mammals in October/November from Admiralty Head (immediately north of Keystone Harbor), in preparation for a proposed Admiralty Inlet tidal energy project. Over 43 days of monitoring, zero Pacific White-sided dolphins were observed (Orca Network 2009).

According to the NMFS National Stranding Database (2012-2014), there were zero Pacific White-sided dolphin strandings in the vicinity of the 24" steel vibratory hammer ZOI quadrants for this project (NMFS 2015a).

3.4.4 Killer Whale

The Eastern North Pacific Southern Resident (SRKW) (Figure 3-12) and West Coast Transient (Transient)(Figure 3-13) stocks of killer whale may be found near the project site. Killer whales are mid-frequency hearing range cetaceans (Southall et al. 2007).

3.4.4.1 Numbers

Southern Resident Stock

The Southern Residents live in three family groups known as the J, K and L pods. As of March 30, 2015, the stock collectively numbers 81 individuals, including four new calves (three in J pod, one in L pod) (CWR 2015).

Figure 3-12 Southern Resident (J Pod) with Calf

Figure 3-13 Transient with Calf

On February 10, 2015, NOAA Fisheries announced a final rule that includes Lolita, a captive Southern Resident at the Miami Seaquarium (captured in Puget Sound in 1970), in the endangered species listing for the Southern Resident killer whale population (Figure 3-15). While technically this raises the total stock to 82, 81 will be used as Lolita is still captive (50 CFR Part 224).

Figure 3-14 **Lolita** *(photo by The Orca Project)*

West Coast Transient Stock

Transient killer whales generally occur in smaller (less than 10 individuals), less structured pods (NMFS 2013). According to the Center for Whale Research (CWR 2013), they tend to travel in small groups of one to five individuals, staying close to shorelines, often near seal rookeries when pups are being weaned. The West Coast Transient stock, which includes individuals from California to southeastern Alaska, is has a minimum population estimate of 243 (NMFS 2013d).

3.4.4.2 Status

Southern Resident Stock

The SRKW stock was declared "depleted/strategic" under the MMPA in May 2003 (68 FR 31980). On November 18, 2005, the stock was listed as "endangered" under the ESA (70 FR 69903). On November 29, 2006, NMFS published a final rule designating critical habitat for the SRKW DPS. Both Puget Sound and the San Juan Islands are designated as core areas of critical habitat under the ESA (excluding areas less than 20 feet deep relative to extreme high water) (71 FR 69054). A final recovery plan for SRKW was published in January of 2008 (NMFS 2008).

On February 23, 2015, NOAA Fisheries announced a 12-month finding on a petition to revise the Critical Habitat Designation for SRKW is warranted (NMFS 2015b).

West Coast Transient Stock

The West Coast Transient stock is "non-depleted" under the MMPA, and "unlisted" under the ESA (NMFS 2013d).

Washington State Status

In Washington State, all killer whales (*Orcinus orca*) that may be present in Washington waters (Southern Resident, West Coast Transient, and Offshore) were listed as a state candidate species in 2000. In April 2004, the State upgraded their status to a "state endangered species" (WDFW 2004).

3.4.4.3 Distribution

The SRKW and West Coast Transient 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).

Southern Resident Stock

SRKW are documented in coastal waters ranging from central California to the Queen Charlotte Islands, British Columbia (NMFS 2008). They occur in all inland marine waters (Figure 3-14). SR 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).

Seasonal Distribution

Records from 1976 through 2013 document SRKW 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 (Osborne 2008/Orca Network 2013).

Spring/Summer Distribution

Beginning in May or June and through the summer months, all three pods (J, K and L) 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, J pod also occurred intermittently during this time in Puget Sound; however, records from 1997-2007 show that J pod did not enter Puget Sound south of the Strait of Juan de Fuca from approximately June through August (Osborne 2008).

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.

Project-specific Observations

During the 2010 WSF Keystone Wingwalls project, over 21 days of monitoring from three positions within the vibratory ZOI, zero SRKW were observed (WSF 2010A).

During the 2010 WSF Port Townsend Dolphins project, monitoring for ESA listed marine mammals was implemented from positions that observed a portion of the Coupeville 24" steel vibratory hammer ZOI. Over three days of monitoring, zero SRKW were observed (WSF 2010b).

For the years 2009 to 2013, in the September to February timeframe scheduled for this project, The Whale Museum reported 97 sightings days for SRKW in the Coupeville 24" steel vibratory hammer ZOI quadrants (Table 3-2), and 210 in Puget Sound (TWM 2014).

In 2009, the Orca Network monitored for marine mammals in October/November from Admiralty Head (immediately north of Keystone Harbor), in preparation for a proposed Admiralty Inlet tidal energy project. Over 43 days of monitoring, SRKW were observed three days. Groups of up to 20 were observed during two of those days, and a group of up to 10 was observed the third day (Orca Network 2009).

According to the NMFS National Stranding Database (2012-2014), there were zero SRKW strandings in the vicinity of the 24" steel vibratory hammer ZOI quadrants for this project (NMFS 2015a).

Table 3-2 Coupeville ZOI SR Killer Whale Sightings* 2009-2013

Month	Sightings
September	7
October	25
November	22
December	25
January	8
February	10

*group or individual (TWM 2014)

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).

Seasonal Distribution

West Coast Transients are documented intermittently year-round in Washington inland waters.

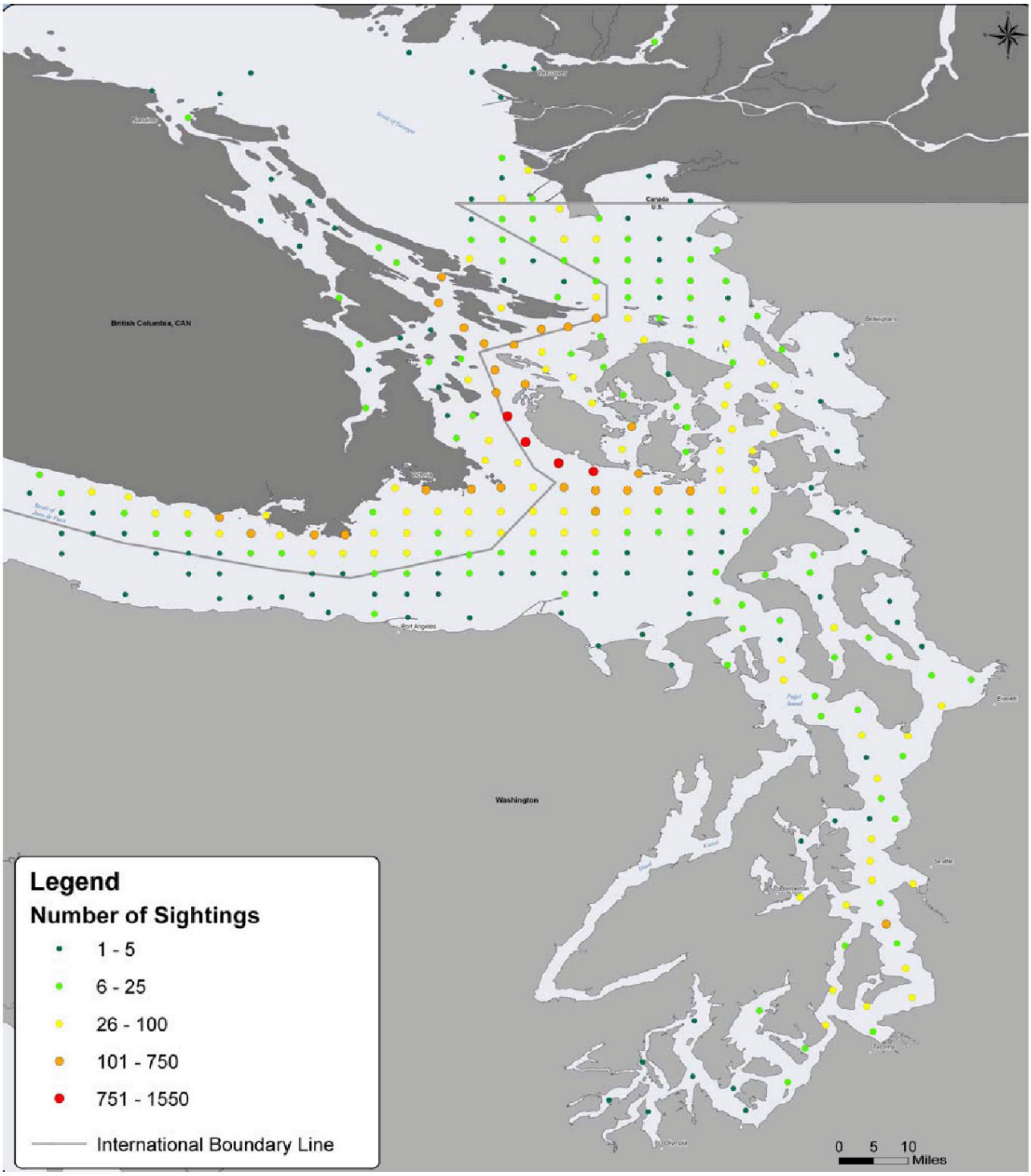

Figure from the Recovery Plan for Southern Resident Killer Whales (NMFS 2008).

Figure 3-15 Distribution of Southern Resident killer whale sightings (groups) 1990-2005

Project-specific Observations

During the 2010 WSF Keystone Wingwalls project, over 21 days of monitoring from three positions within the vibratory ZOI, Transients were observed one day, in a group of up to 10 (WSF 2010a).

During the 2010 WSF Port Townsend Dolphins project, monitoring for ESA listed marine mammals was implemented from positions that observed a portion of the Coupeville 24" steel vibratory hammer ZOI. Over three days of monitoring, zero Transients were observed (WSF 2010b).

During the 2012/13 WSF Port Townsend Transfer Span Project, approximately 10 Transients were observed January 25th from a Port Townsend monitoring position. They traveled south outside of the ZOI for the Transfer Span Project, but within what will be the Coupeville 24" steel vibratory ZOI (WSF 2013).

For the years 2009 to 2014, in the September to February timeframe scheduled for this project, The Whale Museum reported 11 sightings days for Transients in the Coupeville 24" steel vibratory hammer ZOI (Table 3-3), and 77 in Puget Sound (TWM 2014).

In 2009, the Orca Network monitored for marine mammals in October/November from Admiralty Head (immediately north of Keystone Harbor), in preparation for a proposed Admiralty Inlet tidal energy project. Over 43 days of monitoring, zero Transients were observed (Orca Network 2009).

According to the NMFS National Stranding Database (2012-2014), there were zero Transient strandings in the vicinity of the 24" steel vibratory hammer ZOI quadrants for this project (NMFS 2015a).

Table 3-3 Coupeville ZOI Transient Killer Whale Sightings* 2009-2014

Month	Sightings
September	2
October	1
November	3
December	1
January	2
February	2

*group or individual (TWM 2014)

3.4.5 Gray Whale

The Eastern North Pacific stock of gray whale may be found near the project site (Figure 3-16). Gray whales are low-frequency hearing range cetaceans (Southall et al. 2007).

3.4.5.1 Numbers

The most recent population estimate for the Eastern North Pacific stock is 19,126 individuals (NMFS 2014c). 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. 2004a). Forty-eight individual gray whales were observed in Puget Sound and Hood Canal in 2004 and 2005 (Calambokidis 2007).

Figure 3-16 Gray Whale – South Whidbey Island

3.4.5.2 Status

The Eastern North Pacific stock of gray whales is "non-depleted" under the MMPA, and was "delisted" 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/NMFS 2011f).

3.4.5.3 Distribution

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 (south Whidbey Island area) from March through May to feed on ghost shrimp (Weitkamp et al. 1992; Calambokidis pers. comm. 2006). The size of the group is 10-12 individuals, and some are arriving as early as January and staying into July (Orca Network 2015b). During this time frame they are also seen in the Strait of Juan de Fuca, the San Juan Islands and areas of Puget Sound, although the observations in Puget Sound are highly variable between years (Calambokidis et al. 1994). The average tenure within Washington inland waters is 47 days and the longest stay was 112 days (J. Calambokidis pers. comm. 2007).

Project-specific Observations

During the 2010 WSF Keystone Wingwalls project, over 21 days of monitoring from three positions within the vibratory ZOI, zero gray whales were observed (WSF 2010A).

During the 2010 WSF Port Townsend Dolphins project, monitoring for ESA listed marine mammals was implemented from positions that observed a portion of the Coupeville 24" steel vibratory hammer ZOI. Over three days of monitoring, zero gray whales were observed (WSF 2010b).

For the years 2009 to 2014, in the September to February timeframe scheduled for this project, The Whale Museum reported 4 sightings days for gray whale in the Coupeville 24" steel vibratory hammer ZOI (Table 3-4), and 96 in Puget Sound (TWM 2014).

In 2009, the Orca Network monitored for marine mammals in October/November from Admiralty Head (immediately north of Keystone Harbor), in preparation for a proposed Admiralty Inlet tidal energy project. Over 43 days of monitoring, zero gray whales were observed (Orca Network 2009).

According to the NMFS National Stranding Database (2012-2014), there were zero gray whale strandings in the vicinity of the 24" steel vibratory hammer ZOI quadrants for this project (NMFS 2015a).

Table 3-4 Coupeville ZOI Gray Whale Sightings* 2009-2014

Month	Sightings
September	3
October	0
November	0
December	0
January	0
February	1

*group or individual (TWM 2014)

3.4.6 Humpback Whale

The California-Oregon-Washington (CA-OR-WA) stock of humpback whale may be found near the project site (Figure 3-17). Humpback whales are low-frequency hearing range cetaceans (Southall et. al. 2007).

3.4.6.1 Numbers

The stock abundance estimate is 1,918 individuals (NMFS 2014d).

Figure 3-17 Humpback Whale – San Juan Island
(photo by Justine Buckmaster, Victoria Clipper Naturalist)

3.4.6.2 Status

The CA-OR-WA stock of humpback whales is "depleted/strategic" under the MMPA, and "endangered" under the under the Endangered Species Conservation Act of 1969. This protection was transferred to the ESA in 1973. A recovery plan was adopted in 1991(NMFS 2011g).

On April 21, 2015, NOAA proposed to divide the species into 14 DPSs, remove the current species-level listing, and in its place list two DPSs as endangered and two DPSs as threatened. The remaining 10 DPSs are not proposed for listing based on their current statuses. This proposal also constitutes a negative 12-month finding on a petition to delineate and "delist" a DPS of humpback whales spanning the entire North Pacific and a positive 12-month finding on a petition to delineate and "delist" a DPS in the Central North Pacific (Hawaii breeding population). At this time, NOAA does not propose to designate critical habitat for the two listed DPSs that occur in U.S. waters (Western North Pacific, Central America) because it is not currently determinable (80 CFR 2230).

3.4.6.3 Distribution

Historically, humpback whales were common in inland waters of Puget Sound and the San Juan Islands (Calambokidis et al. 2004b). 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). Commercial hunts ended in the 1960's. Since the mid-1990s, sightings in Puget Sound have increased.

This stock calves and mates in coastal Central America and Mexico and migrates 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. 2007b). 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.

Project-specific Observations

During the 2010 WSF Keystone Wingwalls project, over 21 days of monitoring from three positions within the vibratory ZOI, zero humpback whales were observed (WSF 2010A).

During the 2010 WSF Port Townsend Dolphins project, monitoring for ESA listed marine mammals was implemented from positions that observed a portion of the Coupeville 24" steel vibratory hammer ZOI. During this monitoring, zero humpback whales were observed (WSF 2010b).

For the years 2009 to 2014, in the September to February timeframe scheduled for this project, The Whale Museum reported 5 sightings days for humpback whale in the Coupeville 24" steel vibratory hammer ZOI quadrants (Table 3-2), and 40 in Puget Sound (TWM 2014).

In 2009, the Orca Network monitored for marine mammals in October/November from Admiralty Head (immediately north of Keystone Harbor), in preparation for a proposed Admiralty Inlet tidal energy project. Over 43 days of monitoring, zero humpback whales were observed (Orca Network 2009).

According to the NMFS National Stranding Database (2012-2014), there were zero humpback whale strandings in the vicinity of the 24" steel vibratory hammer ZOI quadrants for this project (NMFS 2015a).

Table 3-5 Coupeville ZOI Humpback Whale Sightings* 2009-2014

Month	Sightings
September	1
October	3
November	1
December	0
January	0
February	0

*group or individual

3.4.7 Minke Whale

The California-Oregon-Washington (CA-OR-WA) stock of minke whale may be found near the project site (Figure 3-17). Minke whales are low-frequency hearing range cetaceans (Southall et. al. 2007).

The CA-WA-OR stock is considered a resident stock (NMFS 2008b), and includes minke whales within the inland Washington waters of Puget Sound and the San Juan Islands (Dorsey et al. 1990; Carretta et al. 2007b).

Minke whales have small dark sleek bodies and a small dorsal fin. These whales are often recognized by surfacing snout first and a shallow but visible "bushy" blow. Minke whales feed by side lunging into schools of prey and gulping in large amounts of water. Food sources typically consist of krill, copepods, and small schooling fish, such as anchovies, herring, mackerel, and sand lance (NMFS 2008b).

3.4.7.1 Numbers

Information on minke whale population and abundance is limited due to difficulty of detection (Green et al. 1991). Conducting surveys for the minke whale is difficult because of their low profiles, indistinct blows, and tendency to occur as single individuals (Green et al. 1992). The minimum population estimate of minke whales in the CA-OR-WA stock is 202 individuals (NMFS 2011d).

Over a 10-year period, 30 individuals were photo-identified in the U.S./Canada trans-boundary area around the San Juan Islands and demonstrated high site fidelity (Dorsey et al. 1990; Calambokidis and Baird 1994). In a single year, up to 19 individuals were photo-identified from around the San Juan Islands (Dorsey et al. 1990).

Figure 3-18 Minke Whale
(Photo by John Calambokidis, Cascadia Research)

3.4.7.2 Status

Minke whales are not listed under the ESA and are classified as non-depleted under the MMPA.

3.4.7.3 Distribution

Minke whales are reported in Washington inland waters year-round, although few are reported in the winter (Calambokidis and Baird 1994). Minke whales are relatively common in the San Juan Islands and Strait of Juan de Fuca (especially around several of the banks in both the central and eastern Strait), but are relatively rare in Puget Sound.

Project-specific Observations

During the 2010 WSF Keystone Wingwalls project, over 21 days of monitoring from three positions within the vibratory ZOI, zero Minke whales were observed (WSF 2010a).

During the 2010 WSF Port Townsend Dolphins project, monitoring for ESA listed marine mammals was implemented from positions that observed a portion of the Coupeville 24" steel vibratory hammer ZOI. Over three days of monitoring, zero Minke whales were observed (WSF 2010b).

During the 2012/13 WSF Port Townsend Transfer Span Project, one Minke whale was observed on November 17, 2012 from a Port Townsend monitoring position. The whale was observed inside of the ZOI for the Transfer Span Project (but not during active pile work), but may have been present in what will be the Coupeville 24" steel vibratory hammer ZOI (WSF 2013).

For the years 2009 to 2014, in the September to February timeframe scheduled for this project, The Whale Museum reported 6 sightings days for Minke whale in the Coupeville 24" steel vibratory hammer ZOI quadrants(Table 3-6), and 27 in Puget Sound (TWM 2014).

In 2009, the Orca Network monitored for marine mammals in October/November from Admiralty Head (immediately north of Keystone Harbor), in preparation for a proposed Admiralty Inlet tidal energy project. Over 43 days of monitoring, two Minke whales were observed (Orca Network 2009).

According to the NMFS National Stranding Database (2012-2014), there were zero Minke whale strandings in the vicinity of the 24" steel vibratory hammer ZOI quadrants for this project (NMFS 2015a).

Table 3-6 Coupeville ZOI Minke Whale Sightings* 2009-2014

Month	Sightings
September	3
October	0
November	3
December	0
January	0
February	0

*group or individual (TWM 2014)

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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.

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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 July 15, 2014 through July 14, 2015 for Level B incidental take (behavioral harassment) of the marine mammals described within this application during the Coupeville Timber Towers Preservation project.

The requested authorization is for incidental harassment of any 11species of marine mammals that might enter the 160 dB ZOI during impact pile driving, and the 120 dB ZOI during active vibratory pile removal activity.

The scheduled pile-removal activities discussed in this application will occur between September 1, 2015 and August 31, 2016.

5.2 Method of Incidental Taking

The method of incidental take is Level B acoustical harassment of any marine mammal occurring within the 160 dB ZOI during impact pile driving, and within the 120 dB ZOI during vibratory pile removal.

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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 the Coupeville project. Section 6.2 describes the methods used to calculate the estimated ZOI and Section 6.3 describes the 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 impact pile driving, and vibratory pile removal source levels, this IHA application will incidentally take by Level B acoustical harassment small numbers of harbor seal, Elephant seal, California sea lion, Steller sea lion, Harbor porpoise, Dall's porpoise, Pacific White-sided Dolphin, Southern Resident killer whale, Transient killer whale, Gray whals, Humpback whale and Minke whale.

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

6.1 Estimated Duration

Durations are provided below, and summarized in Table 6-1. The actual number of hours is expected to be less.

- Vibratory timber pile removal will take approximately 15 to 30 minutes per pile. Assuming the worst case of 30 minutes per pile (with no direct pull or clamshell removal), removal of 7 piles will take an estimated 210 minutes/3.5 hours over 2 days of pile removal.
- Impact pile driving of 6 temporary steel piles will take approximately 15 minutes per pile, or 90 minutes/1.5 hours over 2 days.
- Impact pile driving of 8 permanent steel piles will take approximately 30 minutes per pile, or 240 minutes/4 hours over 2 days.
- Vibratory pile removal of 6 temporary steel piles will take approximately 30 minutes per pile, or 180 minutes/3 hours over 2 days.
- It is likely that the actual hours of vibratory pile removal and driving, and impact driving will be less.

Table 6-1 Worst Case Pile Durations

Pile Type/Method	Number of Piles	Minutes	Hours	Days
Vibratory Timber Removal	7	210	3.5	2
Temporary Steel Impact Driving	6	90	1.5	2
Permanent Steel Impact Driving	8	240	4	2
Vibratory Steel Removal	6	180	3	2
Total	27	720	12	8*

*Both vibratory and impact driving of permanent steel piles will take place over a total of 6 days.

6.2 Estimated Zones of Influence

Distances to the NMFS threshold for Level B (harassment) take for impact pile driving and vibratory pile removal were estimated and presented in Section 1.6.4, Attenuation to NMFS Thresholds:

- ZOI-1: the 160 dBRMS impact pile driving harassment threshold for 24" steel (185 dB_{RMS} at 10 m) = 464 m/1,523 ft.
- ZOI-2: the 120 vibratory harassment threshold for 12-inch timber vibratory pile removal (152 dB_{RMS} at 16 m) = ~2.3 km/1.4 miles
- ZOI-3: the 120 vibratory harassment threshold for 24-inch steel vibratory pile removal (176 dB_{RMS} at 6 m) = ~32 km/20 miles (land is reached at ~31 km/19 miles)

Airborne noises can affect pinnipeds, especially resting seals hauled out on rocks or sand spits. The 90 dBRMS harbor seal threshold was estimated at 126 feet/38 meters, and the 100 dBRMS sea lion threshold at 40 feet/12 meters (Figure 1-8).

The closest documented harbor seal haulout is the Rat Island/Kilisut Harbor Spit haulout in Port Townsend Bay, 5.5 miles southwest. The closest documented California sea lion haulout is a channel marker buoy located off Whidbey Island's Bush Point, 9 miles south. The closest documented Steller sea lion haulout is Craven Rock haulout, east of Marrowstone Island 5.5 miles south of the ferry terminal (Figure 3-1).

In-air disturbance will be limited to those pinnipeds moving on the surface through the immediate pier area, within approximately 126 feet/38 meters and 40 feet/12 meters of pile removal and driving (Figure 1-8).

6.3 Estimated Incidental Takes

Incidental take for each species is estimated by determining the likelihood of a marine mammal being present within a ZOI during active pile driving or removal. Expected marine mammal presence is determined by past observations and general abundance near the project site 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., The Whale Museum, Orca Network, state and federal agencies), opinions from state and federal agencies, observations from WSF biologists, and best professional judgment. All estimates are conservative. A summary of noise durations is provided in Table 6-1.

The calculation for marine mammal exposures is estimated by:

Exposure estimate = N * days of pile driving/removal, where:

N = # of animals

6.3.1 Harbor Seal

Based on the Orca Network monitoring (259 harbor seals observed in 43 days, with a maximum count of 32 observed in one day), this analysis uses a conservative estimate of 32 harbor seals may be present within the nearshore ZOIs (steel impact/timber removal).

ZOI-1: Exposure estimate = 32 * 4 days = 128

ZOI-2: Exposure estimate = 32 * 2 days = 64

ZOI-3: Using the area of the timber removal ZOI (6.4 sq. km) and the area of the steel removal ZOI (140 sq. km), and scaling up proportionally, it is assumed that 704 harbor seals/day may be present in the larger ZOI:

140 sq. km ÷ 6.4 sq. km = 22 X 32 harbor seals/day = 704 harbor seals/day

This is a conservative estimate, as it is likely that harbor seals use the nearshore waters more often than deeper mid-channel waters.

Exposure estimate = 704 * 2 days = 1,408

WSF is requesting authorization for Level B acoustical harassment of 1,600 harbor seals. It is assumed that this number will include multiple harassments of the same individual(s).

6.3.2 Elephant Seal

Based on limited sightings data, it is assumed that 2 Elephant seals may be present within ZOI-1 and ZOI-2, and that 5 may be present in ZOI-3.

ZOI-1: Exposure estimate = 2 * 4 days = 8

ZOI-2: Exposure estimate = 2 * 2 days = 4

ZOI-3: Exposure estimate = 5 * 2 days = 10

WSF is requesting authorization for Level B acoustical harassment of 22 Elephant seals. It is assumed that this number will include multiple harassments of the same individual(s).

6.3.3 California Sea Lion

Based on limited sightings data, it is assumed that 2 California sea lions may be present within ZOI-1 and ZOI-2, and that 5 may be present in ZOI-3.

ZOI-1: Exposure estimate = 2 * 4 days = 8

ZOI-2: Exposure estimate = 2 * 2 days = 4

ZOI-3: Exposure estimate = 5 * 2 days = 10

WSF is requesting authorization for Level B acoustical harassment of 22 California sea lions. It is assumed that this number will include multiple harassments of the same individual(s).

6.3.4 Steller Sea Lion

Based on the Orca Network monitoring (188 Steller sea lions observed in 43 days, with a maximum count of 41 observations in one day), as described in Section 3.0, this analysis uses a conservative estimate of 41 Steller sea lions that may be present.

ZOI-1: Exposure estimate = 41 * 4 days = 164

ZOI-2: Exposure estimate = 41 * 2 days = 82

ZOI-3: Exposure estimate = 41 * 2 days = 82

WSF is requesting authorization for Level B acoustical harassment take of 328 Steller sea lions. It is assumed that this number will include multiple harassments of the same individual(s).

6.3.5 Harbor Porpoise

Based on the water depth within the ZOI, and on the Orca Network monitoring (160 harbor porpoise observed in 43 days, with a maximum count of 55 observed in one day), as described in Section 3.0, this analysis uses a conservative estimate of 55 harbor porpoise that may be present within the ZOIs. However, it is assumed that they will not be present each day in the smaller ZOIs, but may be present more than one day in the larger ZOI.

ZOI-1
For steel impact pile driving, the duration estimate is 5.5 hours over 4 days (Table 6-1). For the exposure estimate, it will be conservatively assumed that 55 harbor porpoise may be present within the impact pile driving ZOI and be exposed multiple times during the project.

Exposure estimate = 55 * 1 day = 55

ZOI-2
For vibratory timber pile removal, the duration estimate is 3.5 hours over 2 days (Table 6-1). For the exposure estimate, it will be conservatively assumed that 55 harbor porpoise may be present within the vibratory pile removal ZOI and be exposed multiple times during the project.

Exposure estimate = 55 * 1 day = 55

ZOI-3
For vibratory steel pile removal, the duration estimate is 3.0 hours over 2 days (Table 6-1). For the exposure estimate, it will be conservatively assumed that 55 harbor porpoise may be present within the vibratory pile removal ZOI and be exposed multiple times during the project.

Exposure estimate = 55 * 2 days = 110

WSF is requesting authorization for Level B acoustical harassment of 220 harbor porpoise. It is assumed that this number will include multiple harassments of the same individual(s).

6.3.6 Dall's Porpoise

Based on the average winter group size (3), and The Whale Museum report of 2 sightings days in the 24" ZOI, it is assumed that 3 Dall's porpoise (one group) may be present within ZOI-1 and ZOI-2, and that 9 (3 groups) may be present in ZOI-3.

ZOI-1: Exposure estimate = 3 * 4 days = 12

ZOI-2: Exposure estimate = 3 * 2 days = 6

ZOI-3: Exposure estimate = 9 * 2 days = 18

WSF is requesting authorization for Level B acoustical harassment of 36 Dall's porpoise. It is assumed that this number will include multiple harassments of the same individual(s).

6.3.7 Pacific White-sided Dolphin

Based on limited sightings data, and the presence of single individuals observed in Southern Puget Sound, it is assumed that 2 Pacific White-sided dolphins may be present within ZOI-1 and ZOI-2, and that 4 may be present in ZOI-3.

ZOI-1: Exposure estimate = 2 * 4 days = 8

ZOI-2: Exposure estimate = 2 * 2 days = 4

ZOI-3: Exposure estimate = 5 * 2 days = 8

WSF is requesting authorization for Level B acoustical harassment of 22 Pacific White-sided dolphins. It is assumed that this number will include multiple harassments of the same individual(s).

6.3.8 Killer Whale

6.3.8.1 Southern Resident Killer Whale

Due to the status of SRKW, NMFS is limiting Level B harassment to 'unintentional take' of 5 percent of the stock per year (Guan 2013). As of March 30, 2015, the SRKW population is 81, and 5 percent of the stock is 4 individuals.

WSF is requesting authorization for Level B acoustical harassment 'unintentional' take of 4 SRKW.

To ensure that project take does not exceed 5 percent, the following monitoring steps will be implemented (see Appendix B – Monitoring Plan):

- If SRKW approach the ZOIs during pile driving or removal, work will be paused until the SRKW exit the ZOIs.
- If killer whale approach the ZOIs during pile driving or removal, and it is unknown whether they are SRKW or Transient, it shall be assumed they are SRKW and work will be paused until the whales exit the ZOIs.
- If SRKW enter the ZOIs undetected, up to 4 'unintentional' Level B harassment takes are requested. Work will be paused until the SRKW exit the ZOIs to avoid further Level B harassment take.
- The intent of monitoring is to prevent any take of SRKW.
- The four unintentional Level B harassment takes will be used only if necessary.

6.3.8.2 Transient Killer Whale

Based on the sightings data of two groups of 10 individuals, and The Whale Museum report of 11 sightings days in the 24" ZOI, it is assumed that 10 Transient killer whale may be present within ZOI-1, ZOI-2 and ZOI-3. However, it is assumed that they will not be present each day, and that they will be transiting through the smaller ZOIs, but may be present more than one day in the larger ZOI.

ZOI-1: Exposure estimate = 10 * 1 day = 10

ZOI-2: Exposure estimate = 10 * 1 day = 10

ZOI-3: Exposure estimate = 10 * 2 days = 20

WSF is requesting authorization for Level B acoustical harassment of 40 Transient killer whales. It is assumed that this number will include multiple harassments of the same individual(s).

The following monitoring steps will be implemented during this project (see Appendix B – Monitoring Plan):

- If positively identified Transients (as identified by Orca Network, NMFS or another qualified source) approach the ZOIs during pile removal or driving, and it is know that SRKW are not in the vicinity (from the same qualified sources) work will continue.
- If the 40 Transient killer whale takes have been used, and killer whales approach the ZOIs during pile driving or removal, work shall be paused to avoid take.

6.3.9 Gray Whale

Based on The Whale Museum report of 4 sightings days in the 24" ZOI, it is assumed that 3 Gray whales may be present within ZOI-1, ZOI-2 and ZOI-3. However, it is assumed that they will not be present each day, and that they will be transiting through the smaller ZOIs, but may be present more than one day in the larger ZOI.

ZOI-1: Exposure estimate = 3 * 1 days = 3

ZOI-2: Exposure estimate = 3 * 1 days = 3

ZOI-3: Exposure estimate = 3 * 2 days = 6

WSF is requesting authorization for Level B acoustical harassment of 12 Gray whales. It is assumed that this number will include multiple harassments of the same individual(s).

6.3.10 Humpback Whale

Based on The Whale Museum report of 5 sightings days in the 24" ZOI, it is assumed that 5 Humpback whales may be present within ZOI-1, ZOI-2 and ZOI-3. However, it is assumed that they will not be present each day, and that they will be transiting through the smaller ZOIs, but may be present more than one day in the larger ZOI.

ZOI-1: Exposure estimate = 5 * 1 days = 5

ZOI-2: Exposure estimate = 5 * 1 days = 5

ZOI-3: Exposure estimate = 5 * 2 days = 10

WSF is requesting authorization for Level B acoustical harassment of 20 Humpback whales. It is assumed that this number will include multiple harassments of the same individual(s).

6.3.11 Minke Whale

Based on The Whale Museum report of 6 sightings days in the 24" ZOI, it is assumed that 6 Minke whales may be present within ZOI-1, ZOI-2 and ZOI-3. However, it is assumed that they will not be present each day, and that they will be transiting through the smaller ZOIs, but may be present more than one day in the larger ZOI.

ZOI-1: Exposure estimate = 6 * 1 days = 6

ZOI-2: Exposure estimate = 6 * 1 days = 6

ZOI-3: Exposure estimate = 6 * 2 days = 12

WSF is requesting authorization for Level B acoustical harassment of 24 Minke whales. It is assumed that this number will include multiple harassments of the same individual(s).

6.4 Number of Takes Requested

The total number of Level B acoustical harassment take requests by species is presented below:

Table 6-1 Level B Acoustical Harassment Take Request

Species	Take Request
Harbor Seal	1,600
Elephant Seal	22
California Sea Lion	22
Steller Sea Lion	328
Harbor Porpoise	220
Dall's Porpoise	36
Pacific White-sided Dolphin	22
SR Killer Whale	4
Transient Killer Whale	40
Gray Whale	12
Humpback Whale	20
Minke Whale	24

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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 Year One, the total number of pile removal hours is estimated to not exceed 975 hours over 180 days (Table 2-2). Pile removal generates sounds that exceed thresholds considered disturbing (Level B) to local marine mammals.

WSF is requesting authorization for Level B acoustical harassment take of marine mammals as listed in Table 6-1. Any incidental takes will very likely be multiple takes of individuals, rather than single takes of unique individuals. The stock take calculations below assume takes of individual animals, instead of repeated takes of a smaller number, therefore the stock take percentage calculations are very conservative.

These numbers in relation to the overall stock size of each species are discussed below, and summarized in Table 7-1.

7.1.1 Harbor Seal

The Washington Northern Inland Waters stock is estimated at 11,036 (NMFS 2014a). This application requests incidental taking by Level B acoustical harassment of up to 1,600 harbor seals, or 15.0 percent of the stock.

7.1.2 Northern Elephant Seal

The California stock of Northern Elephant seal minimum population size is estimated very conservatively as 74,913 (NMFS 2007). This application requests incidental taking by Level B acoustical harassment of up to 22 Northern Elephant seals, or 0.03 percent of the stock.

7.1.3 California Sea Lion

The U.S. stock was estimated at 296,750 (NMFS 2011a). This application requests incidental taking by Level B acoustical harassment of up to 22 California sea lions, or 0.007 percent of the stock.

7.1.4 Steller Sea Lion

The eastern stock of Steller sea lions is estimated to be 63,160 (NMFS 2013c). This application requests incidental taking by Level B acoustical harassment of up to 328 Steller sea lions, or 0.6 percent of the stock.

7.1.5 Harbor Porpoise

The Washington Inland Waters Stock of harbor porpoise is estimated to be 10,682 (NMFS 2011b). This application requests incidental taking by Level B acoustical harassment of up to 220 harbor porpoise, or 2.0 percent of the stock.

7.1.6 Dall's Porpoise

The California, Oregon, and Washington stock is estimated to be 42,000 (NMFS 2011c). This application requests of incidental taking by Level B acoustical harassment of up to 36 individuals, or 0.09 percent of the stock.

7.1.7 Pacific White-sided Dolphin

The most recent estimate of Pacific White-sided dolphin stock abundance is 29,930 (NMFS 2014b). This application requests of incidental taking by Level B acoustical harassment of up to 22 individuals, or 0.07 percent of the stock.

7.1.8 Killer Whale

The SR stock is at 81 (CWR 2015). This application requests incidental taking by Level B acoustical harassment of up to 4 SRKW, or 5 percent of the stock.

The West Coast Transient stock is estimated at 243 (NMFS 2013d). This application requests incidental taking by Level B acoustical harassment of up to 40 transient killer whale, or 16.5 percent of the stock.

7.1.9 Gray Whale

The North Pacific Gray whale stock is estimated at 19,126 (NMFS 2014b). This application requests incidental taking by Level B acoustical harassment of up to 12 gray whales, or 0.06 percent of the stock.

7.1.10 Humpback Whale

The California-Oregon-Washington (CA-OR-WA) stock of humpback whale is estimated at 1,918 (NMFS 2014c). This application requests incidental taking by Level B acoustical harassment of up to 20 humpback whales, or 1.0 percent of the stock.

7.1.11 Minke Whale

The minimum population estimate of minke whales in the CA-OR-WA stock is 202 individuals (NMFS 2011d). This application requests incidental taking by Level B acoustical harassment of up to 24 Minke whales, or 12.0 percent of the stock.

Table 7-1 Level B Acoustical Harassment Take Request Percent of Total Stock

Species	Stock Size	Take Request	Take Request % of Stock
Harbor Seal	11,036	1,600	15.0
Northern Elephant Seal	74,913	22	0.007
California Sea Lion	296,750	22	0.03
Steller Sea Lion	63,160	328	0.6
Harbor Porpoise	10,682	2,750	2.0
Dall's Porpoise	42,000	36	0.09
Pacific White-sided Dolphin	29,930	22	0.07
SR Killer Whale	81	4	5.0
Transient Killer Whale	243	40	16.5
Gray Whale	19,126	12	0.06
Humpback Whale	1,918	20	1.0
Minke Whale	202	24	12.0

7.2 Anticipated Impact on Stocks

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

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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 (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 (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 2011a). 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 2 animals per year (NMFS 2007). 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 2007). On June 16, 1994, gray whales were removed from the endangered species list after a determination that the population had “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 2007b). 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 2005).

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 2007b). 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 (DEIS) to examine the alternatives for a decision to approve or deny the waiver was released for public comment in May 2008, but later terminated in May 2012 to begin developing a new DEIS because of substantial new scientific information. In March 2015 the new DEIS was released, and is currently in public comment (NMFS 2015c).

However, any future hunts by the Makah would occur along the outer coast of Washington, not in the Puget Sound 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 through increases in-air noise and in-water sound pressure levels from pile removal. 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 pile removal and driving is estimated to reach the behavioral threshold at 38 m for harbor seals and 12 m for all other pinnipeds. No documented haulout sites are within the in-air disturbance threshold distances. It is possible that a seal could be hauled out on beaches adjacent to the ferry terminal (Figure 1-8), but it is likely that construction activity would temporarily make this beach unattractive for hauling out.

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 Coupeville 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, unless the site-specific background noise is higher than 120 dB_{RMS}. In that case, the higher background becomes the threshold. The distance to the Level B acoustical harassment thresholds is described in Section 1.6.4, Attenuation to NMFS Thresholds.

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 threshold levels at which anthropogenic noise becomes harmful to killer whales are poorly understood (NMFS 2008). Because whale occurrence is occasional near the project site, in-water noise impacts are localized and of short duration, any impact on individual cetaceans and pinnipeds will be limited. Pile removal and driving will expose marine mammals to potential Level B harassment. The impact pile driving Zone of Exclusion (ZOE) will be monitored, and

work ceased if any marine mammals approaches the ZOE. Because there are no documented haulouts within the immediate project area, pinniped disturbance will be limited to individuals transiting the ZOIs.

9.4 Water and Sediment Quality

Short-term turbidity is a water quality effect of most in-water work, including pile removal. 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 within the regulatory compliance radius of 150 feet (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, within 150 feet, local turbidity levels (from removal of timber and steel piles) did not exceed 0.2 NTU above background levels (WSF 2012). 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 project site to experience turbidity, and any pinnipeds will be transiting the area and could avoid localized turbidity. Therefore, the impact from increased turbidity levels is expected to be discountable to marine mammals.

9.5 Passage Obstructions

Pile removal and driving at the project site will not obstruct movements of marine mammals. Construction at Coupeville will occur within 35 m of the shoreline, leaving 5.5 km of Admiralty Inlet for marine mammals to pass unaffected by construction noise. A construction barge will be used to remove pilings. In a previous ESA concurrence letter for the Vashon Island Dolphin Replacement Project that used similar types of construction equipment (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 of other cetaceans and pinnipeds are unlikely for this 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 marine mammal species utilizing habitat near the project site will likely be transiting the area.

Any adverse effects on prey species during project construction will be short term. Given the large numbers of fish and other prey species in Admiralty 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, conducting work within the approved in-water work window), the proposed project is not expected to have measurable effects on the distribution or abundance of potential marine mammal prey species.

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 not 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, temporary prey (fish) disturbance, and localized, temporary water quality effects. The direct loss of habitat available to marine mammals during the project 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) 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 mitigation measures will be employed during all pile removal and driving during the project. The language in each mitigation measures 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 mitigation measures is a contract violation.

General mitigation measures used for all construction practices are listed first (Section 11.1, All Construction Activities), followed by specific mitigation measures for pile related activities (Section 11.2, Pile Removal). The mitigation measures listed under Section 11.1 apply to different activities and are, therefore, listed additional times where appropriate. For further information on WSF's Construction Minimization Measures, see the WSF Biological Assessment Reference Document, Section 2.0 (WSF 2014).

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 will have a WSF inspector on site during construction. The role of the inspector is to ensure contract compliance. The inspector and the contractor will have a copy of the Contract Plans and Specifications on site and will be aware of all requirements. The inspector will also be trained in environmental provisions and compliance.
- WSF will obtain Hydraulic Project Approval (HPA) from WDFW as appropriate and the contractor will follow the conditions of the HPA. HPA requirements will be listed in the contract specifications, and will be a legal requirement 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, chemicals or other toxic or deleterious materials shall be allowed to enter surface waters.
- WSF will comply with water quality restrictions imposed by the Washington State Department of Ecology (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.

11.2 Timing Windows

Timing restrictions are imposed by NOAA, USFW and WDFW 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 project is September 1 through February 15.

11.3 Pile Removal BMPs

The following pile removal mitigation measures are proposed by WSF to reduce impacts on marine mammals to the lowest extent practicable. Additional BMPs that will be incorporated into the project include:

- The vibratory hammer method will be used to remove timber piles to minimize noise levels.
- Hydraulic water jets will not be used to remove piles.
- Marine mammal monitoring during vibratory pile removal will be employed for the Level B ZOI (see Section 11.5, Marine Mammal Monitoring).
- The crane operator will be instructed to remove piles slowly to minimize turbidity in the water as well as sediment disturbance.
- The operator will “wake up “the pile to break the bond with surrounding sediment by vibrating the pile slightly prior to removal. Waking up the pile avoids pulling out large blocks of sediment, which could cause the pile to break apart during the removal process, and usually results in little to no sediment attached to the pile during withdrawal.
- Extraction equipment will be kept out of the water, above the water line, to prevent creosote release into the water that could occur if the pile is pinched by extraction equipment below the water line.
- Piling will not be broken off intentionally by twisting, bending, or other deformation, to minimize any potential release of creosote into the water column.
- Treated wood will be contained during and after removal to preclude sediments and contaminated materials from entering the aquatic environment.
- The work surface on the barge deck or pier will include a containment basin for pile and any sediment removed during pulling. The basin will be constructed of durable plastic sheeting with sidewalls supported by hay bales or a support structure to contain all sediment. The containment basin shall be removed and disposed of in accordance with applicable federal and state regulations.
- The work surface shall be cleaned by properly disposing of sediment or other residues along with cut-off piling.
- Upon removal from the substrate the pile shall be moved immediately from the water into the containment basin. The pile shall not be shaken, hosed-off, stripped or scraped off, left hanging to drip or any other action intended to clean or remove adhering material from the pile.

- Holes left when removing piling will be filled with clean sand or gravel. Sand or gravel used as fill material will be obtained from a commercial source that is free of contaminants.
- During removal of creosote-treated piles, containment booms and absorbent booms (or other oil-absorbent fabric) will be placed around the perimeter of the work area to capture wood debris, oil, and other materials that could inadvertently be released into marine waters. All accumulated debris will be collected daily and disposed of at an approved upland site.
- Removed creosote-treated piles will be disposed of in a manner that precludes their further use. Piles will be cut into manageable lengths (four feet or less) for transport and disposal in an approved upland location that meets the liner and leachate standards contained in the Washington Administrative Code (WAC), Chapter 173-304, Minimum Functional Standards. No reuse of treated wood will occur.
- Water quality will be monitored during pile removal. Work barges and dredged material disposal barges will not be allowed to ground out or rest on the substrate, or be over or within 25 feet of vegetated shallows (except where such vegetation is limited to state-designated noxious weeds).
- Barges will not be anchored over vegetated shallows for more than 24 hours.
- Demolition and construction materials shall not be stored where high tides, wave action, or upland runoff can cause materials to enter surface waters.

11.4 Pile Driving BMPs

BMPs to be employed during pile installation include:

- The vibratory hammer method will be used to the extent possible to drive steel piles to minimize noise levels.
- A bubble curtain or other noise attenuation device will be employed during impact installation or proofing of steel piles unless the piles are driven in the dry.
- Creosote-treated timber piling shall be replaced with non-creosote-treated 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.
- Steel, plastic/steel, concrete, or ACZA-treated wood piling will be used. No creosote-treated timber piling will be used.

11.5 Safety Zone/Zone of Exclusion

The purpose of the safety zone/Zone of Exclusion (ZOE) is to ensure that noise-generating activities are shut down before Level A (injury) take occurs from cetaceans entering a 180 dB ZOI or a pinniped entering a 190 dB ZOI while impact pile driving is active.

During impact hammering Level A take (for cetaceans) can occur out to 22 m/72 ft. (the distance to the 180 dB isopleth). During impact hammering of 24-inch steel piles, a 12 m/72 ft. radius safety zone/ZOE will be fully monitored and impact hammering will shut down at the approach of any marine mammal to this zone (see Appendix B Marine Mammal Monitoring). There is no Level A take during vibratory hammering, because source energy levels do not exceed the 180 dB cetacean or the 190 dB pinniped injury thresholds.

11.6 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/Admiralty 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 Coordination

WSF will conduct briefings with the construction supervisors and the crew, and marine mammal observer(s) prior to the start of pier removal to discuss marine mammal monitoring protocol and requirement to halt work.

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. Daily sightings information can be found on the Orca Network Twitter site (https://twitter.com/orcanetwork), which will be checked several times a day.

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.

13.2 Visual Monitoring

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

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. A monitoring plan is provided in Appendix B.

13.3 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 report the number of marine mammals that may have been harassed.

If comments are received from the NMFS 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 pile removal and driving at the project site is the primary issue of concern relative to local marine mammals. WSF has conducted research on sound propagation from vibratory and impact hammers, and plans on continuing that research in 2015-2016 to provide data and new technologies for future ferry terminal projects. Impact and vibratory noise will be monitored during the project, in order to collect further data.

As described in Section 13, WSF will 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. Marine mammal monitoring will be conducted to collect information on presence of marine mammals within the ZOIs for this project.

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15.0 Literature Cited

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71 FR 69054. Endangered and Threatened Species; Designation of Critical Habitat for Southern Resident Killer Whale. November 29, 2006.

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78 FR Part 25044. Listing Endangered or Threatened Species: Amendment to the Endangered Species Act Listing of the Southern Resident Killer Whale Distinct Population Segment. February 10, 2015.

78 FR 66140. Endangered and Threatened Species; Delisting of the Eastern Distinct Population Segment of Steller Sea Lion Under the Endangered Species Act; Amendment to Special Protection Measures for Endangered Marine Mammals. November 4, 2013.

80 CFR 2230. Endangered and Threatened Species; Identification of 14 Distinct Population Segments of the Humpback Whale (Megaptera novaeangliae). April 21, 2015.

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Appendix A
Project Sheets

Appendix B
The Whale Museum Marine Mammal Sightings Report

Appendix C
Marine Mammal Monitoring Plan

Coupeville Ferry Terminal
Timber Towers Preservation Project
Marine Mammal Monitoring Plan

April 24, 2015

In accordance with the May 2015, Washington State Ferries Coupeville Ferry Terminal Timber Towers Preservation Project Incidental Harassment Authorization Request, marine mammal monitoring will be implemented during this project.

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

The project includes vibratory removal of 12-inch timber piles and 24-inch steel piles, and impact driving of 24-inch steel piles. Distances to injury and harassment thresholds are provided below:

Table 1 Distances/Areas to Injury and Harrassment Thresholds

Pile Driving Method	190 dB Injury (m)	180 dB Injury (m)	160 dB Harassment (m)	120 dB Harassment (km)	ZOI size (km^2)
Vibratory pile removal (12-in timber)	NA	NA	NA	2.3	6.4
Vibratory pile removal (24-in steel)	NA	NA	NA	32	140
Impact driving (24-in steel pile)	5	22	464	NA	1.5

During the project, in-water measurements of vibratory and impact pile driving will be taken. Project ZOIs/ZOE may be adjusted based on these measurements.

Monitoring to Estimate Level B Take Levels and Prevent Level A Take

WSF proposes the following Marine Mammal Monitoring Plan in order to prevent Level A injury take in the ZOE, and to estimate Level B harassment take in the ZOIs:

- During 24-inch steel impact pile driving, two land-based PSOs monitors will monitor the ZOE and ZOI (Figure 1). Pile driving will be paused if any marine mammal approaches the ZOE.
- During vibratory timber pile removal, two land-based PSOs will monitor the ZOI (Figure 2).
- During 24-inch vibratory pile removal, 7 land-based PSOs and one monitoring boat with a PSO and boat operator will monitor the ZOI (Figure 3).
- If weather prevents safe use of the boat in the main channel of the ZOI, the boat will be used in other areas of the ZOI that are safe, such as the southwest corner of the ZOI, where lack of public access prevents stationing a land-based PSO.

- To verify the required monitoring distance, the ZOE and ZOIs will be determined by using a range finder or hand-held global positioning system device.
- The ZOE and ZOIs will be monitored for the presence of marine mammals 30 minutes before, during, and 30 minutes after any pile removal activity.
- Monitoring will be continuous unless the contractor takes a significant break, in which case, monitoring will be required 30 minutes prior to restarting pile removal.
- If marine mammals are observed, their location within the ZOIs, and their reaction (if any) to pile removal or driving activities will be documented.

Monitoring to Prevent Killer Whale Take

WSF proposes the following measures to prevent SRKW Level B acoustical harassment take:

- If SRKW (as identified by Orca Network, NMFS or another qualified source) approach the ZOIs during pile removal or driving, work will be paused until the SRKW exit the ZOIs to avoid Level B harassment take.
- If killer whales approach the ZOIs during pile removal or driving, and it is unknown whether they are SRKW or transient, it shall be assumed they are SRKW in order to prevent SRKW Level B harassment take.
- If SRKW enter the ZOIs undetected, up to 4 'unexpected' Level B harassment takes may be used. Work will be paused until the SRKW exit the ZOI to avoid further Level B harassment take. The intent of monitoring is to prevent any take of SRKW. The 4 unexpected Level B harassment takes will be used only if necessary.

WSF proposes the following Marine Mammal Monitoring Plan for Transient killer whale:

- If positively identified Transients (as identified by Orca Network, NMFS or another qualified source) approach the ZOIs during pile removal or driving, and it is know that SR killer whales are not in the vicinity (from the same qualified sources) work will continue.
- If the permitted number of Transient killer whale takes have been used, and killer whale approach the ZOI during vibratory pile removal, work shall be paused to avoid take.

Minimum Qualifications for Protected Species Observers

Qualifications for PSOs 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.
- 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 Level B acoustical harassment ZOI; dates and times when pile removal was paused due to the presence of marine mammals.

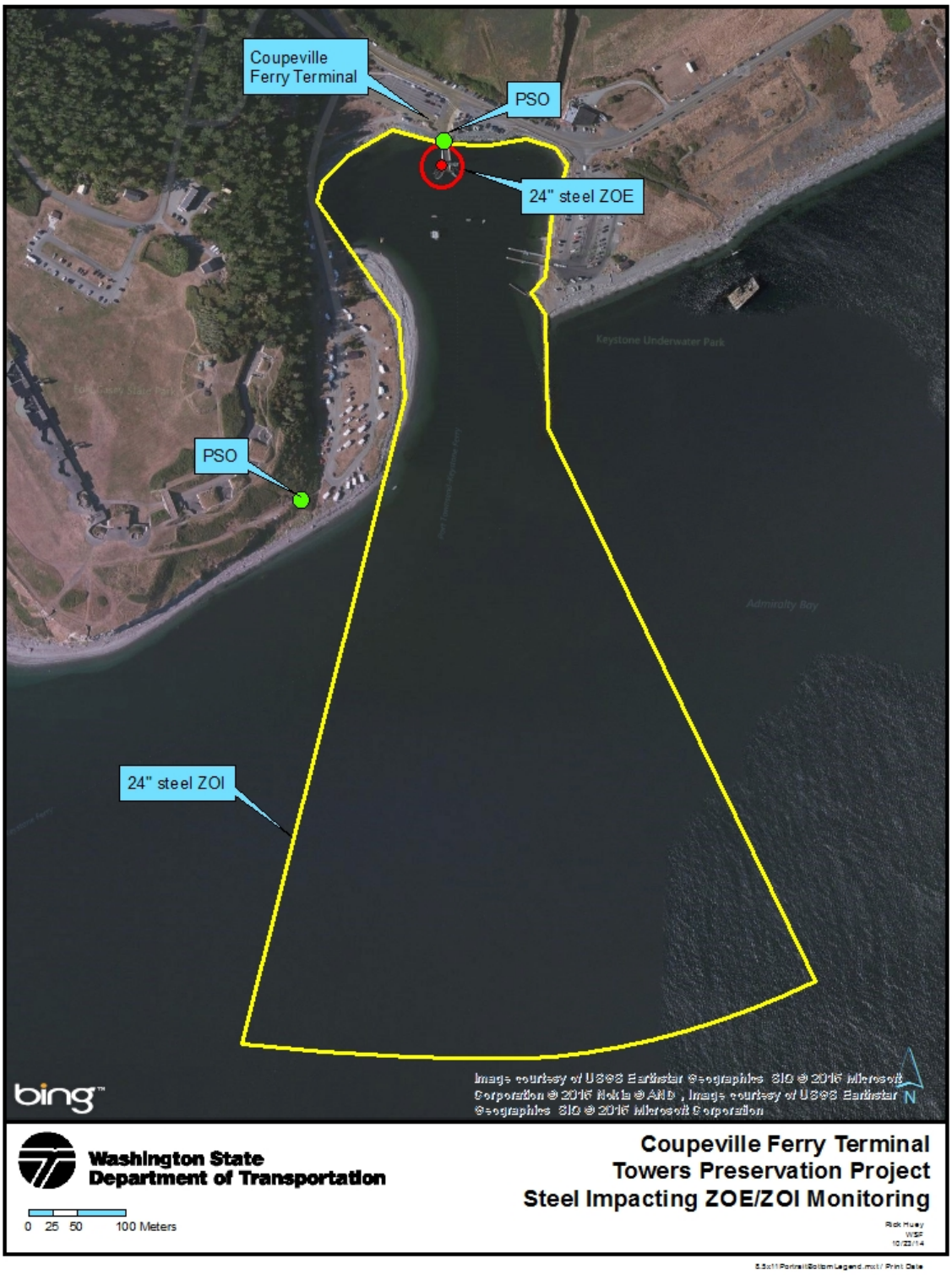

Figure 1 – 24” Steel Impact Driving Monitoring

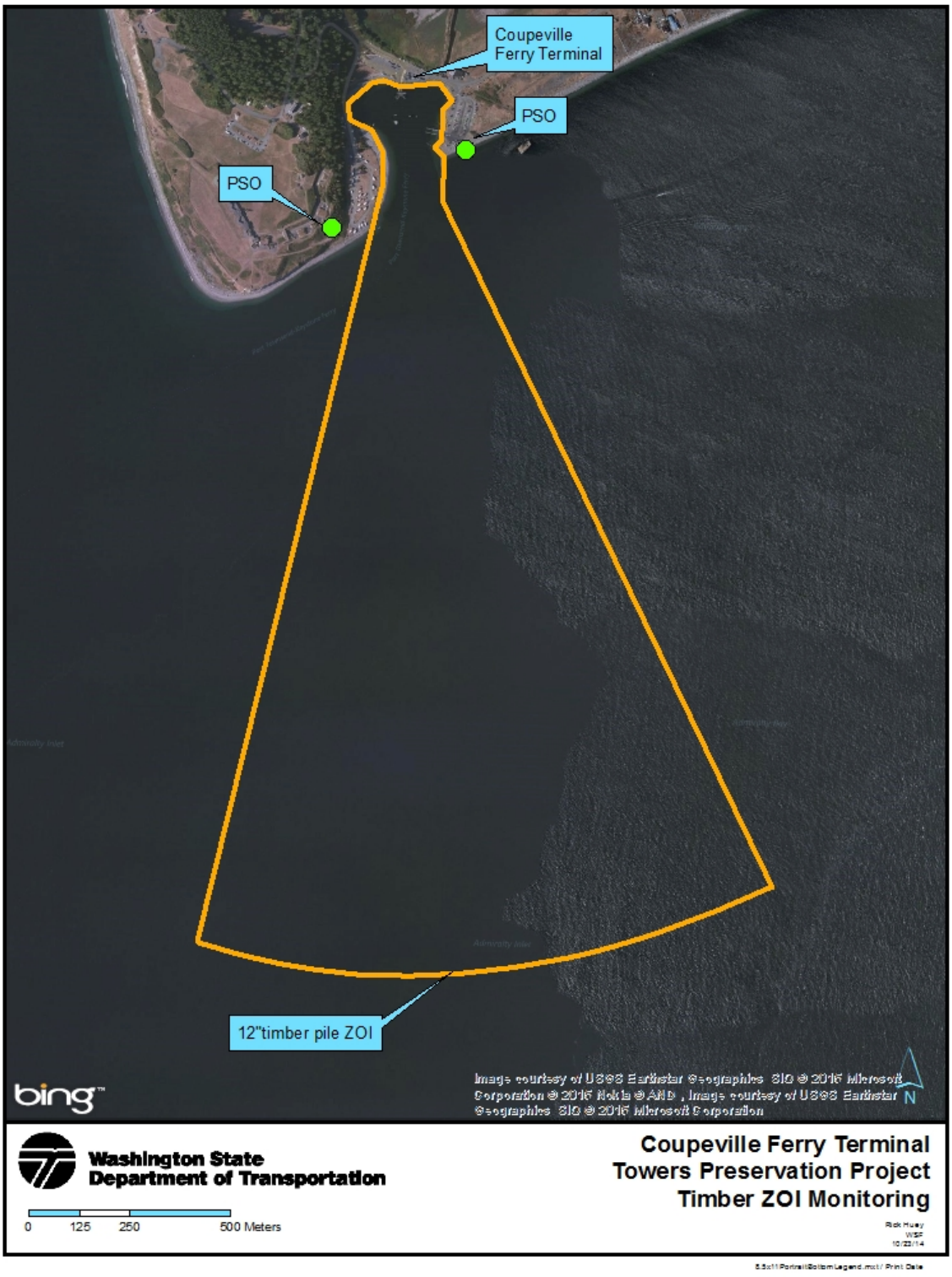

Figure 2 – 12” Timber Vibratory Removal Monitoring

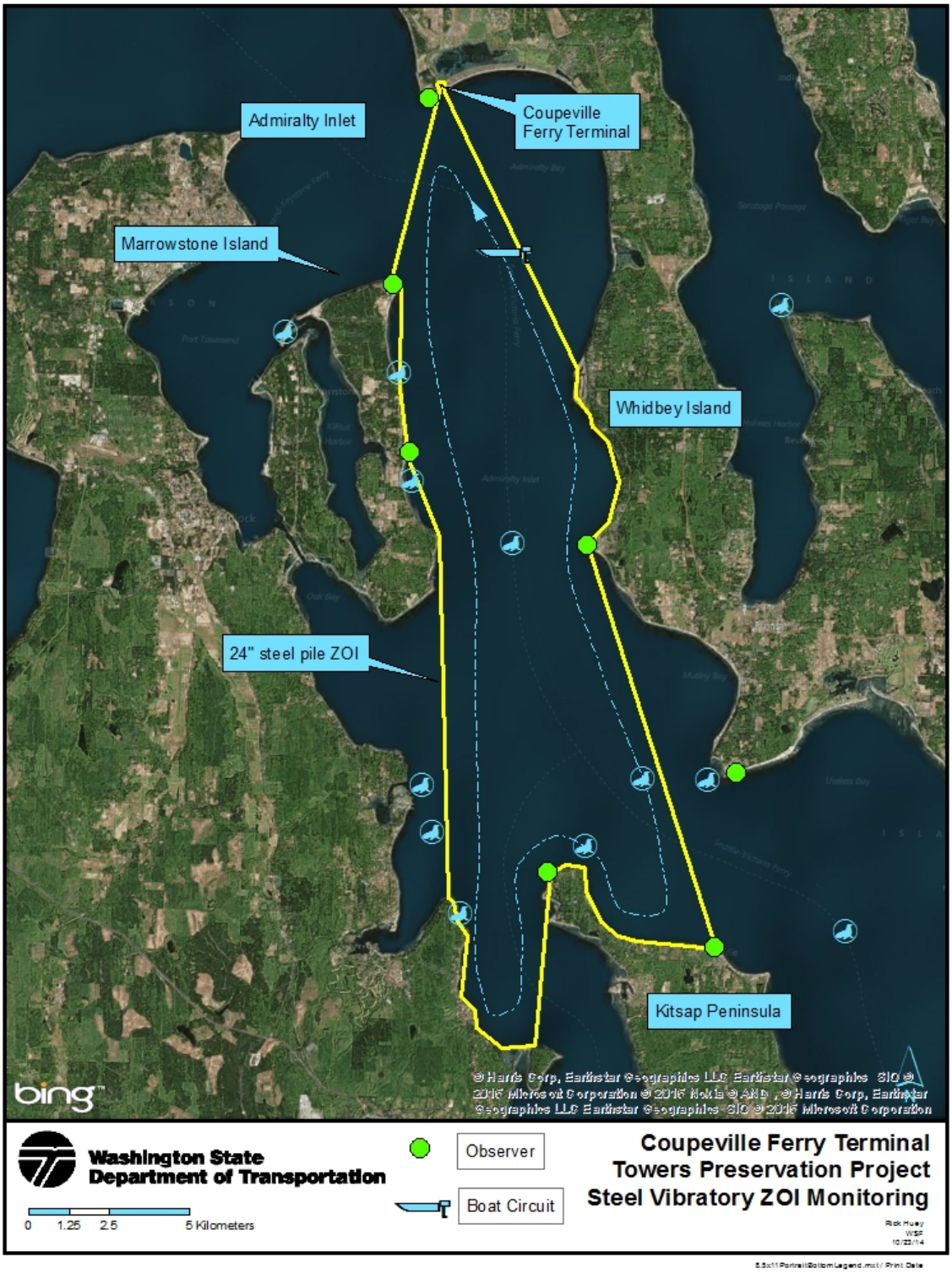

Figure 3 – 24" Steel Vibratory Removal Monitoring