

REPORT

Produced for Port of Bellingham

August 28, 2023



moffatt & nichol

INCIDENTAL HARASSMENT AUTHORIZATION

Bellingham Shipping Terminal (BST) Marine Infrastructure Maintenance and Rehabilitation

Produced by:

Moffatt & Nichol

600 University Street, Suite 610

(206) 622-0222

www.moffattnichol.com

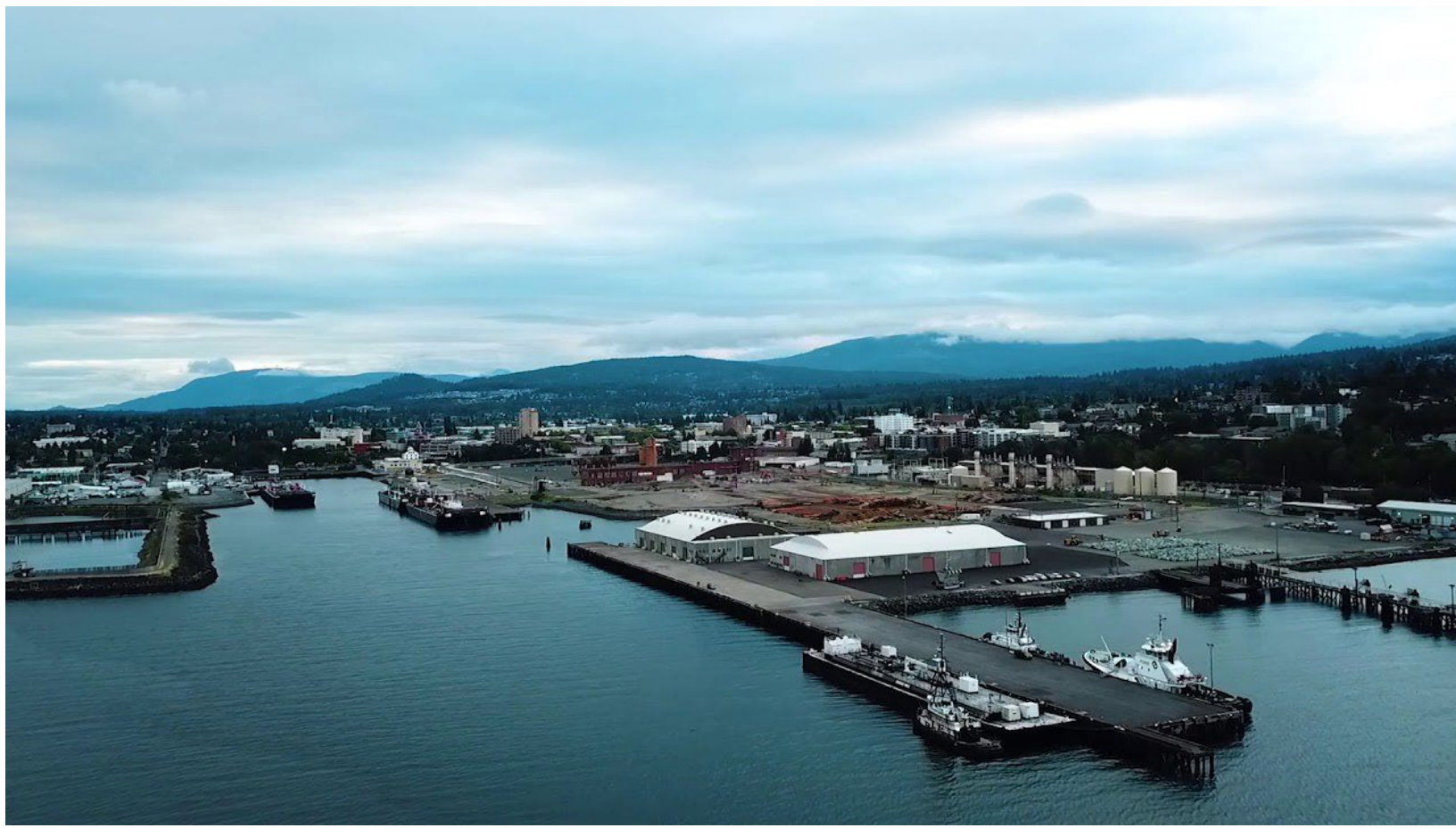


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Glossary

AMMs	Avoidance and Minimization Measures
BE	Biological Evaluation
BMP	Best Management Practices
BNSF	Burlington Northern Santa Fe
BST	Bellingham Shipping Terminal
cy	Cubic Yards
dB	Decibels
dBA	A-weighted Decibels
DPS	Distinct Population Segments
Ecology	Washington State Department of Ecology
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ft.	Feet
FTA	Federal Transportation Administration
HTL	High Tide Line
Hz	Hertz
IHA	Incidental Harassment Authorization
kHz	Kilohertz
km	Kilometers
LF	Linear Feet
MARAD	Maritime Administration
MHW	Mean High Water
MLLW	Mean Lower Low Water
MMPA	Marine Mammal Protection Act
MTCA	Model Toxics Control Act
NMFS	National Marine Fisheries Service
OHWM	Ordinary High-Water Mark
Port	Port of Bellingham
PSO	Protected Species Observers
PTS	Permanent Threshold Shift
RMC	Residual Management Cover
RMS	Root Mean Square
SEL	Sound Exposure Level
SELcum	Cumulative Sound Exposure Level
SPPC	Spill Prevention and Control Countermeasures
sq. ft.	Square Feet
TTS	Temporary Threshold Shift
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
WAC	Washington Administrative Code
WDFW	Washington Department of Fish & Wildlife
WQC	Water Quality Certification
WWU	Western Washington University



1. Description of Specified Activity

The Port of Bellingham (Port) is proposing repairs and maintenance to rehabilitate the Bellingham Shipping Terminal (BST) in conjunction with U.S. Department of Transportation (USDOT) Maritime Administration (MARAD), who awarded the Port grant funding. The BST is a full-service marine terminal specializing in break bulk and clean bulk cargos. BST has 1,300 feet (ft.) of wharf length adjacent to a 1,800 ft. berthing area, with over 85,000 square feet (sq. ft.) of warehousing on eleven (11) acres of adjacent upland.

The project involves structural repairs to key deteriorated and damaged components along the Central and South Terminals, as well as adjacent upland concrete/paving and utility repairs to the BST (refer to Section 1.1 for more details). The Port also proposes to complete maintenance dredging in front of Berths 1 and 2 to return safe vessel access to the berths, which involves removing sediment that limits the depth to as little as 26 ft. at the dock face of Berth 1. The BST is located within the City of Bellingham's industrial waterfront to the south of city center in marine waters of the Whatcom Waterway, which provides vessel access into Port facilities from Bellingham Bay.

These two independent maintenance and rehabilitation activities constitute proposed *Marine Infrastructure Maintenance and Rehabilitation at BST* and are referred to as “the project”. The proposed project may result in the incidental Level A (potential injury or permanent threshold shifts) and incidental Level B (behavioral) take of marine mammals protected under the Marine Mammal Protection Act (MMPA). Level A and Level B take is related to construction noise introduced through in-water and/or in-air work from pile driving. The Port is requesting Incidental Harassment Authorization (IHA) for Level A and Level B for four (4) species, harbor seal (*Phoca vitulina*), California sea lion (*Zalophus californianus*), Stellar sea lion (*Eumetopias jubatus*), and harbor porpoise (*Phocoena phocoena*) pursuant to 50 CFR 216.104 guidance.

No take is requested of species protected under the Endangered Species Act (ESA). The Port is completing Section 7 review with the Services (the National Oceanic and Atmospheric Administration [NOAA] Fisheries or National Marine Fisheries Service [NMFS] and the U.S Fish and Wildlife Service [USFWS]). A Biological Evaluation (BE) was submitted to NMFS, West Coast Region and USFWS, Pacific Region in February of 2022. Biological Opinions for from both USFWS and NMFS were received in summer 2023. The NMFS West Coast Region's Biological Opinion was forwarded to NMFS Office of Protected Resources in Silver Spring, Maryland on May 23, 2023 , .

1.1. Description of Project Activities

The Port, or applicant, proposes to undertake maintenance repairs to the BST. The proposed work would include wharf and pier maintenance and rehabilitation as well as maintenance dredging. These activities are discussed in detail in Sections 1.1.1 and 1.1.2.



1.1.1. Wharf and Pier Maintenance and Rehabilitation

The wharf and pier repairs will include decking and pile replacement and other minor and structural repairs to the Central and South Terminals, as well as adjacent upland repairs. Wharf and pier repairs will rehabilitate and return the BST to current maritime safety standards to handle cargo demands, including up-to-standards for modern electrical infrastructure. Much of the existing structure has either deteriorated or been damaged by bulk loading/unloading across the deck (i.e., large “jetty rock” damage). Wharf repairs and rehabilitation is proposed for the deteriorated or damaged structural components along the Central Terminal, with additional select structural repairs to the South Terminal. The proposed work elements are summarized in Sections 1.1.1.1 through 1.1.1.3.

1.1.1.1. Central Terminal

The following repairs are proposed at Central Terminal:

- Replace up to 12,600 sq. ft. of the damaged wharf deck – 9,800 sq. ft. waterward of the mean high water (MHW) line – with new concrete or steel deck panels that will be removable, with no permanent topping slab.
- Up to 36 existing 24-inch diameter structural steel piles beneath the deck area will be removed and replaced with 56, 24-inch steel pipe piles waterward of the existing bulkhead and 14, 24-inch diameter steel pipe piles behind the existing bulkhead wall landward of the MHW line. Up to 15 existing ACZA-treated timber fender piles (14- to 16-inches in diameter) would be replaced with 13 steel H-piles (about 16-inches in diameter).
- Up to 10,614 sq. ft. of existing riprap located immediately around the piles to be replaced would be reworked (moved to the side and replaced in the same footprint following pile removal and installation). The existing concrete revetment mat, around the existing piles, will be cut and reworked to accommodate pile removal and installation. No new fill material (sand or riprap) is proposed waterward of the HTL/OHWM of 9.77 ft MLLW.
- The existing concrete bulkhead wall will remain in place. Up to 140 linear feet of the top 5 ft. of the wall will be removed to accommodate decking repairs and pile replacement. Work landward of the existing bulkhead wall will include some removal, rework and reuse, and replacement of fill material. The area adjacent to the replaced deck panels will be repaved.

1.1.1.2. South Terminal

The following repairs at South Terminal are proposed:

- Up to two (2) creosote-treated timber piles (18- to 20-inches in diameter) will be replaced with up to two (2) wrapped ACZA-treated timber piles of similar size (18- to 20-inches in diameter).



- Replacement and/or repair of creosote-treated cross members with ACZA treated timber material, minimal top-split pile repairs, and decking (up to 660 sq. ft.) and pile cap replacement in specific areas.

1.1.1.3. Adjacent Upland Repairs

Adjacent upland repairs will include repaving damaged areas, including sink holes and potholes immediately adjacent to the wharf. Existing utilities next to the proposed wharf repairs will also be upgraded to meet current standards.

1.1.2. Maintenance Dredging at Berths 1 and 2

The lack of uniform and sufficient draft in the BST berths due to sloughing from under the wharf has reduced the ability of ships to use the berths. Proposed maintenance dredging will remove sediment that limits the depth to as little as 26 ft. at the dock face of Berth 1. Maintenance dredging will allow ships to berth directly along the face of the dock, improving operational safety and efficiency for loading and unloading cargo by crane and allowing the facility to serve longer vessels, specifically those with a deadweight of more than 40,000 metric tons and an overall length greater than 600 feet. Such vessels are currently unable to safely use the terminal due to the danger of running aground. Maintenance dredging will correct these deficiencies.

The Port proposed to complete maintenance dredging of the area in front of Berths 1 and 2 to return safe vessel access to the berths. The proposed dredge prism will have a finished dredge elevation of -35.5 ft. mean lower low water (MLLW) with a +1-foot allowable over-dredge to accommodate the placement of the 6-inch residual management cover (RMC) layer and allow for a final design elevation of -35 ft. MLLW for safe vessel access. The dredging will extend up the slope under the wharf to minimize sloughing from future erosion of that slope. Approximately 4,000 cubic yards (cy) will be removed from beneath the wharf. RMC material will not be placed beneath the wharf.

The proposed maintenance dredging will remove a total of up to approximately 19 cy that will be disposed upland at a permitted upland landfill disposal site. A minimum 6-inch layer RMC material (approximately 2,000 cy of clean sand) will be placed after dredging is complete to address the potential presence of contaminated sediment left behind after dredging. Both maintenance dredging and RMC placement will be completed in accordance with the existing Whatcom Waterway Cleanup Consent Decree.

1.2. Construction Methods

The proposed project anticipates using the following methods and equipment. Of the following methods and equipment detailed below, those associated with pile driving activities could result in take of harbor seals and sea lions.



1.2.1. Pile Installation and Removal Methods

The following pile installation and removal activities are proposed waterward of the existing bulkhead wall:

- Up to 36, 24-inch diameter steel pipe piles would be removed. It is anticipated that up to 6, 24-inch steel piles could be removed a day and removal could take up to 10 total days. Vibratory removal is the primary method proposed. Direct-pull methods, likely using a sling on a derrick barge, will be used if vibratory removal methods are not successful. Up to 30 minutes of vibratory removal could be required for each pile, resulting in up to 180 total minutes of vibratory removal each day.
- Up to 56, 24-inch diameter steel pipe piles could be installed waterward of the bulkhead wall. It is anticipated that installation could take up to 67 total days. Piles would first be installed with a vibratory hammer and then driven to the design depth with an impact hammer. Up to 90 total minutes of vibratory installation could occur a day. Up to 1,725 total blows could occur a day.
- Up to 15, 14 to 16-inch diameter ACZA-treated timber fender piles would be removed. Up to 8, 14 to 16-inch ACZA treated fender piles could be removed a day and removal could take up to 3 total days. Vibratory removal is the primary method proposed. Direct-pull methods, likely using a sling on the derrick barge, will be used if vibratory removal methods are not successful. Up to 15 minutes of vibratory removal could be required to remove each pile, resulting in up to 120 total minutes of vibratory removal each day.
- Up to 13 steel H-piles (about 16-inches in diameter) would be installed. Up to 6, steel H-piles could be installed a day and installation could take up to 3 total days. Piles would first be installed with a vibratory hammer and then driven to the design depth with an impact hammer. Up to 30 minutes of vibratory installation could be required for each pile, resulting in up to 180 total minutes of vibratory installation each day. Up to 150 blows could be required to install each pile, resulting in up to 900 total blows each day.
- Up to 2, 18-20-inch diameter creosote-treated piles could be removed. Up to 2, 18-20-inch creosote-treated piles could be removed a day and removal could take up to 2 days. Vibratory removal is the primary method proposed for pile removal. Direct-pull methods, likely using a sling on a derrick barge, will be used if vibratory removal methods are not successful. Up to 15 minutes of vibratory removal could be required to remove each pile, resulting in up to 30 total minutes of vibratory removal each day.
- Up to 2, 18-20-inch diameter ACZA treated wrapped piles could be installed. Up to 2, 18-20-inch ACZA-treated wrapped piles could be installed a day and installation could take up to two total days. Piles would be installed with an impact hammer. Up to 800 blows could be required to install each pile, resulting in up to 1,600 total blows each day.



Pile driving could occur on up to 72 days total (stops and starts each day). Pile removal could occur for up to 15 total days.

1.2.2. Decking and Bulkhead

Decking repairs will be completed by barge or from land. Bulkhead cutting and replacement is necessary to replace existing wharf decking and will be completed from land. In-water equipment could include one or two barges and work boats. A saw cutter and small pneumatic hand tools will also likely be used for bulkhead and beneath deck repairs.

1.2.3. Maintenance Dredging:

Maintenance dredging will be completed using mechanical (e.g., clamshell) dredging equipment operated from a barge. The RMC layer will be placed using clamshell equipment.

1.3. Estimated Sound Production

Pile installation and removal has the greatest potential to create in-water and in-air noise impacts. As discussed in Section 1.1.1 and 1.2.1, up to 36, 24-inch diameter steel piles will be replaced with up to 56, 24-inch steel pipe piles waterward of the existing bulkhead. In addition, up to 15, 14 to 16-inch diameter ACZA-treated fender piles would be removed and replaced with 13, steel H-piles. Two, 18 to 20-inch diameter creosote-treated piles may also be removed and replaced with two 18 to 20-inch diameter wrapped ACZA-treated and wrapped timber piles.

Vibratory removal is the primary method proposed for pile removal. Direct-pull methods, likely using a sling on the derrick barge, will be used if vibratory removal methods are not successful. Steel pipe piles will first be installed with a vibratory hammer to the extent feasible. An impact hammer will be required to install piles to the design depth, and set with an impact hammer. Timber piles would be installed with an impact hammer.

Anticipated noise levels for the proposed pile removal and installation activities are identified in Tables 1 and 2. In the case that noise data is not available for the proposed pile size, available data for larger piles is referenced. The use of a bubble curtain during impact installation of steel piles is anticipated to reduce noise levels by at least 5 decibels (dB). Therefore, a 5 dB reduction has been incorporated into the values presented in Table 1 where applicable.

Table 1. Anticipated In-water Equipment Noise

Equipment	Noise Level			Measurement Distance
	dB Peak	dBrms	dB SEL	
Impact pile driver (24-inch diameter steel pile, attenuated) ¹	203	190	174	10 meters
Impact pile driver (16-inch diameter steel H-pile, attenuated) ²	195	178	165	10 meters
Impact pile driver (18-20-inch diameter timber pile) ³	189	177	164	10 meters
Vibratory driving/removal (24-inch diameter steel) ⁴	--	166	--	10 meters
Vibratory driving/removal (16-inch diameter steel) ⁵	196	158	158	10 meters



Equipment	Noise Level			Measurement Distance
	dB Peak	dBrms	dB SEL	
Vibratory removal (20-inch diameter timber pile) ⁶	--	162	--	10 meters

-- Data not available

¹ Laughlin 2005 using average unattenuated noise levels documented for the installation of 5, 24-inch steel pipe piles. 5 dB reduction applied for use of bubble curtain.

² Caltrans 2015. A 5 dB reduction applied for use of bubble curtain

³ Noise data for the impact installation of 18-20-inch diameter timber piles is not available. Therefore, anticipated noise levels are based on available noise data for the impact installation of 20-inch diameter concrete piles (Caltrans 2020).

⁴ Laughlin 2010a, as cited in WSDOT 2020.

⁵ Noise data for the vibratory installation/removal of 16-inch diameter steel piles is not available. Therefore, anticipated noise levels are based on available noise levels for the vibratory installation of 18-inch diameter steel piles (Caltrans 2020)

⁶ Noise data for the vibratory installation/removal of 20-inch diameter timber piles is not available. Therefore, anticipated noise levels are based on available noise levels for the vibratory removal of 20-inch diameter concrete piles (Naval Facilities Engineering Systems Command Southwest 2022). Noise levels were backcalculated to a 10 meter measurement distance assuming a 15 log transmission loss.

Table 2. Anticipated In-air Equipment Noise

Equipment	Noise Level	Measurement Distance
	Unweighted dBA	
Impact pile driver (unattenuated, 24-inch steel, 16-inch steel, 20-inch timber) ¹	101	15.25 meters
Vibratory driving/removal (unattenuated, 24-inch steel, and 20-inch timber) ²	98	15.25 meters
Vibratory driving/removal (unattenuated, 16-inch steel) ³	88	15.25 meters

¹ In-air noise data for the impact installation of 24-inch diameter steel piles, 16-inch diameter steel, and 20-inch diameter timber piles is not available. Therefore, anticipated noise levels are based on available in-air noise levels for the impact installation of 30-inch diameter steel piles (Ghebreghzabiher 2017, as cited in WSDOT 2020).

² In-air noise data for the vibratory installation of 24-inch steel diameter piles and 20-inch diameter timber piles is not available. Therefore, anticipated noise levels are based on available in-air noise levels for the vibratory installation of 30-inch diameter steel piles (Laughlin 2009, as cited in WSDOT 2020).

³ In-air noise levels for the vibratory installation of 16-inch diameter steel piles are not available. Therefore, anticipated noise levels are based on available in-air noise levels for 18-inch diameter steel piles (Laughlin 2010b, as cited in WSDOT 2020).



2. Dates, Duration, and Specified Geographic Region

2.1. Project Location Description

The Project occurs at Bellingham Shipping Terminal (BST), in Bellingham Washington (Figure 1). The project site is bordered by Port and heavy industrial properties, berths and industry, and Bellingham Bay. The Burlington Northern Santa Fe (BNSF) railway mainline that runs between Vancouver, British Columbia, Canada and Seattle, Washington with connections to other railways in between and beyond is located adjacent to the BST yard entrance (Figure 1). The BST is located near the Interstate 5 (I-5) corridor with good access to and from interstate, local, and regional industries.

2.2. Construction Schedule

Wharf and dock maintenance and rehabilitation will commence once all permits are obtained, tentatively summer 2023 or 2024. In-water work will occur only within the approved in-water work window (anticipated as August 1 through February 15). Work will likely be completed within approximately one year but may require an additional in-water work window depending on the timeframe for permit issuance, bidding, and construction labor/equipment/material considerations.

Maintenance dredging will also commence once all permits are obtained, tentatively summer through fall 2023 or 2024 and will be completed over approximately three (3) months during the approved in-water work window (anticipated as August 1 through February 15). As discussed in detail in Section 1.2.1, pile driving could occur for up to 72 days total (stops and starts each day) at the Project site. Pile removal could occur for up to 15 total days.



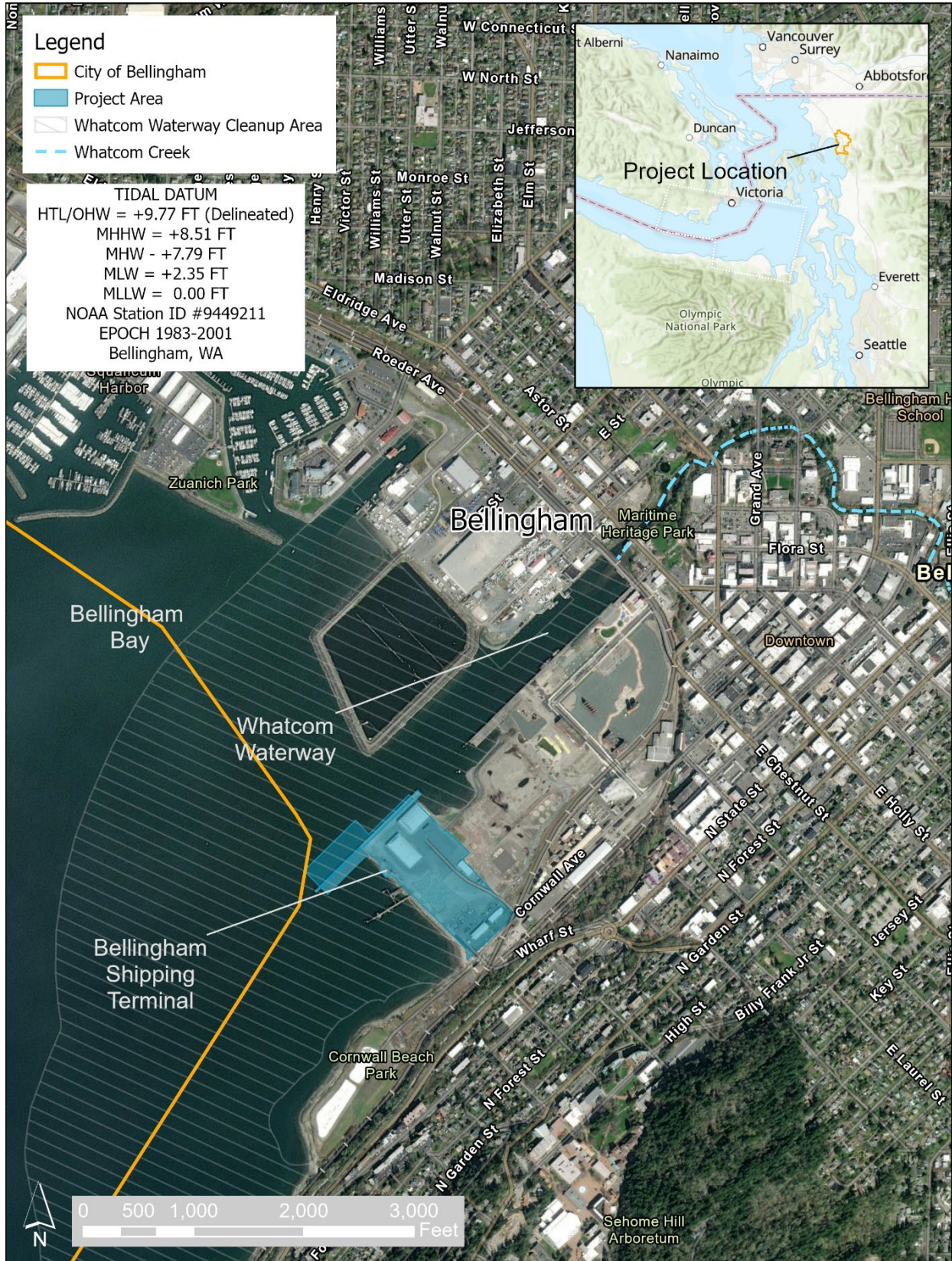


Figure 1. Project Location Map



3. Species and Numbers of Marine Mammals

According to the Biological Evaluation (BE) (M&N 2022), several MMPA protected species could occur within the project vicinity (Table 3). Of these species, take is only proposed for the harbor seal (*Phoca vitulina*), California sea lion (*Zalophus californianus*), Eastern DPS Stellar sea lion (*Eumetopias jubatus*), and harbor porpoise (*Phocoena phocoena*). Exclusion zones will be implemented for all other marine mammals to avoid take. Take is not proposed for any species listed under the ESA. Any species and critical habitat not discussed in this IHA were determined to not be present and/or it was determined that the proposed activities will have no effect on the species and critical habitat.

Table 3. Marine Mammals with Potential to Occur in Project Vicinity

Species	Scientific Name	Occurrence in Project Area	Status	Take
Killer whale (Southern Resident DPS)	<i>Orcinus orca</i>	Could occur within the project vicinity, but presence is considered unlikely.	Protected under the ESA and MMPA	Take not proposed. See Section 3.1.1.
Humpback whale (Central American DPS/Mexico DPS)	<i>Megaptera novaeangilae</i>	Could occur within the project vicinity, but presence is considered unlikely.	Protected under the ESA and MMPA	Take not proposed. See Section 3.1.2.
Gray whale (North Pacific DPS)	<i>Eschrichtius robustus</i>	Could occur within the project vicinity, but presence is considered unlikely.	Protected under the ESA and MMPA	Take not proposed. See Section 3.1.3.
Minke whale	<i>Balaenoptera acutorostrata</i>	Could occur within the project vicinity, but presence is considered unlikely.	Protected under the MMPA	Take not proposed. See Section 3.1.4.
Harbor seal	<i>Phoca vitulina</i>	Could occur within project vicinity.	Protected under the MMPA	Take proposed. See Section 4.1.
California sea lion	<i>Zalophus californianus</i>	Could occur within project vicinity.	Protected under the MMPA	Take proposed. See Section 4.2.
Stellar sea lion (Eastern DPS)	<i>Eumetopias jubatus</i>	Could occur within project vicinity.	Protected under the MMPA	Take proposed. See Section 4.2.
Harbor porpoise	<i>Phocoena phocoena</i>	Could occur within project vicinity.	Protected under the MMPA	Take proposed. See Section 4.3.

3.1. MMPA Species not Proposed for Take by Project

3.1.1. Southern Resident Killer Whale

The Southern Resident killer whale (*Orcinus orca*), ESA-listed as endangered, could occur within the project area, although based on historical sightings, their presence within the project area is considered unlikely. The Southern Resident killer whale is also protected under the MMPA.



The Southern Resident killer whale population is made up of the J, K, and L pods. These killer whales are found in the Salish Sea during fall, spring, and summer. Less is known about their winter habitat; however, they are known to travel along the Oregon and Washington coast. Southern Resident killer whales consume fish, particularly salmon. Their preferred prey is Chinook salmon, particularly in the summer (NMFS 2014a).

According to sighting data retrieved from the Orca Network, between the years of 2017 and 2021 there have been approximately five recorded sightings within approximately 3 miles of the project site (Orca Network 2021). Water depths shallower than 20 ft. relative to MHW are not considered a part of Southern Resident killer whale habitat. Within the immediate vicinity of BST, the water is shallow and would not be anticipated to provide suitable Southern Resident killer whale habitat. Although the immediate vicinity does not provide water depths optimal for Southern Resident killer whales, the greater Action Areas could provide suitable water depths. Exclusion zones will be implemented to avoid potential Level A and Level B take. Take is not proposed, and this species will not be discussed further.

3.1.2. Humpback Whale

The Central American and Mexico distinct population segment (DPS) Humpback whale (*Megaptera novaeangliae*), ESA-listed as endangered (Central American DPS) and threatened (Mexico DPS), could occur within the project area, although based on historical sightings, their presence within the project area is considered unlikely. The Humpback whale is also protected under the MMPA.

According to sighting data retrieved from the Orca Network, between the years of 2017 and 2021 there have been approximately two recorded sightings within approximately 3 miles of the project site (Orca Network 2021). Within the immediate vicinity of BST, the water is shallow and would not be anticipated to provide habitat for humpback whales (NOAA 2011). Although the immediate vicinity does not provide water depths optimal for humpback whales, the greater vicinity could provide suitable water depths. Exclusion zones will be implemented to avoid potential Level A and Level B take. Take is not proposed, and this species will not be discussed further.

3.1.3. Gray Whale

The North Pacific DPS gray whale (*Eschrichtius robustus*) is ESA-listed as endangered and “depleted” under the MMPA. North Pacific stock gray whales occur along the west coast of North America. Two groups of gray whales typically enter Puget Sound during the spring migration north (Cascadia Research Collective 2010). According to sighting data retrieved from the Orca Network, between the years of 2017 and 2021 there have been approximately nine recorded sightings within approximately three (3) miles of the project site (Orca Network 2021). Within the immediate vicinity of BST, the water is shallow and would not be anticipated to provide suitable habitat for gray whales. Although the immediate vicinity does not provide optimal water depths for gray whales, the greater Action Areas could provide suitable water depths.



It is not anticipated that the species will occur in the project area; however, in the rare instance that a gray whale occurs within the Action Area, exclusion zones will be implemented to avoid potential Level A and Level B take. Take is not proposed for the gray whale, and this species will not be discussed further.

3.1.4. Minke Whale

The minke whale (*Balaenoptera acutorostrata*) is not listed as endangered or threatened under the ESA and is protected under the MMPA. Minke whale distribution includes polar, temperate, and tropical waters worldwide. This species has both migratory and resident stocks. Distribution also varies by age, reproductive status, and sex. Minke whales occurring in inland waters of California, Oregon, and Washington are considered resident populations because they have established home ranges. Minke whales are known to occur in the waters around the San Juan Islands and it is assumed that they could occur within the Action Area.

According to sighting data retrieved from the Orca Network, between the years of 2017 and 2021 there have been approximately three recorded sightings within approximately three (3) miles of the project site (Orca Network 2021). Within the immediate vicinity of BST, the water is shallow and would not be anticipated to provide suitable habitat for minke whales. Although the immediate vicinity does not provide optimal water depths for minke whales, the greater Action Areas could provide suitable water depths. Exclusion zones will be implemented to avoid potential Level A and Level B take. Take is not proposed, and this species will not be discussed further.

3.2. MMPA Species that Could Result in Take by Project

3.2.1. Harbor Seal

The Harbor seal (*Phoca vitulina*) is protected under the MMPA and inhabits temperate coastal habitats along the entire coast of California (NMFS 2023a). The species hauls out on rocks, reefs, and beaches to rest, regulate body temperature, give birth, nurse pups, and molt. Harbor seals feed in both deep and shallow coastal waters and their diet consists primarily of fish, crustaceans, and mollusks. This population shall be discussed further in Section 4.

3.2.2. California Sea Lion

The California sea lion (*Zalophus californianus*) is protected under the MMPA and occurs in the shallow waters of the eastern North Pacific Ocean (NMFS 2023b). The species prefers sandy beaches or rocky coves for breeding and hauling out, though they also occur on marina docks, jetties, and buoys along the west coast. Their primary breeding range is from the Channel Islands to central Mexico. California sea lions primarily feed offshore on a variety of prey species, including squid, anchovies, mackerel, rockfish, and sardines. This population shall be discussed further in Section 4.



3.2.3. Stellar Sea Lion

The Eastern DPS Stellar sea lion (*Eumetopias jubatus*) was delisted from the ESA and is protected under the MMPA. Stellar sea lions occur along the North Pacific Ocean rim including throughout the Puget Sound (NMFS 2023c). The species prefers beaches, ledges, and rocky reefs for breeding and hauling out. Their diet varies throughout their range and at different times of the year and consists of a wide range of fish and cephalopods (including squid and octopus). This population shall be discussed further in Section 4.

3.2.4. Harbor Porpoise

The harbor porpoise (*Phocoena phocoena*) is protected under the MMPA and occurs globally in temperate, subarctic, and arctic coastal and offshore waters (NMFS 2022c). The species is commonly found in coastal areas, bays, estuaries, harbors, and fjords and is most often seen in groups of under ten individuals (NMFS 2022c). Diet consists primarily of schooling fish and occasionally includes squid and octopus. This population shall be discussed further in Section 4.



4. Affected Species Status and Distribution

Although the species listed in Section 3 may occur near the project area, four (4) of these species are common in the vicinity of the project area and may result in take. These species are further described below.

4.1. Harbor Seal

The harbor seal is not listed as “endangered” or “threatened” under the ESA or designated as “depleted” under the MMPA. Harbor seals spend about half their time in the water, where they typically dive for seven minutes in relatively shallow waters to feed on a variety of prey items, including fish, shellfish, and crustaceans (NMFS 2023a). Harbor seal pups are typically born between February and April, which would possibly coincide with pile driving activities for the project.

4.1.1. Hearing Ability

Harbor seals are classified as phocid pinnipeds and have an approximate in-water hearing range of 50 hertz (Hz) to 86 kilohertz (kHz) (NMFS 2018).

4.1.2. Distribution

Harbor seals are widely distributed in the North Atlantic and North Pacific (NMFS 2013). Two subspecies exist in the Pacific: *P. v. stejnegeri* in the western North Pacific, near Japan, and *P. v. richardii* in the eastern North Pacific (NMFS 2013). The latter subspecies could occur in the project vicinity and are found in estuarine and coastal waters in Baja California, along the western coast of the U.S., British Columbia, and Southeast Alaska, as well as throughout the Gulf of Alaska and in the Bering Sea (NMFS 2014b). Within U.S. West Coast waters, there are five (5) stocks; 1) Southern Puget Sound (south of the Tacoma Narrows Bridge); 2) Washington Northern Inland Waters (including Puget Sound north of the Tacoma Narrows Bridge, the San Juan Islands, and the Strait of Juan de Fuca); 3) Hood Canal; 4) Oregon/Washington Coast; and 5) California (NMFS 2014b). The Northern Inland stock could occur in the project vicinity. Pacific harbor seals do not make extensive pelagic migrations but do travel 300-500 kilometers (km) to find food or suitable breeding areas (NMFS 2019a). Harbor seal haulout sites are distributed among intertidal beaches, reefs, sandbars, log booms, and floats.

4.1.3. Status

There is no minimum population size estimate for the Washington inland waters stock of harbor seals (NMFS 2014b). The mean count of harbor seals occurring in Washington inland waters was 7,213 individuals in 1999 (NMFS 2014b).



4.1.4. Presence in the Project Area

Harbor seals are anticipated to be abundant within the project vicinity. Their abundance in a given area is often linked to the availability of prey and proximity to haulout locations. Pupping occurs from June to August in the Bellingham area (Washington Department of Fish and Wildlife [WDFW] 2000). The number of individuals at haul out locations typically peaks during the pupping season.

There are several haulouts within the vicinity (Table 4 and Figure 2). The nearest haulout is the ‘log pond’ and pier approximately 0.1 miles (500 feet) from the project site (Table 4, Figure 2, pers comm, Conwell 2023). In August of 2015, the log booms that were used as a haul-out site at the log pond were permanently removed. Since this removal, seal numbers at this location have decreased. However, many seals, including hauled out individuals, can still be found at the log pond and at the adjacent pier (Figure 2). Western Washington University (WWU) students complete seal observations at the two (2) sites all year long, five (5) days a week, for thirty (30) minutes each day. Approximately 450 total seals were observed between the two sites during August of 2020 (Figure 3).

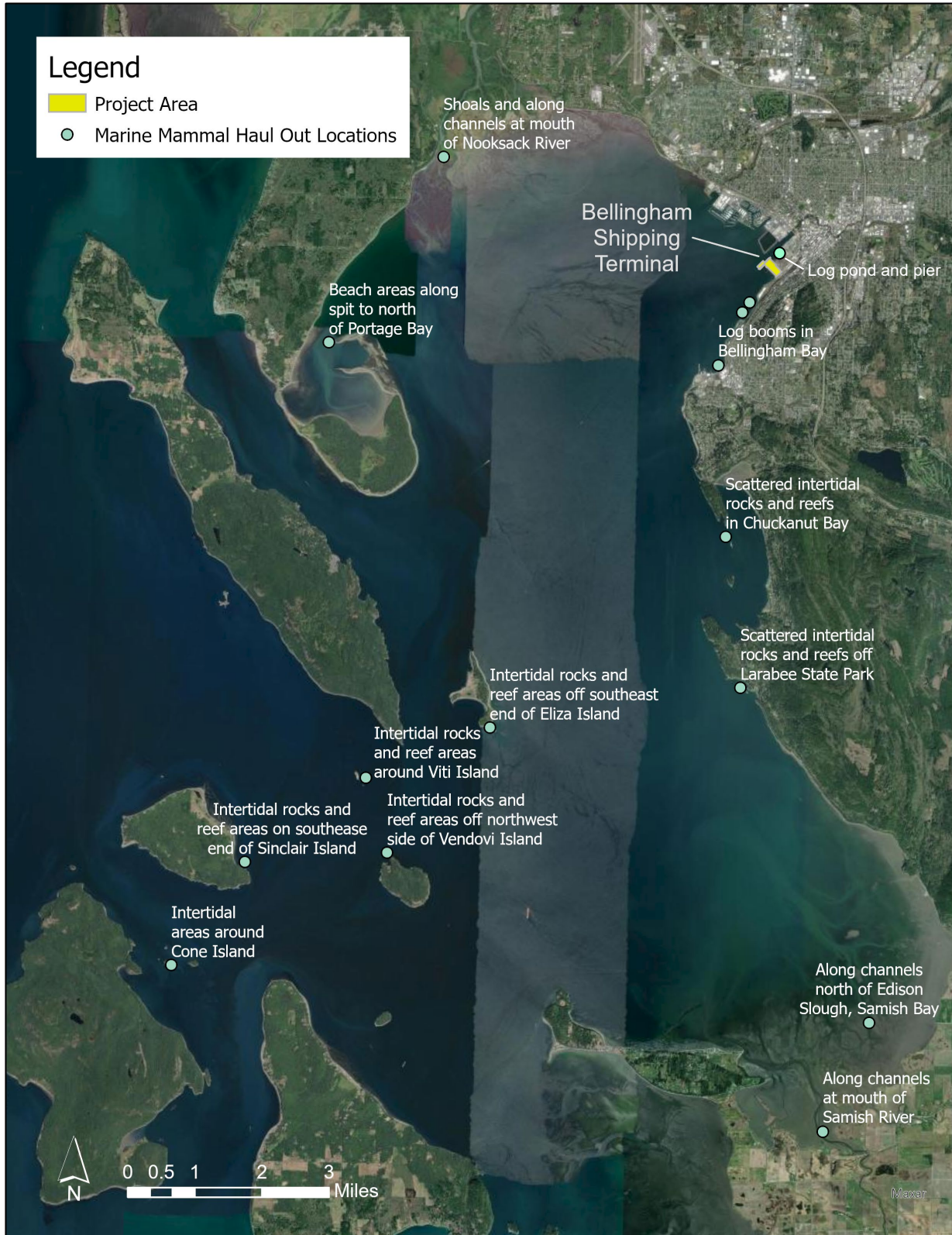
Table 4. Harbor Seal Haulout Location in the Steel Pile Action Area

Location	Latitude/Longitude	Description	Distance from Project Site
<i>Bellingham Bay</i>	48° 44'48/ 122° 29'28	Log pond and Pier	0.10 mi E
<i>Bellingham Bay</i>	48° 44'28/ 122° 29'82	On log booms in Bellingham Bay	0.55 mi S
<i>Bellingham Bay</i>	48° 44.12/ 122° 29'96	On log booms in Bellingham Bay	0.75 mi S
<i>Bellingham Bay</i>	48° 43'43/ 122° 30'43	On log booms in Bellingham Bay	1.75 mi S
<i>Chuckanut Bay Area</i>	48° 40'99/ 122° 30'05	Scattered intertidal rocks and reefs in Chuckanut Bay	4 mi S
<i>Nooksack River Mouth</i>	48° 46'09/ 122° 35'90	On shoals and along channels at mouth of Nooksack River	5.1 mi NW
<i>Spit N of Portage Bay</i>	48° 43'61/ 122° 37'84	Beach areas along spit to north of Portage Bay	6.0 mi W
<i>Rocks off Wildcat Cove</i>	48° 39'22/ 122° 29'73	Scattered intertidal rocks and reefs off Larabee State Park	6.2 mi S
<i>Eliza Rocks</i>	48° 38'63/ 122° 34'60	Intertidal rocks and reef areas off southeast end of Eliza Island	7.9 mi SW
<i>Viti Island</i>	48° 37'96/ 122° 37'26	On intertidal rocks and reef areas around Viti Island	9.7 mi SE
<i>Vendovi Island</i>	48° 37'02/ 122° 36'66	Intertidal rocks and reef areas off northwest side of island	10.3 mi S



Location	Latitude/Longitude	Description	Distance from Project Site
<i>Sinclair Island, SE</i>	48° 36'77/ 122° 39'41	On intertidal rocks and reef areas on southeast end of island	11.5 mi SE
<i>Samish Bay Area</i>	48° 34'34/ 122° 27'59	Along channels north of Edison Slough	12.0 mi SE
<i>Samish Bay Area</i>	48° 33'57/ 122° 28'14	Along channels at mouth of Samish River.	12.8 mi SE
<i>Cone Island</i>	48° 35'54/ 122° 40'69	On intertidal areas around Cone Islands	13.7 mi SE

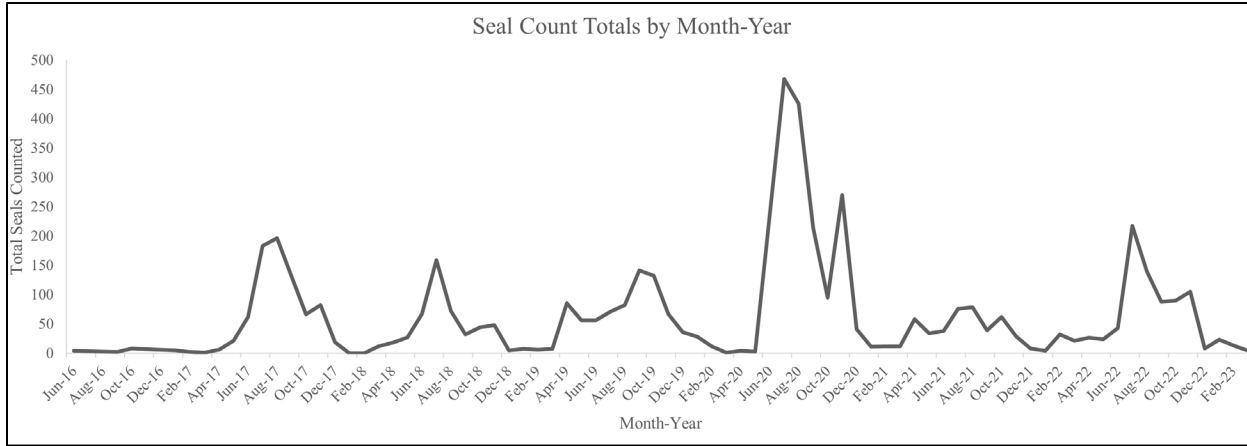




Source: WDFW 2000, Pers Comm. Conwell 2023

Figure 2. Pinniped Haulouts





Provided by Holland Conwell, WWU (Pers Comm. Conwell 2023)

Figure 3. Total Combined Seal Counts at Log Pond and Adjacent Pier

4.2. Sea lions (California and Eastern DPS Stellar Sea lions)

California sea lions in the U.S. are not listed as “endangered” or “threatened” under the ESA or as “depleted” under the MMPA. California sea lions would typically dive for less than three minutes in less than 80 meters of water to feed on prey items such as squid, herring, rockfish, and small sharks (NMFS 2019b).

Eastern DPS Steller sea lions were delisted from the ESA and are protected under the MMPA. Steller sea lions, especially males, can travel long distances seasonally. Their diving ability changes with age, with the deepest dive documented at about 1,400 ft. in depth (NMFS 2023c).

4.2.1. Hearing Ability

California sea lions and Stellar sea lions are classified as otariid pinnipeds and have an approximate in-water hearing range of 60 Hz to 39 kHz (NMFS 2018).

4.2.2. Distribution

California sea lions are native to the west coast of North America and are typically found in coastal waters (NMFS 2023b). They breed on islands located in southern California, western Baja California, and the Gulf of California (WDFW 2000). California sea lions in Washington waters use haulout sites along the outer coast, Strait of Juan de Fuca, and in Puget Sound. Haulout sites are located on jetties, offshore rocks and islands, log booms, marina docks, and navigation buoys.

Steller sea lions are distributed along the North Pacific Ocean rim from northern Hokkaido, Japan through the Kuril Islands and Sea of Okhotsk, the Aleutian Islands and Bering Sea, the southern coast of Alaska, and south to central California (NMFS 2023c). Stellar sea lions are typically found in coastal waters (NMFS 2023c). Stellar sea lion breeding and haulout sites usually consist of beaches (gravel, rocky, or sand), ledges, and rocky reefs. In Washington, haulout sites are located along the



outer coast from the Columbia River to Cape Flattery, and along the Vancouver Island side of the Strait of Juan de Fuca (WDFW 2000).

4.2.3. Status

California sea lion population size has been increasing from 1975 to 2014 (NMFS 2019c). In 2014, California sea lion population size was estimated at 257,606 animals, with a pup count of 47,691 animals along the U.S. west coast (NMFS 2019c).

The steller sea lion eastern DPS population has been increasing since the year 1990 across all regions (NMFS 2019c). In 2017, the estimated eastern stock pup count was 18,450 and the estimated non-pup count was 58,699 (NMFS 2019c). This is considered the minimum population estimate, as it does not account for animals at sea. In recent years, a new breeding rookery was established on the outer Washington coast, specifically Carroll Island and Sea lion Rock complexes, with more than 100 pups born in 2015 (NMFS 2019c).

4.2.4. Presence in Project Area

California sea lions are the most frequently sighted otariid in Washington waters (WDFW 2000). During the fall months 3,000 to 5,000 individuals may move into Washington and British Columbia waters each year. (WDFW 2000). These individuals typically remain in the area until spring when they move south towards their breeding rookeries in California and Mexico waters. Peak counts of up to 1,000 individuals a year have been documented in the Puget Sound during recent years. The Navy Marine Species Density Database (NMSDD) estimates that the density of California sea lions in the project area ranges from 0.0017 to 0.0251 animals per km² with the largest concentrations occurring from September to November (NMFS 2020a). Haulouts in Washington waters are located along the coast, within the Strait of Juan de Fuca, and in the Puget Sound. There are no known haulouts in Bellingham Bay (WDFW 2000).

The eastern DPS of stellar sea lions are occasional visitors in Puget Sound but are more regularly seen in Washington's coastal waters. They are typically found in peak numbers during the fall and winter months (WDFW 2000). In Washington waters, stellar sea lions typically use haulout sites along the coast and along the Vancouver Island side of the Strait of Juan de Fuca. They may also occasionally be found hauling out on navigation buoys within Puget Sound. The Navy Marine Species Density Database (NMSDD) estimates that the density of California sea lions in the project area ranges from 0.0003 to 0.00270 animals per km² with the largest concentrations occurring in the fall and winter (NMFS 2020a). There are no known Steller sea lion haulouts in Bellingham Bay. The nearest known haulout is located 14 miles east of the project site (Wiles and Stocking 2015).

In general, sea lion abundance would be considered uncommon during the spring and summer months. During the fall and winter months, sea lion abundance would be anticipated to be linked to the availability of prey in that area. It has been conservatively assumed that California sea lions and Steller sea lions could occur occasionally foraging within the vicinity during fall and winter months, particularly during fish runs.



4.3. Harbor Porpoise

The harbor porpoise (*Phocoena phocoena*) is not currently listed as “threatened” or “endangered” under the ESA or listed as “depleted” under the MMPA (NOAA 2017). Harbor porpoises are often seen alone or in groups with two to ten individuals. Harbor porpoises tend to eat schooling fish and squid on rare occasions. Since they inhabit coastal areas, they are more susceptible to human disturbances such as fishing and underwater noise (NOAA 2022).

4.3.1. Hearing Ability

Harbor porpoises are classified as high-frequency cetaceans and have an approximate in-water hearing range of 160 Hz to 275 Hz (NMFS 2018).

4.3.2. Distribution

Harbor porpoises are found in most nearshore waters around the northern hemisphere. There are eleven stocks of harbor porpoise that range from California to Alaska (NOAA 2017). The Washington Inland Waters stock begins off the coast of Lincoln City, Oregon and moves north to British Columbia, Canada. Although they are year-long members of Washington waters, their exact seasonal movements are not fully understood (NOAA 2017).

4.3.3. Status

In the 1940s, harbor porpoises were quite common but there was a decline in records ranging from 1970 to 1990 in the south Puget Sound. In the early 2000s there was an increase in the Puget Sound (NOAA 2017). The Washington Island Waters Stock population is approximately 11,233 individuals not including harbor porpoises in Canada (NOAA 2017).

4.3.4. Presence in Project Area

In the past 25 years, there has been an increase in the Salish Sea harbor porpoise population (WDFW 2016). The Navy Marine Species Density Database (NMSDD) estimates the density of harbor porpoises in the North Puget Sound waters to be 2.16 animals per km² (NMFS 2020a). This is anticipated to be an overestimate for the project area which includes waters adjacent to Ports and heavy industrial properties. NMFS has recommended using a density estimate of approximately 0.1 animals per km² (Personal communications Craig Cockrell, NOAA Fisheries Office of Protected Resources 2023), based on a 2018 marine mammal monitoring report for Port Angeles (Northwest Environmental Consulting, LLC 2018).



5. Type of Incidental Taking Authorization Requested

Under Section 101(a)(5)(D) of the MMPA, the Port is requesting an IHA for in-water pile driving and removal activities that could result in in-water noise levels above established noise thresholds. Level A and Level B harassment for exposure to underwater sound is being requested for harbor seals. In addition, Level B harassment is being requested for the harbor porpoise, California sea lion, and Eastern DPS Stellar sea lion.

Exposure to substantial in-water noise can result in a noise-induced hearing threshold shift in marine mammals. If the hearing threshold returns to normal after the exposure, this is considered a temporary threshold shift (TTS). If the hearing threshold does not return to normal for some extended period after the exposure, this is considered a permanent threshold shift (PTS). Both TTS and PTS data have been used to determine safe noise exposure levels for marine mammals.

Using TTS and PTS data, NMFS's NMFS has identified Level A (PTS) and Level B (potential behavioral disturbance) in-water noise thresholds for marine mammals (NMFS 2020b). Level A harassment is defined as *“any act of pursuit, torment, or annoyance that has the potential to injure a protected marine mammal or marine mammal stock in the wild”*. Level B harassment is defined as *“any act of pursuit, torment, or annoyance that has the potential to disturb a protected 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, but does not have the potential to injure a marine mammal or marine mammal stock in the wild”* (NMFS 2020b).

Noise has the potential to directly impact marine mammals by causing physical injury, hearing threshold shift, or altering behavior when these noise thresholds are exceeded. Established noise thresholds are based on the hearing class of the marine mammal. The NMFS noise thresholds for phocid (including harbor seals), otariid (including sea lions), and high frequency (harbor porpoises) hearing classes are shown in Table 5.

Table 5. Phocid Pinniped and Otariid Pinniped Noise Thresholds

Hearing Group	Noise Type	Level A Harassment		Level B Harassment
		dB SELcum	dB Peak	dBrms
Phocid Pinnipeds	In-water, Impulsive	185	218	160
	In-water, Continuous	201	-	120
	In-air, All Sources, Non-harbor Seal Phocids	-	-	100
	In-air, All Sources, Harbor Seals	-	-	90
Otariid Pinnipeds	In-water, Impulsive	203	232	160
	In-water, Continuous	219	-	120
	In-air, all Sources	-	-	100
High Frequency Cetaceans	In-water, Impulsive	155	202	160
	In-water, Continuous	173	-	120

Source: NMFS 2020b

- No applicable threshold



6. Take Estimates for Marine Mammals

6.1. Estimated Zones of Influence

Determining the area(s) exceeding each threshold level (Level A and Level B) is necessary to estimate the number of animals that may be potentially exposed to Level A harassment or potential injury and Level B acoustical harassment, and to establish a monitoring area. To estimate the zones of influence, available noise data for and methods for the installation of 24-inch steel pipe piles were used. This is conservative of all installation and removal methods and is anticipated to simplify monitoring efforts. As discussed in Section 1.2.1, up to 1,725 total blows a day could be required to install the 24-inch steel piles. Additionally, up to 90 minutes of vibratory pile driving could be required a day. To remove the existing 24-inch steel piles, up to 180 minutes of vibratory removal could be required each day. Distances to established Level A (PTS) and Level B (behavioral) thresholds are shown in Table 6 and 7.

The NMFS User Spreadsheet (NMFS 2020b) was used to calculate in-water distances to Level A harassment isopleths from pile driving activities. The in-water distances to Level B (potential disturbance) were calculated using the practical spreading loss model assuming a 4.5 dB attenuation rate for each doubling distance (NMFS 2012). The in-air distances to the Level B threshold were calculated using the in-air spherical spreading loss model assuming a 6 dB attenuation rate for each doubling distance (Federal Transit Administration [FTA] 2018).

Table 6. Potential Exposure of Harbor Seals, Sea Lions, and Harbor Porpoises During Impact Pile Driving Activities

	In-water Level A		In-water Behavioral	In-air Behavioral
Harbor seal (Phocid Pinniped) threshold	185 dB SELcum	218 dB Peak	160 dBrms	90 dBrms
Distance to threshold, impact installation all pile types and pile sizes. ¹	194 meters (0.174 km ²)	Does not exceed	1,000 meters (1.865 km ²)	55 meters (0.444 km ²)
Sea lion (Otariid Pinniped) threshold	203 dB SELcum	232 dB Peak	160 dBrms	100 dBrms
Distance to threshold, impact installation all pile types and pile sizes. ¹	15 meters (0.014 km ²)	Does not exceed	1,000 meters (1.865 km ²)	18 meters (0.017 km ²)
Harbor porpoise (High Frequency) threshold	155 db SELcum	202 db Peak	160 dbrms	-
Distance to threshold, impact installation all pile types and pile sizes. ¹	430 meters (0.557 km ²)	12 meters (0.012 km ²)	1,000 meters (1.865 km ²)	-

¹ Calculated distances to thresholds are based on noise data and installation/removal methods for 24-inch steel pipe piles. This is conservative of all installation methods.

Table 7. Potential Exposure of Harbor Seals, Sea Lions, and Harbor Porpoises During Vibratory Pile Driving Activities

	In-water Level A	In-water Behavioral	In-air Behavioral
Harbor seal (Phocid Pinniped) threshold	201 dB SELcum	120 dBrms	90 dBrms
Distance to threshold, vibratory installation all pile types and pile sizes. ¹	12 meters (0.012 km ²)	11,660 meters (80.527 km ²)	39 meters (0.032 km ²)



Distance to threshold, vibratory removal all pile types and pile sizes. ¹	19 meters (0.016 km ²)	11,660 meters (80.527 km ²)	39 meters (0.032 km ²)
Sea lion (Otariid Pinniped) threshold	219 dB SELcum	130 dBrms ¹	100 dBrms
Distance to threshold, vibratory installation all pile types and pile sizes. ¹	1 meter (0.007 km ²)	11,660 meters (80.527 km ²)	13 meters (0.0143 km ²)
Distance to threshold, vibratory removal all pile types and pile sizes. ¹	2 meters (0.007 km ²)	11,660 meters (80.527 km ²)	13 meters (0.0143 km ²)
Harbor porpoise (High Frequency) threshold	173 dB SELcum	130 dBrms ¹	-
Distance to threshold, vibratory installation all pile types and pile sizes. ¹	29 meters (0.044 km ²)	11,660 meters (80.527 km ²)	-
Distance to threshold, vibratory removal all pile types and pile sizes. ¹	46 meters (0.065 km ²)	11,660 meters (80.527 km ²)	-

¹ Calculated distances to thresholds are based on noise data and installation/removal methods for 24-inch steel pipe piles. This is conservative of all installation methods.

For harbor seals, the Level A noise thresholds could be exceeded within approximately 194 meters (0.12 miles) of impact pile driving, 12 meters (0.008 miles) of vibratory pile driving, and 19 meters (0.01 miles) of vibratory removal (Tables 6 and 7, Figure 4). For sea lions, the Level A noise thresholds could be exceeded within approximately 15 meters (0.009 miles) of impact pile driving, 1 meter (0.0006 miles) of vibratory pile driving, and 2 meters (0.001 miles) of vibratory pile removal (Tables 6 and 7, Figure 5). For harbor porpoises, the Level A noise thresholds could be exceeded within approximately 430 meters (0.267 miles) of impact pile driving, 29 meters (0.018 miles) of vibratory pile driving, and 45 meters (0.028 miles) of vibratory pile removal (Tables 6 and 7, Figure 6).

For harbor seals, sea lions, and harbor porpoises the in-water behavioral threshold could be exceeded within approximately 1,000 meters (0.63 miles) of impact pile driving and 11,660 meters (7.25 miles) of vibratory pile driving or removal (Tables 6 and 7, Figure 7). For harbor seals, the in-air behavioral threshold could be exceeded within approximately 55 meters (0.035 miles) of impact pile driving and 39 meters (0.025 miles) of vibratory pile driving or removal (Tables 6 and 7, Figure 8). For sea lions, the in-air behavioral threshold could be exceeded within approximately 18 meters (0.01 miles) of impact pile driving and 13 meters (0.008 miles) of vibratory pile driving or removal (Tables 6 and 7, Figure 9).





Figure 4. Harbor Seal Level A In-water Threshold Areas





Figure 5. Sea Lion Level A In-water Threshold Areas



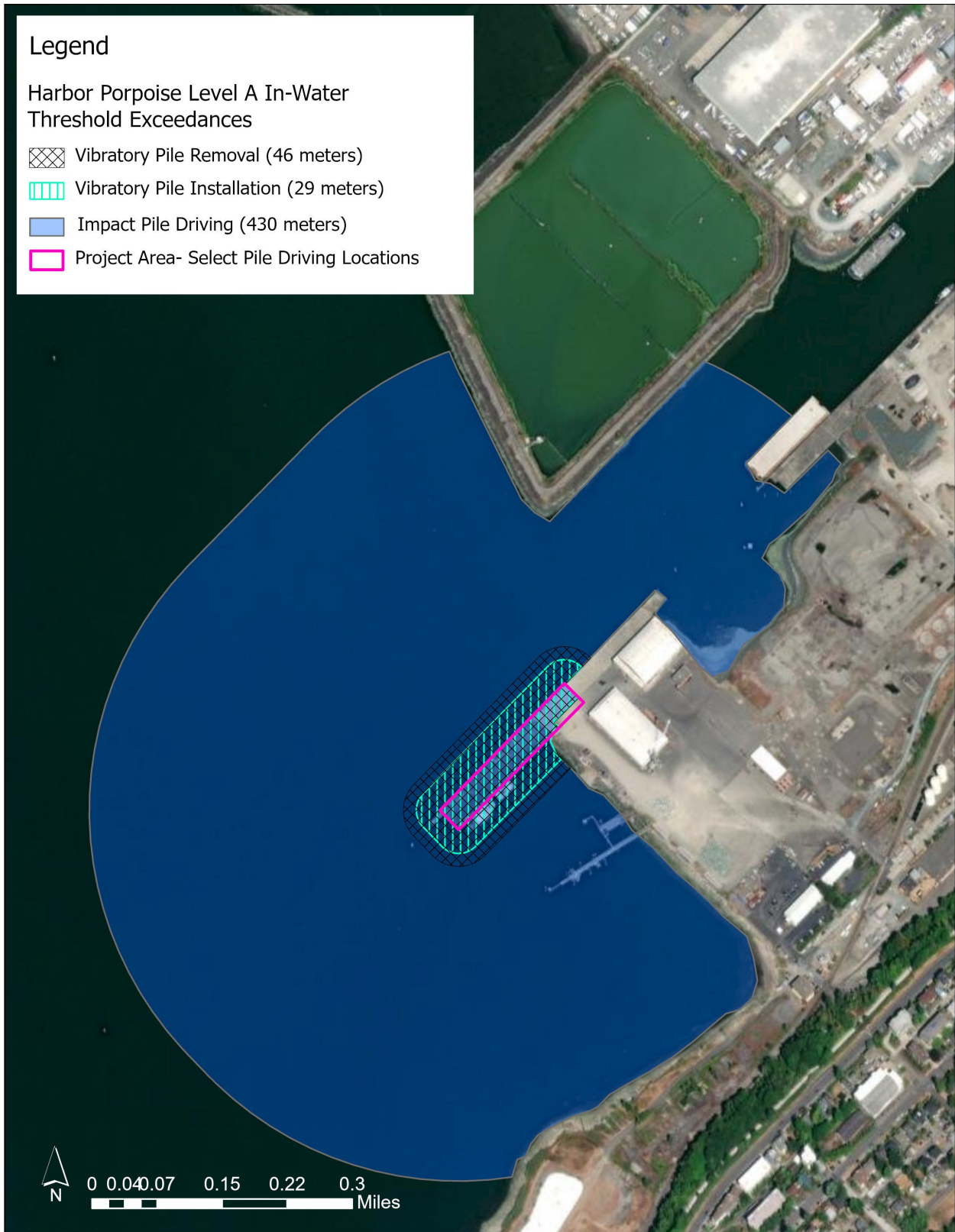


Figure 6. Harbor Porpoise Level A In-water Threshold Areas



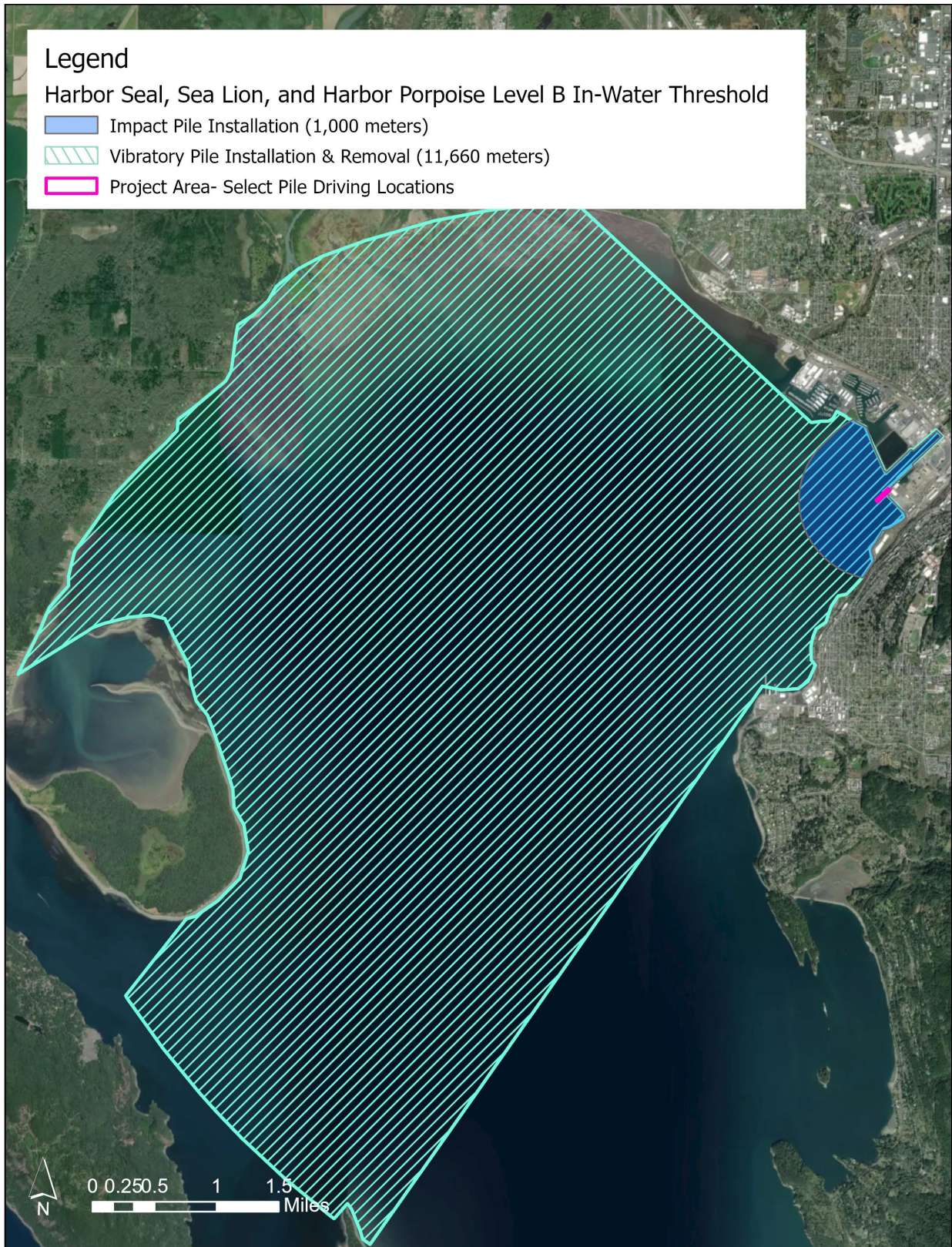


Figure 7. Harbor Seal, Sea Lion, and Harbor Porpoise Level B In-water Threshold Areas



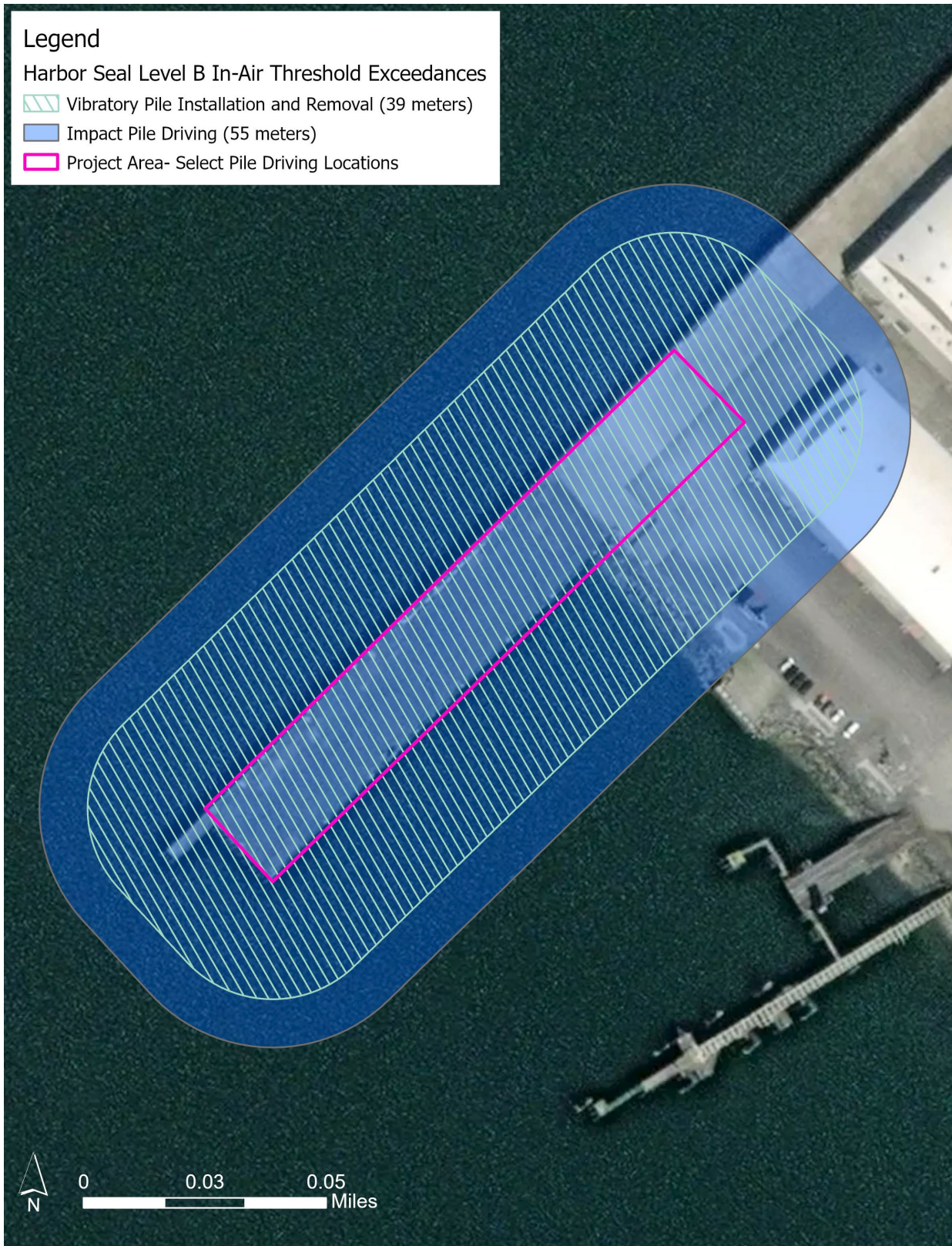


Figure 8. Harbor Seal Level B In-air Threshold Areas





Figure 9. Sea Lion Level B In-air Threshold Areas



6.2. Estimated Take

Take estimates are based on the calculated zones of influence (Section 6.1, Figures 4 through 9), anticipated likelihood of species occurrence within these zones, and total duration of the proposed pile driving and removal activities.

Proposed Level A and Level B take is summarized in Table 8. The total take is based on anticipated take levels for each of the activities discussed in detail in Sections 6.2.1 and 6.2.2. Incidental takes will likely be the result of multiple takes of individuals, rather than single takes of unique individuals. This is especially the case for harbor seals with nearby haul out locations in the areas adjacent to the proposed pile driving activities. Take presented in this section is therefore likely very conservative. In actuality take counts will likely be a result of multiple takes to the same individual as opposed to single takes to individual animals.

Table 8. Estimated Take for 72 Days of Pile Driving Activities and 15 days of Removal Activities

Species	Level A Take	Level B Take
Harbor Seal	264	2,029
California Sea Lion	0	175
Steller Sea Lion	0	19
Harbor Porpoises	0	703

6.2.1. Potential Level A Threshold Exposures

Level A take counts are based on the anticipated Level A exposures that could occur during each of the pile driving/removal activities. To calculate take it has been assumed that of the 72 total days of pile installation activities, 70 of the days may involve vibratory driving and 17 of the days may involve impact driving. During some days, piles may be installed with a combination of a vibratory hammer and impact hammer. In addition to the 72 total days of pile driving, vibratory pile removal may occur for up to 15 days.

The anticipated exposures are summarized in Sections 6.2.1.1 through 6.2.1.3. Actual exposures during each of the activities may vary, but total take counts (Table 8) will not be exceeded.

6.2.1.1. In-water Vibratory Pile Installation

Harbor Seal

The harbor seal Level A threshold could be exceeded within approximately 12 meters of the proposed vibratory pile installation activities. A 40-meter exclusion zone will be implemented to avoid Level A take (see Section 13).

California Sea Lion and Steller Sea Lion

The sea lion Level A threshold could be exceeded within approximately 1 meter of the proposed vibratory pile installation activities. A 20-meter exclusion zone will be implemented to avoid Level A take (see Section 13).



Harbor Porpoise

The harbor porpoise Level A threshold could be exceeded within approximately 29 meters of the proposed vibratory pile installation activities. A 50-meter exclusion zone will be implemented to avoid Level A take (see Section 13).

6.2.1.2. In-water Impact Pile Installation

Harbor Seal

The harbor seal Level A threshold could be exceeded within approximately 194 meters of the proposed impact pile driving activities. A 55-meter exclusion zone will be implemented to minimize Level A take. Based on available WWU abundance data, anecdotal statements from Port staff, and NMFS guidance, it is anticipated that up to 264 harbor seals could be exposed to noise levels above the Level A threshold during impact pile driving which is anticipated to occur on up to approximately 17 days.

California Sea Lion and Steller Sea Lion

The sea lion Level A threshold could be exceeded within approximately 15 meters of the proposed impact installation activities. A 20-meter exclusion zone will be implemented to avoid Level A take (see Section 13).

Harbor Porpoise

The harbor porpoise Level A threshold could be exceeded within approximately 430 meters of the proposed impact installation activities. A 430-meter exclusion zone will be implemented to avoid Level A take (see Section 13).

6.2.1.3. In-water Vibratory Pile Removal

Harbor Seal

The harbor seal Level A threshold could be exceeded within approximately 19 meters of the proposed vibratory removal activities. A 40-meter exclusion zone will be implemented to avoid Level A take (see Section 13).

California Sea Lion and Steller Sea Lion

The sea lion Level A threshold could be exceeded within approximately two (2) meters of the proposed vibratory removal activities. A 20-meter exclusion zone will be implemented to avoid Level A take (see Section 13).

Harbor Porpoise

The harbor porpoise Level A threshold could be exceeded within approximately 46 meters of the proposed vibratory removal activities. A 50-meter exclusion zone will be implemented to avoid Level A take (see Section 13).



6.2.2. Potential Level B Threshold Exposures

Level B take counts are based on the anticipated Level B exposures that could occur during each of the pile driving/removal activities. Typically, potential take is estimated by multiplying the area of the harassment zone by the local animal density. This provides an estimate of the number of animals that might occupy the harassment zone at any given moment.

Incidental take for each activity is estimated by the following equation:

Incidental take estimate = species density × harassment zone area × days of pile installation + removal

When site-specific density data was unavailable, density estimates from the Navy Marine Species Density Database (NMSDD) (NOAA 2020a) were used.

These anticipated exposures are summarized in Sections 6.2.2.1 through 6.2.2.4. Actual exposures during each of the activities may vary, but total take counts (see Table 8) will not be exceeded.

6.2.2.1. In-water Pile Installation and Removal

If impact installation activities occur on the same day as vibratory installation activities, the larger vibratory Level B threshold area will apply for that day. Therefore, Level B take counts have been conservatively calculated assuming that the larger vibratory Level B threshold area will apply during all 87 days in which pile installation and removal activities could occur.

Harbor Seal

The harbor seal in-water Level B threshold could be exceeded within approximately 11,660 meters or 80.527 km² during pile driving and removal activities. Exclusion zones will be implemented as discussed in Section 6.2.1, however these will not result in substantial reductions to the Level B monitoring area. Based on available WWU abundance data, anecdotal statements from Port staff, and NMFS guidance it is anticipated that up to 2,029 harbor seals could be exposed to noise levels above the Level B threshold during pile driving and removal activities.

California Sea Lion and Steller Sea Lion

The sea lion in-water Level B threshold could be exceeded within approximately 11,660 meters or 80.527 km² during pile driving and removal activities. Exclusion zones will be implemented, however these will not result in substantial reductions to the Level B monitoring area. Therefore, the total 80.527 km² zone was conservatively used to calculate the anticipated Level B take. The highest estimated density of California sea lions in Bellingham Bay during the season in which pile driving and removal activities could occur is 0.0251 animals per km² (NMFS 2020a). Based on the take equation presented in Section 6.2.2, a take of 175 California sea lions is anticipated during the proposed installation and removal activities.

The highest estimated density of Steller sea lions in Bellingham Bay during the season in which pile driving and removal activities could occur is 0.00270 animals per km² (NMFS 2020a). Based on the



take equation presented in Section 6.2.2, a take of 19 Steller sea lions is anticipated during the proposed installation and removal activities.

Harbor Porpoise

The harbor porpoise in-water Level B threshold could be exceeded within approximately 11,660 meters or 80.527 km². Exclusion zones will be implemented, however these will not result in substantial reductions to the Level B monitoring area. Therefore, the total 80.527 km² zone was conservatively used to calculate the anticipated Level B take. The estimated density of harbor porpoise in the project area is anticipated to be 0.1 animals per km² (Personal Communications Craig Cockrell, NOAA Fisheries Office of Protected Resources 2023). Based on the take equation presented in Section 6.2.2, a take of 701 harbor porpoises is anticipated to occur during the proposed installation and removal activities.

6.2.2.2. In-air driving and removal

In-air Level B threshold exposures are not anticipated to occur during the proposed pile driving or removal activities. The in-air Level B threshold areas are small and do not overlap with any known haulouts. Exclusion zones will be implemented to prevent any in-air Level B take.



7. Anticipated Impact of the Activity

7.1. Noise

7.1.1. In-water

The proposed project may produce noise that has the potential to result in Level A or Level B threshold exceedances. However, the estimated level A and Level B take is low compared to the overall marine mammal stocks. Noise can produce short-term and long-term effects on marine mammals. Exposure to elevated noise for sufficient duration can result in a loss of hearing sensitivity or a threshold shift. If the hearing threshold shift returns to baseline this is considered a TTS, which can occur due to noise exposures over the Level B threshold (NMFS 2023d). If hearing thresholds do not return to baseline and remain elevated for an extended period, this is a PTS, which can result from exposures to noise levels above the Level A threshold (NMFS 2023d). Level A threshold exceedances can also result in lung or gastrointestinal tract injury.

Risk of exposure to Level A threshold exceedances is limited. It is anticipated that up to 264 harbor seals could be exposed to noise levels that exceed the Level A threshold. Sea lions and harbor porpoises are not anticipated to be exposed to Level A threshold exceedances. As discussed in Section 6, incidental takes will likely be multiple takes of the same individuals, rather than single takes of unique individuals, especially for harbor seals which are known to haulout/utilize areas adjacent to the proposed activities. Exposure to noise levels above the Level B threshold may occur regularly during the duration of the project. Noise levels above the Level B threshold can result in temporary threshold shifts and behavioral responses. However, it is likely that harbor seals, sea lions, and harbor porpoises that occur within proximity to the project and that are exposed to noise levels above the Level B threshold, are habituated high levels of in-water and in-air noise given the level of human and Port activities within the vicinity.

Marine mammals may exhibit behavior that indicates that they are startled by noise, and they may swim away from the project area. This could result in increased swimming by marine mammals, increased time spent out of water, including haul out time and surface time, which may result in a temporary decrease in their foraging in the affected area. This avoidance behavior is expected to be short-term in duration, and upon conclusion of the pile driving period, it is anticipated that marine mammal activity will return to baseline levels. It is unlikely that work will result in a permanent displacement of marine mammals from the area. No population-level impacts are anticipated to the species nor are any population-level impacts anticipated to the long-term fitness of any of the marine mammal species covered in this application.

7.1.2. In-air

The in-air Level B threshold area for harbor seals and sea lions is small and would not overlap with any known haulouts. Given the small threshold area and uncommon occurrence of hauled out



harbor seals and sea lions within the vicinity, it is considered unlikely that they will be behaviorally disturbed by in-air noise levels.



8. Anticipated Impacts on Subsistence Uses

Marine mammals in the project area are not harvested for substance use. Therefore, no impact will occur to subsistence uses.



9. Anticipated Impacts on Habitat

No permanent impacts to harbor seal, sea lion, or harbor porpoise habitat are anticipated. Once pile driving ceases, existing functionality of habitat within the project area is not anticipated to be altered. Any impacts will be temporary in nature and will not require restoration. Minor increase in turbidity during in-water construction activities such as dredging, pile driving, and removal could occur. Any increase in turbidity from the project is expected to be short term and localized. Turbidity produced from project activities is expected to disperse quickly with tidal action. Site conditions are anticipated to be substantially unchanged from existing conditions for harbor seals, sea lions, and harbor porpoises following project implementation. The project does not propose the construction of structures that will represent a significant barrier to movement for marine mammals within the project area.



10. Anticipated Effects of Habitat Impacts on Marine Mammals

Impacts to harbor seals, sea lions, and harbor porpoises could include a temporary loss of foraging habitat if harbor seals, sea lions, and harbor porpoises avoid the project area during pile driving and removal activities. Additionally, the acoustic energy produced from pile driving and removal activities has the potential to disturb fish present within the project area, causing them to avoid the area. As a result, this could potentially reduce the amount of available foraging habitat. This reduction in forage area will be temporary, and any disturbed fish are anticipated to return to the area upon the completion of pile driving and removal activities. The area of foraging habitat that could be temporarily impacted from pile driving and removal activities represents a small, industrialized portion of available harbor seal, sea lion, and harbor porpoise foraging habitat. The project may also result in minor increases in turbidity during in-water construction activities such as dredging, pile driving, and removal. Any increase in turbidity from the project is expected to be short term, localized, and lower than thresholds typically associated with impacts to fish species that marine mammals feed upon.

The project is not anticipated to have any significant or long-term impacts to marine mammals or their habitat. Sea lions are not known to frequently haulout at the project site and therefore, the project will not alter the condition of sea lion haulouts. Sea lion pupping is not known to occur at the project site and therefore impacts to sea lion pupping habitat are not anticipated. Harbor seal haulouts do occur within the project vicinity, however project activities are not anticipated to result in noise threshold exceedances at these haulout locations. Therefore, impacts to haulouts and/or pupping at these haulouts are not anticipated. Furthermore, in-water pile driving activities would be limited to the in-water work window from August 1 through February 15, while pupping typically occurs from June to August in Bellingham Bay.



11. Mitigation Measures to Protect Marine Mammals and Their Habitat

The repairs have been designed to avoid and minimize possible adverse impacts to the environment and marine mammals, including those listed under the ESA. The following outlines avoidance and minimization measures (AMMs), and best management practices (BMPs) to reduce impacts associated with construction activities.

11.1. Measures Proposed to Minimize Impacts to Marine Mammals

- Methods to reduce in-water noise will be implemented such as implementation of a soft start technique, use of a wood cushion block, and/or use of a bubble curtain. Noise reduction techniques will be chosen and implemented based on pile material-specific effectiveness. A bubble curtain will be used when impact driving steel piles.
- To avoid impacts to ESA-listed marine mammals, a shutdown zone will be implemented during all pile removal and pile driving activities. The following in-water shutdown zones are proposed to avoid all potential Level A and Level B harassment of ESA-listed marine mammals:
 - A 11,660 meter (7.25 miles) shutdown zone will be implemented during pile driving on days in which vibratory pile driving or removal will or has occurred (Figure 10).
 - A 1,000-meter shutdown zone (0.62 miles) shutdown zone will be implemented during pile driving on days in which impact pile driving is the sole installation method (Figure 10).
- Visual monitoring of the exclusion zone (Figure 10) shall commence at least 30 minutes prior to the beginning of pile driving and removal activities each day and after each break of more than 30 minutes. If ESA-listed marine mammals are observed within the proposed exclusion zones, all pile driving and removal activities shall cease. Project activities shall not commence or continue until the marine mammal has either been observed having left the exclusion zone, or at least 15 minutes have passed since the last sighting whereby it is assumed the marine mammal has voluntarily left the exclusion zone. Pile installation activities shall not occur if any part of the exclusion zones is obscured by weather or sea conditions.
- Monitoring for harbor seals, sea lions, and harbor porpoises shall be completed in accordance with Section 13 of this document. The monitoring areas shall encompass all areas in which in-water or in-air noise could exceed Level A or Level B thresholds.
- Visual monitoring of the monitoring zones (Figures 11 through 14) shall commence at least 30 minutes prior to the beginning of pile driving and removal activities each day and after



each break of more than 30 minutes. Level A take will be tallied anytime a harbor seal occurs within the Level A monitoring zones. Level B take will be tallied anytime a harbor seal, sea lion, or harbor porpoise occurs within the Level B monitoring zones. Take will be tallied against allowed take authorized by the IHA (Table 8). Pile installation activities shall not occur if any part of the monitoring zones is obscured by weather or sea conditions.

11.2. General Measures

- The proposed use of BST will not change. Minimal repairs, rehabilitation, and maintenance dredging are proposed to maintain function of the existing industrial wharf, berths, and affiliated terminal uplands.
- The proposed repairs will not increase the size of the existing BST facility. The wharf remains the same size. Replacement piles will not extend beyond the footprint of the existing wharf structure.
- Proposed work will not begin prior to obtaining all necessary local, state, and federal permits and/or approvals.
- The Puget Sound Nearshore Calculator has been completed and submitted to NOAA's National Marine Fisheries Service (NMFS) for review of potential impacts of the proposed maintenance and repair activities on nearshore habitat. The Port will comply with and implement any identified habitat conservation credits specified by NMFS.
- In-water work will only be completed during the approved in-water work window for the project site area anticipated to be August 1 through February 15 of a given year to avoid key migration periods for protected aquatic species.
- The Washington State Department of Ecology (Ecology) has been contacted about this project, which occurs in the Whatcom Waterway Model Toxics Control Act (MTCA) Site. Ecology will review any final BMPs in the project construction specifications prior to construction.
- The selected contractor(s) will be notified that the project occurs within the Whatcom Waterway MTCA Site and will be required to comply with all state water quality standards and use standard marine BMPs throughout construction.
- A crepuscular limited operating period during the marbled murrelet nesting season (April 1 through September 23), which prohibits work from two hours prior to sunset, to two hours after sunrise will be implemented during steel pile installation.
- Checking equipment for leaks and other problems that could result in the discharge of petroleum-based products or other materials at the site or into waters of Bellingham Bay.



- No petroleum products, hydraulic fluids, chemicals, or any other polluting substance shall be allowed to enter surface waters.
- All areas for equipment fuel storage will be located 150 ft. from open water.
- Fueling and servicing of equipment will be confined to an established staging area that is at least 150 ft. from surface waters.
- Proper BMPs such as silt fence and/or straw wattles will be used to provide a physical barrier to sediment and prevent runoff into surface waters.
- No stockpiling or staging of materials will occur waterward of the HTL/ OHWM unless on a barge, workboat, or solid wharf deck. Stockpiles will be covered with plastic to prevent contact with the elements and erosion.
- Leftover concrete product will not be allowed to drain onto the deck or into storm drains or allows to drain to waters of the state.
- Contractor(s) will be required to develop a Spill Prevention and Control Countermeasures (SPPC) plan to be implemented in the event of a spill during construction activities. The SPPC plan will describe how the contractor will store all fuels and hazardous substances that may be onsite during construction. Containment and cleanup efforts will begin immediately upon discovery of the spill and will be completed in an expeditious manner in accordance with all local, state, and federal regulations. Cleanup will include proper disposal of any spilled material and used cleanup material.
- The cause of any spill will be ascertained, and appropriate actions taken to prevent further incidents or environmental damage.
- Spills into surface waters will be reported to the Ecology Northwest Regional Spill Response Office (360-255-4400) pursuant to the Washington Administrative Code (WAC) 173-303-145 and WAC 173-182-260.
- Excess or waste materials will not be disposed of or abandoned waterward of the HTL/OHWM or be allowed to enter surface waters. Construction debris and waste materials, including removed concrete mat material and/or riprap) will be transported and disposed of in an appropriate manner consistent with applicable local, state, and federal regulations.
- Slurry, cuttings, or process water will not be allowed to drain to surface waters or existing stormwater conveyance systems.
- Stormwater BMPs will be in place to assure that any dust is not carried through existing wharf deck drains and to assure that stormwater does not contact wet or fresh concrete.



- Oil-absorbent materials will be present on site for use in the event of a spill or if any oil product is observed in the water.
- Work that could result in debris and substances entering waters of the State shall include a containment structure capable of collecting all debris and substances. Collected debris will be removed from the water and disposed of at an appropriate upland facility pursuant to applicable regulations local, state, and federal regulations.
- When possible, construction will be performed in the dry (i.e., the first two bents of pile to be installed waterward of the existing bulkhead wall will likely be able to accommodate pile driving in the dry, thus minimizing the potential for in-water noise impacts).
- Removed creosote-treated timber and piles will be handled, transported, and disposed of pursuant to applicable state and federal guidelines.
- Work barges or work boats will not be allowed to ground out in the mudline.
- Removal of creosote-treated piles will be conducted consistent with the BMPs established and required by Ecology, which build upon and include pile removal guidance from the Environmental Protection Agency (EPA) Region 10, Department of Natural Resources (DNR), and WDFW (Ecology 2021).
- A containment boom will surround the work area to contain and collect any floating debris and sheen while creosote-treated piles are being removed. Debris will be retrieved and disposed of at an appropriate upland landfill.
- Piles for removal will be dislodged with a vibratory hammer when possible and will not be intentionally broken by twisting or bending.
- Piles for removal will be removed in a single, slow, and continuous motion, when possible, to minimize sediment disturbance and turbidity in the water column. If a treated timber pile breaks above or below the mudline, it will be cut or pushed into the sediment (the existing rock slope may limit the ability to cut broken timber piles below the mudline).
- Removed creosote-treated piles and timber and associated sediments will be contained on a barge. If piles are placed directly on the barge and not in a container, the storage area will consist of a row of hay or straw bales, filter fabric, or similar material placed around the perimeter of the barge.
- All creosote-treated piles and timber and associated sediments will be disposed of by the contractor in a landfill approved to accept those types of materials.
- Dredging will be conducted in compliance with Surface Water Quality Standards for Washington (WAC 173-201A), or other conditions as specified in the anticipated Section 401 Water Quality Certification (WQC). Water quality monitoring will be conducted in



accordance with the Whatcom Waterway Final Engineering Design Report Phase 1: Appendix L - Water Quality Monitoring Plan (Anchor QEA 2015) and will include instrumented dissolved oxygen and turbidity monitoring. Water quality samples will be collected for chemical analysis as required under the monitoring plan.

- Appropriate BMPs will be employed to minimize sediment loss and turbidity generation during dredging. BMPs may include, but are not limited to, the following:
 - No stockpiling of dredged material below the HTL/OHWM,
 - Smooth closure of the clamshell bucket when at the bottom,
 - Slowing of the velocity (i.e., cycle time) of the ascending loaded clamshell bucket through the water column,
 - Pausing the dredge bucket near the bottom while descending and near the waterline while ascending, and/or
 - Placing filter material over the barge scuppers to clear return water.
- No spill of sediment from the barges will be allowed. The barge will be managed such that the dredged sediment load does not exceed the capacity of the barge. The load will be placed in the barge to maintain an even keel and avoid listing.



12. Mitigation Measures to Protect Subsistence Uses

The Project will have no impact on subsistence. Therefore, mitigation measures to protect subsistence uses are not proposed.



13. Monitoring and Reporting

13.1. Proposed Monitoring and Shutdown Zones

13.1.1. ESA-listed Marine Mammals

An exclusion zone for all ESA-listed marine mammals would be established to avoid potential noise impacts to these species. This exclusion zone would include all areas in which Level A or Level B thresholds could be exceeded (Table 9, Figure 10). The proposed exclusion zones would prevent all possible Level A or Level B harassment to ESA-listed marine mammals including Southern Resident killer whales, humpback whales, gray whales, and minke whales.

Table 9. Proposed Exclusion Zone for ESA-listed Marine Mammals

Project Activity	Proposed Exclusion Zone
Pile driving on days in which impact pile driving is the sole installation method	<i>1,000 meters</i>
Pile driving on days in which vibratory pile driving or removal will or has occurred	<i>11,660 meters</i>



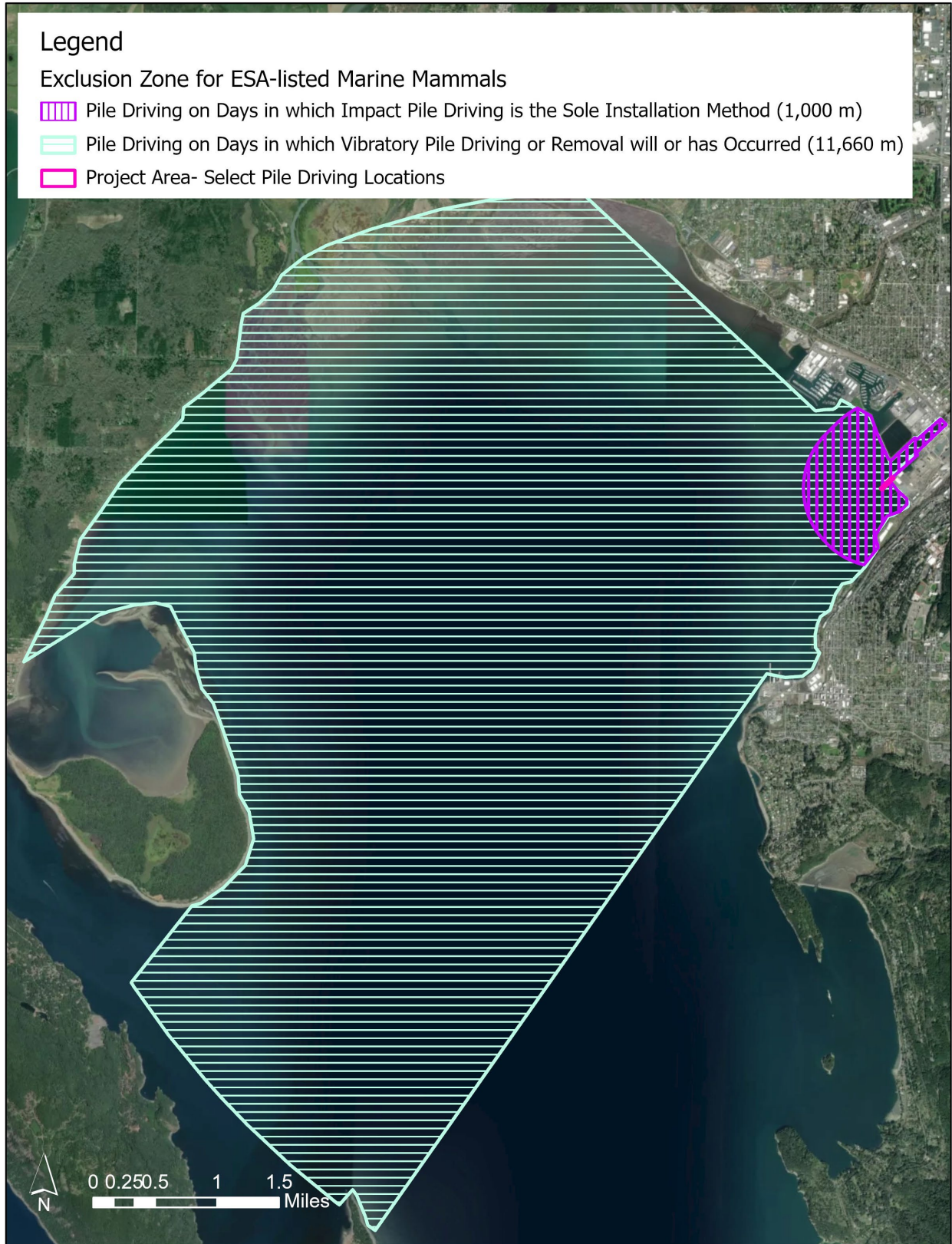


Figure 10. Exclusion Zone for ESA-listed Marine Mammals

13.1.2. Harbor Seal, Sea Lion and Harbor Porpoise

The proposed Level A and Level B monitoring zones for harbor seals, sea lions, and harbor porpoises are based on the calculated zones of influence summarized in Section 6.1. The proposed exclusion zones have been developed to avoid all possible Level A take for sea lions and harbor porpoises and to minimize Level A take for harbor seals. The proposed monitoring zones are identified in Table 10 and shown in Figures 10 through 15.

Table 10. Proposed Monitoring Zones

Project Activity	Species	Level B Monitoring Zone	Level A Monitoring and Exclusion Zone
Impact Pile Driving	Harbor seal	1,000 meters in-water (Figure 12) ¹	194 meters in-water monitoring zone 55-meter exclusion zone (Figure 11)
	Sea lion	1,000 meters in-water (Figure 12) ¹	20-meter exclusion zone (Figure 11)
	Harbor porpoise	1,000 meters in-water (Figure 12) ¹	430 meters exclusion zone (Figure 11)
Vibratory Pile Driving and Removal	Harbor seal	11,660 meters in-water (Figure 14) ¹	40-meter exclusion zone (Figure 13)
	Sea lion	11,660 meters in-water (Figure 14) ¹	20-meter exclusion zone (Figure 13)
	Harbor porpoise	11,660 meters in-water (Figure 14) ¹	50-meter exclusion zone (Figure 13)

¹ The Level B monitoring zone for vibratory driving and removal will also apply during impact pile driving if vibratory pile driving or removal has occurred or will occur that day.



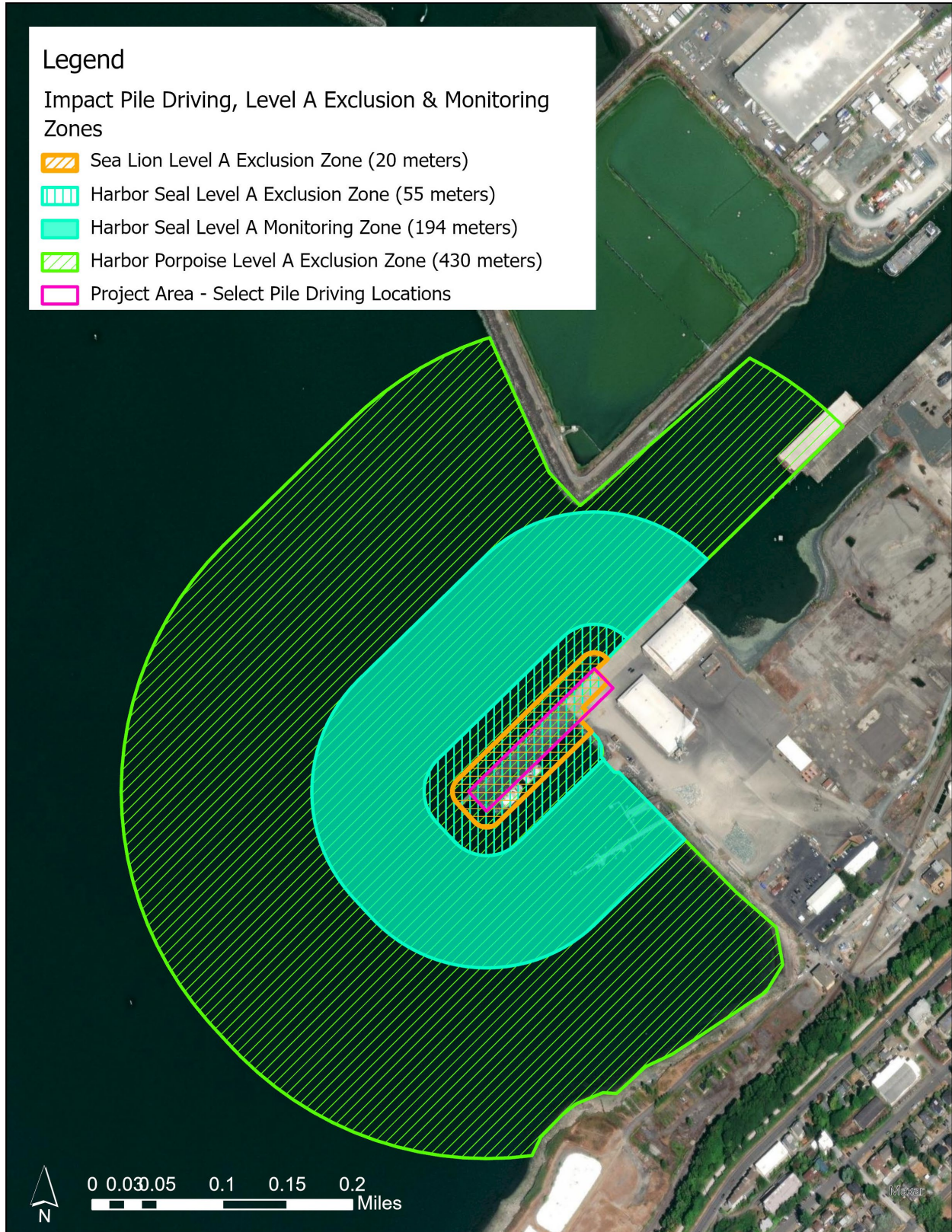


Figure 11. Impact Pile Driving, Level A Exclusion and Monitoring Zones





Figure 12. Impact Pile Driving, Level B Monitoring Zone



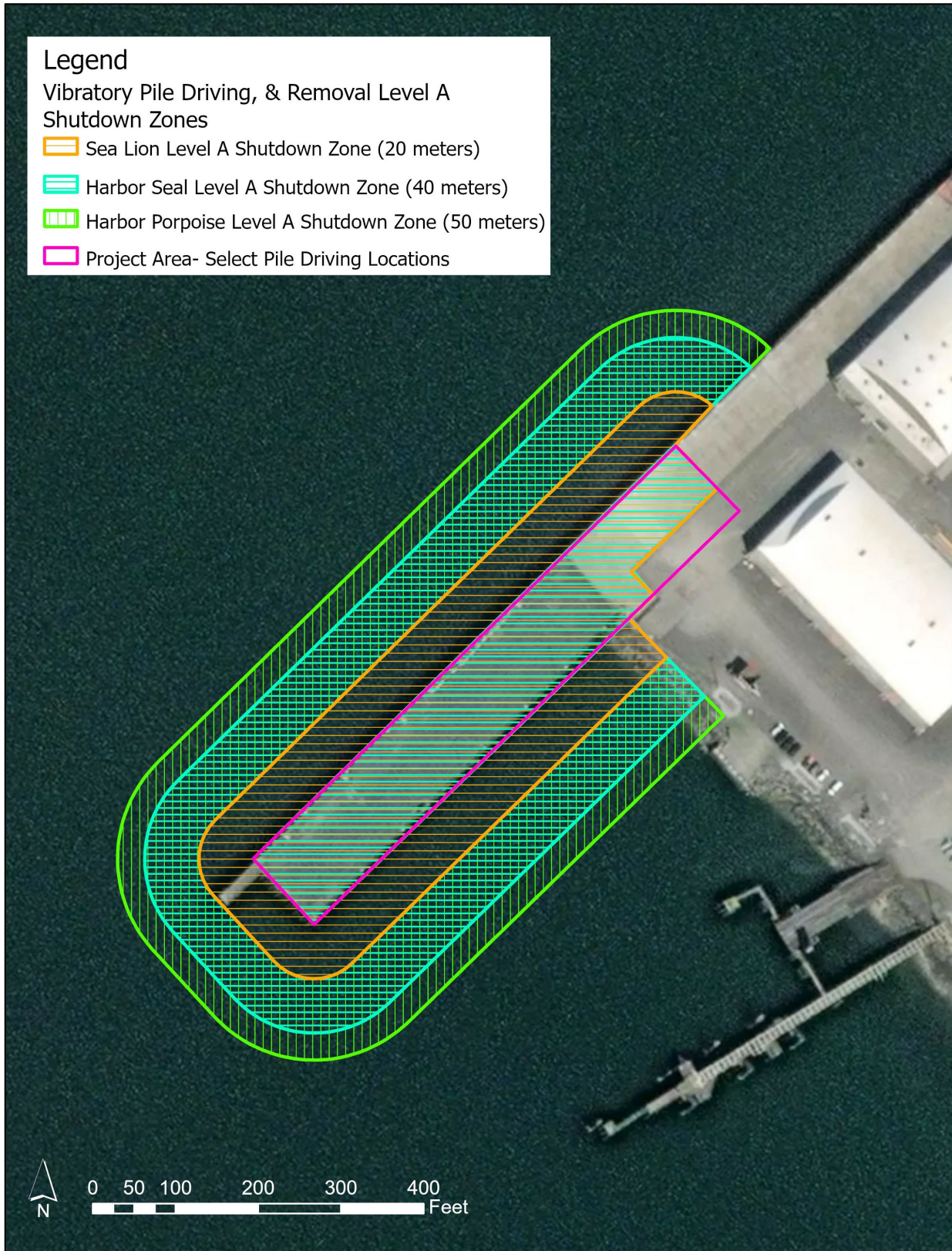


Figure 13. Vibratory Pile Driving and Removal, Level A Exclusion Zones



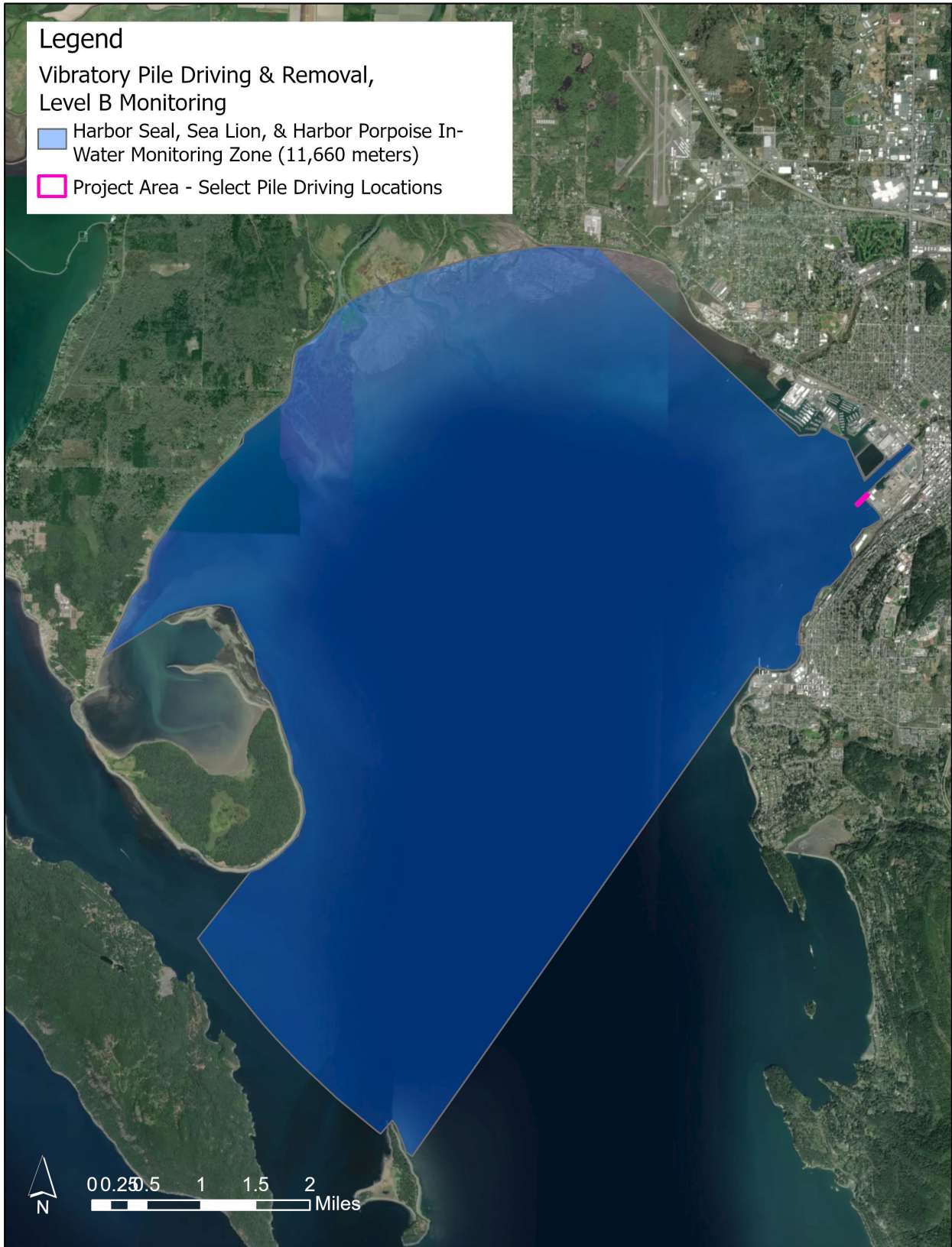


Figure 14. Vibratory Pile Driving and Removal, Level B Monitoring Zones



13.2. Construction Monitoring

One or more protected species observers (PSOs), able to accurately identify and distinguish species of marine mammals, will be present before and during all in-water pile driving and removal activities. Prior to in-water pile driving and removal activities, the proposed exclusion zones for ESA-listed marine mammals will be established (Figure 10). In addition, monitoring zones and exclusion zones for harbor seals, sea lions, and harbor porpoises will also be established (Figures 11 through 14). Monitoring of the applicable exclusion zones and monitoring zones shall commence at least 30 minutes prior to the beginning of pile driving and removal activities each day and after each break of more than 30 minutes.

If an ESA-listed marine mammal is seen entering the exclusion zone, pile installation and removal activities shall cease until the species has left the area of potential sound effects on its own. Take for ESA-listed marine mammals is not proposed. Level A take will be tallied anytime a harbor seal or sea lion occurs within the Level A monitoring zones. Level B take will be tallied anytime a harbor seal, sea lion, or harbor porpoise occurs within the Level B monitoring zones. Take will be tallied against allowed take authorized by the IHA (Table 8). Pile installation and removal activities shall not occur if any part of the monitoring zones is obscured by weather or sea conditions.

One to two marine mammal monitor(s) will observe construction activities from either the BST wharf, or a small boat and will keep a daily log that outlines marine mammal observations, location of the animal, behavior of the animal, and when the observation event was resolved. A Marine Mammal Monitoring Report will be developed to include the following criteria:

- Dates and times (begin and end) of all marine mammal monitoring.
- Construction activities occurring during each daily observation period, including how many and what type of piles were driven or removed and by what method (i.e., impact).
- Weather parameters and water conditions during each monitoring period (e.g., wind speed, percent cover, visibility, sea state).
- The number of marine mammals observed, by species, relative to the pile location and if pile driving or removal was occurring at time of sighting.
- Age and sex class, if possible, of all marine mammals observed.
- Marine mammal monitor location during marine mammal monitoring.
- Distances and bearings of each marine mammal observed to the pile being driven for each sighting.
- Description of any marine mammal behavior patterns during observation, including direction of travel and estimated time spent within the Level A and Level B harassment zones while the source was active.
- Number of individuals of each species (differentiated by month or as appropriate) detected within the monitoring zone, and estimates of number of marine mammals taken, by species.



- Detailed information about any implementation of any mitigation triggered (e.g., shutdowns and delays), a description of specific actions that ensued, and resulting behavior of the animal, if any.
- All marine mammal monitor datasheets and/or raw sighting data (in a separate file from the Final Report)

13.3. PSO Requirements

Prior to project commencement, the Port, or a contractor on behalf of the Port, will hire one to two qualified PSO(s) to complete monitoring during construction. The employed PSO(s) will determine the most appropriate observation location(s) for monitoring during pile installation. Locations could include the BST wharf, or a small boat. If necessary, observations may occur from two locations simultaneously.

The minimum qualifications for PSOs will include:

1. Visual acuity in both eyes (correction is permissible) sufficient to discern moving targets at the water's surface with ability to estimate target size and distance. Use of binoculars or spotting scope may be necessary to correctly identify the target.
2. Advanced education in biological science, wildlife management, mammalogy or related fields (Bachelor's degree or higher is preferred).
3. Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience).
4. Experience or training in the field identification of marine mammals (cetaceans and pinnipeds).
5. Sufficient training, orientation or experience with vessel operation and pile driving operations to provide for personal safety during observations.
6. Writing skills sufficient to prepare a report of observations. Reports should include such information as the number, type, and location of marine mammals observed; the behavior of marine mammals in the area of potential sound effects during construction; dates and times when observations and in-water construction activities were conducted; dates and times when in-water construction activities were suspended because of marine mammals, etc.
7. 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 needed.

In addition, the following conditions will be met:

1. The PSO(s) will be positioned such that the entire exclusion and monitoring zones are visible to them. If weather or sea conditions restrict the observer's ability to observe for species or become unsafe for the monitoring vessel(s) to operate, cease pile installation until conditions allow for monitoring to resume.



2. The PSO(s) will have the following to aid in determining the location of observed listed species, to take action if listed species enter the exclusion or monitoring zone, and to record these events:
 - a. Binoculars
 - b. Range finder
 - c. GPS
 - d. Compass
 - e. Two-way radio communication with construction foreman/superintendent
 - f. A logbook of all activities which will be made available to the U.S. Army Corps of Engineers (USACE) and NMFS upon request.
3. The PSO(s) will have no other primary duty than to watch for and report on events related to marine mammals.
4. The PSO(s) will be in direct communication with on-site project lead and will have shutdown authority.
5. The PSO(s) will scan the exclusion and monitoring zones the waters for 30 minutes before and continuously during all pile driving. If marine mammals enter or are observed near the identified exclusion zones during or 20 minutes before pile driving, the observer(s) will immediately notify the on-site supervisor or inspector and require that pile driving either not be initiated or temporarily cease until the animals have moved outside of the area of potential sound effects on its own.
6. A final technical report will be submitted to NMFS within 90 days after the final pile has been driven for the project. The report will summarize findings, and results of marine mammal monitoring conducted during pile driving activities.
7. If a listed marine mammal is taken (i.e., a listed marine mammal(s) is observed entering the exclusion zone before pile-driving operations can be shut down), re-initiation of consultation is required, and the take must be reported to NMFS within one business day.



14. Suggested Means of Coordination

All marine mammal data gathered during construction will be made available to NMFS, researchers, and other interested parties. The project will coordinate activities as needed with relevant federal agencies.



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