Authorization

NMFS has issued an IHA to ADOT&PF for conducting pile installation and removal activities at the Auke Bay ferry terminal between January 1, 2020 and December 31, 2020, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated.

Dated: October 17, 2019.

Donna S. Wieting,

Director, Office of Protected Resources, National Marine Fisheries Service.

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XR048

Take of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the North Jetty Maintenance and Repairs Project, Coos Bay, Oregon

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; two proposed incidental harassment authorizations; request for comments on proposed authorizations and possible renewals.

SUMMARY: NMFS has received a request from the U.S. Army Corps of Engineers (USACE) for two authorizations to take marine mammals incidental to the pile driving and removal activities over two years associated with the Coos Bay North Jetty maintenance and repairs project. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue two incidental harassment authorizations (IHA) to incidentally take marine mammals during the specified activities. NMFS is also requesting comments on a possible one-year renewals that could be issued under certain circumstances and if all requirements are met, as described in *Request for Public Comments* at the end of this notice. NMFS will consider public comments prior to making any final decision on the issuance of the requested MMPA authorizations and agency responses will be summarized in the final notice of our decision.

DATES: Comments and information must be received no later than November 22, 2019.

ADDRESSES: Comments should be addressed to Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service. Physical comments should be sent to 1315 East-West Highway, Silver Spring, MD 20910 and electronic comments should be sent to *ITP.Egger@noaa.gov.*

Instructions: NMFS is not responsible for comments sent by any other method, to any other address or individual, or received after the end of the comment period. Comments received electronically, including all attachments, must not exceed a 25-megabyte file size. Attachments to electronic comments will be accepted in Microsoft Word or Excel or Adobe PDF file formats only. All comments received are a part of the public record and will generally be posted online at *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection*-act without change. All personal identifying information (*e.g.,* name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Stephanie Egger, Office of Protected Resources, NMFS, (301) 427–8401. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act.* In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

The MMPA prohibits the ''take'' of marine mammals, with certain exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed incidental take authorization may be provided to the public for review. Under the MMPA, ''take'' is defined as meaning to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other ''means of effecting the least practicable adverse impact'' on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stocks for taking for certain subsistence uses (referred to in shorthand as ''mitigation''); and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth. The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below.

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order (NAO) 216–6A, NMFS must review our proposed action (*i.e.,* the issuance of an incidental harassment authorization) with respect to potential impacts on the human environment.

These actions are consistent with categories of activities identified in Categorical Exclusion B4 (incidental harassment authorizations with no anticipated serious injury or mortality) of the Companion Manual for NOAA Administrative Order 216–6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has preliminarily determined that the issuance of these proposed IHAs qualifies to be categorically excluded from further NEPA review.

We will review all comments submitted in response to this notice prior to concluding our NEPA process or making a final decision on the IHA requests.

Summary of Request

On March 18, 2019, NMFS received a request from USACE for two IHAs to take marine mammals incidental to vibratory pile driving and removal associated with the North Jetty maintenance and repairs project, Coos Bay, Oregon over the course of two years with pile installation occurring during Year 1 and pile removal occurring during Year 2. The application was deemed adequate and complete on September 10, 2019. The USACE's request is for take of a small number of seven species of marine mammals by Level B harassment only. Neither USACE nor NMFS expects injury, serious injury or mortality to result from this activity and, therefore, IHAs are appropriate. The IHAs, if issued, will be effective from September 1, 2020 through August 31, 2021 for pile driving installation (Year 1) and from July 1, 2022 through June 30, 2023 for pile removal (Year 2). The USACE, in coordination with the Oregon Department of Fish and Wildlife (ODFW) and NMFS' Northwest Region, proposes to conduct pile driving and removal October 1st through February 15th and June 1st and July 31st to minimize effects to listed salmonids. Adherence to the in-water work window is part of USACE's Endangered Species Act (ESA) consultation under Standard Local Operating Procedures for Endangered Species (SLOPES) to administer actions authorized or carried out by the USACE in Oregon (SLOPES IV In-water Over-water Structures). The ODFW will make the final determination of the in-water work window.

Description of Proposed Activity

Overview

The USACE is proposing to repair critically damaged sections of the North Jetty, monitor erosion, and to maintain stable deep-draft navigation through the entrance into Coos Bay. Repair activities completed now will reduce the risk of jetty failure or a potential breach of the Coos Bay North Spit (CBNS). The USACE maintains this jetty system and navigational channels, and is currently proposing major repair and rehabilitation of the North Jetty. As part of its mission to build and maintain navigation facilities, the USACE also continues to maintain ownership of CBNS land to support jetty monitoring, ensure evaluation access, and to provide construction staging and stockpile areas in the event jetty maintenance or navigation repairs are needed. Work associated with the project may occur year-round beginning in September 2020. The USACE proposes to use vibratory pile driving/removal for the Material Off-loading Facility (MOF) portion of the project using 30-inch (in) steel piles and 24-in AZ sheet piles OR 12-in H piles. The use of AZ-sheets versus H-piles will be per the contractor's discretion, largely based on site conditions, material availability, and cost.

Dates and Duration

The USACE currently anticipates that construction for North Jetty maintenance and repair project will occur over two years. The IHA application is requesting take that may occur from the pile driving activities in the first year (September 1, 2020 through August 31, 2021) and from pile removal activities in the second year of pile driving activities (July 1, 2022 through June 30, 2023). The USACE proposes to complete pile driving activities between October 1st through February 15th and June 1st through July 31st each year to protect salmonids.

The USACE estimates vibratory pile driving may occur over a 1–4 month time period each year but likely would take one month for installation (Year 1) and one month for removal (Year 2). There would be an estimate of 7 days of noise expose during pile driving for each type of pile (*i.e.,* and 30-in steel piles and 24-in AZ sheet piles OR 12-in H piles) for a total of 14 days of pile driving activity each year. Pile driving may occur up to 6 hours per day depending on the pile type.

Specific Geographic Region

Coos Bay is an approximately 55.28 km² estuary located in Coos County on the Oregon coast, approximately 200 miles south of the Columbia River. The bay provides a harbor- and water-dependent economy for the local and state community and, as the second largest estuary in Oregon (14,000 acres), the largest located entirely within state borders (Hickey and Banas 2003, Arneson 1975), and is an important biological resource. It is considered the best natural harbor between San Francisco Bay, California and the Puget Sound, Washington. The average depth of the Coos estuary is 4 m (13 ft). The Coos estuary exhibits the typical features of a drowned river valley estuary type. It features a V-shaped cross section, a relatively shallow and gently sloping estuary bottom, and a fairly uniform increase in depth from the upper, river-dominated part of the estuary toward the mouth. Large expanses of intertidal sand and mud flats complement channels, eelgrass beds, vegetated marshes, and swamps to provide a diversity of estuarine habitats.

The entrance to the Coos Bay estuary and navigation channel lies between Coos Head and the Coos Bay North Spit (CBNS) (see Figure 1–1 of the application). The Coos Bay north and south jetties stabilize a 1-mile long, 47-foot deep channel. Channel depth decreases to approximately 37 feet at RM 1 and extends 15 miles upstream where it runs adjacent to the cities of Charleston, North Bend, and Coos Bay.

The CBNS is a large isolated peninsula about 15 miles from downtown Coos Bay; supporting unique coastal habitats. The USACE parcel (see Figure 1–2 of the application) runs north from the boundary of the North Jetty, to the southern boundary of land owned by the U.S. Bureau of Land Management (BLM). It is bound by the Pacific Ocean to the west, which includes South Beach (the beach between the North Jetty and the FAA towers as shown), and by the Log-Spiral Bay (LSB) and Coos Bay to the east. The extent of the North Jetty repairs and staging areas of the overall project area are shown below in Figure 1.

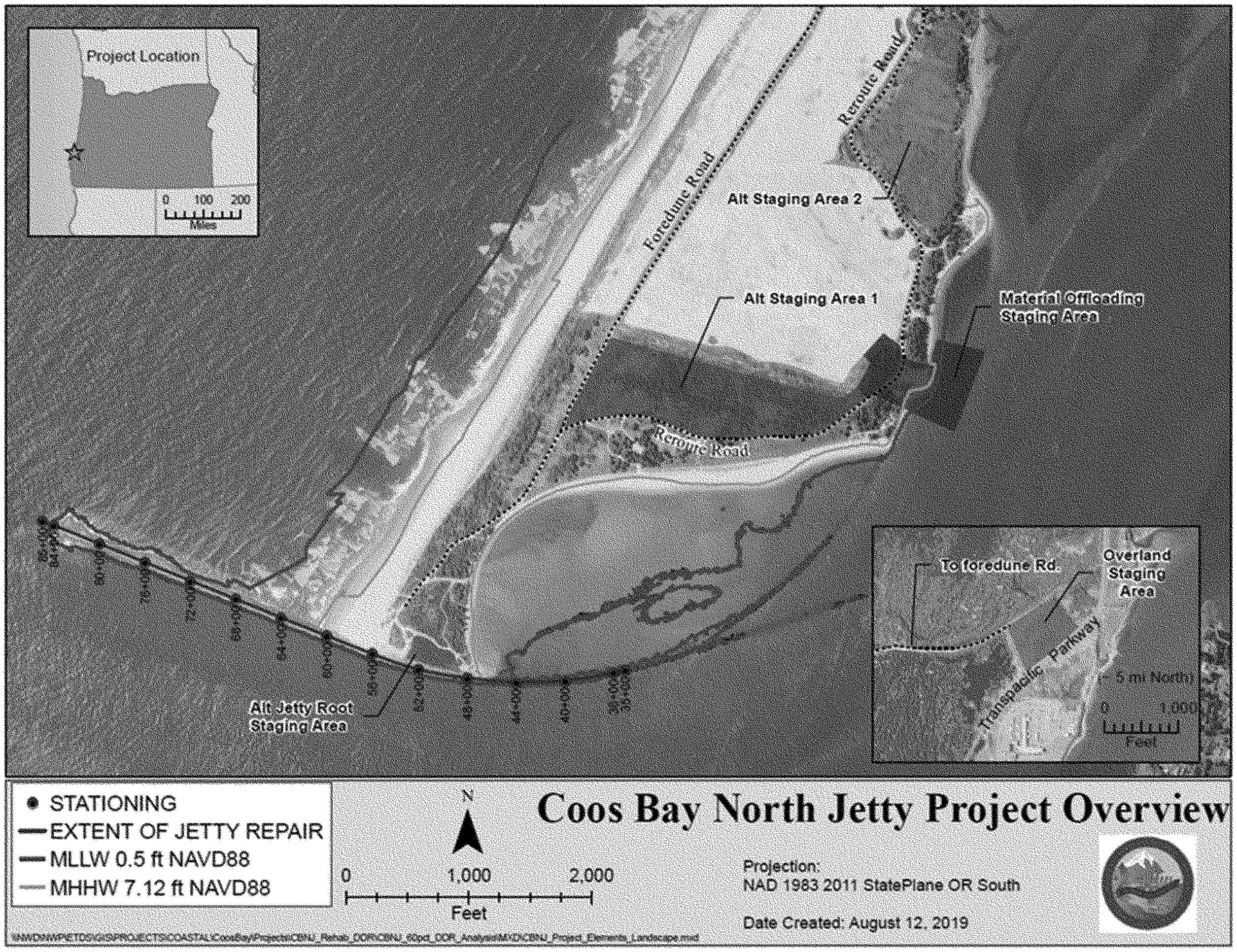

Figure 1. Project Area and Components

Detailed Description of Specific Activity

The purpose of the proposed action is to repair critically damaged sections of the North Jetty in order to maintain stable deep-draft navigation through the entrance into Coos Bay and to prevent breaching of the CBNS. Completing the proposed repair activities now will reduce the risk of future jetty failure. Progressive damages to the North Jetty system over the last 20 years have resulted in an emergency repair action in 2002 and an interim repair in 2008. The proposed major maintenance of the Coos Bay North Jetty is critical to keeping the river and harbor open to deep-draft navigation and to sustaining important navigation-related components of local and state economies.

The proposed activities would include repair activities for three main jetty components: The jetty head, root, and trunk. Repair activities also require re-establishment and repair of the following three temporary construction features including the MOF, upland staging areas and road turn-outs to facilitate equipment and material delivery. Removal and site restoration for each of the temporary construction features is proposed.

The majority of proposed jetty repairs will be completed within the existing authorized footprint of the jetty structure, returning specified sections to pre-erosional conditions. However, the length of the final repaired jetty (8,425 feet (ft)) will be shorter than its originally authorized footprint length of 9,600 ft. The jetty head stabilizes the oceanward end of the jetty structure and is exposed to the most severe loading. The jetty trunk connects the jetty head to the jetty root and transitions from a jetty reach exposed to both ocean-side and channel-side loading, to the root, which is primarily loaded from the channel-side. Proposed repair elements may include some minor areas that occur outside of the existing jetty footprint, but are necessary to maintain jetty function.

- Repair of the jetty root entails rebuilding up to 1,600 ft of the jetty root. Toe protection around the tip of the reconstructed section would be completed to compensate for accelerated ebb-tidal flows caused by the reconstructed root. This protection could extend beyond the area of the existing relic jetty root.
- Construction of a rubble-mound jetty head (located shoreward of the originally authorized North Jetty head). While it is expected that the vast majority of the head construction will remain on the relic stone base, there may be some small increase in footprint to ensure a stable jetty head design.

The USACE proposes to rebuild sections of the jetty root where the structure has deteriorated at or below the water line. The jetty head and trunk require extensive repairs, but not to the same extent as the jetty root, which has not been repaired since the original construction. Optional repairs to the jetty root could provide additional stability to LSB and prevent further erosion. The optional repairs to the jetty trunk could place larger stone atop sections that were previously addressed with slightly smaller stone during an interim repair. Each of these optional repairs would be contingent on funding availability.

Construction Staging Areas

Jetty repairs and associated construction elements require additional areas for activities involving equipment and supply staging and storage, parking areas, access roads, scales, general yard requirements, and jetty stone stock pile areas. Staging areas are required to store materials, equipment and tools, field offices, turn and maneuver trucks, and to provide parking for contractors.

There are three proposed staging areas for the Proposed Action: The Overland Delivery Staging Area (ODSA, up to about 10 acres), the North Jetty Staging Area (NJSA, up to 20 combined acres from three alternate staging areas), and the MOF Staging Area (up to 2.5 acres) (see Figure 1–3 of the application). The MOF Staging Area is where all pile driving and removal activities will occur. The ODSA was used previously for the 2008 North Jetty Interim Repair Project. The MOF Staging Area, also previously used and located upland of the MOF itself, would be necessary to accommodate stockpile and transfer of jetty stone from barges to transport vehicles prior to delivery to the NJSA. The NJSA will be a combination of areas; either approximately 20 acres near the jetty root, on top of the LSB sand placement area, or a jetty root staging area (1.5 acres) and up to an additional 18.5 acres to be chosen by the Contractor from the available Alternate Staging Area locations shown on the plans.

Staging area equipment would include a crane or excavator for transferring large stones from the highway-transport vehicles to heavy-duty off-road vehicles, or from a barge to heavy-duty off-road vehicles, an excavator, front-end loaders, and bulldozers. All of the stockpile areas would accommodate storage of a range of different sized jetty stone and other rock and gravel construction materials throughout the year. Construction of each upland staging area would require vegetation clearing and site grading, which would be followed by restoration at the completion of construction.

North Jetty Major Maintenance and Repairs

Most of the proposed jetty stone placement work would use land-based equipment for construction of the repair and modifications to the North Jetty. The majority of the work is expected to be conducted from on top of the jetty using an excavator or a crane. Where appropriate, there may also be rework and reuse of the existing relic and jetty prism stone. Most of the proposed stone placement would occur on existing relic stone that formed the original jetty. The prism footprint could increase in width compared to the existing prism by about 10 ft along the length of the proposed repair sections. During new stone placement, there is a chance of stone slippage down the slope of the jetty. This is only a remote possibility given the size of the rocks. Additionally, dropping armor stone from a height greater than 2 ft would be prohibited, further minimizing the risk of stone slippage. The length of the repaired jetty would remain shorter than its originally authorized footprint length.

The full width of the repaired jetty crest would double as a ‘‘jetty crest haul road’’ that allows construction equipment to access and reach the entire jetty construction areas (*i.e.,* crest, slope, and toe). As described in Table 1–2 of the application, up to three turnouts would also be required every 300 to 500 ft along the length of the jetty and parallel to the jetty crest haul road for safety purposes (allows for vehicle and equipment passing and turns while on the jetty). The footprint of repairs would not extend substantially beyond the extent of relic jetty stone (possibly up to 10 ft on either side).

Material Offloading Facility (MOF)

The MOF will be constructed from the land waterward using land-based equipment. The MOF will provide vehicle access to/from the shore. The MOF could either be a simplified design of singular pipe piles for mooring a barge with spuds as a dock face, or a more complicated MOF design with piles supporting mooring dolphins with H or Z-piles to help retain material. In either case, pilings will be installed by barge using vibratory pile driving methods. Figure 1–4 of the application provides a basic overview of potential MOF elements, though the final configuration of pilings and specifications within the broader scope will be determined by the contractor. Fill material to construct the MOF could be obtained from maintenance dredging activities that occur annually in the Federal Navigation Channel, from dredging at the MOF site, or from other suitable sources, similar to those that provide the armor stone and gravel materials for the Project. Any imported material will be obtained from a clean and permitted source, suitable for in-water placement. Initial dredging of up to about 24,000 cubic yards may be required at the MOF to reach draft depth for the delivery barges. This activity will most likely be completed by mechanical dredge (*e.g.,* clamshell). Dredged material from the MOF site will be tested for contaminants, prior to dredging, following standard USACE and U.S. Environmental Protection Agency procedures. If clean, material will be side-cast or used to supplement MOF construction. If not suitable for ocean placement, dredged material will be transported to a suitable and certified upland facility. Maintenance dredging at the MOF will occur throughout construction to maintain depths needed for delivery vessels.

Additional details on the project construction elements can be found in Section 1 of the project application. The USACE has not requested, and NMFS does not propose to issue, take from any activities other than from vibratory pile driving and removal for the MOF.

The type and amount of piles associated with the project are provided in Table 1.

TABLE 1—PILE DRIVING (YEAR 1) AND REMOVAL (YEAR 2) ASSOCIATED WITH THE MOF OF THE NORTH JETTY REPAIRS AND MAINTENANCE PROJECT. THE SAME NUMBER OF PILES DRIVEN IN YEAR 1 WILL BE REMOVED IN YEAR 2

Pile type	Size	Total number of piles to be driven (year 1)	Total number of piles to be removed (year 2)	Maximum number of piles driven per day (year 1)	Maximum number of piles removed per day (year 2)	Driving type
Steel Pipe Pile	30-inch	24	24	6	6	Vibratory.
Steel H Pile	12-in	40	40	25	25	Vibratory.
Steel AZ Sheet	24-in	100	100	25	25	Vibratory.

Proposed mitigation, monitoring, and reporting measures are described in detail later in this document (please see *Proposed Mitigation* and *Proposed Monitoring and Reporting* section).

Description of Marine Mammals in the Area of Specified Activities

Systematic marine mammal surveys in Coos Bay are limited; therefore, the USACE relied on two multi-day AECOM surveys of Coos Bay, Oregon Department of Fish and Wildlife (ODFW), and anecdotal reports to better understand marine mammal presence in Coos Bay and in support of the IHA application. Seven marine mammal species comprising seven stocks have the potential to occur within Coos Bay during the project.

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history, of the potentially affected species. Additional information regarding population trends and threats may be found in NMFS's Stock Assessment Reports (SARs; *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*) and more general information about these species (*e.g.,* physical and behavioral descriptions) may be found on NMFS's website (*https://www.fisheries.noaa.gov/find-species*).

Table 2 lists all species with expected potential for occurrence around Coos Bay and summarizes information related to the population or stock, including regulatory status under the MMPA and ESA and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2016). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS's SARs). While no mortality is anticipated or authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS's stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS's U.S. Pacific and Alaska 2018 SARs (*e.g.,* Carretta *et al.,* 2018; Muto *et al.,* 2018). All values presented in Table 2 are the most recent available at the time of publication and are available in the 2018 SARs *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports*).

TABLE 2—MARINE MAMMALS OCCURRENCE IN THE PROJECT AREA

Common name	Scientific name	Stock	ESA/MMPA status; strategic (Y/N) [1]	Stock abundance (CV, N_{min}, most recent abundance survey) [2]	PBR	Annual M/SI [3]
Order Cetartiodactyla—Cetacea—Superfamily Mysticeti (baleen whales)						
Family Balaenopteridae (rorquals):						
Blue whale	*Balaenoptera m. musculus*	Eastern North Pacific Stock	E,D;Y	1,647 (0.07; 1,551; 2011)	2.3	≥19
Humpback whale	*Megaptera novaeangliae*	California/Oregon/Washington Stock.	E,D;Y	2,900 (0.05; 2,784; 2014)	16.7	≥40.2
Family Eschrichtiidae:						
Gray whale	*Eschrichtius robustus*	Eastern North Pacific	N, N	26,960 (0.05, 25,849, 2016)	801	139
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae:						
Killer Whale	*Orcinus orca*	West Coast Transient	N, N	243 (-, 243, 2006) [4]	2.4	0
Family Phocoenidae (porpoises):						
Harbor porpoise	*Phocoena phocoena*	Northern CA/Southern OR	N, N	35,769 (0.52, 23,749, 2011)	475	≥0.6
Order Carnivora—Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions):						
Northern elephant sea	*Mirounga angustirostris*	California breeding	N, N	179,000 (n/a, 81,368, 2010)	4,882	8.8
Steller sea lion	*Eumetopias jubatus*	Eastern U.S.	N, N	41,638 (-, 41,638, 2015)	2,498	108
California sea lion	*Zalophus californianus*	U.S.	N, N	257,606 (n/a, 233,515, 2014)	14,011	>320
Family Phocidae (earless seals):						
Harbor seal	*Phoca vitulina*	Oregon/Washington Coast	N, N	24,732 (0.12, -, 1999) [5]	unk	unk

[1] Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

[2] NMFS marine mammal stock assessment reports online at: *www.nmfs.noaa.gov/pr/sars/.* CV is coefficient of variation; Nmin is the minimum estimate of stock abundance.

[3] These values, found in NMFS' SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (*e.g.,* commercial fisheries, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.

[4] The minimum population estimate (NMIN) for the West Coast Transient stock of killer whales is derived from mark-recapture analysis for West Coast transient population whales from the inside waters of Alaska and British Columbia of 243 whales (95 percent probability interval = 180–339) in 2006 (DFO 2009), which includes animals found in Canadian waters.

[5] Because the most recent abundance estimate is >8 years old (1999), there is no current estimate of abundance available for this stock. However, for purposes of this analysis, we apply the previous abundance estimate, corrected for animals missed in the water as described in Carretta *et al.* (2014) of 24,732.

All species that could potentially occur in the proposed survey areas are included in Table 2. Humpback whales (*Megaptera novaeangliae*) and blue whales (*Balaenoptera musculus musculus*) are not uncommon along the Oregon coast, however, they are unlikely to enter Coos Bay and be affected by construction noise. Given these considerations, the temporary duration of potential pile driving, and noise isopleths that would not extend beyond the river mouth, there is no reasonable expectation for proposed activities to affect these species and they are not discussed further.

As described below, the remaining seven species comprising seven stocks temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur, and we have proposed authorizing it.

Gray Whales

Gray whales are only commonly found in the North Pacific. Genetic comparisons indicate there are distinct ''Eastern North Pacific'' (ENP) and ''Western North Pacific'' (WNP) population stocks, with differentiation in both mtDNA haplotype and microsatellite allele frequencies (LeDuc *et al.* 2002; Lang *et al.* 2011a; Weller *et al.* 2013). Tagging, photo-identification and genetic studies show that some whales identified in the WNP off Russia have been observed in the ENP, including coastal waters of Canada, the U.S. and Mexico (Lang 2010; Mate *et al.* 2011; Weller *et al.* 2012; Urbán *et al.* 2013, Mate *et al.* 2015). However, WNP gray whales are not expected to enter Coos Bay and therefore will not be discussed further.

From 2009 to 2013, researchers attached satellite tags to 35 gray whales off the coasts of Oregon and northern California from September to December 2009, 2012, and 2013 (Lagerquist *et al.,* 2019). These whales are members of the Pacific Coast Feeding Group (PCFG), a subset of gray whales in the ENP that feed off the PNW, during summer and fall. Tracking periods for the satellite-tagged whales in this study ranged from 3 days to 383 days. Feeding-area home ranges for the resulting 23 whales covered most of the near-shore waters from northern California to Icy Bay, Alaska, and ranged in size from 81 km^2 to 13,634 km^2. Core areas varied widely in size (11–3,976 km^2) and location between individuals, with the highest-use areas off Point St. George in northern California, the central coast of Oregon, and the southern coast of Washington. Tag data indicates whales primarily occupied waters predominantly over continental shelf waters less than 10 km from shore and in depths less than 50 m. Gray whales are not known to enter Coos Bay; however, they do enter larger bays such as San Francisco Bay during their northward and southward migration and therefore are included in this analysis.

Since January 1, 2019, elevated gray whale strandings have occurred along the west coast of North America from Mexico through Alaska. This event has been declared an Unusual Mortality Event (UME). A UME is defined under the MMPA as a stranding that is unexpected; involves a significant die-off of any marine mammal population; and demands immediate response. As of September 5, 2019, 117 gray whales have stranded in the U.S. between Alaska and California with an additional 10 strandings in Canada and 81 in Mexico. Of the U.S. strandings, six of the animals have been found in Oregon. Full or partial necropsy examinations were conducted on a subset of the whales. Preliminary findings in several of the whales have shown evidence of emaciation. These findings are not consistent across all of the whales examined, so more research is needed. Threats to gray whales include ship strike, fishery gear entanglement, and climate change-related impacts such as reduction in prey availability, and increased human activity in the Arctic (Carretta *et. al.,* 2019).

Killer Whales

Killer whales are found throughout the North Pacific. Along the west coast of North American, 'resident,' transient,' and 'offshore' ecotypes have overlapping distributions and multiple stocks are recognized within that broader classification scheme. The West Coast Transient (WCT) Stock includes animals that range from California to southern Alaska, and is genetically distinct from other transient populations in the region (*i.e.,* Gulf of Alaska, Aleutian Islands, and Bering Sea transients and AT1 transients). While not regularly seen in Coos Bay, anecdotal accounts by ODFW biologists suggest bachelor pods of transient killer whales may be observed in Coos Bay semi-annually. In May 2017, a pair of killer whales feeding on what was concluded to be a seal were opportunistically observed in Coos Bay (AECOM 2017). The whales moved through the estuary northwards past Jordan Cove to the Highway 101 Bridge. However, the whales are not known to linger in the area and no biologically important habitat for this stock exists in Coos Bay.

Harbor Porpoise

In the Pacific Ocean, harbor porpoise are found in coastal and inland waters from Point Conception, California to Alaska and across to Kamchatka and Japan (Gaskin 1984). There are several stocks of harbor porpoise along the west coast of the U.S. and in inland waterways. While harbor porpoise are rare within Coos Bay, if present, animals are likely belonging to the Northern California/Southern Oregon stock which is delimited from Port Arena, California in the south to Lincoln City, Oregon. Use of Coos Bay by this stock is rare.

Northern Elephant Seal

Northern elephant seals are found occasionally in Oregon either resting or molting (shedding their hair) on sandy beaches. Elephant seals do not generally breed in Oregon; however, there are a number of breeding sites in California such as Ano Nuevo State Reserve. Cape Arago State Park, just south of the entrance to Coos Bay, is the only spot where northern elephant seals haulout year-around in Oregon. The majority of the elephant seals seen in Oregon are sub-adult animals that come to shore to molt. Northern elephant seals regularly occur at haul-out sites on Cape Arago, approximately 3.7 miles south of the entrance to Coos Bay. Scordino (2006) reported total counts (average, maximum, minimum) of harbor seal, elephant seal, California sea lion, and Steller sea lion at Cape Arago during each month surveyed between 2002 and 2005. Abundance of elephant seals was low in all months, with a maximum of 54 animals reported in May (Scordino 2006). No Northern elephant seals have been observed within Coos Bay; however, given their close proximity to the mouth of the estuary, they have been included in this analysis.

California Sea Lion

California sea lions are distributed along the North Pacific waters from central Mexico to southeast Alaska, with breeding areas restricted primarily to island areas off southern California (the Channel Islands), Baja California, and in the Gulf of California (Wright *et al.,* 2010). There are five genetically distinct geographic populations. The population seen in Oregon is the Pacific Temperate stock, which are commonly seen in Oregon from September through May (ODFW 2015). The approximate growth rate for this species is 5.4 percent annually (Caretta *et al.,* 2004).

Almost all California sea lions in the Pacific Northwest are sub-adult or adult males (NOAA 2008). The occurrence of the California sea lion along the Oregon coast is seasonal with lowest abundance in Oregon in the summer months, from May to September, as they migrate south to the Channel Islands in California to breed. During other times of the year, the primary areas where it comes ashore are Cascade Head, Tillamook County; Cape Argo, Coos County; and Rouge Reef and Orford Reef in Curry County.

The California sea lion stock has been growing steadily since the 1970s. The stock is estimated to be approximately 40 percent above its maximum net productivity level (MNPL = 183,481 animals), and it is therefore considered within the range of its optimum sustainable population (OSP) size (Laake *et al.,* 2018). The stock is also near its estimated carrying capacity of 275,298 animals (Laake *et al.,* 2018). However, there remain many threats to California sea lions including entanglement, intentional kills, harmful algal blooms, and climate change. For example, for each 1 degree Celsius increase in sea surface temperature (SST), the estimated odds of survival declined by 50 perfect for pups and yearlings, while negative SST anomalies resulted in higher survival estimates (DeLong *et al.,* 2017). Such declines in survival are related to warm oceanographic conditions (*e.g.,* El Niño) that limit prey availability to pregnant and lactating females (DeLong *et al.,* 2017). Changes in prey abundance and distribution have been linked to warm-water anomalies in the California Current that have impacted a wide range of marine taxa (Cavole *et al.,* 2016).

There were at least eight California sea lions sighted opportunistically during the 2017 AECOM surveys (ACEOM, 2017). No pups were observed.

Steller Sea Lion

The Steller sea lion range extends along the Pacific Rim, from northern Japan to central California. For management purposes, Steller sea lions inhabiting U.S. waters have been divided into two DPS: The Western U.S. and the Eastern U.S. The population known to occur within the Lower Columbia River is the Eastern DPS. The Western U.S. stock of Steller sea lions are listed as endangered under the ESA and depleted and strategic under the MMPA. The Eastern U.S. stock (including those living in Oregon) was de-listed in 2013 following a population growth from 18,000 in 1979 to 70,000 in 2010 (an estimated annual growth of 4.18 percent) (NOAA 2013). A population growth model indicates the eastern stock of Steller sea lions increased at a rate of 4.76 percent per year (95 percent confidence intervals of 4.09–5.45 percent) between 1989 and 2015 based on an analysis of pup counts in California, Oregon, British Columbia, and Southeast Alaska (Muto *et al.,* 2017). This stock is likely within its OSP; however, no determination of its status relative to OSP has been made (Muto *et al.,* 2017).

Steller sea lions can be found along the Oregon coast year-round with breeding occurring in June and July. The southern coast of Oregon supports the largest Steller breeding sites in U.S. waters south of Alaska, producing some 1,500 pups annually. Near the entrance of Coos Bay, Steller sea lions can be found year round at Cape Arago State Park. The most recent Steller sea lion survey at Cape Arago was June 29, 2017, during which ODFW counted 910 non-pup Steller sea lions ashore. Steller sea lions may occasionally enter Coos Bay; however, no long-term residency patterns have been observed. One Steller sea lion was sighted opportunistically during the 2017 AECOM surveys (ACEOM 2017). No pups were observed.

Harbor Seal

Harbor seals inhabit coastal and estuarine waters off Baja California, north along the western coasts of the continental U.S., British Columbia, and Southeast Alaska, west through the Gulf of Alaska and Aleutian Islands, and in the Bering Sea north to Cape Newenham and the Pribilof Islands (Caretta *et al.,* 2014). Within U.S. west coast waters, five stocks of harbor seals are recognized: (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. Seals belonging to the Oregon/Washington Coast stock are included in this analysis.

Harbor seals generally are non-migratory, with local movements associated with tides, weather, season, food availability, and reproduction (Scheffer and Slipp 1944; Fisher 1952; Bigg 1969, 1981). Harbor seals do not make extensive pelagic migrations, though some long distance movement of tagged animals in Alaska (900 km) and along the U.S. west coast (up to 550 km) have been recorded (Brown and Mate 1983, Herder 1986, Womble 2012). Harbor seals have also displayed strong fidelity to haulout sites (Pitcher and Calkins 1979, Pitcher and McAllister 1981).

The harbor seal is the most widespread and abundant resident pinniped in Oregon. They haul out to rest at low tide on sand bars in most bays and estuaries along the Oregon coast. They are also found on nearshore rocks and islands usually within 3 miles of the coast. Within Coos Bay, four harbor seal haulout sites have been identified by ODFW (Wright 2013); three of which have documented pup sightings. From the inlet to the upper Bay, these are South Slough (southeast of the entrance channel), Pigeon Point, Clam Island, and Coos Port. However, only three of the four haulouts are in the project area including the South Slough, Pigeon Point, and Clam Island (see Figure 4–1 of the application). Harbor seals generally foraging with in close proximity to their haulouts. For example, a study of radio tagged harbor seals in San Francisco Bay found that the majority of foraging trips were less than 10 km from their regular haulout (Grigg *et al.,* 2012), and a similar study in Humboldt Bay found that the majority of seals travelled 13 km or less to forage (Ougzin 2013). Both studies found that harbors seals typically forage at in relatively shallow water depths; a median value of 7 m was reported for the San Francisco Bay Study (Grigg *et al.,* 2012).

The most recent haulout counts were conducted by ODFW in May and June 2014. In 2014, 333 seals were observed at Coos Bay haulouts in June (Wright, pers comm., August 27, 2019). May yielded slightly higher numbers, as expected since it is closer to peak pupping season; however, the South Slough haulout site was not surveyed in May due to fog.

Marine mammal presence and abundance data collection throughout Coos Bay in 2017 and 2018. These surveys were vessel based line transect surveys. Observations made by AECOM during May 2017 site-specific surveys found similar patterns to the ODFW aerial surveys. More than 350 observations of harbor seals were recorded in the estuary over the four days of survey. AECOM conducted additional surveys during November and December 2018 using vessel based line transect surveys and aerial surveys using a drone to establish a fall/winter local abundance estimate for harbor seals. A maximum of 167 seals were hauled out between the Clam Island and Pigeon Point haulouts at any one time. ODFW indicates it is likely many harbor seals are year-round residents in Coos Bay and relay on these waters for all life stages and behaviors including, by not limited to, breeding, pupping, and foraging (Wright 2013).

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (*e.g.,* Richardson *et al.,* 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007) recommended that marine mammals be divided into functional hearing groups based on directly measured or estimated hearing ranges on the basis of available behavioral response data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e.,* low-frequency cetaceans). Subsequently, NMFS (2018) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 decibel (dB) threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. Marine mammal hearing groups and their associated hearing ranges are provided in Table 3.

TABLE 3—MARINE MAMMAL HEARING GROUPS

[NMFS, 2018]

Hearing group	Generalized hearing range*
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 35 kHz.
Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz.
High-frequency (HF) cetaceans (true porpoises, *Kogia,* river dolphins, cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*).	275 Hz to 160 kHz.
Phocid pinnipeds (PW) (underwater) (true seals)	50 Hz to 86 kHz.
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 39 kHz.

* Represents the generalized hearing range for the entire group as a composite (*i.e.,* all species within the group), where individual species' hearing ranges are typically not as broad. Generalized hearing range chosen based on ~65 dB threshold from normalized composite audiogram, with the exception for lower limits for LF cetaceans (Southall *et al.* 2007) and PW pinniped (approximation).

The phocid pinniped functional hearing group was modified from Southall *et al.* (2007) on the basis of data indicating that phocid species have consistently demonstrated an extended frequency range of hearing compared to otariids, especially in the higher frequency range (Hemilä *et al.,* 2006; Kastelein *et al.,* 2009; Reichmuth and Holt, 2013).

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information. Seven marine mammal species (three cetacean and four pinniped (three otariid and one phocid) species) have the reasonable potential to co-occur with the proposed survey activities. Please refer to Table 2. Of the cetacean species that may be present, one is classified as a low-frequency cetacean (*i.e.,* all mysticete species), one is classified as a mid-frequency cetacean (*i.e.,* all delphinid and ziphiid species and the sperm whale), and one is classified as a high-frequency cetacean (*i.e.,* harbor porpoise and Kogia spp.).

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

This section includes a summary and discussion of the ways that components of the specified activity may impact marine mammals and their habitat. The *Estimated Take by Incidental Harassment* section later in this document includes a quantitative analysis of the number of individuals that are expected to be taken by this activity. The *Negligible Impact Analysis and Determination* section considers the content of this section, the *Estimated Take by Incidental Harassment* section, and the *Proposed Mitigation* section, to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and how those impacts on individuals are likely to impact marine mammal species or stocks.

Description of Sound and the Sources Used

This section contains a brief technical background on sound, on the characteristics of certain sound types, and on metrics used in this proposal inasmuch as the information is relevant to the specified activity and to a discussion of the potential effects of the specified activity on marine mammals found later in this document. For general information on sound and its interaction with the marine environment, please see, *e.g.,* Au and Hastings (2008); Richardson *et al.* (1995); Urick (1983).

Sound travels in waves, the basic components of which are frequency, wavelength, velocity, and amplitude. Frequency is the number of pressure waves that pass by a reference point per unit of time and is measured in hertz (Hz) or cycles per second. Wavelength is the distance between two peaks or corresponding points of a sound wave (length of one cycle). Higher frequency sounds have shorter wavelengths than lower frequency sounds, and typically attenuate (decrease) more rapidly, except in certain cases in shallower water. Amplitude is the height of the sound pressure wave or the ''loudness'' of a sound and is typically described using the relative unit of the decibel (dB). A sound pressure level (SPL) in dB is described as the ratio between a measured pressure and a reference pressure (for underwater sound, this is 1 microPascal (μPa)), and is a logarithmic unit that accounts for large variations in amplitude; therefore, a relatively small change in dB corresponds to large changes in sound pressure. The source level (SL) represents the SPL referenced at a distance of 1 m from the source (referenced to 1 μPa), while the received level is the SPL at the listener's position (referenced to 1 μPa).

Root mean square (rms) is the quadratic mean sound pressure over the duration of an impulse. Root mean square is calculated by squaring all of the sound amplitudes, averaging the squares, and then taking the square root of the average (Urick, 1983). Root mean square accounts for both positive and negative values; squaring the pressures makes all values positive so that they may be accounted for in the summation of pressure levels (Hastings and Popper, 2005). This measurement is often used in the context of discussing behavioral effects, in part because behavioral effects, which often result from auditory cues, may be better expressed through averaged units than by peak pressures.

Sound exposure level (SEL; represented as dB re 1 μPa^2-s) represents the total energy in a stated frequency band over a stated time interval or event, and considers both intensity and duration of exposure. The per-pulse SEL is calculated over the time window containing the entire pulse (*i.e.,* 100 percent of the acoustic energy). SEL is a cumulative metric; it can be accumulated over a single pulse, or calculated over periods containing multiple pulses. Cumulative SEL represents the total energy accumulated by a receiver over a defined time window or during an event. Peak sound pressure (also referred to as zero-to-peak sound pressure or 0-pk) is the maximum instantaneous sound pressure measurable in the water at a specified distance from the source, and is represented in the same units as the rms sound pressure.

When underwater objects vibrate or activity occurs, sound-pressure waves are created. These waves alternately compress and decompress the water as the sound wave travels. Underwater sound waves radiate in a manner similar to ripples on the surface of a pond and may be either directed in a beam or beams or may radiate in all directions (omnidirectional sources), as is the case for sound produced by the pile driving activity considered here. The compressions and decompressions associated with sound waves are detected as changes in pressure by aquatic life and man-made sound receptors such as hydrophones.

Even in the absence of sound from the specified activity, the underwater environment is typically loud due to ambient sound, which is defined as environmental background sound levels lacking a single source or point (Richardson *et al.,* 1995). The sound level of a region is defined by the total acoustical energy being generated by known and unknown sources. These sources may include physical (*e.g.,* wind and waves, earthquakes, ice, atmospheric sound), biological (*e.g.,* sounds produced by marine mammals, fish, and invertebrates), and anthropogenic (*e.g.,* vessels, dredging, construction) sound. A number of sources contribute to ambient sound, including wind and waves, which are a main source of naturally occurring ambient sound for frequencies between 200 hertz (Hz) and 50 kilohertz (kHz) (Mitson, 1995). In general, ambient sound levels tend to increase with increasing wind speed and wave height. Precipitation can become an important component of total sound at frequencies above 500 Hz, and possibly down to 100 Hz during quiet times. Marine mammals can contribute significantly to ambient sound levels, as can some fish and snapping shrimp. The frequency band for biological contributions is from approximately 12 Hz to over 100 kHz. Sources of ambient sound related to human activity include transportation (surface vessels), dredging and construction, oil and gas drilling and production, geophysical surveys, sonar, and explosions. Vessel noise typically dominates the total ambient sound for frequencies between 20 and 300 Hz. In general, the frequencies of anthropogenic sounds are below 1 kHz and, if higher frequency sound levels are created, they attenuate rapidly.

The sum of the various natural and anthropogenic sound sources that comprise ambient sound at any given location and time depends not only on the source levels (as determined by current weather conditions and levels of biological and human activity) but also on the ability of sound to propagate through the environment. In turn, sound propagation is dependent on the spatially and temporally varying properties of the water column and sea floor, and is frequency-dependent. As a result of the dependence on a large number of varying factors, ambient sound levels can be expected to vary widely over both coarse and fine spatial and temporal scales. Sound levels at a given frequency and location can vary by 10–20 decibels (dB) from day to day (Richardson *et al.,* 1995). The result is that, depending on the source type and its intensity, sound from the specified activity may be a negligible addition to the local environment or could form a distinctive signal that may affect marine mammals.

Sounds are often considered to fall into one of two general types: Pulsed and non-pulsed (defined in the following). The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (*e.g.,* Ward, 1997 in Southall *et al.,* 2007). Please see Southall *et al.* (2007) for an in-depth discussion of these concepts. The distinction between these two sound types is not always obvious, as certain signals share properties of both pulsed and non-pulsed sounds. A signal near a source could be categorized as a pulse, but due to propagation effects as it moves farther from the source, the signal duration becomes longer (*e.g.,* Greene and Richardson, 1988).

Pulsed sound sources (*e.g.,* airguns, explosions, gunshots, sonic booms, impact pile driving) produce signals that are brief (typically considered to be less than one second), broadband, atonal transients (ANSI, 1986, 2005; Harris, 1998; NIOSH, 1998; ISO, 2003) and occur either as isolated events or repeated in some succession. Pulsed sounds are all characterized by a relatively rapid rise from ambient pressure to a maximal pressure value followed by a rapid decay period that may include a period of diminishing, oscillating maximal and minimal pressures, and generally have an increased capacity to induce physical injury as compared with sounds that lack these features.

Non-pulsed sounds can be tonal, narrowband, or broadband, brief or prolonged, and may be either continuous or intermittent (ANSI, 1995; NIOSH, 1998). Some of these non-pulsed sounds can be transient signals of short duration but without the essential properties of pulses (*e.g.,* rapid rise time). Examples of non-pulsed sounds include those produced by vessels, aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems. The duration of such sounds, as received at a distance, can be greatly extended in a highly reverberant environment.

The impulsive sound generated by impact hammers is characterized by rapid rise times and high peak levels. Vibratory hammers produce non-impulsive, continuous noise at levels significantly lower than those produced by impact hammers. Rise time is slower, reducing the probability and severity of injury, and sound energy is distributed over a greater amount of time (*e.g.,* Nedwell and Edwards, 2002; Carlson *et al.,* 2005).

Acoustic Effects on Marine Mammals

We previously provided general background information on marine mammal hearing (see *Description of Marine Mammals in the Area of the Specified Activity* section). Here, we discuss the potential effects of sound on marine mammals.

Note that, in the following discussion, we refer in many cases to a review article concerning studies of noise-induced hearing loss conducted from 1996–2015 (*i.e.,* Finneran, 2015). For study-specific citations, please see that work. Anthropogenic sounds cover a broad range of frequencies and sound levels and can have a range of highly variable impacts on marine life, from none or minor to potentially severe responses, depending on received levels, duration of exposure, behavioral context, and various other factors. The potential effects of underwater sound from active acoustic sources can potentially result in one or more of the following: Temporary or permanent hearing impairment, non-auditory physical or physiological effects, behavioral disturbance, stress, and masking (Richardson *et al.,* 1995; Gordon *et al.,* 2004; Nowacek *et al.,* 2007; Southall *et al.,* 2007; Götz *et al.,* 2009). The degree of effect is intrinsically related to the signal characteristics, received level, distance from the source, and duration of the sound exposure. In general, sudden, high level sounds can cause hearing loss, as can longer exposures to lower level sounds. Temporary or permanent loss of hearing will occur almost exclusively for noise within an animal's hearing range. We first describe specific manifestations of acoustic effects before providing discussion specific to pile driving.

Richardson *et al.* (1995) described zones of increasing intensity of effect that might be expected to occur, in relation to distance from a source and assuming that the signal is within an animal's hearing range. First is the area within which the acoustic signal would be audible (potentially perceived) to the animal but not strong enough to elicit any overt behavioral or physiological response. The next zone corresponds with the area where the signal is audible to the animal and of sufficient intensity to elicit behavioral or physiological responsiveness. Third is a zone within which, for signals of high intensity, the received level is sufficient to potentially cause discomfort or tissue damage to auditory or other systems. Overlaying these zones to a certain extent is the area within which masking (*i.e.,* when a sound interferes with or masks the ability of an animal to detect a signal of interest that is above the absolute hearing threshold) may occur; the masking zone may be highly variable in size.

We describe the more severe effects (*i.e.,* certain non-auditory physical or physiological effects) only briefly as we do not expect that there is a reasonable likelihood that pile driving may result in such effects (see below for further discussion). Potential effects from impulsive sound sources can range in severity from effects such as behavioral disturbance or tactile perception to physical discomfort, slight injury of the internal organs and the auditory system, or mortality (Yelverton *et al.,* 1973). Non-auditory physiological effects or injuries that theoretically might occur in marine mammals exposed to high level underwater sound or as a secondary effect of extreme behavioral reactions (*e.g.,* change in dive profile as a result of an avoidance reaction) caused by exposure to sound include neurological effects, bubble formation, resonance effects, and other types of organ or tissue damage (Cox *et al.,* 2006; Southall *et al.,* 2007; Zimmer and Tyack, 2007; Tal *et al.,* 2015). The construction activities considered here do not involve the use of devices such as explosives or mid-frequency tactical sonar that are associated with these types of effects.

Threshold Shift—NMFS defines a noise-induced threshold shift (TS) as ''a change, usually an increase, in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level'' (NMFS, 2016). The amount of threshold shift is customarily expressed in dB (ANSI 1995, Yost 2007). A TS can be permanent (PTS) or temporary (TTS). As described in NMFS (2016), there are numerous factors to consider when examining the consequence of TS, including, but not limited to, the signal temporal pattern (*e.g.,* impulsive or non-impulsive), likelihood an individual would be exposed for a long enough duration or to a high enough level to induce a TS, the magnitude of the TS, time to recovery (seconds to minutes or hours to days), the frequency range of the exposure (*i.e.,* spectral content), the hearing and vocalization frequency range of the exposed species relative to the signal's frequency spectrum (*i.e.,* how animal uses sound within the frequency band of the signal; *e.g.,* Kastelein *et al.,* 2014), and the overlap between the animal and the source (*e.g.,* spatial, temporal, and spectral). When analyzing the auditory effects of noise exposure, it is often helpful to broadly categorize sound as either impulsive—noise with high peak sound pressure, short duration, fast rise-time, and broad frequency content—or non-impulsive. When considering auditory effects, vibratory pile driving is considered a non-impulsive source while impact pile driving is treated as an impulsive source.

TS can be permanent (PTS), in which case the loss of hearing sensitivity is not fully recoverable, or temporary (TTS), in which case the animal's hearing threshold would recover over time (Southall *et al.,* 2007). NMFS defines PTS as a permanent, irreversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS 2018). Available data from humans and other terrestrial mammals indicate that a 40 dB threshold shift approximates PTS onset (see NMFS 2018 for review). Repeated sound exposure that leads to TTS could cause PTS. In severe cases of PTS, there can be total or partial deafness, while in most cases the animal has an impaired ability to hear sounds in specific frequency ranges (Kryter, 1985).

NMFS defines TTS as a temporary, reversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS 2018). Based on data from cetacean TTS measurements (see Finneran 2014 for a review), a TTS of 6 dB is considered the minimum threshold shift clearly larger than any day-to-day or session-to-session variation in a subject's normal hearing ability (Schlundt *et al.,* 2000; Finneran *et al.,* 2000; Finneran *et al.,* 2002).

Depending on the degree (elevation of threshold in dB), duration (*i.e.,* recovery time), and frequency range of TTS, and the context in which it is experienced, TTS can have effects on marine mammals ranging from discountable to serious (similar to those discussed in auditory masking, below). For example, a marine mammal may be able to readily compensate for a brief, relatively small amount of TTS in a non-critical frequency range that takes place during a time when the animal is traveling through the open ocean, where ambient noise is lower and there are not as many competing sounds present. Alternatively, a larger amount and longer duration of TTS sustained during time when communication is critical for successful mother/calf interactions could have more serious impacts. We note that reduced hearing sensitivity as a simple function of aging has been observed in marine mammals, as well as humans and other taxa (Southall *et al.,* 2007), so we can infer that strategies exist for coping with this condition to some degree, though likely not without cost.

Relationships between TTS and PTS thresholds have not been studied in marine mammals, and there is no PTS data for cetaceans, but such relationships are assumed to be similar to those in humans and other terrestrial mammals. PTS typically occurs at exposure levels at least several decibels above (a 40-dB threshold shift approximates PTS onset; *e.g.,* Kryter *et al.,* 1966; Miller 1974) that inducing mild TTS (a 6-dB threshold shift approximates TTS onset; *e.g.,* Southall *et al.,* 2007). Based on data from terrestrial mammals, a precautionary assumption is that the PTS thresholds for impulse sounds (such as impact pile driving pulses as received close to the source) are at least 6 dB higher than the TTS threshold on a peak-pressure basis and PTS cumulative sound exposure level thresholds are 15 to 20 dB higher than TTS cumulative sound exposure level thresholds (Southall *et al.,* 2007). Given the higher level of sound or longer exposure duration necessary to cause PTS as compared with TTS, it is considerably less likely that PTS could occur.

TTS is the mildest form of hearing impairment that can occur during exposure to sound (Kryter, 1985). While experiencing TTS, the hearing threshold rises, and a sound must be at a higher level in order to be heard. In terrestrial and marine mammals, TTS can last from minutes or hours to days (in cases of strong TTS). In many cases, hearing sensitivity recovers rapidly after exposure to the sound ends. Few data on sound levels and durations necessary to elicit mild TTS have been obtained for marine mammals.

Marine mammal hearing plays a critical role in communication with conspecifics, and interpretation of environmental cues for purposes such as predator avoidance and prey capture. Depending on the degree (elevation of threshold in dB), duration (*i.e.,* recovery time), and frequency range of TTS, and the context in which it is experienced, TTS can have effects on marine mammals ranging from discountable to serious. For example, a marine mammal may be able to readily compensate for a brief, relatively small amount of TTS in a non-critical frequency range that occurs during a time where ambient noise is lower and there are not as many competing sounds present. Alternatively, a larger amount and longer duration of TTS sustained during time when communication is critical for successful mother/calf interactions could have more serious impacts.

Currently, TTS data only exist for four species of cetaceans (bottlenose dolphin (*Tursiops truncatus*), beluga whale (*Delphinapterus leucas*), harbor porpoise, and Yangtze finless porpoise (*Neophocoena asiaeorientalis*)) and three species of pinnipeds (northern elephant seal, harbor seal, and California sea lion) exposed to a limited number of sound sources (*i.e.,* mostly tones and octave-band noise) in laboratory settings (Finneran, 2015). TTS was not observed in trained spotted (*Phoca largha*) and ringed (*Pusa hispida*) seals exposed to impulsive noise at levels matching previous predictions of TTS onset (Reichmuth *et al.,* 2016). In general, harbor seals and harbor porpoises have a lower TTS onset than other measured pinniped or cetacean species (Finneran 2015). Additionally, the existing marine mammal TTS data come from a limited number of individuals of cetaceans and pinnipeds. There are no data available on noise-induced hearing loss for mysticetes. For summaries of data on TTS in marine mammals or for further discussion of TTS onset thresholds, please see Southall *et al.* (2007), Finneran and Jenkins (2012), Finneran (2015), and NMFS (2016).

Behavioral Effects—Behavioral disturbance may include a variety of effects, including subtle changes in behavior (*e.g.,* minor or brief avoidance of an area or changes in vocalizations), more conspicuous changes in similar behavioral activities, and more sustained and/or potentially severe reactions, such as displacement from or abandonment of high-quality habitat. Behavioral responses to sound are highly variable and context-specific and any reactions depend on numerous intrinsic and extrinsic factors (*e.g.,* species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day), as well as the interplay between factors (*e.g.,* Richardson *et al.,* 1995; Wartzok *et al.,* 2003; Southall *et al.,* 2007; Weilgart, 2007; Archer *et al.,* 2010). Behavioral reactions can vary not only among individuals but also within an individual, depending on previous experience with a sound source, context, and numerous other factors (Ellison *et al.,* 2012), and can vary depending on characteristics associated with the sound source (*e.g.,* whether it is moving or stationary, number of sources, distance from the source). Please see Gomez *et al.,* 2016 for a review of studies involving marine mammal behavioral responses to sound.

The acoustic habitat in Coos Bay is regularly elevated by medium to large-sized boats. Site-specific ambient noise data were collected during a baseline survey by AECOM in Coos Bay in May 2017 and November and December 2018. Underwater sound levels for water transit vessels, which operate throughout the day in Coos Bay, ranged from 152 dB to 177 dB. The results suggested that the ambient noise level was approximately 120 dB, with high daily variability due to vessel traffic. We expect some level of habituation and or sensitization, described in more detail below, to occur due to the existing acoustic environment in Coos Bay.

Habituation can occur when an animal's response to a stimulus wanes with repeated exposure, usually in the absence of unpleasant associated events (Wartzok *et al.,* 2003). Animals are most likely to habituate to sounds that are predictable and unvarying. It is important to note that habituation is appropriately considered as a progressive reduction in response to stimuli that are perceived as neither aversive nor beneficial, rather than as, more generally, moderation in response to human disturbance (Bejder *et al.,* 2009). The opposite process is sensitization, when an unpleasant experience leads to subsequent responses, often in the form of avoidance, at a lower level of exposure. As noted, behavioral state may affect the type of response. For example, animals that are resting may show greater behavioral change in response to disturbing sound levels than animals that are highly motivated to remain in an area for feeding (Richardson *et al.,* 1995; NRC, 2003; Wartzok *et al.,* 2003). Controlled experiments with captive marine mammals have showed pronounced behavioral reactions, including avoidance of loud sound sources (Ridgway *et al.,* 1997; Finneran *et al.,* 2003). Observed responses of wild marine mammals to loud pulsed sound sources (typically airguns or acoustic harassment devices) have been varied but often consist of avoidance behavior or other behavioral changes suggesting discomfort (Morton and Symonds, 2002; see also Richardson *et al.,* 1995; Nowacek *et al.,* 2007). However, many delphinids approach low-frequency airgun source vessels with no apparent discomfort or obvious behavioral change (*e.g.,* Barkaszi *et al.,* 2012), indicating the importance of frequency output in relation to the species' hearing sensitivity.

Available studies show wide variation in response to underwater sound; therefore, it is difficult to predict specifically how any given sound in a particular instance might affect marine mammals perceiving the signal. If a marine mammal does react briefly to an underwater sound by changing its behavior or moving a small distance, the impacts of the change are unlikely to be significant to the individual, let alone the stock or population. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on individuals and populations could be significant (*e.g.,* Lusseau and Bejder, 2007; Weilgart, 2007; NRC, 2005). However, there are broad categories of potential response, which we describe in greater detail here, that include alteration of dive behavior, alteration of foraging behavior, effects to breathing, interference with or alteration of vocalization, avoidance, and flight.

Changes in dive behavior can vary widely and may consist of increased or decreased dive times and surface intervals as well as changes in the rates of ascent and descent during a dive (*e.g.,* Frankel and Clark, 2000; Costa *et al.,* 2003; Ng and Leung, 2003; Nowacek *et al.,* 2004; Goldbogen *et al.,* 2013a, 2013b). Variations in dive behavior may reflect interruptions in biologically significant activities (*e.g.,* foraging) or they may be of little biological significance. The impact of an alteration to dive behavior resulting from an acoustic exposure depends on what the animal is doing at the time of the exposure and the type and magnitude of the response.

Disruption of feeding behavior can be difficult to correlate with anthropogenic sound exposure, so it is usually inferred by observed displacement from known foraging areas, the appearance of secondary indicators (*e.g.,* bubble nets or sediment plumes), or changes in dive behavior. As for other types of behavioral response, the frequency, duration, and temporal pattern of signal presentation, as well as differences in species sensitivity, are likely contributing factors to differences in response in any given circumstance (*e.g.,* Croll *et al.,* 2001; Nowacek *et al.;* 2004; Madsen *et al.,* 2006; Yazvenko *et al.,* 2007). A determination of whether foraging disruptions incur fitness consequences would require information on or estimates of the energetic requirements of the affected individuals and the relationship between prey availability, foraging effort and success, and the life history stage of the animal.

Variations in respiration naturally vary with different behaviors and alterations to breathing rate as a function of acoustic exposure can be expected to co-occur with other behavioral reactions, such as a flight response or an alteration in diving. However, respiration rates in and of themselves may be representative of annoyance or an acute stress response. Various studies have shown that respiration rates may either be unaffected or could increase, depending on the species and signal characteristics, again highlighting the importance in understanding species differences in the tolerance of underwater noise when determining the potential for impacts resulting from anthropogenic sound exposure (*e.g.,* Kastelein *et al.,* 2001, 2005, 2006; Gailey *et al.,* 2007; Gailey *et al.,* 2016).

Marine mammals vocalize for different purposes and across multiple modes, such as whistling, echolocation click production, calling, and singing. Changes in vocalization behavior in response to anthropogenic noise can occur for any of these modes and may result from a need to compete with an increase in background noise or may reflect increased vigilance or a startle response. For example, in the presence of potentially masking signals, humpback whales and killer whales have been observed to increase the length of their songs (Miller *et al.,* 2000; Fristrup *et al.,* 2003; Foote *et al.,* 2004), while right whales have been observed to shift the frequency content of their calls upward while reducing the rate of calling in areas of increased anthropogenic noise (Parks *et al.,* 2007). In some cases, animals may cease sound production during production of aversive signals (Bowles *et al.,* 1994).

Avoidance is the displacement of an individual from an area or migration path as a result of the presence of a sound or other stressors, and is one of the most obvious manifestations of disturbance in marine mammals (Richardson *et al.,* 1995). For example, gray whales are known to change direction—deflecting from customary migratory paths—in order to avoid noise from airgun surveys (Malme *et al.,* 1984). Avoidance may be short-term, with animals returning to the area once the noise has ceased (*e.g.,* Bowles *et al.,* 1994; Goold, 1996; Stone *et al.,* 2000; Morton and Symonds, 2002; Gailey *et al.,* 2007). Longer-term displacement is possible, however, which may lead to changes in abundance or distribution patterns of the affected species in the affected region if habituation to the presence of the sound does not occur (*e.g.,* Blackwell *et al.,* 2004; Bejder *et al.,* 2006; Teilmann *et al.,* 2006).

A flight response is a dramatic change in normal movement to a directed and rapid movement away from the perceived location of a sound source. The flight response differs from other avoidance responses in the intensity of the response (*e.g.,* directed movement, rate of travel). Relatively little information on flight responses of marine mammals to anthropogenic signals exist, although observations of flight responses to the presence of predators have occurred (Connor and Heithaus, 1996). The result of a flight response could range from brief, temporary exertion and displacement from the area where the signal provokes flight to, in extreme cases, marine mammal strandings (Evans and England, 2001). However, it should be noted that response to a perceived predator does not necessarily invoke flight (Ford and Reeves, 2008), and whether individuals are solitary or in groups may influence the response.

Behavioral disturbance can also impact marine mammals in more subtle ways. Increased vigilance may result in costs related to diversion of focus and attention (*i.e.,* when a response consists of increased vigilance, it may come at the cost of decreased attention to other critical behaviors such as foraging or resting). These effects have generally not been demonstrated for marine mammals, but studies involving fish and terrestrial animals have shown that increased vigilance may substantially reduce feeding rates (*e.g.,* Beauchamp and Livoreil, 1997; Fritz *et al.,* 2002; Purser and Radford, 2011). In addition, chronic disturbance can cause population declines through reduction of fitness (*e.g.,* decline in body condition) and subsequent reduction in reproductive success, survival, or both (*e.g.,* Harrington and Veitch, 1992; Daan *et al.,* 1996; Bradshaw *et al.,* 1998). However, Ridgway *et al.* (2006) reported that increased vigilance in bottlenose dolphins exposed to sound over a five-day period did not cause any sleep deprivation or stress effects.

Many animals perform vital functions, such as feeding, resting, traveling, and socializing, on a diel cycle (24-hour cycle). Disruption of such functions resulting from reactions to stressors such as sound exposure are more likely to be significant if they last more than one diel cycle or recur on subsequent days (Southall *et al.,* 2007). Consequently, a behavioral response lasting less than one day and not recurring on subsequent days is not considered particularly severe unless it could directly affect reproduction or survival (Southall *et al.,* 2007). Note that there is a difference between multi-day substantive behavioral reactions and multi-day anthropogenic activities. For example, just because an activity lasts for multiple days does not necessarily mean that individual animals are either exposed to activity-related stressors for multiple days or, further, exposed in a manner resulting in sustained multi-day substantive behavioral responses.

Stress Responses—An animal's perception of a threat may be sufficient to trigger stress responses consisting of some combination of behavioral responses, autonomic nervous system responses, neuroendocrine responses, or immune responses (*e.g.,* Seyle, 1950; Moberg, 2000). In many cases, an animal's first and sometimes most economical (in terms of energetic costs) response is behavioral avoidance of the potential stressor. Autonomic nervous system responses to stress typically involve changes in heart rate, blood pressure, and gastrointestinal activity. These responses have a relatively short duration and may or may not have a significant long-term effect on an animal's fitness.

Neuroendocrine stress responses often involve the hypothalamus-pituitary-adrenal system. Virtually all neuroendocrine functions that are affected by stress—including immune competence, reproduction, metabolism, and behavior—are regulated by pituitary hormones. Stress-induced changes in the secretion of pituitary hormones have been implicated in failed reproduction, altered metabolism, reduced immune competence, and behavioral disturbance (*e.g.,* Moberg, 1987; Blecha, 2000). Increases in the circulation of glucocorticoids are also equated with stress (Romano *et al.,* 2004).

Relationships between these physiological mechanisms, animal behavior, and the costs of stress responses are well-studied through controlled experiments and for both laboratory and free-ranging animals (*e.g.,* Holberton *et al.,* 1996; Hood *et al.,* 1998; Jessop *et al.,* 2003; Krausman *et al.,* 2004; Lankford *et al.,* 2005). Stress responses due to exposure to anthropogenic sounds or other stressors and their effects on marine mammals have also been reviewed (Fair and Becker, 2000; Romano *et al.,* 2002b) and, more rarely, studied in wild populations (*e.g.,* Romano *et al.,* 2002a). For example, Rolland *et al.* (2012) found that noise reduction from reduced ship traffic in the Bay of Fundy was associated with decreased stress in North Atlantic right whales. These and other studies lead to a reasonable expectation that some marine mammals will experience physiological stress responses upon exposure to acoustic stressors and that it is possible that some of these would be classified as ''distress.'' In addition, any animal experiencing TTS would likely also experience stress responses (NRC, 2003).

Auditory Masking—Sound can disrupt behavior through masking, or interfering with, an animal's ability to detect, recognize, or discriminate between acoustic signals of interest (*e.g.,* those used for intraspecific communication and social interactions, prey detection, predator avoidance, navigation) (Richardson *et al.,* 1995; Erbe *et al.,* 2016). Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher intensity, and may occur whether the sound is natural (*e.g.,* snapping shrimp, wind, waves, precipitation) or anthropogenic (*e.g.,* shipping, sonar, seismic exploration) in origin. The ability of a noise source to mask biologically important sounds depends on the characteristics of both the noise source and the signal of interest (*e.g.,* signal-to-noise ratio, temporal variability, direction), in relation to each other and to an animal's hearing abilities (*e.g.,* sensitivity, frequency range, critical ratios, frequency discrimination, directional discrimination, age or TTS hearing loss), and existing ambient noise and propagation conditions.

Under certain circumstances, marine mammals experiencing significant masking could also be impaired from maximizing their performance fitness in survival and reproduction. Therefore, when the coincident (masking) sound is man-made, it may be considered harassment when disrupting or altering critical behaviors. It is important to distinguish TTS and PTS, which persist after the sound exposure, from masking, which occurs during the sound exposure. Because masking (without resulting in TS) is not associated with abnormal physiological function, it is not considered a physiological effect, but rather a potential behavioral effect.

The frequency range of the potentially masking sound is important in determining any potential behavioral impacts. For example, low-frequency signals may have less effect on high-frequency echolocation sounds produced by odontocetes but are more likely to affect detection of mysticete communication calls and other potentially important natural sounds such as those produced by surf and some prey species. The masking of communication signals by anthropogenic noise may be considered as a reduction in the communication space of animals (*e.g.,* Clark *et al.,* 2009) and may result in energetic or other costs as animals change their vocalization behavior (*e.g.,* Miller *et al.,* 2000; Foote *et al.,* 2004; Parks *et al.,* 2007; Di Iorio and Clark, 2009; Holt *et al.,* 2009). Masking can be reduced in situations where the signal and noise come from different directions (Richardson *et al.,* 1995), through amplitude modulation of the signal, or through other compensatory behaviors (Houser and Moore, 2014). Masking can be tested directly in captive species (*e.g.,* Erbe, 2008), but in wild populations it must be either modeled or inferred from evidence of masking compensation. There are few studies addressing real-world masking sounds likely to be experienced by marine mammals in the wild (*e.g.,* Branstetter *et al.,* 2013).

Masking affects both senders and receivers of acoustic signals and can potentially have long-term chronic effects on marine mammals at the population level as well as at the individual level. Low-frequency ambient sound levels have increased by as much as 20 dB (more than three times in terms of SPL) in the world's ocean from pre-industrial periods, with most of the increase from distant commercial shipping (Hildebrand, 2009). All anthropogenic sound sources, but especially chronic and lower-frequency signals (*e.g.,* from vessel traffic), contribute to elevated ambient sound levels, thus intensifying masking.

Potential Effects of USACE's Activity—As described previously (see *Description of Active Acoustic Sound Sources* section), USACE proposes to conduct vibratory pile driving in Coos Bay. The effects of pile driving on marine mammals are dependent on several factors, including the size, type, and depth of the animal; the depth, intensity, and duration of the pile driving sound; the depth of the water column; the substrate of the habitat; the standoff distance between the pile and the animal; and the sound propagation properties of the environment. It is likely that the onset of pile driving could result in temporary, short term changes in an animal's typical behavioral patterns and/or avoidance of the affected area. These behavioral changes may include (Richardson *et al.,* 1995): Changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); avoidance of areas where sound sources are located; and/or flight responses.

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

Sounds produced by vibratory driving or removal would be active for relatively short durations, with relation to potential for masking. The frequencies output by pile driving activity are lower than those used by most species expected to be regularly present for communication or foraging. We would expect any masking to occur concurrently within the zones of behavioral harassment already estimated for vibratory pile driving and removal, and which have already been taken into account in the exposure analysis.

The biological significance of behavioral disturbance is difficult to predict, especially if the detected disturbances appear minor. While, generally speaking, the consequences of behavioral modification could be expected to be biologically significant if the change affects growth, survival, or reproduction, significant behavioral modifications that could lead to impacts on health or fitness, such as drastic changes in diving/surfacing patterns or significant habitat abandonment are extremely unlikely to result from this activity.

Anticipated Effects on Marine Mammal Habitat

The proposed activities would not result in permanent impacts to habitats used directly by marine mammals, but may have potential short-term impacts to food sources such as forage fish. The proposed activities could also affect acoustic habitat (see masking discussion above), but meaningful impacts are unlikely. There are no known foraging hotspots, or other ocean bottom structures of significant biological importance to marine mammals present in the marine waters in the vicinity of the project areas. Therefore, the main impact issue associated with the proposed activity would be temporarily elevated sound levels and the associated direct effects on marine mammals, as discussed previously in this preamble. The most likely impact to marine mammal habitat occurs from pile driving effects on likely marine mammal prey (*i.e.,* fish) near the MOF. Impacts to the immediate substrate during installation and removal of piles are anticipated, but these would be limited to minor, temporary suspension of sediments, which could impact water quality and visibility for a short amount of time, but which would not be expected to have any effects on individual marine mammals. Impacts to substrate are therefore not discussed further.

Effects to Prey—Sound may affect marine mammals through impacts on the abundance, behavior, or distribution of prey species (*e.g.,* crustaceans, cephalopods, fish, zooplankton). Marine mammal prey varies by species, season, and location and, for some, is not well documented. Here, we describe studies regarding the effects of noise on known marine mammal prey.

Fish utilize the soundscape and components of sound in their environment to perform important functions such as foraging, predator avoidance, mating, and spawning (*e.g.,* Zelick *et al.,* 1999; Fay, 2009). Depending on their hearing anatomy and peripheral sensory structures, which vary among species, fishes hear sounds using pressure and particle motion sensitivity capabilities and detect the motion of surrounding water (Fay *et al.,* 2008). The potential effects of noise on fishes depends on the overlapping frequency range, distance from the sound source, water depth of exposure, and species-specific hearing sensitivity, anatomy, and physiology. Key impacts to fishes may include behavioral responses, hearing damage, barotrauma (pressure-related injuries), and mortality.

Fish react to sounds which are especially strong and/or intermittent low-frequency sounds, and behavioral responses such as flight or avoidance are the most likely effects. Short duration, sharp sounds can cause overt or subtle changes in fish behavior and local distribution. The reaction of fish to noise depends on the physiological state of the fish, past exposures, motivation (*e.g.,* feeding, spawning, migration), and other environmental factors. Hastings and Popper (2005) identified several studies that suggest fish may relocate to avoid certain areas of sound energy. Additional studies have documented effects of pile driving on fish, although several are based on studies in support of large, multiyear bridge construction projects (*e.g.,* Scholik and Yan, 2001, 2002; Popper and Hastings, 2009). Several studies have demonstrated that impulse sounds might affect the distribution and behavior of some fishes, potentially impacting foraging opportunities or increasing energetic costs (*e.g.,* Fewtrell and McCauley, 2012; Pearson *et al.,* 1992; Skalski *et al.,* 1992; Santulli *et al.,* 1999; Paxton *et al.,* 2017). However, some studies have shown no or slight reaction to impulse sounds (*e.g.,* Pena *et al.,* 2013; Wardle *et al.,* 2001; Jorgenson and Gyselman, 2009; Cott *et al.,* 2012). More commonly, though, the impacts of noise on fish are temporary.

SPLs of sufficient strength have been known to cause injury to fish and fish mortality. However, in most fish species, hair cells in the ear continuously regenerate and loss of auditory function likely is restored when damaged cells are replaced with new cells. Halvorsen *et al.* (2012a) showed that a TTS of 4–6 dB was recoverable within 24 hours for one species. Impacts would be most severe when the individual fish is close to the source and when the duration of exposure is long. Injury caused by barotrauma can range from slight to severe and can cause death, and is most likely for fish with swim bladders. Barotrauma injuries have been documented during controlled exposure to impact pile driving (Halvorsen *et al.,* 2012b; Casper *et al.,* 2013).

The most likely impact to fish from pile driving activities at the project areas would be temporary behavioral avoidance of the area. The duration of fish avoidance of an area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution and behavior is anticipated. In general, impacts to marine mammal prey species are expected to be minor and temporary due to the expected short daily duration of individual pile driving events and the relatively small areas being affected.

Any behavioral avoidance by fish of the disturbed area would still leave significantly large areas of fish and marine mammal foraging habitat in the nearby vicinity. As described in the preceding, the potential for pile driving or removal to affect the availability of prey to marine mammals or to meaningfully impact the quality of physical or acoustic habitat is considered to be insignificant. Effects to habitat will not be discussed further in this document.

Estimated Take

This section provides an estimate of the number of incidental takes proposed for authorization through these IHAs, which will inform both NMFS' consideration of ''small numbers'' and the negligible impact determinations.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of 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).

Take of marine mammals incidental to USACE's pile driving and removal activities could occur by Level B harassment only, as pile driving has the potential to result in disruption of behavioral patterns for individual marine mammals. Based on the nature of the activity, Level A harassment is neither anticipated nor proposed to be authorized. The proposed mitigation and monitoring measures are expected to minimize the severity of such taking to the extent practicable. As described previously, no mortality is anticipated or proposed to be authorized for this activity. Below we describe how the take is estimated.

Generally speaking, we estimate take by considering: (1) Acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) and the number of days of activities. We note that while these basic factors can contribute to a basic calculation to provide an initial prediction of takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.,* previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the proposed take estimates for each IHA.

Acoustic Thresholds

Using the best available science, NMFS has developed acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment).

Level B Harassment—Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.,* frequency, predictability, duty cycle), the environment (*e.g.,* bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et al.,* 2007, Ellison *et al.,* 2012). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 dB re 1 μPa (rms) for continuous (*e.g.,* vibratory pile-driving, drilling) and above 160 dB re 1 μPa (rms) for non-explosive impulsive (*e.g.,* impact pile driving seismic airguns) or intermittent (*e.g.,* scientific sonar) sources. The USACE's proposed activities include the use of continuous, non-impulsive (vibratory pile driving) therefore, the 120 dB re 1 μPa (rms) is applicable.

Level A Harassment—NMFS' *Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing* (Version 2.0) (Technical Guidance, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise. The technical guidance identifies the received levels, or thresholds, above which individual marine mammals are predicted to experience changes in their hearing sensitivity for all underwater anthropogenic sound sources, and reflects the best available science on the potential for noise to affect auditory sensitivity by:

- Dividing sound sources into two groups (*i.e.,* impulsive and non-impulsive) based on their potential to affect hearing sensitivity;
- Choosing metrics that best address the impacts of noise on hearing sensitivity, *i.e.,* sound pressure level (peak SPL) and sound exposure level (SEL) (also accounts for duration of exposure); and
- Dividing marine mammals into hearing groups and developing auditory weighting functions based on the science supporting that not all marine mammals hear and use sound in the same manner.

These thresholds were developed by compiling and synthesizing the best available science, and are provided in Table 4 below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2018 Technical Guidance, which may be accessed at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technicalguidance.*

TABLE 4—THRESHOLDS IDENTIFYING THE ONSET OF PERMANENT THRESHOLD SHIFT

Hearing group	PTS onset acoustic thresholds* (received level)	
	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	*Cell 1*: $L_{pk,flat}$: 219 dB; $L_{E,LF,24h}$: 183 dB	*Cell 2*: $L_{E,LF,24h}$: 199 dB.
Mid-Frequency (MF) Cetaceans	*Cell 3*: $L_{pk,flat}$: 230 dB; $L_{E,MF,24h}$: 185 dB	*Cell 4*: $L_{E,MF,24h}$: 198 dB.
High-Frequency (HF) Cetaceans	*Cell 5*: $L_{pk,flat}$: 202 dB; $L_{E,HF,24h}$: 155 dB	*Cell 6*: $L_{E,HF,24h}$: 173 dB.
Phocid Pinnipeds (PW) (Underwater)	*Cell 7*: $L_{pk,flat}$: 218 dB; $L_{E,PW,24h}$: 185 dB	*Cell 8*: $L_{E,PW,24h}$: 201 dB.
Otariid Pinnipeds (OW) (Underwater)	*Cell 9*: $L_{pk,flat}$: 232 dB; $L_{E,OW,24h}$: 203 dB	*Cell 10*: $L_{E,OW,24h}$: 219 dB.

* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.

Note: Peak sound pressure (L_{pk}) has a reference value of 1 μPa, and cumulative sound exposure level (L_E) has a reference value of 1μPa²s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript "flat" is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (*i.e.,* varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

Ensonified Area

Here, we describe operational and environmental parameters of the activity that will feed into identifying the area ensonified above the acoustic thresholds, which include source levels and transmission loss coefficient.

Sound Propagation

Transmission loss (TL) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for underwater TL is:

$TL = B * \log_{10}(R_1/R_2)$,

Where

B = transmission loss coefficient (assumed to be 15)

R_1 = the distance of the modeled SPL from the driven pile, and

R_2 = the distance from the driven pile of the initial measurement.

This formula neglects loss due to scattering and absorption, which is assumed to be zero here. The degree to which underwater sound propagates away from a sound source is dependent on a variety of factors, most notably the water bathymetry and presence or absence of reflective or absorptive conditions including in-water structures and sediments. Spherical spreading occurs in a perfectly unobstructed (free-field) environment not limited by depth or water surface, resulting in a 6 dB reduction in sound level for each doubling of distance from the source (20*log(range)). Cylindrical spreading occurs in an environment in which sound propagation is bounded by the water surface and sea bottom, resulting in a reduction of 3 dB in sound level for each doubling of distance from the source (10*log(range)). As is common practice in coastal waters, here we assume practical spreading loss (4.5 dB reduction in sound level for each doubling of distance). Practical spreading is a compromise that is often used under conditions where water depth increases as the receiver moves away from the shoreline, resulting in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions.

Sound Source Levels

The intensity of pile driving sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity takes place. There are source level measurements available for certain pile types and sizes from the similar environments recorded from underwater pile driving projects (CALTRANS 2015, WSDOT 2010) that were used to determine reasonable sound source levels likely result from the USACE's pile driving and removal activities (Table 5).

TABLE 5—PREDICTED SOUND SOURCE LEVELS FOR BOTH INSTALLATION AND REMOVAL OF PILES

Pile type	Sound source level at 10 meters
12-inch steel H-pile [1]	150 dB_{RMS}
24-inch AZ steel sheet [1]	160 dB_{RMS}
30-inch steel pipe pile [2]	164 dB_{RMS}

[1] Average typical sound pressure levels referenced from Caltrans (2015) and were either measured or standardized to 10 m from the pile.

[2] Average sound pressure levels measured at the Vashon Ferry Terminal (WSDOT, 2010).

Level A Harassment

When the NMFS Technical Guidance (2016) was published, in recognition of the fact that ensonified area/volume could be more technically challenging to predict because of the duration component in the new thresholds, we developed a User Spreadsheet that includes tools to help predict a simple isopleth that can be used in conjunction with marine mammal density or occurrence to help predict takes. We note that because of some of the assumptions included in the methods used for these tools, we anticipate that isopleths produced are typically going to be overestimates of some degree, which may result in some degree of overestimate of Level A harassment take. However, these tools offer the best way to predict appropriate isopleths when more sophisticated 3D modeling methods are not available, and NMFS continues to develop ways to quantitatively refine these tools, and will qualitatively address the output where appropriate. For stationary sources (such as from vibratory pile driving), NMFS User Spreadsheet predicts the closest distance at which, if a marine mammal remained at that distance the whole duration of the activity, it would incur PTS. Inputs used in the User Spreadsheet (Table 6), and the resulting isopleths are reported below (Table 7).

TABLE 6—NMFS TECHNICAL GUIDANCE (2018) USER SPREADSHEET INPUT TO CALCULATE PTS ISOPLETHS FOR VIBRATORY PILE DRIVING

[User spreadsheet input—Vibratory Pile Driving Spreadsheet Tab A.1 Vibratory Pile Driving Used]

	12-in H piles (install/removal)	24-in sheet piles (install/removal)	30-in piles (install/remove)
Source Level (RMS SPL)	150	160	164
Weighting Factor Adjustment (kHz)	2.5	2.5	2.5
Number of piles within 24-hr period	25	25	6
Duration to drive a single pile (min)	10	10	60
Propagation (xLogR)	15	15	15
Distance of source level measurement (meters)	10	10	10

TABLE 7—NMFS TECHNICAL GUIDANCE (2018) USER SPREADSHEET OUTPUTS TO CALCULATE LEVEL A HARASSMENT PTS ISOPLETHS.

User spreadsheet output		PTS isopleths (meters)				
		Levl A harassment				
Activity	Sound source level at 10 m	Low-frequency cetaceans	Mid-frequency cetaceans	High-frequency cetaceans	Phocid	Otariid
Vibratory Pile Driving/Removal						
12-in H pile steel installation/removal.	150 dB SPL	3.3	0.3	4.8	2.0	0.1

TABLE 7—NMFS TECHNICAL GUIDANCE (2018) USER SPREADSHEET OUTPUTS TO CALCULATE LEVEL A HARASSMENT PTS ISOPLETHS.—Continued

User spreadsheet output		PTS isopleths (meters)				
		Levl A harassment				
Activity	Sound source level at 10 m	Low-frequency cetaceans	Mid-frequency cetaceans	High-frequency cetaceans	Phocid	Otariid
24-in sheet pile installation/removal.	160 dB SPL	15.2	1.3	22.4	9.2	0.6
30-in pile installation/removal.	164 dB SPL	35.7	3.2	52.8	21.7	1.5

Level B Harassment

Utilizing the practical spreading loss model, USACE determined underwater noise will fall below the behavioral effects threshold of 120 dB rms for marine mammals at the distances shown in Table 8 for vibratory pile driving/removal. Table 8 below provides all Level B harassment radial distances (m) and their corresponding areas (km^2) during the USACE's proposed activities. It is undetermined whether sheet piles, H-piles, or a combination of the two will be used for MOF construction; therefore, the USACE estimated potential take based on the larger disturbance zone for Level B harassment (*i.e.,* for sheet pile—9.1 km^2) for the 12-inch H pile Level B harassment zone.

TABLE 8—RADIAL DISTANCES (METERS) TO RELEVANT BEHAVIORAL ISOPLETHS AND ASSOCIATED ENSONIFIED AREAS (SQUARE KILOMETERS (KM^2)) USING THE PRACTICAL SPREADING MODEL

Activity	Received level at 10 m	Level B harassment zone (m)*	Level B harassment zone (km^2)
Vibratory Pile Driving/Removal			
12-inch H piles installation/removal	150 dB SPL	1,000	9.1 (actual calculated zone is 2).
24-inch sheet pile installation/removal	160 dB SPL	4,642	9.1
30-inch pile installation/removal	164 dB SPL	8,577	11.5

Marine Mammal Occurrence and Take Calculation and Estimation

In this section we provide the information about the presence, density, or group dynamics of marine mammals that will inform the take calculations. Potential exposures to vibratory pile driving/removal for each acoustic threshold were estimated using group size estimates and local observational data to create a density estimate. As previously stated, take by Level B harassment only will be considered for this action. Distances to Level A harassment thresholds are relatively small and mitigation is expected to avoid Level A harassment from these activities.

Harbor Seals

Over the last several decades, intermittent and independent surveys of harbor seal haul outs in Coos Bay have been conducted. The most recent aerial survey of haulouts occurred in 2014 by ODFW. Those surveys were conducted during a time when the highest number of animals would be expected to haul out (*i.e.,* the latter portion of the pupping season (May and June) and at low tide). In 2014, 333 seals were observed at Coos Bay haulouts in June (Wright, pers comm., August 27, 2019).

AECOM conducted surveys vessel-based surveys in May/June 2017 and November 2018 from the Highway 101 Bridge to the seaward entrance to the Coos Bay estuary. In 2017, during the line transect surveys, there were an estimated 374 harbor seals counted in 19 groups with a relative density of 6.2 harbor seals/km. In 2018, because of the low number of harbor seals sightings during the line transect effort, reliable statistical estimates of species density could not be accurately calculated. However, for comparison with the May 2017 data, the number of seals observed/km yielded a sighting rate of 0.12 harbor seals/km.

AECOM also conducted three days of aerial (drone) flyovers at the Clam Island and Pigeon Point haulouts to capture aerial imagery during November and December 2018 to determine a fall/winter estimate for harbor seals. This aerial field effort observed a maximum of 167 harbor seals hauled out at Clam Island and 41 harbor seals hauled out at Pigeon Point on any one day. Based on these counts, an estimate of relative density was determined for the study area and ranged from 8.5–11.1 harbor seals/km^2. Because the pile driving and removal for the MOF will likely occur over the winter season and to be conservative, USACE used the maximum density of 11.1 harbor seals/km^2 to calculate take.

The estimated take for each IHA was calculated using this density multiplied by the area ensonified above the threshold (9.1 km^2 for sheet piles and 11.5 km^2 for 30-in piles) multiplied by the number of days per activity (*e.g.,* 7 days of vibratory pile driving per pile type for a total of 14 days of pile driving activity each year). Therefore, a total of 1,601 instances of take by Level B harassment are proposed for harbor seals in both Year 1 for installation and in Year 2 for removal (Table 9). Because the Level A harassment zones are relatively small (21.7 m at the largest for pile driving/removal of 30-in piles), and activities will occur over a small number of days, we believe the Protected Species Observer (PSO) will be able to effectively monitor the Level A harassment zones and we do not anticipate take by Level A harassment of harbor seals.

California Sea Lions and Steller Sea Lions

No data are available to calculate density estimates California sea lion and Steller sea lions; therefore, USACE considers likely occurrences in estimating take for California sea lions and Steller sea lions. As described in the *Description of Marine Mammals* section, no haulouts for California sea lions and Steller sea lions exist within Coos Bay where harassment from exposure to pile driving could occur, however, these species do haul out on the beaches adjacent to the entrance to Coos Bay. These animals forage individually and seasonal use of Coos Bay have been observed, primarily in the spring and summer when prey are present. The estimate for daily California sea lion and Steller sea lions abundance (n = 1) was based on recent marine mammal surveys in Coos Bay (AECOM 2017).

For this reason, USACE estimates one California and Steller sea lion may be present each day of pile driving. We multiplied 1 animal by the number of days per activity (*e.g.,* 7 days of vibratory pile driving per pile type). Therefore, a total of 14 instances of take by Level B harassment are proposed for both California sea lions and Steller sea lions in both Year 1 for installation and in Year 2 for removal (Table 9). Because the Level A harassment zones are relatively small (Less than 2 m at the largest for pile driving/removal of 30-in piles), and activities will occur over a small number of days, we believe the PSO will be able to effectively monitor the Level A harassment zones and we do not anticipate take by Level A harassment of California sea lions or Steller sea lions.

Northern Elephant Seals

The abundance estimate for Northern elephant seals was based on the maximum number of seals observed at Cape Arago, a prominent haulout site roughly 6 km south of Coos Bay jetties. Surveys were conducted between 2002 and 2005 (Scordino 2006) and the reference abundance (n = 54) was the maximum count observed. USACE applied a 3.8 percent annual population growth rate (NMFS 2014c) to approximate the relative abundance of elephant seals in 2019 (*i.e.,* n = 91). Lastly, an estimated density of elephant seals was calculated across the project area extended to include Cape Arago (*i.e.,* approximately 30 km^2) as a basis for determining the number of animals that could be present in Level B harassment zones during vibratory pile driving activities. This calculated density is 3.03 Northern elephant seals/km^2. The estimated take was calculated using this density (3.03 animals/km^2) multiplied by the area ensonified above the threshold (9.1 km^2 for sheet piles and 11.5 km^2 for 30-in piles) multiplied by the number of days per activity (*e.g.,* 7 days of vibratory pile driving per pile type). Therefore, a total of 437 instances of take by Level B harassment are proposed for Northern elephant seals in both Year 1 for installation and in Year 2 for removal (Table 9). Because the Level A harassment zones are relatively small (21.7-m isopleth at the largest for pile driving/removal of 30-in piles), and activities will occur over a small number of days, we believe the PSO will be able to effectively monitor the Level A harassment zones and we do not anticipate take by Level A harassment of Northern elephant seals.

Killer Whales

It is not possible to calculate density for killer whales in Coos Bay as they are not present in great abundance; therefore, USACE estimates take based on likely occurrence and considers group size. During migration, the species typically travels singly or as a mother and calf pair. This species has been reported in Coos Bay only a few times in the last decade. The typical group size for transient killer whales is two to four, consisting of a mother and her offspring (Orca Network 2018). Males and young females also may form small groups of around three for hunting purposes (Orca Network 2018). Previous sightings in Coos Bay documented a group of five transient killer whales in May 2007 (as reported by the Seattle Times) and a pair of killer whales were observed during the 2017 May surveys. USACE assumes that a group of two killer whales come into Coos Bay and could enter a Level B harassment zone for one day in each year of pile driving activities. Therefore, a total of two instances of take by Level B harassment are proposed for killer whales in both Year 1 for installation and in Year 2 for removal (Table 9). Because the Level A harassment zones are relatively small (Less than a 4-m isopleth at the largest for pile driving/removal of 30-in piles), and activities will occur over a small number of days, we believe the PSO will be able to effectively monitor the Level A harassment zones and we do not anticipate take by Level A harassment of killer whales.

Harbor Porpoise

It is not possible to calculate density for harbor porpoise in Coos Bay as they are not present in great abundance; therefore, USACE estimates take based on likely occurrence and considers group size. Harbor porpoise are most often seen singly, in pairs, or in groups of up to 10, although there are reports of aggregations of up to 200 harbor porpoises. No harbor porpoises were detected during recent marine mammal surveys within the Coos Bay estuary (AECOM 2017, 2018). However, harbor porpoises were counted during aerial surveys of marine mammals off the coasts of California, Oregon, and Washington. The maximum estimated count of harbor porpoises within approximately 1,700 km^2 of Coos Bay (n = 24 in January 2011) was the basis for estimated abundance (Adams *et al.,* 2014). USACE applied a 4 percent annual population growth rate (NMFS 2013a) to approximate the relative abundance of harbor porpoises in 2019 (*i.e.,* n = 33). Lastly, an estimated density of harbor porpoise was calculated across approximately 1,700 km^2 as a basis for determining the number of animals that could be present in Level B harassment zones during vibratory pile driving activities. This calculated density is 0.019 harbor porpoise/km^2. The estimated take was calculated using this density (0.019 animals/km^2) multiplied by the area ensonified above the threshold (9.1 km^2 for sheet piles and 11.5 km^2 for 30-in piles) multiplied by the number of days per activity (*e.g.,* 7 days of vibratory pile driving per pile type, 14 total days). Therefore, a total of four instances of take by Level B harassment are proposed for harbor porpoise in both Year 1 for installation and in Year 2 for removal (Table 9). Because the Level A harassment zones are relatively small (a 52.8-m isopleth at the largest for pile driving/removal of 30-in piles), and activities will occur over a small number of days, we believe the PSO will be able to effectively monitor the Level A harassment zones and we do not anticipate take by Level A harassment of harbor porpoise.

Gray Whales

It is not possible to calculate density for gray whales in Coos Bay as they are not present in great abundance; therefore, USACE estimates take based on likely occurrence and considers group size. Gray whales are frequently observed traveling alone or in small, unstable groups, although large aggregations may be seen in feeding and breeding grounds. The maximum estimated count of gray whales within approximately 1,700 km^2 of Coos Bay (n = 10) was the basis for estimated abundance (Adams *et al.,* 2014). USACE then applied a 6 percent population growth rate (NOAA 2014b) to derive the current estimated abundance to approximate the relative abundance of gray whales in 2019 (*i.e.,* n = 16). Lastly, an estimated density of gray whales was calculated across approximately 1,700 km² as a basis for determining the number of animals that could be present in Level B harassment zones during vibratory pile driving activities. This calculated density is 0.0094 gray whales/km². The estimated take was calculated using this density (0.0094 animals/km²) multiplied by the area ensonified above the threshold (9.1 km² for sheet piles and 11.5 km² for 30-in piles) multiplied by the number of days per activity (*e.g.,* 7 days of vibratory pile driving per pile type, 14 total days). Therefore, a total of two instances of take by Level B harassment are proposed for gray whales in both Year 1 for installation and in Year 2 for removal (Table 9). Because the Level A harassment zones are relatively small (a 35.7-m isopleth at the largest for pile driving/removal of 30-in piles), and activities will occur over a small number of days, we believe the PSO will be able to effectively monitor the Level A harassment zones and we do not anticipate take by Level A harassment of gray whales.

For both year 1 and year 2, Table 9 below summarizes the proposed estimated take for all the species described above as a percentage of stock abundance.

TABLE 9—PROPOSED ESTIMATED TAKE BY LEVEL B HARASSMENT AND AS A PERCENTAGE OF STOCK ABUNDANCE

Marine mammal	Level B harassment AZ sheets (or H-plies)	Level B harassment 30-inch piles	Level B harassment AZ sheets (or H-plies)	Level B harassment 30-inch piles	Total take by Level B harassment (percent by stock)	Total take by Level B harassment (percent by stock)
	YR–1 installation	YR–1 installation	YR–2 removal	YR–2 removal	YR–1 installation	YR–2 removal
Harbor seal (*Phoca vitulinal*)	707	894	707	894	1,601 (2.3 percent)	1,601 (2.3 percent).
Northern Elephant seal (*Mirounga angustirostris*).	193	244	193	244	437 (0.2 percent)	437 (0.2 percent).
Steller sea lion (*Eumetopias jubatus*).	7	7	7	7	14 (0.02 percent)	14 (0.02 percent).
California sea lion (*Zalophus californianus*).	7	7	7	7	14 (less than 0.001 percent)	14 (less than 0.001 percent).
Gray whale (*Eschrichtius robustus*).	1	1	1	1	2 (less than 0.001 percent)	2 (less than 0.001 percent).
Killer whale (*Orcinus orca*)	2		2		2 (0.5 percent)	2 (0.5 percent).
Harbor porpoise (*Phocoena phocoena*).	2	2	2	2	4 (0.008 percent)	4 (0.008 percent).

Proposed Mitigation

In order to issue an IHA under Section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about 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 and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, we carefully consider two primary factors:

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned), and;

(2) the practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

The following mitigation measures are included in the proposed IHAs:

Timing Restrictions

All work will be conducted during daylight hours. If poor environmental conditions restrict visibility full visibility of the shutdown zone, pile installation would be delayed.

Shutdown Zone for In-Water Heavy Machinery Work

For in-water heavy machinery work other than pile driving, if a marine mammal comes within 10 m of such operations, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions.

Shutdown Zones

For all pile driving/removal activities, the USACE will establish shutdown zones for a marine mammal species that is greater than its corresponding Level A harassment zone. To be conservative, the USACE is proposing to implement one cetacean shutdown zone (55 m) and one pinniped shutdown zone (25 m) during any pile driving/removal activity (*i.e.,* during sheet piles, H-piles, and 30-in steel pile installation and removal) (Table 10) which exceeds the maximum calculated PTS isopleths as described in Table 7. The purpose of a shutdown zone is generally to define an area within which shutdown of the activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area).

TABLE 10—PILE DRIVING SHUTDOWN ZONES DURING PROJECT ACTIVITIES

Activity	Shutdown zones (radial distance in m, area in km²*)				
	Low-frequency cetaceans	Mid-frequency cetaceans	High-frequency cetaceans	Phocid	Otariid
In-Water Construction Activities:					
Heavy machinery work (other than pile driving)	10 (0.00015)	10 (0.00015)	10 (0.00015)	10 (0.00015)	10 (0.00015)
Vibratory Pile Driving/Removal:					
12-in H pile steel installation/removal	55 (0.00475)	55 (0.00475)	55 (0.00475)	25 (0.00098)	25 (0.00098)
24-in sheet pile installation/removal	55 (0.00475)	55 (0.00475)	55 (0.00475)	25 (0.00098)	25 (0.00098)
30-in pile installation/removal	55 (0.00475)	55 (0.00475)	55 (0.00475)	25 (0.00098)	25 (0.00098)

* **Note:** km² were divided by two to account for land.

Non-Authorized Take Prohibited

If a species enters or approaches the Level B harassment zone and that species is either not authorized for take or its authorized takes are met, pile driving and removal activities must shut down immediately using delay and shutdown procedures. Activities must not resume until the animal has been confirmed to have left the area or an observation time period of 15 minutes has elapsed for pinnipeds and small cetaceans and 30 minutes for large whales.

Based on our evaluation of the USACE's proposed measures, NMFS has preliminarily determined that the proposed mitigation measures provide the means effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Proposed Monitoring and Reporting

In order to issue an IHA for an activity, Section 101(a)(5)(D) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the proposed action area. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.,* presence, abundance, distribution, density);
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) Action or environment (*e.g.,* source characterization, propagation, ambient noise); (2) affected species (*e.g.,* life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.,* age, calving or feeding areas);
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors;
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks;
- Effects on marine mammal habitat (*e.g.,* marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat); and
- Mitigation and monitoring effectiveness.

Pre-Activity Monitoring

Prior to the start of daily in-water construction activity, or whenever a break in pile driving of 30 min or longer occurs, PSOs will observe the shutdown and monitoring zones for a period of 30 min. The shutdown zone will be cleared when a marine mammal has not been observed within the zone for that 30-min period. If a marine mammal is observed within the shutdown zone, pile driving activities will not begin until the animal has left the shutdown zone or has not been observed for 15 min. If the Level B Harassment Monitoring Zone has been observed for 30 min and no marine mammals (for which take has not been authorized) are present within the zone, work can continue even if visibility becomes impaired within the Monitoring Zone. When a marine mammal permitted for Level B harassment take has been permitted is present in the Monitoring zone, piling activities may begin and Level B harassment take will be recorded.

Monitoring Zones

The USACE will establish and observe monitoring zones for Level B harassment as presented in Table 8. The monitoring zones for this project are areas where SPLs are equal to or exceed 120 dB rms (for vibratory pile driving/removal). These zones provide utility for monitoring conducted for mitigation purposes (*i.e.,* shutdown zone monitoring) by establishing monitoring protocols for areas adjacent to the shutdown zones. Monitoring of the Level B harassment zones enables observers to be aware of and communicate the presence of marine mammals in the project area, and thus prepare for potential shutdowns of activity. The USACE will also be gathering information to help better understand the impacts of their proposed activities on species and their behavioral responses.

Visual Monitoring

Monitoring would be conducted 30 minutes before, during, and 30 minutes after all pile driving/removal activities. In addition, PSO shall record all incidents of marine mammal occurrence, regardless of distance from activity, and shall document any behavioral reactions in concert with distance from piles being driven/removed. Pile driving/removal activities include the time to install, remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than thirty minutes.

Monitoring will be conducted by PSOs from on land and boat. The number of PSOs will vary from one to three, depending on the type of pile driving, method of pile driving and size of pile, all of which determines the size of the harassment zones. Monitoring locations will be selected to provide an unobstructed view of all water within the shutdown zone and as much of the Level B harassment zone as possible for pile driving activities. During vibratory driving or removal of AZ-sheets or H-piles, two PSOs will be present. One PSO will be located on the shoreline adjacent to the MOF site or on the barge used for driving piles. The other PSO will be boat-based and detect animals in the water, along with monitoring the three haulout sites in the Level B harassment zone *(i.e.,* Pigeon Point, Clam Island/North Spit, and South Slough). During vibratory driving and removal of steel pipe piles (30-in), three PSOs will be present. As indicated above, one PSO will be on the shoreline or barge adjacent to the MOF site. A second PSO will be stationed near the South Slough haul out site, and the third PSO will be boat-based and make observations while actively monitoring at and between the two remaining haulout sites (*i.e.,* Pigeon Point and Clam Island).

In addition, PSOs will work in shifts lasting no longer than 4 hours with at least a 1-hour break between shifts, and will not perform duties as a PSO for more than 12 hours in a 24-hour period (to reduce PSO fatigue).

Monitoring of pile driving shall be conducted by qualified, NMFS-approved PSOs, who shall have no other assigned tasks during monitoring periods. The USACE shall adhere to the following conditions when selecting PSOs:

- Independent PSOs shall be used (*i.e.,* not construction personnel);
- At least one PSO must have prior experience working as a marine mammal observer during construction activities;
- Other PSOs may substitute education (degree in biological science or related field) or training for experience;
- Where a team of three or more PSOs are required, a lead observer or monitoring coordinator shall be designated. The lead observer must have prior experience working as a marine mammal observer during construction; and
- The USACE shall submit PSO CVs for approval by NMFS for all observers prior to monitoring. The USACE shall ensure that the PSOs have the following additional qualifications:
- 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 and ability to conduct field observations and collect data according to assigned protocols;
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior;
- 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; and
- Sufficient training, orientation, or experience with the construction operations to provide for personal safety during observations.

Reporting of Injured or Dead Marine Mammals

In the unanticipated event that the planned activity clearly causes the take of a marine mammal in a manner prohibited by the IHA, such as serious injury, or mortality, the USACE must immediately cease the specified activities and report the incident to the NMFS Office of Protected Resources and the West Coast Region Stranding Coordinator. The report must include the following information:

- Time and date of the incident;
- Description of the incident;
- Environmental conditions (*e.g.,* wind speed and direction, Beaufort sea state, cloud cover, and visibility);
- Description of all marine mammal observations and active sound source use in the 24 hours preceding the incident;
- Species identification or description of the animal(s) involved;
- Fate of the animal(s); and
- Photographs or video footage of the animal(s).

Activities must not resume until NMFS is able to review the circumstances of the prohibited take. NMFS will work with USACE to determine what measures are necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. The USACE may not resume their activities until notified by NMFS.

In the event the USACE discovers an injured or dead marine mammal, and the lead observer determines that the cause of the injury or death is unknown and the death is relatively recent (*e.g.,* in less than a moderate state of decomposition), the USACE must immediately report the incident to the Office of Protected Resources, NMFS, and the West Coast Region Stranding Coordinator, NMFS. The report must include the same information as the bullets described above. Activities may continue while NMFS reviews the circumstances of the incident. NMFS will work with the USACE to determine whether additional mitigation measures or modifications to the activities are appropriate.

In the event that the USACE discovers an injured or dead marine mammal, and the lead observer determines that the injury or death is not associated with or related to the specified activities (*e.g.,* previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), the USACE must report the incident to the Office of Protected Resources, NMFS, and the West Coast Region Stranding Coordinator, NMFS, within 24 hours of the discovery.

Final Report

The USACE shall submit a draft report to NMFS no later than 90 days following the end of construction activities or 60 days prior to the issuance of any subsequent IHA for the project. The USACE shall provide a final report within 30 days following resolution of NMFS' comments on the draft report. Reports shall contain, at minimum, the following:

- Date and time that monitored activity begins and ends for each day conducted (monitoring period);
- Construction activities occurring during each daily observation period, including how many and what type of piles driven;
- Deviation from initial proposal in pile numbers, pile types, average driving times, etc.;
- Weather parameters in each monitoring period (*e.g.,* wind speed, percent cloud cover, visibility);
- Water conditions in each monitoring period (*e.g.,* sea state, tide state);
- For each marine mammal sighting:
  - Species, numbers, and, if possible, sex and age class of marine mammals;

○ Number of individuals of each species (differentiated by month as appropriate) detected within the monitoring zones, and estimates of number of marine mammals taken, by species (a correction factor may be applied to total take numbers, as appropriate);
○ Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;
○ Type of construction activity that was taking place at the time of sighting;
○ Location and distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
○ If shutdown was implemented, behavioral reactions noted and if they occurred before or after shutdown.
▪ Description of implementation of mitigation measures within each monitoring period (*e.g.,* shutdown or delay);
▪ Other human activity in the area within each monitoring period;
▪ A summary of the following:
○ Total number of individuals of each species detected within the Level B Harassment Zone, and estimated as taken if correction factor appropriate;
○ Total number of individuals of each species detected within the Level A Harassment Zone and the average amount of time that they remained in that zone; and
○ Daily average number of individuals of each species (differentiated by month as appropriate) detected within the Level B Harassment Zone, and estimated as taken, if appropriate.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.,* population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be ''taken'' through harassment, NMFS considers other factors, such as the likely nature of any responses (*e.g.,* intensity, duration), the context of any responses (*e.g.,* critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS's implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.,* as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

To avoid repetition, the majority of our analyses applies to all the species listed in Table 9, given that many of the anticipated effects of this project on different marine mammal stocks are expected to be relatively similar in nature. For harbor seals, because there is thought to be a potential resident population and potential repeat takes of individuals, we provide a supplemental analysis independent of the other species for which we propose to authorize take. Also, because both the number and nature of the estimated takes anticipated to occur are identical in years 1 and 2, the analysis below applies to each of the IHAs.

The USACE did not request, and NMFS is not proposing to authorize, take in the form of injury, serious injury, or mortality. The nature of the work precludes the likelihood of serious injury or mortality, and the mitigation is expected to ensure that no Level A harassment occurs. For all species and stocks, any take would occur within a limited, confined area of any given stock's home range (Coos Bay). Take would be limited to Level B harassment only. Exposure to noise resulting in Level B harassment for all species is expected to be temporary and minor due to the general lack of use of Coos Bay by cetaceans and pinnipeds, as explained above. In general, cetacean and non-harbor seal pinnipeds are infrequent visitors with only occasional sightings within Coos Bay. Cetaceans such as transient killer whales may wander into Coos Bay; however, any behavioral harassment occurring during the project is highly unlikely to impact the health or fitness of any individuals, much less effect annual rates of recruitment or survival, given any exposure would be very brief with any harassment potential from the project decreasing to zero once the animals leave the bay. There are no habitat areas of particular importance for cetaceans (*e.g.,* biologically important area, critical habitat, primary foraging or calving habitat) within Coos Bay. Further, the amount of take proposed to be authorized for any given stock is very small when compared to stock abundance, demonstrating that a very small percentage of the stock would be affected at all by the specified activity. Finally, while pile driving could occur year-round, pile driving would be intermittent (not occurring every day) and primarily limited to the MOF site, a very small portion of Coos Bay.

For harbor seals, the impact of harassment on the stock as a whole is negligible given the stocks very large size (70,151 seals). However, we are aware that it is likely a resident population of harbor seals resides year round within Coos Bay. While this has not been scientifically investigated through research strategies such as tagging/mark-recapture techniques, anecdotal evidence suggests some seals call Coos Bay home year-round, as suggested through AECOM's winter surveys. The exact home range of this potential resident population is unknown but harbor seals, in general, tend to have limited home range sizes. Therefore, we can presume that some harbor seals will be repeatedly taken. Repeated, sequential exposure to pile driving noise over a longer duration could result in more severe impacts to individuals that could affect a population; however, the limited number of non-consecutive pile driving days for this project means that these types of impacts are not anticipated. Further, these animals are already exposed, and likely somewhat habituated, to industrial noises such as USACE maintenance dredging, commercial shipping and fishing vessel traffic (Coos Bay contains a major port), and coastal development.

In summary, although this potential small resident population is likely to be taken repeatedly, the impacts of that take are negligible to the stock because the number of repeated days of exposure is small (14 or fewer) and non-consecutive, the affected individuals represent a very small subset of the stock that is already exposed to regular higher levels of anthropogenic stressors, injurious noise levels are not proposed for authorization, and the pile driving/removal would not take place during the pupping season and during a time in which harbor seal density is greatest.

The following factors primarily support our preliminary determination that the impacts resulting from each of these two years of activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival:

▪ No serious injury or mortality is anticipated or authorized;

▪ No Level A harassment is anticipated or authorized;

▪ The number and intensity of anticipated takes by Level B harassment is relatively low for all stocks;

▪ No biologically important areas have been identified for the effected species within Coos Bay;

▪ For all species, including the Oregon/Washington Coastal stock of harbor seals, Coos Bay is a very small part of their range; and

▪ No pile driving would occur during the harbor seal pupping season; therefore, no impacts to pups from this activity is likely to occur.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the proposed monitoring and mitigation measures, NMFS preliminarily finds that the total marine mammal take from each of the two years of proposed activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under Sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

The take of seven marine mammal stocks proposed for authorization comprises no more than 2.3 percent of any stock abundance.

Based on the analysis contained herein of the proposed activity (including the proposed mitigation and monitoring measures) and the anticipated take of marine mammals, for each proposed IHA, NMFS preliminarily finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, for both proposed IHAs, NMFS has preliminarily determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act (ESA)

Section 7(a)(2) of the Endangered Species Act of 1973 (ESA: 16 U.S.C. 1531 *et seq.*) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the issuance of IHAs, NMFS consults internally, in this case with the West Coast Region Protected Resources Division, whenever we propose to authorize take for endangered or threatened species.

No incidental take of ESA-listed marine mammal species is proposed for authorization or expected to result from this activity. Therefore, NMFS has determined that formal consultation under section 7 of the ESA is not required for this action.

Proposed Authorizations

As a result of these preliminary determinations, NMFS proposes to issue two IHAs to USACE for pile driving and removal activities associated with the North Jetty maintenance and repairs project in Coos Bay, Oregon over the course of two non-consecutive years, beginning September 2020 through June 2023, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. Drafts of the proposed IHAs can be found at *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act.*

Request for Public Comments

We request comment on our analyses, the proposed authorization, and any other aspect of this Notice of Proposed IHAs for the proposed pile driving and removal activities associated with the USACE's North Jetty maintenance and repairs project in Coos Bay, Oregon. We also request at this time comment on the potential renewal of these proposed IHAs as described in the paragraph below. Please include with your comments any supporting data or literature citations to help inform decisions on the request for these IHAs or a subsequent Renewal.

On a case-by-case basis, NMFS may issue a one-year IHA renewal with an additional 15 days for public comments when (1) another year of identical or nearly identical activities as described in the Specified Activities section of this notice is planned or (2) the activities as described in the Specified Activities section of this notice would not be completed by the time the IHA expires and a second IHA would allow for completion of the activities beyond that described in the Dates and Duration section of this notice, provided all of the following conditions are met:

• A request for renewal is received no later than 60 days prior to expiration of the current IHA.

• The request for renewal must include the following:

(1) An explanation that the activities to be conducted under the requested Renewal are identical to the activities analyzed under the initial IHA, are a subset of the activities, or include changes so minor (*e.g.,* reduction in pile size) that the changes do not affect the previous analyses, mitigation and monitoring requirements, or take estimates (with the exception of reducing the type or amount of take because only a subset of the initially analyzed activities remain to be completed under the Renewal).

(2) A preliminary monitoring report showing the results of the required monitoring to date and an explanation showing that the monitoring results do not indicate impacts of a scale or nature not previously analyzed or authorized.

• Upon review of the request for renewal, the status of the affected species or stocks, and any other pertinent information, NMFS determines that there are no more than minor changes in the activities, the mitigation and monitoring measures will remain the same and appropriate, and the findings in the initial IHA remain valid.

Dated: October 17, 2019.

Donna S. Wieting,

Director, Office of Protected Resources, National Marine Fisheries Service.

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DEPARTMENT OF COMMERCE

Patent and Trademark Office

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Updated Legal Framework for Patent Electronic System

AGENCY: United States Patent and Trademark Office, Department of Commerce.