DEPARTMENT OF COMMERCE

International Trade Administration

[A–588–854]

Certain Tin Mill Products From Japan: Rescission of Antidumping Duty Administrative Review; 2018–2019

AGENCY: Enforcement and Compliance, International Trade Administration, Department of Commerce.

SUMMARY: The Department of Commerce (Commerce) is rescinding the administrative review of the antidumping duty order on certain tin mill products (tin mill products) from Japan for the period of August 1, 2018, through July 31, 2019, based on the timely withdrawal of the request for review.

DATES: Applicable November 18, 2019.

FOR FURTHER INFORMATION CONTACT: Olatunbosun Leigh, AD/CVD Operations, Office VI, Enforcement and Compliance, International Trade Administration, U.S. Department of Commerce, 1401 Constitution Avenue NW, Washington, DC 20230; telephone: (202) 482–0506.

SUPPLEMENTARY INFORMATION:

Background

On August 2, 2019, Commerce published in the **Federal Register** a notice of opportunity to request an administrative review of the antidumping duty order on tin mill products from Japan for the period August 1, 2018, through July 31, 2019.[1] On August 30, 2019, United States Steel Corporation (U.S. Steel), the petitioner, timely filed a request for review, in accordance with section 751(a) of the Tariff Act of 1930, as amended (the Act), and 19 CFR 351.213(b).[2] Pursuant to this request, and in accordance with section 751(a) of the Act and 19 CFR 351.221(c)(1)(i), we initiated an administrative review of 11 companies.[3] On October 29, 2019, the petitioner timely filed a withdrawal of request for the administrative review with respect to all 11 companies.[4]

Rescission of Review

Pursuant to 19 CFR 351.213(d)(1), the Secretary will rescind an administrative review, in whole or in part, if the party that requested the review withdraws the request within 90 days of the date of publication of the notice of initiation of the requested review. As noted above, the petitioner, the only party to file a request for review, withdrew its request by the 90-day deadline. Accordingly, we are rescinding the administrative review of the antidumping duty order on tin mill Products from Japan for the period August 1, 2018, through July 31, 2019, in its entirety.

Assessment

Commerce will instruct U.S. Customs and Border Protection (CBP) to assess antidumping duties on all appropriate entries of tin mill products from Japan. Antidumping duties shall be assessed at rates equal to the cash deposit of estimated antidumping duties required at the time of entry, or withdrawal from warehouse, for consumption, in accordance with 19 CFR 351.212(c)(1)(i). Commerce intends to issue appropriate assessment instructions to CBP 15 days after the date of publication of this notice in the **Federal Register**.

Notification to Importers

This notice serves as a reminder to importers of their responsibility under 19 CFR 351.402(f)(2) to file a certificate regarding the reimbursement of antidumping duties prior to liquidation of the relevant entries during this review period. Failure to comply with this requirement could result in Commerce's presumption that reimbursement of antidumping duties occurred and the subsequent assessment of doubled antidumping duties.

Notification Regarding Administrative Protective Orders

This notice also serves as a reminder to all parties subject to administrative protective order (APO) of their responsibility concerning the disposition of proprietary information disclosed under APO in accordance with 19 CFR 351.305. Timely written notification of the return/destruction of APO materials or conversion to judicial protective order is hereby requested. Failure to comply with the regulations and terms of an APO is a violation which is subject to sanction.

This notice is issued and published in accordance with sections 751(a)(1) and 777(i)(1) of the Act, and 19 CFR 351.213(d)(4).

Dated: November 12, 2019.

James Maeder,

Deputy Assistant Secretary for Antidumping and Countervailing Duty Operations.

[FR Doc. 2019–24901 Filed 11–15–19; 8:45 am]

BILLING CODE 3510–DS–P

[1] *See Antidumping or Countervailing Duty Order, Finding, or Suspended Investigation; Opportunity to Request Administrative Review,* 84 FR 37834 (August 2, 2019).

[2] *See* Letter from the petitioners, "Tin Mill Products from Japan: Petitioners' Request for 2018/2019 Administrative Review," dated August 30, 2019.

[3] *See Initiation of Antidumping and Countervailing Duty Administrative Reviews,* 84 FR 53411 (October 7, 2019).

[4] *See* Letter from the petitioners, "Tin Mill Products from Japan A–588–854: Withdrawal of Request for Administrative Review," dated October 29, 2019.

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648–XR026]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Jordan Cove Energy Project, Coos Bay, Oregon

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

ACTION: Notice; proposed incidental harassment authorization; request for comments on proposed authorization and possible renewal.

SUMMARY: NMFS has received a request from Jordan Cove Energy Project, LP (JCEP) for authorization to take marine mammals incidental to construction of the Jordan Cove Liquified Natural Gas (LNG) terminal and ancillary projects. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an incidental harassment authorization (IHA) allowing JCEP to incidentally take marine mammals during the specified activities. NMFS is also requesting comments on a possible one-year Renewal 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. This project is being tracked on the Fast Act Permitting Dashboard which can be accessed at *https://www.permits.performance.gov/permitting-projects/jordan-cove-lng-terminal-and-pacific-connector-gas-pipeline.*

DATES: Comments and information must be received no later than December 18, 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.Daly@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: Jaclyn Daly, 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 is 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.

This action is 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 the proposed IHA 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 request.

Summary of Request

On April 23, 2019, NMFS received a request from JCEP for an IHA to take marine mammals incidental to pile driving associated with the Jordan Cove LNG Project, Coos Bay, Oregon. The application was deemed adequate and complete on August 16, 2019. JCEP's request is for the take of a small number of seven species of marine mammals by Level B harassment. Neither JCEP nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate. The IHA, if issued, would be effective from October 1, 2020 through September 30, 2021.

Description of Proposed Activity

Overview

JCEP is proposing to construct an LNG terminal in Coos Bay, install a pipeline, conduct dredging to allow for a broader operational weather window, widen the TransPacific Parkway (TPP) to facilitate construction traffic, and carry out two habitat-related compensatory mitigation projects. A subset of this work would occur under the proposed IHA. Pile driving is the primary means by which marine mammals within Coos Bay may be taken by Level B harassment. Work associated with the project may occur year-round beginning in October 2020; however, impact pile driving is restricted to the in-water work window established to protect salmonids (October 1 to February 15, annually). In-water vibratory pile driving may occur year-round. Pile driving at various locations may occur simultaneously; however, JCEP would only use one hammer at any given site.

Dates and Duration

JCEP currently anticipates that construction for the LNG Terminal would begin in 2020, with a target in-service date in the first half of 2024. JCEP is requesting take that may occur from the pile driving activities in the first year of construction (October 1, 2020 through September 30, 2021). Conformance to the ODFW regulatory in-water work window for dredging and in-water impact driving will be implemented to reduce impacts on listed fish species per other permitting authorities. The in-water work window is the period of October 1 to February 15, and the period outside the in-water work window is February 16 to September 30.

JCEP estimates pile driving may occur over 230 days from October 1, 2020 through September 30, 2021. The majority of this pile driving would be at the water's edge but would result in elevated in-water noise levels. Pile driving may occur from approximately 10 minutes to 5 hours per day depending on the pile driving location and pile driving method. At any given location, only one hammer will be used.

Specific Geographic Region

JCEP would construct the LNG terminal and ancillary projects within Coos Bay, Oregon. Coos Bay is an approximately 55.28 km^2 estuary in Coos County, Oregon, making it the second largest estuary in Oregon, and the sixth largest on the US west coast.

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 approximately 4 m (13 ft) while the shipping channel is approximately 13 m (45 ft) deep. 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. From the entrance, the lower bay runs nine miles northeast then swings to the south after the McCullough Bridge in North Bend and widens into the tide-flat dominated upper bay. The Coos River enters the upper bay near the confluence with Catching Slough, about 27.35 km (17 mi) from the mouth of the estuary.

There are four distinct regions in the Coos estuary—Marine, Bay, Slough and Riverine—each based on distinct physical features and bottom types, salinity gradients, habitats, and dominant species. There are no distinct boundaries between the regions, but each has distinctive features.

The highly energetic Marine region extends from the Coos estuary mouth up to about river mile (RM) 2.5. Although the estuary entrance is protected by jetties, powerful waves nevertheless propagate through the mouth during winter storms. Water quality and salinity are similar to the open ocean in this region, but it is moderated by rain-fed river and stream flow during winter months.

The Bay region, divided into the Lower Bay and the Upper Bay, is characterized by broad, mostly unvegetated (except for intertidal eelgrass beds) tidal flats exposed at low tide and flooded by brackish water during higher tides. Tidal flats range from sandy to muddy throughout the bay, depending on currents and circulation. Sand may be either terrestrial (erosional) or carried into the lower bay from nearby ocean sources.

The Lower Bay region begins above RM 2.5 and extends to about the railroad bridge at RM 9. Water salinity in this region is slightly fresher than in the ocean, whose influence gradually diminishes throughout this zone as the distance from the ocean increases.

The Upper Bay begins at the railroad bridge (RM 9) and extends to the southeastern corner of Bull Island at RM 17. Although the shoreline has been drastically altered over the past 150 years, the upper bay still includes extensive tidal flats, many acres of which are used for commercial oyster cultivation. The shipping channel runs along the western shore of the upper bay to access the shipping terminals located along the developed shorelines of the cities of North Bend and Coos Bay.

The Coos Bay Federal Navigation Channel (FNC) is included in the Coos Bay Estuary Management Plan (CBEMP) and is zoned Deep-Draft Navigation Channel which is routinely dredged to an average depth of 11.5 m (38 ft)(MLLW) and width of 300 m (984 ft). The FNC is bounded by the North Spit on the west and north, and the mainland to the south and east. Along the mainland bounding the FNC are the communities of Charleston and Barview, and the cities of Coos Bay and North Bend. The Coos Bay FNC extends from the mouth of Coos Bay to the city of Coos Bay docks at about Channel Mile (CM) 15.1.

The peninsula within Coos Bay is heavily developed with concentrated urbanization and industrialization areas. A critical airport is located across from the proposed LNG terminal. Timber and fishing are the foundation of the county's economy and the Port of Coos Bay is one of the largest forest products shipper in the world. Some of the more commonly abundant fish include Pacific herring (*Clupea pallasii*), and the non-native American shad (*Alosa sapidissima*). Most fish species are migratory or seasonal, spending only part of their life in these waters. Other common seasonal marine fish species include surfperch (family *Embiotocidae*), lingcod (*Ophiodon elongatus*), rock greenling (*Hexagrammos lagocephalus*), sculpin, surf smelt (*Hypomesus pretiosus*), Pacific herring (*Clupea pallasii*), English sole (*Parophrys vetulus*), black rockfish (*Sebastes melanops*), northern anchovy (*Engraulis mordax*), eulachon (*Thaleichthys pacificus*), longfin smelt (*Spirinchus thaleichthys*), Pacific tomcod (*Microgadus proximus*), sandsole (*Psettichthys melanostictus*), and topsmelt (*Atherinops affinis*) (Monaco et. al 1990). Clams, crabs, oysters, and shrimp make up important components of these invertebrates in the bay. Some of the most abundant and commercially important of these species include bentnose clams (*Macoma nasuta*), Pacific oyster (*Crassostrea gigas*), Dungeness crab (*Metacarcinus magister*), and ghost shrimp (*Neotrypaea californiensis*) (Monaco et. al. 1990).

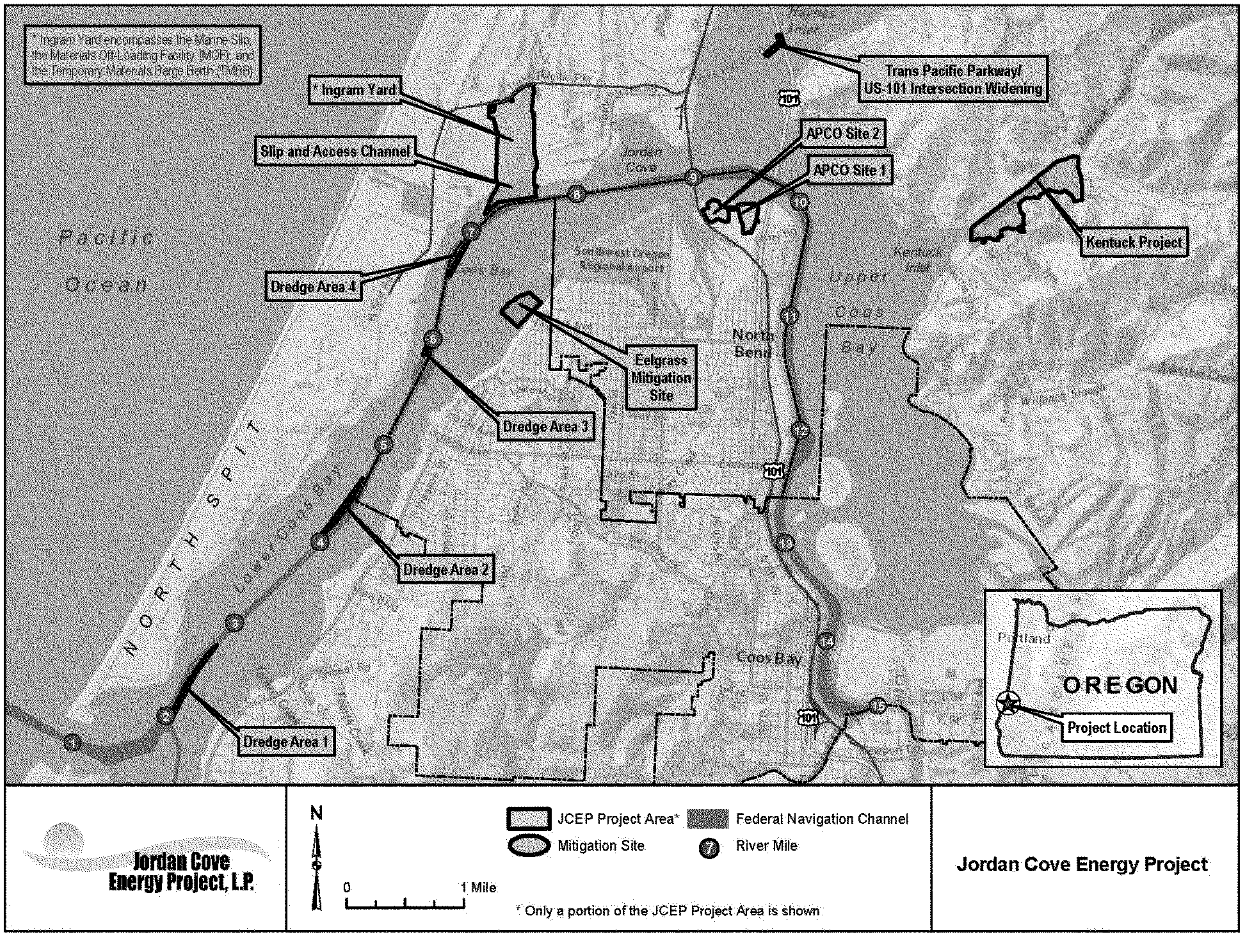

Figure 1. Jordan Cove LNG Terminal Project Area and Location of Ancillary Activities.

Detailed Description of Specific Activity

JCEP is proposing to construct an LNG facility on the bay side of the North Spit of Coos Bay at about Channel Mile (CM) 7.3, along the existing federal navigation channel. The LNG Terminal would be capable of receiving and loading ocean-going LNG carriers, to export LNG to Asian markets, and sized to export 7.8 million metric tons of LNG per annum. The LNG Terminal is located in what is referenced as Ingram Yard in Figure 1 and would include a gas conditioning plant, a utility corridor, liquefaction facilities (including five liquefaction trains), two full-containment LNG storage tanks, and LNG loading facilities. The LNG Terminal also would include a marine slip, access channel, material offloading facility (MOF), and temporary materials barge berth (TMBB), collectively referred to as the Marine Facilities. It is these Marine Facilities which are the focus of JCEP's application as these are within or connected to the waters of Coos Bay where marine mammals may be present.

Marine Slip

The marine slip would include the LNG carrier berth, west lay berth, a tsunami protection wall, a retaining wall, an LNG loading platform, and a tug dock. The new marine slip would be constructed by excavating an existing upland area, keeping an earthen berm on the southern side intact during construction. The marine slip would be separated from the waters of Coos Bay by the earthen berm. The earthen berm would be removed during the last year of construction.

The eastern and western sides of the slip would be formed from sheet pile walls. The sheet piles that would be installed at these locations are designed to be driven ''in the dry,'' to ensure structural integrity. To form these walls, sheet piles would be driven with a vibratory hammer into sandy soils that have been loosened with an auger drill prior to piling. The sheets would be installed in the upland area before excavating the material that eventually would be on the waterside of the sheet pile walls (*i.e.,* ''in the dry''); therefore, noise transmitted directly through water would be eliminated, and noise indirectly reaching the marine environment would be greatly reduced or eliminated. In addition, sheet piles would extend along the southwestern corner, beyond the marine slip. The construction methodology for this area would be similar to the eastern and western walls in the slip (*i.e.,* ''in the dry'' construction). For those piles that would be installed in the dry but near the shoreline (*e.g.,* the sheet piles at the southwestern wall or the MOF face), noise may indirectly propagate into the water.

Material Offloading Facility (MOF)

JCEP would construct a MOF to be used primarily for delivery of large and heavy material and equipment shipments during construction that cannot be transported by rail or road. The MOF would cover about 3 acres on the southeastern side of the slip, and vessels calling at the MOF also would use the access channel for navigation and berthing (Figure 1–2). The MOF would be constructed using the same construction methods and sheet pile wall system as the eastern and western sides of the slip (see Section 1.2.1). The top of the MOF would be at elevation 13 feet North American Vertical Datum of 1988 (NAVD88), and the bottom of the exposed wall would be at the access channel elevation (−45 NAVD88 or −45 feet mean lower low water [MLLW]). The MOF would provide approximately 450 linear feet of dock face for the mooring and unloading of a variety of vessel types. Under the proposed IHA, all pile driving would be on sediment but close to the water's edge (within approximately 30 meters of the shoreline but still ''in-the-dry''). Given the potential propagation of sound through the water-laden sediments, these piles have been included in this analysis.

During sheet piling for the marine slip and MOF, soil would first be loosened with an auger prior to installation of the sheet piles. This auguring would be also done in-the-dry but it does not use any percussive force; therefore, it is not expected to generate vibration that may translate into underwater noise in excess of NMFS thresholds in the nearby waters of Coos Bay. In-water geotechnical boring, which is a similar non-percussive drilling method to the proposed auguring, produces sound levels of 145 decibels re: 1 microPascal (dB re:1μPa) or less at 1 meter (Erbe and McPherson 2017). Since this auguring would occur in-the-dry and at 10 meters or more from the water's edge, noise levels in Coos Bay from auguring are expected to be far less than NMFS harassment thresholds and therefore, auguring is not expected to result in harassment of marine mammals and is not discussed further.

To construct the MOF, earthwork equipment would first cut soil from the southern portion of the existing dune. Clean sand would be placed in the adjacent waterway, to create a work platform extending outside the MOF footprint. Riprap or other suitable material would be placed temporarily on the face of the slope, to protect sandy material from tidal erosion. Using the placed fill to position construction equipment, sheet piles would be driven near the edge of Coos Bay, but without direct contact with the marine environment, but close enough that noise may be generated into the water indirectly. Material from the front of the MOF would then be removed to achieve operational depth requirements after the sheet piles have relaxed and locked into place. After the sheet piles have relaxed, a topping-off operation would occur behind the sheet pile wall to approximate elevation +du13 (NAVD88) before concrete and rock are placed on top of the MOF.

A West Berth wall would be construction on the opposite side of the marine slip than the MOF and in a manner identical to the MOF (in-the-dry). The West Berth wall will consist of additional sheet piles installed with a vibratory driver after an auger is used to loosen the soil. Only the southern end of the West Berth wall is included in this analysis as those piles would be near enough to Coos Bay waters to potentially cause harassment to marine mammals (Table 1).

Temporary Materials Barge Berth (TMBB)

The TMBB would be an offloading facility that would be cut from the shoreline area near the western edge entrance to the slip (Figure 1–2 in JCEP's application), to facilitate early construction activities. A section large enough to receive and moor the end of an ocean-going barge would be excavated. Following the excavation work, up to six mooring piles would be installed. Piles would be vibrated in, to the maximum extent possible, and then would be impact-driven to depth if necessary. All piles would be installed within the footprint of the earthen berm and not driven in open water (*i.e.,* in-the-dry). These piles would be removed during the berm excavation to open the slip in Year 2 of the project which is not considered under this IHA.

TABLE 1—PILE DRIVING ASSOCIATED WITH THE LNG TERMINAL DURING THE 2020–2021 CONSTRUCTION SEASON

[Year 1]

Pile driving activity	Pile type	Size	Number of piles	Number of piles driven per day	Driving type	Water condition
TMBB	Pipe	24-in	6	1	Vibratory	In-the-dry.*
MOF	Sheet	N/A	1,869	13	Vibratory	In-the-dry.*
West Berth Southwest Wall	Sheet	N/A	113	13	Vibratory	In-the-dry.*

* Although these piles would not be driven directly in-water, they would be driven in water-laden sediments such that noise could propagate through the sediments into the water column, as modeled by JASCO (see Appendix D of JCEP's application).

Ancillary Activities

JCEP would also conduct ancillary activities to support LNG terminal construction. The purpose of these activities includes supporting infrastructure and dredge disposal. During the effective period of the IHA, pile driving would be required for the widening of the TransPacific Parkway (TPP) and U.S. Highway 101 (US–101) Intersection and at two sites used for dredge disposal. The purpose of the (TPP/US–101) widening work is to provide safe ingress/egress for construction traffic by creating a left-turn lane from TPP onto northbound US–101 and a right-turn lane from US–101 onto TPP. The dredge disposal sites would require a small amount of pile driving to construct the support trestle.

TransPacific Parkway/US–101 Intersection Widening

The TPP/US101 work would occur in the northern part of Coos Bay (Figure 1). Traffic surveys and studies of projected construction traffic have determined that the intersection of US–101 and TPP (Figure 1–1) would need to be improved to accommodate delivery of materials for LNG terminal construction and operation. These improvements would involve widening the TPP on the northern side to provide a left-turn lane onto northbound US–101, a wider turning radius from southbound US–101 onto the TPP, two 12-foot-wide travel lanes, a 14-foot-wide left-turn lane and widened shoulders with guardrails. The road bases of both the TPP and US–101 are causeways comprised of berms with two openings: One at the western end of TPP before it reaches land (approximately 90 meters wide) and one south of TPP along US–101 (approximately 210 meters wide). All the construction work related to the road improvements will be on the inside of the embayment of the road berms with limited connectivity to the rest of the Bay.

Embankment widening on the northern side of the causeway would be supported with a grid of approximately

1,150 untreated timber pilings. No treated timbers would be used. The untreated timber piles would be approximately 30 feet long and 14 inches in diameter at the top. The grid of timber pilings would be capped with a riprap embankment, providing a foundation to widen the roadway to the north. The timber pilings would be driven into the Bay mud using a vibratory and impact hammer within a temporary, outer sheet pile ''work isolation containment system'' (cofferdam). The sheet pile cofferdam would be installed with a vibratory hammer, and the work area would be surrounded by a turbidity curtain.

To create the cofferdam, approximately 311 sheet pile sections would be installed over approximately 11 days of pile-driving. The cofferdam is expected to be in place for approximately 1 year. After construction in the cofferdam is completed, the sheet piles would be cut at the mudline during low tides using a crane on the shoulder of the TPP. Removal of the cofferdam would be done during the Year 2 construction season.

To construct the timber pile grid, the contractor would construct a work access bridge as pile driving progresses parallel to the TPP, on the inside of the bermed road. The work bridge would consist of thirty-six 24-inch piles. The piles would be installed using a combination of vibratory and impact driving. A bubble curtain attenuator (BCA) would be used during impact driving as these piles will be in-water piles and installed during the ODFW in-water work window. The work bridge would be temporary and would be in place for approximately 1 year. Pile removal would be done using vibratory methods or cutting below the mudline during the Year 2 construction season which is not addressed in this IHA.

Dredging

Four permanent dredge areas adjacent to the federal navigation channel (FNC) would be dredged over multiple years to allow for navigation efficiency and reliability for vessel transit under a broader weather window (labeled as Dredge Areas 1 through 4 on Figure 1–1 in JCEP's application). We note the U.S. Army Corps of Engineers (USACE) dredges the federal navigation channel to maintain navigable depths, not JCEP; therefore dredging the FNC is not part of the specified activities.

Each of the dredge areas consists of expanding the depth immediately adjacent to an existing channel turn or bend. The access channel is maintained by the U.S. Army Corps of Engineers (USACE); maintenance dredging by the USACE is not part of the specified activity. The following dredging work has been identified by JCEP as part of the proposed project.

JCEP would dredge approximately 372,900 cubic yards (CY) of material, of which the majority is very soft sandstone or siltstone and the rest is sand, from four locations in Coos Bay (Dredge Areas 1–4 in Figure 1) over four years, including during the effective period of the proposed IHA. Dredge Area 1—JCEP proposes to widen the Coos Bay channel from the current width of 300 feet to 450 feet, thereby making it easier for all vessels transiting the area to make the turn into the estuary. In addition, the total corner cutoff on the Coos Bay Range side would be lengthened from the current 850 feet to about 1,400 feet from the turn's apex. Dredge Area 2—the current corner cutoff distance from the apex of this turn is about 500 feet, making it difficult for vessels to begin turning sufficiently early to be able to make the turn and be properly positioned in the center of the next channel range. JCEP proposes to widen the turn area from the Coos Bay Range to the Empire Range from the current width of 400 feet to 600 feet at the apex of the turn and lengthen the total corner cutoff area from the current 1,000 feet to about 3,500 feet. Dredge Area 3—JCEP proposes to add a corner cut on the west side in this area that would be about 1,150 feet, thereby providing additional room for vessels to make this turn. Dredge Area 4—JCEP proposes to widen the turn area here from the current 500 feet to 600 feet at the apex of the turn and lengthen the total corner cutoff area of the turn from the current 1,125 feet to about 1,750 feet, thereby allowing vessels to begin their turn in this area earlier.

Two methods of dredging are identified as the most practical, given the historical dredging practices in the region, the material types being dredged, and the location and condition of the placement sites. The primary method utilized will be hydraulic cutter suction dredging, but mechanical dredging via clamshell or excavator is also likely to be used to a limited extent.

JCEP has not requested, and NMFS does not propose to issue, take from the proposed dredging. NMFS has elected to include some mitigation to prevent physical injury or entrapment from dredging (see Proposed Mitigation section); however, marine mammals would unlikely be taken, by harassment, by dredging. Cetaceans are rare in Coos Bay and the only pinniped with common occurrence are harbor seals. USACE channel maintenance dredging is a common occurrence in Coos Bay and seals are likely habituated to this activity. Further, any dredging by JCEP would occur at least 500 m from any harbor seal haul-out, and dredging would not occur during the harbor seal pupping season. As such, dredging is not discussed further in this notice other than in the *Proposed Mitigation* section.

APCO 1 and APCO 2 Sites—Dredged Material Disposal Site Preparation

A primary location for disposal of dredged material from the NRIs would be at two APCO sites (APCO Site 1 and APCO Site 2, collectively referred to as the APCO sites) east of the Southwest Oregon Regional Airport (Figure 1). Management of dredge material at the APCO sites would require construction of a single-lane permanent bridge, and a temporary bridge would be needed to construct the permanent bridge (see Figure 1–5 in JCEP's application). The temporary work bridge would be approximately 30 feet wide and 280 feet long, begin and end on dry land, and would require installation of twelve 24-inch-diameter steel piles below the highest measured tide (HMT) boundary. These would be in-water piles and would be installed during the ODFW in-water work window (October 1–February 15). Steel piles would be driven with a vibratory hammer and may be tested with impact pile drivers to determine whether they have been set properly. If impact driving is necessary for installation due to substrate conditions, a BCA would be used. The temporary work bridge would be in place for less than 24 months and would be removed using vibratory methods. The permanent bridge would be 200 feet long and nearly 40.5 feet wide, would span the tidal mudflat, and would provide access to and from the disposal sites. Because the permanent bridge would span the tidal mudflat, no in-water pile driving would be required for its construction.

If dredged material is offloaded from a barge/scow, a temporary dredge offload facility would need to be constructed, to hydraulically transfer dredge material. Approximately 16 temporary in-water piles and/or spuds that would be 24 inches in diameter would be used to moor the facility and barges. Additionally, the Temporary Dredge Transfer Line will need to be placed across an eelgrass bed at the APCO sites to minimize impacts, so a support cradle for the Temporary Dredge Transfer Line will be needed which will require five 24-inch temporary piles. These five piles would be installed with a vibratory hammer during the in-water work window.

Table 2 summarizes the pile driving associated with the ancillary activities. Only the installation of piles associated with the TPP/US–101 widening and APCO Sites 1 and 2 would occur during the effective period of the IHA. All piles would be driven in the water except for the timber piles at the TPP/US–101, which would be driven behind a partially dewatered cofferdam. All impact driving of pipe piles would be done within a bubble curtain and driven during the ODFW in-water work window.

TABLE 2—PILE DRIVING ASSOCIATED WITH ANCILLARY ACTIVITIES

[TPP/US1010 Widening and APCO Sites 1 and 2]

Ancillary activity	Pile type	Size	Number of piles	Piles driven per day	Driving type
TPP/US–101 Widening:					
Roadway Grid	Timber	14-inch	1,150	20	Impact and vibratory.
Cofferdam	Sheet	NA	311	20	Vibratory.
Work Access Bridge.	Pipe	24-inch	36	4	Vibratory and Impact.
APCO 1 and APCO 2 Sites					
Temporary Work Bridge.	Pipe	24-inch	12	4	Vibratory.
Dredge Line Support Cradle.	Pipe	24-inch	5	4	Vibratory.
Dredge Offloading Area.	Pipe	24-inch	16	4	Vibratory.

Table 3 summarizes all pile installation work associated with the terminal and ancillary activities. At any given site, only one hammer would be operating although pile driving may be simultaneously occurring at multiple sites.

TABLE 3—TOTAL PILES ASSOCIATED WITH THE JORDAN COVE LNG TERMINAL AND ANCILLARY ACTIVITIES

Method	Pile type	In-the-dry vs in-water vs behind cofferdam?	Total piles	Location	Driving days [a]	Duration driving per day (min)
LNG Terminal						
Vibratory	Sheet Pile	In-the-dry	1,246	MOF (outside in water work window).	97	309
Vibratory	Sheet Pile	In-the-dry	623	MOF (inside in water work window).	48	309
Vibratory	Sheet Pile	In-the-dry	113	W. berth wall, 2.5% nearest berm (outside in water work window).	8.5	329
Vibratory	Pipe Pile	In-the-dry	6	TMBB mooring pile (inside in water work window).	10	9
Ancillary Activities (all would occur inside in-water work window)						
Impact	Timber	Behind cofferdam	1,150	TPP/US–101 intersection	60	50
Vibratory					60	100
Vibratory	Sheet Pile	In-water	311	TPP/US–101 intersection	16	100
Impact	Pipe Pile	In-water with BCA (for impact driving).	36	TPP/US–101 intersection	9	20
Vibratory					9	80
Vibratory	Pipe Pile	In-water	33	APCO sites	9	30

a. May occur concurrently with other pile-driving activities but only one pile hammer would be operating in any given area.
TPP/US–101—TransPacific Parkway/U.S. Highway 101.
MOF—Material Offloading Facility.
TMBB—Temporary Material Barge Berth.
LNG Terminal—Liquid Natural Gas Terminal.
BCA—Bubble Curtain Attenuation or equivalent.

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

Description of Marine Mammals in the Area of Specified Activities

Systematic marine mammal surveys in Coos Bay are limited; therefore, JCEP conducted seasonal multi-day surveys in support of the IHA application and relied on Oregon Department of Fish and Wildlife (ODFW) aerial surveys as well as anecdotal reports (*e.g.,* media reports) to better understand marine mammal presence in Coos Bay. Based on these data, 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 4 lists all species with expected potential for occurrence in Coos Bay and summarizes information related to the population or stock, including regulatory status under the MMPA and ESA and potential biological removal (PBR) values, 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 Marine Mammal Stock Assessments 2018 (*e.g.,* Carretta *et al.,* 2019). All values presented in Table 4 are the most recent available at the time of publication and are available in the most recent SARs.

TABLE 4—MARINE MAMMAL SPECIES POTENTIALLY PRESENT WITHIN COOS BAY DURING LNG TERMINAL CONSTRUCTION

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 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	521 (-, 243, 2012)	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 seal	*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		41638 (-, 41,638, 2015)	498	247
California sea lion	*Zalophus californianus*	U.S	N, N	257,606 (n/a, 233,515, 2014)	14,011	≥321
Family Phocidae (earless seals):						
Pacific harbor seal	*Phoca vitulina*	Oregon/Washington Coastal	N, N	24,732 (unk, -, 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; N_{min} is the minimum estimate of stock abundance. In some cases, CV is not applicable [explain if this is the case]

[3] These values, found in NMFS's 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% 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 our analysis, we apply the previous abundance estimate (24,732) which accounts for animals in water during aerial surveys.

As described below, all 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 (*e.g.,* Lang 2010; Mate *et al.* 2011; Weller *et al.* 2012; Urbán *et al.* 2013, Mate *et al.* 2015). WNP gray whales are not expected to enter Coos Bay and therefore will not be discussed further.

From 2009 to 2013, researcher 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 undertake annual migrations from northern feeding waters, primarily in the Bering, Chukchi, and western Beaufort seas during the summer, before heading south to breeding and calving grounds off Mexico over the winter. Between December and January, late-stage pregnant females, adult males, and immature females and males migrate southward. The northward migration occurs in two stages between February and late May. The first group, consisting of adult males and immature females, moves north in this stage, while females with calves spend more time in southern waters and travel north later (Calambokidis et al. 2014).

Gray whales enter larger bays such as San Francisco Bay during their northward and southward migration. Although Coos Bay is not a common stopping point, the Corvallis Gazette-Times (2000) reported that a gray whale (*Eschrichtius robustus*) entered Coos Bay and traveled 15 miles from the mouth into the estuary in June 2000. Furthermore, a local television station (KCBY, North Bend) reported a gray whale occurrence in Coos Bay in November 2009, although this has not been verified. The November 2009 observation likely occurred during the gray whale's southbound migration, while the observation in June 2000 probably was during the northbound migration, both of which occur in near-shore waters off the coast of Oregon.

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 30, 2019, 121 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 (Caretta *et. al.,* 2019).

Gray whales belonging to the ENP stock are not listed as endangered or threatened under the ESA nor designated as depleted or strategic under the MMPA. The stock is within its OSP range. Punt and Wade (2012) estimated the ENP population was at 85 percent of carrying capacity (K) and at 129 percent of the maximum net productivity level (MNPL), with a probability of 0.884 that the population is above MNPL and therefore within the range of its optimum sustainable population (OSP). In 2018, the IWC approved a 7-year quota (2019–2025) of 980 gray whales landed, with an annual cap of 140, for Russian and U.S. (Makah Indian Tribe) aboriginals based on the joint request and needs statements submitted by the U.S. and the Russian Federation. The U.S. and the Russian Federation have agreed that the quota will be shared with an average annual harvest of 135 whales by the Russian Chukotka people and 5 whales by the Makah Indian Tribe. Total takes by the Russian hunt during the past five years were: 143 in 2012, 127 in 2013, 124 in 2014, 125 in 2015, and 120 in 2016 (IWC). There were no whales taken by the Makah Indian Tribe during that period because their hunt request is still under review. Other sources of mortality and serious injury include commercial fishery interaction, ingestion of marine debris, and nearshore industrialization and shipping congestion throughout gray whale migratory corridors leading to increased exposure to pollutants and ship strikes, as well as a general habitat degradation. In addition, the Arctic climate which include part of this stock's range is changing significantly, resulting in a reductions in sea ice cover that are likely to affect gray whale populations (Johannessen *et al.* 2004, Comiso *et al.* 2008).

Killer Whales

Killer whales are found throughout the North Pacific. Along the west coast of North America, killer whales occur along the entire Alaskan coast (Braham and Dahlheim 1982), in British Columbia and Washington inland waterways (Bigg et al. 1990), and along the outer coasts of Washington, Oregon, and California (Green et al. 1992; Barlow 1995, 1997; Forney et al. 1995). Seasonal and year-round occurrence has been noted for killer whales throughout Alaska (Braham and Dahlheim 1982) and in the intracoastal waterways of British Columbia and Washington State, where whales have been labeled as 'resident,' 'transient,' and 'offshore' type killer whales (Bigg *et al.,* 1990) based on aspects of morphology, ecology, genetics, and behavior. Within the transient ecotype, association data (Ford et al. 1994, Ford and Ellis 1999, Matkin et al. 1999), acoustic data (Saulitis 1993, Ford and Ellis 1999) and genetic data (*e.g.,* Hoelzel et al. 1998) confirm that at least three communities of transient whales exist and represent three discrete populations: (1) Gulf of Alaska, Aleutian Islands, and Bering Sea transients, (2) AT1 transients, and (3) West Coast transients. For purposes of this analysis, we limit our assessment to West Coast transients based on project location.

Killer whales belonging to the transient stock have been documented as occurring in Coos Bay. In May 2017, a pair of killer whales was observed feeding on what was concluded to be a seal (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. No killer whales were observed during AECOM's November/December 2018 surveys.

Killer whales are not listed as endangered or threatened under the ESA nor designated as depleted or strategic under the MMPA. Primary threats include commercial fishery and vessel interactions. Human-caused mortality has been underestimated, primarily due to a lack of information on Canadian fisheries, and that the minimum abundance estimate is considered conservative (because researchers continue to encounter new whales and provisionally classified whales from western Alaska, southeastern Alaska, and off the coast of California were not included), resulting in a conservative PBR estimate.

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, approximately 230 miles north of the project site. Use of Oregon estuaries by harbor porpoise are not common; especially in Coos Bay, are not common (*e.g.,* Bayer, 1985). No harbor porpoise were observed during the AECOM May 2017, or November/December 2018, vessel-based line transect surveys.

Harbor porpoise in northern California/southern Oregon are not listed as threatened or endangered under the ESA nor as depleted under the MMPA. The northern California portion of this harbor porpoise stock was determined to be within their Optimum Sustainable Population (OSP) level in the mid-1990s (Barlow and Forney, 1994), based on a lack of significant anthropogenic mortality. There are no known habitat issues that are presently of concern for this stock, although harbor porpoise are sensitive to disturbance by anthropogenic sound sources, such as those generated during the installation and operation of marine renewable energy facilities (Teilmann and Carstensen, 2012). The stock is not known to exceed 10 percent of the calculated PBR (15.1) and, therefore, can be considered to be insignificant and approaching zero mortality and serious injury rate (Carretta *et al.,* 2015).

Northern Elephant Seal

Northern elephant seals belonging to the California breeding stock 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 Año Nuevo State Reserve. Cape Arago State Park, just south of the entrance to Coos Bay, is the only spot where northern elephant seals haul-out 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 (Figure 4–2 in JCEP's application). 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.

Northern elephant seals are not listed as endangered or threatened under the ESA nor designated as depleted under the MMPA. Because their annual human-caused mortality (≥8.8) is much less than the calculated PBR for this stock (4,882), northern elephant seals are not considered a ''strategic'' stock under the MMPA. Threats to Northern elephant seals include commercial and recreational fisheries, marine debris entanglement, direct intentional mortality and injury (*e.g.,* shootings), power plant entrainment; and oil/tar exposure (Carretta *et al.* 2014b). The population continues to grow, with most births occurring at southern California rookeries (Lowry et al. 2014). There are no known habitat issues that are of concern for this stock.

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). California sea lions are dark brown with broad fore flippers and a long, narrow snout. 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).

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 Arago, Coos County; and Rouge Reef and Orford Reef in Curry County.

The California sea lions 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).

California sea lions are not listed as endangered or threatened under the ESA nor designated as depleted under the MMPA Threats to this species include incidental catch and entanglement in fishing gear, such as gillnets; biotoxins, as a result of harmful algal blooms; intentional mortality (*e.g.,* gunshot wounds and other human-caused injuries), as California sea lions are sometimes viewed as a nuisance by commercial fishermen (NOAA 2016). Between 2013 to 2016, NMFS declared a UME for California sea lions in southern California. The likely cause was a change in the availability of sea lion prey, especially sardines, a high value food source for nursing mothers, is a likely contributor to the large number of strandings. Sardine spawning grounds shifted further offshore in 2012 and 2013, and while other prey were available (market squid and rockfish), these may not have provided adequate nutrition in the milk of sea lion mothers supporting pups, or for newly-weaned pups foraging on their own.

During the four-day 2017, May AECOM surveys, two California sea lions were observed while on-effort during the vessel-based line transect surveys while eight animals were observed off-effort. No California sea lions were observed during the three-day November/December 2018, surveys.

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 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 Optimum Sustainable Population (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. Steller sea lions may occasionally enter Coos Bay; however, no long term residency patterns have been observed.

Threats to Steller sea lions include boat/ship strikes, contaminants/pollutants, habitat degradation, illegal hunting/shooting, offshore oil and gas exploration, and interactions (direct and indirect) with fisheries (Muto *et al.,* 2017).

During the four-day May 2017, AECOM surveys, a single Steller sea lion was observed while off-effort during the vessel-based line transect surveys. No Steller sea lions were observed during the three-day November/December 2018, surveys.

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 Pacific 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. Females are mature at around age 4 and give birth to one pup each year. In Oregon, pups are born in late March through April. Nursing pups remain with their mothers for 4 to 6 weeks and are then weaned to forage and survive on their own. Pups are precocious at birth, capable of swimming and following their mothers into the water immediately after birth. Females leave their pups at haul-outs or along sandy beaches while searching for food.

Within Coos Bay, four harbor seal haul-out sites have been identified by ODFW; 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 (see Figure 4–1 in JCEP's application). The Clam Island and Pigeon Point haul-outs flank each side of the FNC. The Pigeon Point haulout is inundated at high tide but Clam Island and Coos Port are not; these haulouts are available at those locations during high tides. The closest haul-out to the LNG Terminal is the northern end of Clam Island, an estimated three miles from the project site. Some of the ancillary features are closer, such as the NRIs, which are about 0.5 to 1 mile from Clam Island. South Slough is well south of any activities involved with the project.

Harbor seals generally forage within close proximity to their haul-outs. 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 haul-out (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).

It is suspected the ''resident'' population of 300–400 harbor seals use Coos Bay year-round with habitat use including breeding, pupping, and foraging. The most recent haul-out counts were conducted by ODFW in May and June 2014 (Table 5). 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. To account for animals in water and not counted in the survey, we applied a 1.53 correction factor to the total June count, as described in Huber et al. (2001) and was done by ODFW to estimate total number of seals along the Oregon and Washington Coast based on 2014 aerial haulout surveys (see *http://geo.maps.arcgis.com/apps/MapJournal/index.html?appid=1899a537f0a046499312b988df7ed405*). This yields a June Coos Bay harbor seal abundance of 509 (333 seals × 1.53).

TABLE 5—HARBOR SEAL COUNTS FROM AERIAL SURVEY DATA—ODFW MAY AND JUNE 2014

Haul-out site	May 22, 2014		June 5, 2014	
	Total	Pups	Total	Pups
Clam Island	287	87	214	40
Coos Port	48	7	75	14
Pigeon Point	17	6	0	0
South Slough	n/a (fog)	n/a (fog)	44	8
Coos Bay Total	352	100	333	62
Coos Bay Total (with correction factor)	539	n/a	509	n/a

JCEP also sponsored marine mammal presence and abundance data collection throughout Coos Bay in 2017 and 2018. Appendix A of JCEP's application contains the field reports from those efforts. 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 300 observations of harbor seals were recorded in the estuary over the four days of survey. AECOM conducted additional surveys during November and December 2018 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 haul-outs at any one time. ODFW indicates it is likely many harbor seals are year-round residents in Coos Bay and rely on these waters for all life stages and behaviors including, by not limited to, breeding, pupping, and foraging.

Harbor seals are not listed as endangered or threatened under the ESA nor designated as depleted under the MMPA. Current threats include commercial fisheries, research fisheries, gillnet tribal fishery, direct mortality (*e.g.,* shootings), and ship strike. The stock was previously reported to be within its Optimum Sustainable Population (OSP) range (Jeffries et al. 2003, Brown et al. 2005), but in the absence of recent abundance estimates, this stock's status relative to OSP is unknown.

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 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 6.

TABLE 6—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 4. Of the cetacean species that may be present, one is classified as low-frequency cetaceans (*i.e.,* all mysticete species), one is classified as mid-frequency cetaceans (*i.e.,* all delphinid and ziphiid species and the sperm whale), and one is classified as high-frequency cetaceans (*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 Sources

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 represented by 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.

As described in Jasco (2019), during impact pile driving, acoustic energy is created upon impact and travels through the water along different paths. These paths are (1) from the top of the pile where the hammer hits, through the air, into the water; (2) from the top of the pile, down the pile, radiating directly in the pile from the length of pile below the waterline; (3) from the top of the pile, down the pile, radiating directly into the water from the length of pile below the waterline, and (4) down the pile radiating into the ground, travelling through the ground, radiating back into the water. Farther away from the pile, ground-borne energy prevails although it is greatly suppressed. Vibratory hammers sit on top of the pile and, using counter-rotating eccentric weights, drives the pile into the ground without striking it. Therefore, noise pathways from vibratory driving do not include number 1 above. Horizontal vibrations are cancelled out while vertical vibrations are transmitted into the pile. In general, sound increases with pile size (diameter and wall thickness), hammer energy, and ground hardness.

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. 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.

Underwater ambient sound in Coos Bay is comprised of sounds produced by a number of natural and anthropogenic sources and varies both geographically and temporally. Human-generated sound is a significant contributor to the ambient acoustic environment in Coos Bay. During AECOM's 2017 and 2018 marine mammal line transect surveys, they also collected acoustic data to identify background sound levels in Coos Bay. Understanding the acoustic habitat of the Bay is important for identifying the potential severity of impact of the proposed acoustic stressor (in this case pile driving) on marine mammals. Twenty acoustic recordings were made between May 4–10, 2017. Background noise levels ranged from 109.6–169.7 dB rms with a median of 124.7 dB rms (Appendix A of JCEP's application). The highest level (169.7 dB rms) was recorded during active loading of a container vessel at the Roseburg Forest Products Chip Terminal on 4 May 2017 in Jordan Cove. The lowest ambient noise levels were recorded on 4 May 2017, also near Jordan Cove, with a calculated rms noise level of 109.6 dB re 1µPa. Eighteen acoustic recordings were made between November 26–28, 2018, during the line transect field survey. The ambient noise levels ranged from 84.7–134.9 rms dB re 1µPa with a median of 120.5 rms dB, with the highest levels recorded on 28 November 2018 in the Lower Estuary (Appendix A of JCEP's application).

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).

Potential Effects of Underwater Sound—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 anthropogenic 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 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. 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 and therefore are not likely to occur.

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, 2018). The amount of TS is customarily expressed in dB (ANSI 1995, Yost 2007). A TS can be permanent (PTS) or temporary (TTS). As described in NMFS (2018), 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).

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 sensitivity, state of maturity, experience with the same or similar stressors, 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.,* signal properties, whether it is moving or stationary, number of sources, distance from the source). Please see Appendices B–C of Southall *et al.* (2007) for a review of studies involving marine mammal behavioral responses to sound.

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. As described above, the background noise levels in Coos Bay are typically around 120 dB rms; therefore, harbor seals would likely be more habituated to elevated noise levels.

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; 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.,* 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.

The frequency range of the potentially masking sound is important in determining any potential 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 JCEP's Activity—As described previously (see "Description of Active Acoustic Sound

Sources''), JCEP proposes to conduct pile driving, including impact and vibratory driving, in Coos Bay. Both vibratory and impact pile driving near the water's edge (in the dry) may occur year round; however, in-water impact pile driving would only occur during the ODFW in-water work window (October 1–February 15). 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.

With both types of pile driving, 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 or respirations 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 biological significance of many of these behavioral disturbances is difficult to predict, especially if the detected disturbances appear minor. However, 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 effects on growth, survival, or reproduction, such as drastic changes in diving/surfacing patterns or significant habitat abandonment are extremely unlikely in this area. 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). However, some of the harbor seals in Coos Bay have likely become habituated to anthropogenic noises in the developed Bay area. As described above, the background noise conditions of the Bay are already elevated (with median levels at or above NMFS Level B harassment thresholds) and harbor seals are likely habituated to these noise levels. Further, if other activities such as active loading of a container vessel at the Roseburg Forest Products Chip Terminal, those activities may mask pile driving noises to some degree.

Whether impact or vibratory driving, sound sources 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 and impact pile driving, and which have already been taken into account in the exposure analysis.

Anticipated Effects on Marine Mammal Habitat

The proposed activities would result in permanent effects to a very small portion of Coos Bay used by marine mammals, primarily the area of the proposed LNG Terminal. The TPP/US–101 site would be permanently widened; however, this northern area is less commonly used by marine mammals than other parts of the bay and all impacts would occur inside the existing berm which acts as the roadway

Temporary impacts include increased noise levels during pile driving, resulting in impacts tothe acoustic habitat, but meaningful impacts are unlikely. There are no known foraging hotspots (although harbor seals likely primarily forage within the bay in general), or other ocean bottom structures of significant biological importance to marine mammals present in the marine waters in the vicinity of the project area. For harbor seals resident to Coos Bay, their daily acoustic habitat would have elevated noise levels during pile driving; however, these noise levels would likely be only a minor increase when considering anthropogenic sources in Coos Bay and would only occur when pile driving is occurring. The most severe noise levels from impact pile driving would not occur during time of sensitive biological importance such as the pupping season.

Impacts to the water column and substrates during pile driving and dredging are anticipated, but these would be limited to minor, temporary suspension of sediments leading to increased turbidity in the immediate area of pile driving and dredging. This increased turbidity could impair visibility during foraging; however, is not expected to have any effects on individual marine mammals because, as described above, these activities would not occur near any critical foraging hotspots.

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). 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 in-water impact pile driving work window is designed to reduce impacts to marine mammal prey such as salmonids; therefore, any effects on prey are also expected to be minor.

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. It is also not expected that the industrial environment of the Naval installations provides important fish habitat or harbors significant amounts of forage fish.

For transient killer whales, impacts to their prey (*e.g.,* harbor seals) is not anticipated to be affected as seals are not expected to abandon the Coos Bay and therefore would remain available to killer whales. Further, killer whales do not forage on harbor seals in any great numbers in Coos Bay as transient killer whales are not common to Coos Bay.

As described in the preceding, the potential for pile driving or dredging 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 this IHA, which will inform both NMFS' consideration of ''small numbers'' and the negligible impact determination.

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).

Authorized takes would be by Level B harassment only, in the form of disruption of behavioral patterns for individual marine mammals resulting from exposure to pile driving. Based on the nature of the activity and the anticipated effectiveness of the mitigation measures (*e.g.,* shutdown zone measures) discussed in detail below in Proposed Mitigation section, Level A harassment is neither anticipated nor proposed to be authorized.

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 estimate.

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 for non-explosive sources—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.,* seismic airguns) or intermittent (*e.g.,* scientific sonar) sources.

JCEP's proposed activity includes the use of continuous, non-impulsive (vibratory pile driving) and intermittent, impulsive (impact pile driving) sources, and therefore the 120 and 160 dB re 1 μPa (rms), respectively, are applicable.

Level A harassment for non-explosive sources—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 from two different types of sources (impulsive or non-impulsive).

These thresholds are provided in Table 7 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-technical-guidance.*

TABLE 7—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.

JCEP investigated potential source levels associated with their proposed pile driving activities. For piles driven in-water, JCEP used data from Caltrans (2015) to estimate source levels and in consideration of use of bubble curtains (required per ODFW regulations) and derive estimated distances to the appropriate NMFS Level B harassment isopleth (160 dB for impact driving, 120 dB for vibratory driving) using a practical (15logR) spreading model (Table 8).

TABLE 8—ESTIMATED SOURCE LEVELS FOR PILES DRIVING AND CORRESPONDING LEVEL B HARASSMENT ISOPLETHS AND AREAS

Pile type/method/location	Source levels at 10 meters (dB)			160/120 dB RMS threshold (Level B harassment)	
	Peak	RMS	SEL	Distance to Level B threshold (m) [2]	Area (sq. km) [2]
LNG Terminal					
Sheet piles/24-in pipe piles (in-the-dry)	See Appendix D is JCEP's application			1,914	2.49/3.14
Ancillary Activities					
24-inch Pipe Piles at TPP/US–101—Impact with BCA	[1] 196	[1] 183	[1] 170	341	0.136
14-inch Timber Piles at TPP/US–101—Impact within cofferdam.	180	170	160	46	0.002
24-inch Pipe Piles at TPP/US–101, and APCO sites—Vibratory.		165	165	10,000	TPP/US101—1.18. APCO—0.40.
14-inch Timber Piles at TPP/US–101—Vibratory		162	162	6,310	1.18
Sheet Piles at TPP/US–101—Vibratory		160	160	4,642	1.18

[1] Assumes a 7dB bubble curtain reduction from unattenuated sources in Caltrans (2015).
[2] Distance to threshold is calculated whereas area accounts for cutoffs from land.

For piles driven close to the water's edge but out of water (in water laden sediments) at the MOF, JCEP contracted JASCO to conduct more sophisticated acoustic modeling to determine if sound propagation through the sediment would contribute to elevated noise levels in-water above NMFS harassment thresholds. Appendix D in JCEP's application contains the full modeling report for vibratory pile driving, respectively, near the water's edge (within 9 m (30 feet)) at the MOF (note Appendix C contains impact pile driving model; however, no impact driving piles in-the-dry would occur under the proposed IHA). The model methods, in summary, included use of a full-wave numerical sound propagation model to simulate the transmission of vibratory pile driving noise through water-saturated soils into the water. Source levels for vibrating sheet piles were based on published hydrophone measurements of in-water sheet pile driving.

To model sound propagation from vibratory pile driving, JASCO used a modified version of the RAM parabolic-equation model (Collins 1993, 1996). The environmental data and source levels were input to underwater noise modeling software to estimate the underwater noise received levels (RL) that would be present in the water near the pile driving. The maximum modeled

Level B harassment threshold distance for vibratory pile driving in-the-dry at the LNG Terminal site is 1,914 m. We note Jasco conservatively applied the findings from the vibratory model for piles set back 30 ft (9 m) from the water's edge to all piles that are to be installed within 100 ft (30 m) of the water's edge. The model predicted that the Level A harassment thresholds for all hearing groups would not be reached during vibratory pile driving at the Terminal (all in-the-dry piles) when considering five hours of vibratory pile driving per day (see Table 5–2 in Appendix B in JCEP's application).

When the NMFS Technical Guidance (2016) was published, in recognition of the fact that an 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 from in-water sources 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 pile driving, NMFS User Spreadsheet predicts the closest distance at which, if a marine mammal remained at that exact distance the whole duration of the activity, it could incur PTS. Inputs used in the User Spreadsheet for all the in-water pile driving work and the resulting isopleths are reported in Table 9. We note none of the peak source levels exceed any Level A harassment threshold.

TABLE 9—NMFS USER SPREADSHEET INPUTS FOR IN-WATER PILE DRIVING

[User spreadsheet input]

	24-in steel impact	14-in timber impact	24-in steel vibratory	Sheet vibratory	14-in timber vibratory
Spreadsheet Tab Used	(E.1) Impact pile driving.	(E.1) Impact pile driving.	(A) Non-Impulse-Stat-Cont.	(A) Non-Impulse-Stat-Cont.	(A) Non-Impulse-Stat-Cont.
Source Level (Single Strike/shot SEL/rms)	170 dB	160 dB	165 dB	160 dB	162 dB.
Weighting Factor Adjustment (kHz)	2 kHz	2 kHz	2.5 kHz	2.5 kHz	2.5 kHz.
(a) Number of strikes per pile	200	100	N/A	N/A	N/A.
(a) Number of piles per day or activity duration	4	20	0.5 hours	1.67 hours	1.67 hours.
Propagation (xLogR)	15	15	15	15	15.
Distance of source level measurement (meters)+	10	10	10	10	10.

The resulting Level A isopleths for in-water pile driving for each marine mammal hearing group are presented in Table 10 (the following discussion does not apply to in-the-dry piles as that was modeled by Jasco). The User Spreadsheet calculates a very small zone (less than 6 m) when considering 1.67 hours of vibratory driving piles in-water (this time does not include time it takes to reset the hammer to new piles) and JCEP would implement a minimum 10 m shutdown zone. Therefore, NMFS has determined there is no potential for Level A take during any of the vibratory pile driving scenarios. During impact hammering in open water (which occurs only at the TPP/US–101 site), the potential for Level A take remains very small; however, it is greater than during vibratory driving. JCEP anticipates it could install up to 20 14-in timber piles per day. This could take several hours over the course of the entire day to reset piles; however, the resulting isopleth for all 20 piles is less than 56 meters for all species. When considering the installation of five 14-in timber piles (a more reasonable but still lengthy amount of time when considering animal movement), the Level A isopleth distance is also very small. Similarly, impact driving 24-in steel pipe piles at the TPP/US–101 site when considering the installation of four piles per day results in a small Level A harassment distance when using the User Spreadsheet. JCEP proposes to install 36 24-in piles over 9 days at this location to construct the work access bridge. The 36 piles installed at the TPP/US–101 site are located in an area that is behind a berm with infrequent harbor seal presence. For a seal to incur PTS, it must remain 63 m from the pile for the time it takes for four piles to be installed. These piles would only be proofed with the impact hammer; therefore, vibratory driving would occur first and then the hammer would have to be reset. In total, the amount of time it may take to install four piles is several hours. JCEP is proposing shutdown zones equal to or greater than the calculated Level A harassment isopleth distance for all pile driving. Because the zones are small and consider several hours in duration, NMFS believes the potential for Level A harassment is *de minimis* and is not proposing to issue take of any marine mammal by Level A harassment.

TABLE 10—CALCULATED LEVEL A HARASSMENT ISOPLETHS BASED ON NMFS USER SPREADSHEET FOR IN-WATER PILE DRIVING

Project element requiring pile installation	Source levels at 10 meters (dB)		Distance to Level A threshold [1] (m)				
	Peak [2]	RMS (vibratory))/ SEL (impact)	Low-frequency cetaceans	Mid-frequency cetaceans	High-frequency cetaceans	Phocids	Otariids
LNG Terminal							
Sheet Piles at MOF/ South West Berth wall and 24-inch TMBB Mooring Piles—Vibratory (in water/in the dry).	(4)	(4)	NE	NE	NE	NE	NE
Ancillary Activities							
24-inch Pipe Piles at TPP/US–101—Impact with BCA.	201	170 SEL	117.0	4.2	139.3	62.6	4.6
14-inch Timber Piles at TPP/US–101—Impact within cofferdam.	180	160 SEL	46.4	1.7	55.3	24.8	1.8
24-inch Pipe Piles at TPP/US–101 and APCO sites—Vibratory in water.	191	165 RMS	8.0	0.7	11.8	4.8	0.3
14-inch Timber Piles at TPP/US–101—Vibratory within cofferdam.	172	162 RMS	11.2	1.0	16.5	6.8	0.5
Sheet Piles at TPP/US–101—Vibratory in water.	175	160 RMS	8.2	0.7	12.2	5.0	0.4

[1] Level A thresholds are based on the NMFS 2018 Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing; cSEL threshold distances are shown. See footnote 3 below.
[2] All distances to the peak Level A harassment thresholds are not met.
[3] Since these piles will be driven on land, source values at 10 m are not available; distances are calculated by JASCO modeling.

Marine Mammal Occurrence

In this section we provide the information about the presence, density, or group dynamics of marine mammals that will inform the take calculations.

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 haul-outs in Washington and Oregon 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). Based on logistic population growth models, harbor seal populations of the Oregon Coast had reached carrying capacities during the late 1980s and early 1990s (Brown et al. 2005). Using these data, an estimation of the number of seals using the Coos Bay estuary haul-outs can be made by simply dividing the area of the Coos Bay estuary by the estimated population size.

The Coos Bay estuary has an area of 55.28 square kilometers, as measured using geographic information system (GIS) files available from the Coastal Atlas (2018). We used the ODFW 2014 June aerial survey data yielding 333 observed individuals to estimate harbor seal density in Coos Bay during the February 15–September 30 timeframe. We did not apply the corrected abundance of 509 seals because those data are collected during times with higher abundance than the rest of the season. Therefore, we used the straight counts which, when considering a timeframe of February through September, is likely more representative of long-term abundance. The resulting density is 6.2 seals/km^2.

AECOM conducted surveys during November and December 2018, to determine a fall/winter estimate for harbor seals. This survey included 3 days of aerial (drone) flyovers at the Clam Island and Pigeon Point haul-outs to capture aerial imagery. In addition, vessel-based transect surveys over a 3-day period, using the same survey methods as the May 2017, surveys. This field effort observed a maximum of 167 harbor seals hauled out at the Clam Island and Pigeon Point sites on any one day for a resulting density of 3.0 seals/km^2 when estimating take for the October 1–February 15th work window.

Other Pinnipeds

No data are available to calculate density estimates for non-harbor seal pinnipeds; therefore, JCEP applies a presence/absence approach considering group size for estimating take for California sea lions, Steller sea lions, and Northern elephant seals. 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. For this reason, JCEP estimates one California and Steller sea lion may be present each day of pile driving.

Northern elephant seals are not common in Coos Bay and also forage/travel individually. JCEP estimates one individual may be present within a given ensonified area greater than the NMFS harassment threshold one day for every seven days of pile driving.

Cetaceans

Similar to pinnipeds other than harbor seals, it is not possible to calculate density for cetaceans in Coos Bay as they are not present in great abundance and therefore JCEP estimates take based on a presence/absence approach and considers group size. During migration, gray whales 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 and thus take of up to two individuals is requested as a contingency. 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 5 transient killer whales in May 2007 (as reported by the Seattle Times, 2007) and a pair of killer whales were observed during the 2017 May surveys. Considering most pile driving would occur outside the time period killer whales are less likely to be present, JCEP assumes that a group of three killer whales come into Coos Bay and could enter a Level B harassment zone for one day up to five times per year which would allow for a combination of smaller (*e.g.,* 2 animals) or larger (*e.g.,* 5 animals) groups.

Take Calculation and Estimation

Here we describe how the information provided above is brought together to produce a quantitative take estimate.

Harbor Seals

ODFW and AECOM survey data suggest approximately 300 to 400 harbor seals are resident to Coos Bay. We also anticipate there is some flux between Coos Bay haulouts and nearby coastal haulouts, which likely contributes to the higher abundance estimates during the pupping season. Given the residency patterns, the standard approach for estimating take is likely insufficient to enumerate the number of harbor seals potentially taken by the specified activity. However, we do not believe that every harbor seal in the estuary (300 to 400 individuals) would be taken every day of pile driving given distances from haulouts to Level B harassment zones and pile driving durations within a day. Therefore, an approach balancing these two extremes needed to be developed.

NMFS typically relies on a standard calculation where estimated take = density × ensonified area × number of pile driving. This is considered a static approach in that it accounts for any given moment of pile driving—a snapshot in time. Typically, this approach allows for a sufficient amount of take from a typical pile driving project and we find it suitable for the Ancillary Activities because they would be limited in duration or would occur in areas where harbor seals are not expected to traverse frequently. However, the inputs described above are not directly applicable for estimating harbor seal take resulting from the vibratory pile driving that is planned at the LNG Terminal, because (1) vibratory driving at the Terminal may be occurring for several hours per day, (2) Coos Bay is narrow and level B noise thresholds are expected to be exceeded across the width of Coos Bay at the Terminal, and (3) many harbor seals that haul out at Clam Island, and to a lesser extent, the other haulouts in Coos Bay, likely swim by the LNG Terminal work zone throughout the day. Because of these factors, individual animals are expected to move into the Level B ZOI throughout the day as active vibratory driving is occurring at the LNG Terminal, and harbor seal take would be underestimated without accounting for the movement of animals. Therefore, JCEP developed a calculation method whereby seals were allowed to move continuously past the LNG Terminal site. JCEP refers to this as the movement method.

JCEP's movement method uses the same base assumption as the typical static method described above—that harbor seals are distributed evenly across the estuary. However, this method then assumes that these evenly distributed harbor seals travel through the harassment zones and they use a current drift speed as a proxy for this drift but it could also be considered a slow swim speed (likely representative for animals milling around an estuary to which they are resident) as described below. The calculations used by JCEP to estimate harbor seal exposures (likely occurring to the same 300 to 400 individuals) is: (Seals/km^2 × (ZOI) km^2) + (Seals/km^2 × (Current) km/min × (Pile Driving) min/day × (Channel Width) km) = Seals/day. This calculation represents that take for each day is calculated by taking a snapshot of the seals that are in the Level B harassment zone when driving starts (*i.e.,* the conventional static method), and then adding to that the seals that ''flow'' into the leading edge of the ZOI for the duration of pile driving. After harbor seals flow across the leading edge of the Level B harassment zone, they are considered taken.

Although seals are active swimmers and do not drift with the current, the purpose of the method was not to characterize actual movement but to estimate how many seals may pass into a given Level B harassment zone throughout the day. The method proposed by JCEP is a method designed to model the possibility seals may come within the Level B harassment zone in greater probability than a single snapshot in time in a given day (the static calculation method described above). In their Acoustic Integration AIM model, the U.S. Navy estimates harbor seal swim speeds range from 1–4 kilometers per hour (0.27 m/sec–1.1 m/sec) (Table B–2 in Navy, 2017). The proposed method assumes a drift speed of 0.39 m/sec (1.4 km/hour), which is within this range. We note the data from which the Navy swim speeds are derived are primarily tagging data during dives and bouts of foraging where animals are likely lunging for prey and moving quickly. Therefore, because we are looking for representative swim speeds crossing zones and these animals are resident to Coos Bay, we believe the lower end of this range is representative of average swim speeds. Further, the proposed movement method assumes seals flow in one direction whereas it is more likely seals are moving in multiple directions, potentially not crossing or taking longer to cross a Level B harassment isopleth. When considering this straight-line movement assumption and that the speed proposed is within a reasonable swim speed, NMFS finds JCEP's method is acceptable to estimate the potential for exposure. More importantly, the resulting number of exposures from this method is an equally reasonable amount of take given the specified activity (Table 11). We do not anticipate the calculated exposures to represent the number of individuals taken but that these exposures likely will occur to the same individuals repeatedly as the population appears to be resident with some flux in abundance as evident by the lower sighting rates in winter months than near pupping season.

TABLE 11—ESTIMATED HARBOR SEAL EXPOSURES

Method	Pile type	Total piles	Location	Animal density [a]	Driving days	Mins driving per day	Level B zone area from GIS (sq. km) [b,c]	Level B takes per day [a]	Total Level B takes (Year 1) [b]	Calculation method
LNG Terminal Piles										
Vibratory	Sheet Pile	1,246	MOF (outside ODFW work window).	6.2	97	309	2.49	64.52	6,258.44	Movement.
Vibratory	Sheet Pile	623	MOF (inside ODFW work window).	3.0	48	309	2.49	31.66	1,519.68	Movement.
Vibratory	Sheet Pile	113	W. berth wall, 2.5% nearest berm (outside ODFW work window).	6.2	8.5	329	2.49	66.34	563.89	Movement.
Vibratory	Pipe Pile	6	TMBB mooring pile (inside ODFW window).	3.0	10	9	3.19	9.64	96.40	Static
Ancillary Activities Piles (all inside ODFW window)										
Impact	Timber	1,150	TPP/US–101 intersection.	3.0	60	50	NA	NA	NA	Static.
Vibratory	Timber	1,150	TPP/US–101 intersection.	3.0	60	100	1.18	3.58	214.80	Static.
Vibratory	Sheet Pile	311	TPP/US–101 intersection.	3.0	16	100	1.18	3.58	57.28	Static.
Impact	Pipe Pile	36	TPP/US–101 intersection.	3.0	9	20	NA [c]	NA	NA	Static.
Vibratory	Pipe Pile	36	TPP/US–101 intersection.	3.0	9	80	1.18	3.58	32.22	Static.
Vibratory	Pipe Pile	33	APCO sites	3.0	9	30	0.40	1.20	10.80	Static.
Grand Total									8,753.51	

[a] Animal density is calculated for both in-water and out-of-water impact pile driving work windows as animal density is not uniform throughout the year.
[b] NA Indicates that Level A threshold is not exceeded for that piling activity.
[c] The calculated area of the Level B zone is influenced by land.

A summary of the proposed amount of take, by species, with respect to stock size is provided in Table 12. For all marine mammal species, it is unlikely Level A harassment would occur due the nature of the work and movement of animals throughout the bay. Cetaceans especially would likely move quickly through the area and JCEP would implement shutdown zones equal to most conservative Level A harassment distance based on the User Spreadsheet (*i.e.,* the output that considers the maximum amount of piles driven in one day).

TABLE 12—TOTAL AMOUNT OF PROPOSED TAKE, PER SPECIES

Common name	Stock	Proposed take		Percent of stock (stock size)
		Level A	Level B	
gray whale	Eastern North Pacific	0	2	<1 (26,960)
killer whale	West Coast Transient	0	15	3 (521)
harbor porpoise	Northern CA/Southern OR	0	12	<1 (35,769)
Northern elephant sea	California breeding	0	33	<1 (179,000)
Steller sea lion	Eastern U.S.	0	230	<1 (41,638)
California sea lion	U.S.	0	230	<1 (257,606)
Pacific harbor seal	Oregon/Washington Coast	0	8,754	<*2 (24,732)

* The number of takes presented here (n = 8,750) represents potential exposures to 300–400 individual harbor seals, not the number of individuals taken.

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.

JCEP's project design greatly reduces marine mammal and fisheries impacts to in-water noise. JCEP is conducting the majority of pile driving (over 90 percent) at the LNG terminal site behind a berm or in-the-dry. Further, the bulk of the terminal slip would be excavated and dredged before being connected to the estuary. Excavated material would be used to restore the former Kentuck golf course to functional wetlands. JCEP will primarily use a vibratory hammer to reduce the potential for auditory injury; pre-drill the soil at the LNG terminal to loosen and facilitate a more efficient installation and optimize vibratory driving, implement NMFS' standard soft-start procedure for impact hammer pile-driving, avoid in-water impact pile driving from February 16 through September 30 which includes the harbor seal pupping season. When in-water impact driving is necessary, JCEP will use a bubble curtain that will distribute air bubbles around 100 percent of the piling perimeter for the full depth of the water column, balance bubbles around the pile, and have the lowest bubble ring on the seabed floor.

JCEP would implement shutdown zones (Table 13) equal to the Level A harassment distances as calculated based on the maximum number of piles driven per day. These zones are all relatively small; therefore, there is little concern for unnecessary project delays. These shutdown zones will also minimize noise exposure such that the severity of any Level B harassment is minimized. If a species for which take is not authorized is observed within Coos Bay and could be exposed to pile driving noise, JCEP would implement a shutdown zone that equates to the Level B harassment zone for that activity.

TABLE 13—SHUTDOWN ZONES, BY PILE DRIVING ACTIVITY AND SPECIES

Species	Impact pile driving		Vibratory pile-driving	
	Timber piles at TPP/US–101	Pipe piles at TPP/US–101	Pipe piles, timber piles and sheet piles at TPP/US–101	Pipe Piles at APCO
Shutdown Zone				
Harbor Seal	30	70	10	10
Northern Elephant Seal	30	70	10	10
California Sea Lion	10	10	10	10
Stellar Sea Lion	10	10	10	10
Gray Whale	60	140	25	30
Killer Whale	10	10	10	10
Harbor Porpoise	60	140	25	30

Based on our evaluation of the applicant'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).

• Mitigation and monitoring effectiveness.

JCEP will implement a marine mammal monitoring plan that will include shutdown zones and monitoring areas. JCEP's Marine Mammal Monitoring Plan includes five components: (1) Conduct a preconstruction survey; (2) monitor marine mammal occurrence near the project site during construction; (3) enforce shutdown zones (Table 12) for marine mammals; (4) record observations of marine mammals in the observable portions of the Level B harassment zones, including movement and behavior of animals; and (5) report the results of the preconstruction survey and the construction monitoring, including take numbers. Each of these components is discussed in detail in the associated Marine Mammal Monitoring Plan, provided in Appendix E of JCEP's application.

At least two protected species observers (PSOs) will be on-watch during all pile driving. Monitoring locations will be specific to each activity and may be subject to change depending on physical conditions at the site. PSOs will be positioned on either land-based structures, the shoreline, or boats, depending on activity, best vantage point, and field and safety conditions. The PSOs will be stationed to observe shut-down zone and maximum visual coverage of the Level B harassment zones.

A two-person PSO team will complete a one-time, boat-based, 2-day pre-construction survey of potential Level B harassment zones prior to pile driving activities at the LNG Terminal Marine Facilities (Table 2). A one-day survey would be conducted at the TPP/US–101 and APCO sites prior to pile driving work. The surveys will include on-water observations at each of the pile driving locations to observe species numbers and general behaviors of animals in the area. Surveys will occur no earlier than seven days before the first day of construction at each activity site.

Special attention will be given to the two closest harbor seal haul-out sites in proximity to the project area—Clam Island and Pigeon Point—as described in Section 4 of the IHA application. On each of the monitoring days, monitoring will occur for up to 12 hours (weather-dependent), to include one low-tide survey and one high-tide survey in daylight hours. A small boat will be used for the survey from various locations that provide the best vantage points. The information collected from monitoring will be used for comparison with results of marine mammal behaviors during pile-driving activities and will contribute to baseline monitoring data for the area.

Marine mammal observations will begin 30 minutes prior to the onset of pile driving. Monitoring the Level B harassment zone for a minimum of 30 minutes after pile-driving stops.

Recording marine mammal presence in the entirety of the vibratory driving Level B harassment zones is not practicable and is not planned The Level B harassment zone will be monitored out to visible distances and then using the daily density calculated for each species observed, the number of Level B harassment take will be extrapolated out to the full zone or if hydroacoustics data is available, the measured Level B harassment zone. PSOs will continue monitoring 30 minutes post pile driving each day.

A final marine mammal monitoring report shall be prepared and submitted within thirty days following resolution of comments on the draft report from NMFS. This report must contain the informational elements described in the Marine Mammal Monitoring Plan, including, but not limited to: dates and times (begin and end) of all marine mammal monitoring, a description of construction activities occurring during each daily observation period, weather and sightability conditions, sighting data (*e.g.,* number of marine mammals observed, by species) PSO locations during marine mammal monitoring, any mitigation action, and other applicable parameters as listed in the Draft IHA available at *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act.* The report must also distinguish between the number of individual animals taken and the number of incidences of take, such as ability to track groups or individuals, and the number of total takes estimated based on sighting capabilities.

In addition to marine mammal monitoring, JCEP, in coordination with NMFS, has developed a preliminary Hydroacoustic Monitoring Plan. This plan is designed to conduct sound source verification and verify that underwater noise thresholds are not exceeded over distances greater than predicted by the acoustic models used in JCEP's application and this analysis. For the 2020–2021 construction season, hydroacoustic monitoring will be conducted for a portion of all piles to be installed by impact or vibratory methods. In general, approximately 5 percent of each pile driving activity would be monitored, with a minimum of three and a maximum of 20 piles monitored.

Two hydrophones will be placed for each monitoring event, one placed close to the pile and one placed at a greater distance so that a transmission loss value can be measured. For in-water pile driving, the hydrophone nearest the pile will be placed at least 3H from the pile, where H is the water depth at the pile and 0.7 to 0.85H depth from the surface, or 10 meters, whichever is greater (NMFS 2012b). For all pile driving, including in-the-dry pile installation, hydrophones will be placed at least 1 meter below the surface and with a clear acoustic line-of-sight between the pile and the hydrophone. The other hydrophone will be placed at mid-column depth, at a distance at least 20 times the source depth from each pile being monitored, in waters at least 5 meters deep (NMFS 2012a). If the water velocity is 1.5 meters per second or greater, 1 to 3 meters off the bottom is recommended for near-field hydrophones and greater than 5 meters from the surface is recommended for any far-field hydrophones (FHWG 2013). A weighted tape measure will be used to determine the depth of the water. The hydrophones will be attached to a nylon cord, a steel chain, or other proven anti-strum features, if the current is swift enough to cause strumming of the line. The nylon cord or chain will be attached to an anchor that will keep the line the appropriate distance from each pile. The nylon cord or chain will be attached to a float or tied to a static line at the surface. The distances will be measured by a tape measure, where possible, or a laser range-finder. The acoustic path (line of sight) between the pile and the hydrophone(s) should be unobstructed in all cases.

The on-site inspector/contractor will inform the acoustics specialist when pile driving is about to begin, to ensure that the monitoring equipment is operational. Underwater sound levels will be monitored continuously during the entire duration of each pile being driven, with a minimum one-third octave band frequency resolution. The wideband instantaneous absolute peak pressure and sound exposure level (SEL) values of each strike, and daily cumulative SEL (cSEL) should be monitored in real time during construction, to ensure that the project does not exceed its authorized take level. Peak and RMS pressures will be reported in dB (1 μPa). SEL will be reported in dB (1 μPa^2 per second). Wideband time series recording is strongly recommended during all impact pile driving.

Underwater sound levels will be continuously monitored during the entire duration of each pile being driven. The peak, root-mean-square (RMS) (impulse level), and SEL of each strike will be monitored in real time. The cSEL also will be monitored, assuming no contamination from other noise sources. Underwater sound levels will be measured in dB re:1 µPa. JCEP will submit a draft report on all monitoring conducted under the IHA within ninety calendar days of the completion of marine mammal and/or acoustic monitoring or sixty days prior to the issuance of any subsequent IHA for this project, whichever comes first. When applying for a subsequent IHA, JCEP will include a summary of the monitoring data collected to date with its application.

A final draft report, including data collected and summarized from all monitoring locations, will be submitted to NMFS within 90 days of completion of the hydroacoustic monitoring. The results will be summarized in graphical form and will include summary statistics and time histories of impact sound values for each pile. A final report will be prepared and submitted to NMFS within 30 days following receipt of comments on the draft report from NMFS. The report will include information of the circumstances surrounding the recordings (*e.g.,* pile size, type, hydrophone distance to pile, etc.) as presented in JCEP's Hydroacoustic Monitoring Plan.

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by this IHA, such as serious injury, or mortality, JCEP must immediately cease the specified activities and report the incident to the NMFS Office of Protected Resources (301–427–8401) and the West Coast Region Stranding Coordinator (206–526–4747). The report must include the 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 JCEP to determine what measures are necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. JCEP may not resume pile driving activities until notified by NMFS.

In the event JCEP 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), JCEP must immediately report the incident to the Office of Protected Resources, NMFS, and the West Coast Region Stranding Coordinator, NMFS. Activities may continue while NMFS reviews the circumstances of the incident. NMFS will work with JCEP to determine whether additional mitigation measures or modifications to the activities are appropriate.

In the event that JCEP 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), JCEP 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.

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 species listed in Table 4 except for harbor seals, 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, there are meaningful differences in anticipated individual responses to activities, impact of expected take on the resident population in Coos Bay (all part of the Oregon/Washington stock), or impacts on habitat; therefore, we provide a supplemental analysis independent of the other species for which we propose to authorize take.

NMFS has identified key qualitative and quantitative factors which may be employed to assess the level of analysis necessary to conclude whether potential impacts associated with a specified activity should be considered negligible. These include (but are not limited to) the type and magnitude of taking, the amount and importance of the available habitat for the species or stock that is affected, the duration of the anticipated effect to the species or stock, and the status of the species or stock. When an evaluation of key factors shows that the anticipated impacts of the specified activity would clearly result in no greater than a negligible impact on all affected species or stocks, additional evaluation is not required. In this case, all the following factors are in place for all affected species or stocks except harbor seals:

- No takes by mortality, serious injury or Level A harassment are anticipated or authorized;
- Takes by Level B harassment is small in number (less than 3 percent of the best available abundance estimates for all stocks);
- Take would not occur in places and/or times where take would be more likely to accrue to impacts on reproduction or survival, such as within ESA-designated or proposed critical habitat, biologically important areas (BIA), or other habitats critical to recruitment or survival (*e.g.,* rookery);
- Take would occur over a short timeframe, being limited to the short duration a marine mammal would be present within Coos Bay during pile driving;
- Take would occur over an extremely small portion of species/stock range;

• The affected stocks are not known to be declining and/or are within OSP range; and

• Any impacts to marine mammal habitat from pile driving are temporary and minimal.

For all species and stocks, take, by Level B harassment only, would only occur within Coos Bay—a limited, confined area of any given stock's home range, including the Oregon/Washington stock of harbor seals. JCEP is not requesting, and NMFS is not proposing to issue Level A harassment of marine mammals incidental to the specified activities.

For harbor seals, we further discuss our negligible impact finding in the context of potential impacts to the resident population, a small subset of the Oregon/Washington coastal stock, within Coos Bay. Similar to other stocks, take by mortality, serious injury, or Level A harassment is not anticipated or proposed to be authorized; takes would occur over a very small portion of the stock's range; and the affected stocks are not known to be declining. OSP for harbor seals is currently unknown; however, the stock was previously reported to be within its OSP range (Jeffries et al. 2003, Brown et al. 2005).

As discussed in the *Description of Marine Mammals and Their Habitat* section, a resident population of approximately 300–400 harbor seals that belong to the Oregon/Washington Coastal stock likely reside year-round within Coos Bay. The exact home range of this sub-population is unknown but harbor seals, in general, tend to have limited home range sizes. Therefore, we can presume a limited number of harbor seals (approximately 300–400) will be repeatedly taken throughout the effective period of the IHA, though not necessarily on sequential days. It is possible a limited number of harbor seals may enter the bay occasionally (similar to occasional Steller sea lion and California sea lion presence) from nearby coastal haulouts (*e.g.,* Cape Arago); however, these seals would likely not be repeatedly exposed throughout the entire year. For those animals exposed repeatedly, these exposures would occur throughout the year but not every single day (230 days of pile driving work total). In addition, pile driving work is spread throughout the Bay thereby changing the areas where Level B harassment may occur. Regardless, in general, repeated exposure, especially over sequential days, of harbor seals to pile driving noise could result in impacts to reproduction or survival of individuals if that exposure results in adverse, long-term impacts. The following discussion analyzes the potential impacts from repeated pile driving exposure to Coos Bay harbor seals.

Harbor seals within Coos Bay are currently exposed to numerous anthropogenic noise sources. As described in the *Specified Geographic Area* section, Coos Bay is highly developed along its coastline. Typical noise sources within Coos Bay include U.S. Army Corps of Engineers maintenance dredging, commercial shipping and fishing vessel traffic, and recreational boating. Despite these existing anthropogenic stressors, unpublished ODFW aerial survey data indicates that harbor seals in Coos Bay have been stable and likely approach carrying capacity (Wright et al. 2019, pers. comm), similar to the status of the entire stock. In the absence of recent abundance estimates throughout its range, the current population trend of the Oregon/Washington Coastal stock is unknown; however, based on the analyses of Jeffries et al. (2003) and Brown et al. (2005), both the Washington and Oregon portions of this stock were reported as reaching carrying capacity. As described in Southall et al. (2007), except for naïve individuals, behavioral responses depend critically on the principles of habituation and sensitization meaning an animal's exposure history with a particular sound and other contextual factors play a role in anticipated behaviors and subsequently, consequences of those behaviors of survival and reproduction. Example contextual factors include nearness to a source, if the source is approaching and general novelty or familiarity with a source (Southall et al., 2007).

AECOM's acoustic surveys indicate median background noise levels in Coos Bay are at or higher than the harassment threshold used in our analysis to estimate Level B harassment (120 dB rms). The range of background noise levels in the presence of working commercial vessels have been measured up to 164 dB rms at close but unknown distance from the source; however, we can assume those measurements were taken several tens of meters away from the vessel for safety and port access reasons. Overall, harbor seals are familiar with several anthropogenic noise sources in Coos Bay, pile driving is stationary (not perceived as approaching), and the haulout sites within Coos Bay are no less than 500 m from any pile driving location.

There are no known concentrated foraging areas around the terminal site or location of the ancillary activities. Further, JCEP would not conduct any impact pile driving during the pupping season which would otherwise be introducing noise that has a greater potential for injury during critical life stages and when abundance and density of harbor seals are greatest.

In summary and as described above, although this small resident population is likely to be taken repeatedly throughout the year, the following factors primarily support our preliminary determination that the impacts resulting from JCEP's proposed activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival on harbor seals:

• No mortality, serious injury, or Level A harassment is anticipated or authorized.

• Exposure resulting in Level B harassment would occur in a very small part of the Oregon/Washington Coastal stock's range.

• Animals exposed would primarily be limited to the 300–400 resident harbor seals in Coos Bay, a small percentage of the overall stock (approximately 2 percent).

• No in-water impact pile driving would occur during the pupping season; therefore, no impacts to pups from this activity is likely to occur. Vibratory pile driving near the water's edge may result in noise propagation near the MOF and ancillary activities; however, pupping sites are located outside the Level B harassment ensonification areas for any pile driving activity.

• Harbor seals in Coos Bay are habituated to several sources of anthropogenic noise sources with no evidence exposure is impacting rates or recruitment and survival (as evident from steady population numbers as derived from several years of ODFW aerial survey data).

• The Oregon/Washington coastal stock is subject to very low anthropogenic sources of mortality and serious injury (*e.g.,* annual minimum level of human-caused mortality and serious injury is 10.6 harbor seals) and is likely reaching carrying capacity (Carretta, 2018).

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 the 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.

For all stocks, the amount of authorized take is small (less than 3 percent; Table 12). Although the number of exposures of harbor seals is high, as described above, takes would likely occur to the small (approximately 300 to 400 animals), resident population of harbor seals within Coos Bay.

Based on the analysis contained herein of the proposed activity (including the proposed mitigation and monitoring measures) and the anticipated take of marine mammals, 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, 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.

Based on the description of the specified activity, the measures described to minimize adverse effects on the availability of marine mammals for subsistence purposes, and the proposed mitigation and monitoring measures, NMFS has preliminarily determined that there will not be an unmitigable adverse impact on subsistence uses from JCEP's proposed activities.

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 Authorization

As a result of these preliminary determinations, NMFS proposes to issue an IHA to JCEP for constructing the proposed Jordan Cove LNG Terminal and associated ancillary activities in Coos Bay, Oregon from October 1, 2020 through September 30, 2021, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. A draft of the proposed IHA 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 IHA for construction of the proposed Jordan Cove LNG Terminal and ancillary activities. We also request at this time comment on the potential renewal of this proposed IHA 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 this IHA 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: November 7, 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–XT020

Atlantic Highly Migratory Species; Atlantic Highly Migratory Species Southeast Data, Assessment, and Review Workshops Advisory Panel

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

ACTION: Notice; nominations for shark stock assessment Advisory Panel.

SUMMARY: NMFS solicits nominations for the ''SEDAR Pool,'' also known as the Atlantic Highly Migratory Species (HMS) Southeast Data, Assessment, and Review (SEDAR) Workshops Advisory Panel. The SEDAR Pool is comprised of a group of individuals who may be selected to consider data and advise NMFS regarding the scientific information, including but not limited to data and models, used in stock assessments for oceanic sharks in the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea. Nominations are being sought for a 5-year appointment (2020–