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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XG910

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Sand Island Pile Dike System Test Piles Project near the Mouth of the Columbia River.

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

ACTION: Notice; Issuance of an Incidental Harassment Authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that NMFS has issued an incidental harassment authorization (IHA) to the U.S. Army Corps of Engineers, Portland District (Corps) to incidentally harass, by Level A and Level B harassment only, marine mammals during construction activities associated with the Sand Island Pile Dike System Test Piles project near the Mouth of the Columbia River.

DATES: This Authorization is effective for one year from the date of issuance.

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

SUPPLEMENTARY INFORMATION:

Background

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

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.

Summary of Request

On March 6, 2019, NMFS received a request from the Corps for an IHA to take marine mammals incidental to pile driving activities in the Columbia River Estuary. The application was deemed adequate and complete on June 20, 2019. The Corps' request is for take of a small number of harbor porpoises (*Phocoena phocoena*), Steller sea lions (*Eumetopias jubatus*), California sea lions (*Zalophus californianus*), and harbor seals (*Phoca vitulina richardii*) by

Level B harassment and Level A harassment. Neither the Corps nor NMFS expect serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

Description of Activity

Overview

The Corps plans to drive test piles in order to investigate the feasibility of different construction methods at two of the four Sand Island pile dikes at the Mouth of the Columbia River (MCR) (Figure 1 in application). The Sand Island pile dikes are comprised of four pile dikes, which are named according to river mile (RM) location, at RMs 4.01, 4.47, 5.15, and 6.37 (the pile dike at RM 6.37 is also referred to as the Chinook pile dike). Three of the pile dikes are connected to West Sand Island and East Sand Island, and the fourth pile dike in open water runs parallel to the Chinook Channel on the upstream side (Figure 2 in application). The Sand Island pile dikes are part of the Columbia River pile dike system and were installed in the 1930's. The Corps intends to restore full functionality of pile dikes in the future but needs to drive test piles in order to inform possible design. The existing pile dikes have deteriorated greatly due to lack of maintenance. Impact and vibratory pile installation and vibratory pile removal would introduce underwater sounds at levels that may result in take, by Level A and Level B harassment, of marine mammals in the Columbia River Estuary. In-water construction activities are expected to last up to 41 days. The maximum 41 days of work includes the following estimates for various pile driving activities:

- Up to 20 days of impact driving only (steel piles);
- Up to 18 days of impact driving AND vibratory installation/removal of steel piles; and
- Up to 3 days for vibratory removal of timber piles only.

A detailed description of the planned test pile project is provided in the **Federal Register** notice for the proposed IHA (84 FR 38227; August 6, 2019). Since that time, no changes have been made to the planned pile driving activities. Therefore, a detailed description is not provided here. Please refer to that **Federal Register** notice for the description of the specific activity.

Comments and Responses

We published a notice of receipt of the Corps application and proposed IHA in the **Federal Register** on August 6, 2019 (84 FR 38227). We received one comment letter from the Marine Mammal Commission (Commission).

Comment 1: The Commission recommended that NMFS continue to prioritize the development of a methodology for determining the extent of the Level A harassment zones based on the associated permanent threshold shift (PTS) cumulative SEL (SELcum) thresholds for the various types of sound sources. The Commission also noted that NMFS should consider incorporating animat modeling into its user spreadsheet.

Response: The issue of accumulation time continues to be a priority for NMFS. The Working Group assembled by NMFS to specifically address this issue is exploring several options, including the use of animat modeling. Once the NMFS internal Working Group develops a proposal, it will be shared with Federal partners and other stakeholders.

Comment 2: The Commission questioned whether the public notice provision, for IHA renewals, including the 15-day comment period, fully satisfy the public notice and comment provision in the MMPA. The Commission also noted the potential burden on reviewers of reviewing key documents and developing comments quickly. Therefore the Commission recommended that NMFS refrain from using the proposed renewal process for the Corps' authorization. The Commission also recommended that NMFS use the IHA Renewal process

sparingly and selectively for activities expected to have the lowest levels of impacts to marine mammals and that require less complex analysis. The Commission's final recommendation to NMFS was to provide the Commission and other reviewers the full 30-day comment period as set forth in section 101(a)(5)(D)(iii) of the MMPA

Response: The Commission has raised this concern before and NMFS refers readers to our full response, which may be found in the notice of issuance of an IHA to Ørsted Wind Power LLC (84 FR 52464, October 2, 2019.

Changes from Proposed to Final Authorization

Based on informal coordination with the Commission, NMFS has made several changes since the publication of the proposed IHA. The number of Level A and Level B harassment takes for both harbor porpoise and harbor seal were underestimated in the proposed IHA. Therefore, authorized take by Level A and Level B harassment for both species has increased and is described in detail in the "Estimated Take" section. In the monitoring report, NMFS will require that the Corps extrapolate observed takes across the entirety of the Level B harassment zone based on the area that is able to be monitored effectively. This measure is described in the "Monitoring" section. Finally, the Corps will be required to provide marine mammal observational datasheets or raw data as part of the marine mammal monitoring report. These changes are described in the "Reporting" section.

Description of Marine Mammals in the Area of Specified Activities

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).

Table 1 lists all species with expected potential for occurrence near the test piles project area and summarizes information related to the population or stock, including regulatory status under the MMPA and ESA and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2016). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS's SARs). While no mortality is anticipated or authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS's stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS's U.S. Pacific Marine Mammal SARs (Carretta *et al.,* 2019) an Alaska Marine Mammal SARS (Muto *et al*., 2019). All values presented in Table 1 are the most recent available at the time of publication.

Table 1. Marine Mammal Species Likely to be Found near the Test Piles Project Area

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N)[1]	Stock abundance (CV, N_{min}, most recent abundance survey)[2]	PBR	Annual M/SI[3]
Order Cetartiodactyla – Cetacea – Superfamily Mysticeti (baleen whales)						

Family Eschrichtiidae						
Gray whale	*Eschrichtius robustus*	Eastern North Pacific	-, -, N	26,960 (0.05, 25849, 2016)	801	139
Family Balaenopteridae (rorquals)						
Humpback whale	*Megaptera novaeangliae*	California/ Oregon/ Washington	-, -, Y	2,900 (0.05, 2,784, 2014)	16.7	40.2
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						
Killer whale	*Orcinus orca*	West Coast Transient	-, -, N	243 (N/A, 243, 2009	2.4	0
Family Phocoenidae (porpoises)						
Harbor porpoise	*Phocoena phocoena*	Northern Oregon/ Washington Coast	-, -, N	21,487 (044, 15,123, 2011)	151	3.0
Order Carnivora – Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions)						
California sea lion	*Zalophus californianus*	U.S. Stock	-, -, N	257,606 (N/A, 233,515, 2014)	14,011	>320
Steller sea lion	*Eumetopias jubatus*	Eastern U.S.	-, -, N	41,638 (See SAR, 41,638, 2015)	2,498	108
Family Phocidae (earless seals)						
Harbor seal	*Phoca vitulina richardii*	Oregon and Washington Coast	-, -, N	UNK (UNK, UNK, 1999)	UND	10.6

1 - Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.
2- NMFS marine mammal stock assessment reports online at: www.nmfs.noaa.gov/pr/sars/. CV is coefficient of variation; Nmin is the minimum estimate of stock abundance. In some cases, CV is not applicable.
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.

A detailed description of the of the species likely to be affected by the test pile project, including brief introductions to the species and relevant stocks as well as available information regarding population trends and threats, and information regarding local occurrence, were provided in the **Federal Register** notice for the proposed IHA (84 FR 38227; August 6, 2019); since that time, we are not aware of any changes in the status of these species and stocks;

therefore, detailed descriptions are not provided here. Please refer to that **Federal Register** notice for these descriptions. More general information about these species (*e.g.*, physical and behavioral descriptions) may be found on NMFS' website (*https://www.fisheries.noaa.gov/find-species*).

Potential Effects of Specified Activities on Marine Mammals and their Habitat

Underwater noise from impact and vibratory pile driving activities associated with the planned test piles project has the potential to result in harassment of marine mammals in the vicinity of the action area. The **Federal Register** notice for the proposed IHA (84 FR 38227; August 6, 2019) included a discussion of the potential effects of such disturbances on marine mammals and their habitat, therefore that information is not repeated in detail here; please refer to the **Federal Register** notice (84 FR 38227; August 6, 2019).

Estimated Take

This section provides an estimate of the number of incidental takes authorized 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 primarily be by Level B harassment, as impact and vibratory pile driving has the potential to result in disruption of behavioral patterns for individual marine mammals. There is also some potential for auditory injury (Level A harassment) to result, primarily for high frequency species and phocids because predicted auditory injury zones are larger than for low-frequency species, mid-frequency species and otariids. Auditory injury is unlikely to occur for low-frequency species, mid-frequency species and otariids. The mitigation and monitoring measures are expected to minimize the severity of such taking to the extent practicable.

As described previously, no mortality is anticipated or 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 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.

The Corps' planned activity includes the use of continuous (vibratory pile driving) and impulsive (impact pile driving) sources, and therefore the 120 and 160 dB re 1 μPa (rms) 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). The Corp's

planned activity includes the use of impulsive (impact pile driving) and non-impulsive (vibratory pile driving) source.

These thresholds are provided in the table 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 4. Thresholds identifying the onset of Permanent Threshold Shift.

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

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

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

Ensonified Area

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

Sound Propagation

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

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

B = transmission loss coefficient (assumed to be 15)

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

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

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

Practical spreading is a compromise that is often used under conditions where water depth increases as the receiver moves away from the shoreline, resulting in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions.

Sound Source Levels

The intensity of pile driving sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity takes place. There are no source level measurements available the piles planned for installation at part of the test piles project. Sound pressure levels for impact driving of 24-in steel piles were taken from Caltrans 2015. Vibratory driving source levels for 24-in steel piles came from the United States Navy (2015). There was no data available pertaining to vibratory removal of 24-in timber piles. NMFS recommended that the Corps use data derived from Washington Department of Transportation Seattle Pier 62 project collected by the Greenbusch Group (2018) for vibratory removal of 14-in timber piles. NMFS reviewed the Greenbusch Group (2018) report and determined that the findings were incorrectly derived by pooling together all steel pile and timber pile measurements at various distances. Furthermore, the data was not normalized to the standard 10 m distance. NMFS analyzed source measurements at different distances for all 63 individual timber piles that were removed and normalized the values to 10 m. The results showed that the median is 152 dB SPLrms. This value was used as the proxy source level for vibratory removal of 24-in timber piles as shown in Table 5.

Table 5. Estimated Unattenuated Underwater Sound Pressure Levels Associated with Pile Installation and Removal.

Pile Type & Activity	Sound Source Level at 10 m		
24-Inch Steel Pile Impact Installation[1]	203 dB_{PK}	190 dB_{RMS}	177 dB_{SEL}
24-Inch Steel Piles	Not Applicable	161 dB_{RMS}	Not Available

Vibratory Installation/Removal[2]			
24-Inch Timber Pile Vibratory Removal[3]	Not Applicable	152 dB_{RMS}	Not Available

[1] From CalTrans 2015 Table I.2-1. Summary of Near-Source (10-Meter) Unattenuated Sound Pressure Levels for In-Water Pile Driving Using an Impact Hammer: 0.61-meter (24-inch) steel pipe pile in water ~5 meters deep.
[2] From United States Navy. 2015. Prepared by Michael Slater, Naval Surface Warfare Center, Carderock Division, and Sharon Rainsberry, Naval Facilities Engineering Command Northwest. Revised January 2015. Table 2-2.
[3]Due to the lack of information for vibratory removal of 24' diameter timber piles, an estimate based on removal of 14-inch timber piles is used as a proxy (Greenbusch Group, 2018)

Level A Harassment

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

Table 6. NMFS Technical Guidance (2018) User Spreadsheet Input To Calculate PTS Isopleths.

Inputs	24-in Steel Impact Installation	24-in Steel Vibratory Installation/Removal	24-in Timber Pile Removal
Spreadsheet Tab Used	E.1) Impact Pile Driving	A.1) Vibratory Pile Driving	A.1) Vibratory Pile Driving

Source Level (Single Strike/shot SEL)	177 dB SEL/ 203 dB Peak	161 dB RMS	152 dB RMS
Weighting Factor Adjustment (kHz)	2	2.5	2.5
Number of strikes per pile	550		
Number of piles per day	6	6/9	9
Duration to install/removal single pile (minutes)	60	30/5	5
Propagation (xLogR)	15	15	15
Distance of source level measurement (meters)	10	10	10

Table 7. Level A Harassment (PTS) Isopleths.

Activity	PTS Isopleth Distance (meters)				
	LF Cetacean	MF Cetacean	HF Cetacean	Phocid Pinniped	Otariid Pinniped
24” Steel Pipe Pile Impact Installation	881.2	31.3	1,049.7	471.6	34.3
24” Steel Pipe Vibratory Installation	14.2	1.3	21.0	8.6	0.6
24” Steel Pipe Vibratory Removal	5.6	0.5	8.3	3.4	0.2
24” Timber Pile Removal Vibratory	1.4	0.1	2.1	0.9	0.1

Level B Harassment

Utilizing the practical spreading loss model, the Corps determined underwater noise will fall below the behavioral effects threshold of 160 dB and 120 dB rms for marine mammals at the distances shown in Table 8 with corresponding ensonified areas.

Table 8. Level B Harassment Isopleths.

Activity	Isopleth Distance (m)	Isopleth Area (km^2)*
24” Steel Pipe Pile Impact Installation	1,000	3-4

24” Steel Pipe Vibratory Installation	5,412	64-73
24” Steel Pipe Vibratory Removal	5,412	64-73
24” Timber Pile Removal Vibratory	1,359	0.6-0.7

*The lower limit represents the isopleth area for the pile dike at RM 4.01, which has a slightly smaller area due to land impedances. The upper limit of the range is the calculated isopleth area for the pile dike at RM 6.37.

Marine Mammal Occurrence and Take Calculation and Estimation

In this section we provide the information about the presence, density, or group dynamics of marine mammals that will inform the take calculations. Potential exposures to impact pile driving, vibratory pile driving and vibratory pile removal were estimated using group size estimates and local observational data. As previously stated, take by Level B harassment as well as small numbers of take by Level A harassment will be will be considered for this action. Take by Level B and Level A harassment are calculated differently for some species based on monthly or daily sightings data and average group sizes within the action area using the best available data. Take by Level A harassment is authorized for two species where the Level A harassment isopleths are very large during impact pile driving (harbor porpoise and harbor seal). Distances to Level A harassment thresholds for other project activities (vibratory pile driving/removal) are considerably smaller compared to impact pile driving, and mitigation is expected to avoid Level A harassment from these other activities.

Cetaceans

Harbor Porpoise

Harbor porpoises are regularly observed in the oceanward waters near the MCR and are known to occur there year-round. Porpoise abundance peaks when anchovy (*Engraulis mordax*) abundance in the river and nearshore are highest, which is usually between April and August

(Litz *et al*. 2008). The 2016 monitoring report indicated that porpoises were sighted on 5 separate occasions (Grette Associates, 2016) while none were recorded as part of the 2017 LOA monitoring report. NMFS assumed a sighting rate of one animal per day in the proposed IHA for the Level B harassment. However, porpoises often occur in groups of 2-3. Therefore, to estimate take for days when there is vibratory pile driving and the Level B harassment zone is large (about five times the distance, and 20 times the area, of the Level B harassment zone for impact-only pile driving), NMFS has included consideration of a group size of 2 animals and will authorize take of two animals per driving day. With 21 days of vibratory driving (18 days of impact/vibratory and 3 days of timber pile vibratory removal), the number of authorized harbor porpoise takes by Level B harassment has been increased from 21 to 42 to account for this increase in the estimated number of harbor porpoises likely to enter that zone per day.

For impact pile driving, the Level A harassment zone is slightly larger than the Level B harassment zone, and as noted above, about one twentieth of the area of the Level B harassment zone for vibratory pile driving. For the proposed IHA, NMFS assumed that due their cryptic behavior, it was plausible that during the 20 days of impact-only driving, some number of porpoises could enter into the Level A harassment zone without being detected by PSOs, and we initially proposed that 10 would be taken (approximately one fourth of the number currently projected for vibratory pile driving, which has a Level B harassment zone 20 times larger). No take by Level B harassment is proposed during impact only driving days (beyond that already counted within the Level A harassment zone) since the Level A harassment isopleth is greater than the Level B isopleth for HF cetaceans. However, in the proposed IHA we neglected to consider the Level A harassment that might occur in the 18 days that includes both vibratory and

impact pile driving, and therefore we have increased the Level A harassment of harbor porpoises from 10 to 20.

Pinnipeds

Take calculations for Steller sea lions and California sea lions were estimated in the IHA using abundance estimates from the South Jetty recorded by the Washington Department of Fish and Wildlife (WDFW) between 2000 and 2014. The South Jetty is approximately four kilometers to the south of Sand Island. The Level B harassment area includes the entirety of the South Jetty where pinnipeds haul out. In order to estimate take, the average number of animals seen for the months of September, October, and November was used a basis for overall pinniped abundance as shown in Table 9. Since there was no data available for harbor seals during those three months, the December average was used to represent the average during the previous three months. NMFS assumed animals counted at the South Jetty comprised the majority of pinnipeds present in the Lower Columbia River west of Interstate 101 between September and November. This total area, including the jetties, was approximately 275 km^2. NMFS calculated the density of each pinniped species per km^2, then multiplied by the area of the harassment zone and number of workdays anticipated at each pile dike (Table 10).

NMFS used the methodology described above to estimate take of harbor seals in the proposed IHA resulting in estimated take of 3 seals by Level A harassment and 270 seals by Level B harassment. However, the Commission felt that the calculated harbor seal density underrepresents the number of seal that may occur at the project area. Harbor seals have been documented at two sites in Chinook/Baker Bay that are within the Level B harassment zone. These sites, however, are used only intermittently and feature less than 100 animals. There are an additional three haulouts at Desmond Sands, located southeast of the project area, including the

main lower Columbia River seal haulout. Two of the haulouts are described as alternate sites to the main haulout and are used intermittently. Surveys resulted in counts of less than 100 seals at one site and 100-500 seals at the other. More than 500 seals have been recorded at the main river haulout at Desmond Sands. However, that location.is approximately 10 km from the nearest test pile location (RM 6.37) or 5 km beyond the largest Level B harassment zone so may over represent seal numbers in the project area. NMFS opted to use WDFW abundance estimates from the South Jetty between 2000 and 2014 where the maximum daily number of observed seals was 57 as shown in Table 9. This daily take rate was multiplied by the number of driving days (41) resulting in 2,337 authorized takes by Level B harassment. This same daily take rate was used to estimate take of harbor seals for the recently expired IHA issued to the City of Astoria for a waterfront bridge replacement project (83 FR 19243; May 5, 2018).

Level A harassment takes for seals could when either an animal pops up in the 100-m shut-down zone before the operators are able to cease pile driving or when a seal occurs within the larger Level A harassment zone of 472 m for impact driving. NMFS has increased harbor seal authorized take by Level A harassment by assuming that two animals could be taken on each of the 38 days of impact driving. NMFS has increased authorized Level A harassment takes of harbor seals from 3 to 76 and the Level B harassment takes of harbor seals from 270 to 2,337.

Table 9. Average Daily Number of Pinnipeds per Month on South Jetty, 2000-2014.

Month	Avg. Number of Steller Sea Lions/Month	Avg. Number of California Sea Lions/Month	Avg. Number of Harbor Seals/Month
September	209	249	--
October	384	508	--
November	1,663	1,214	--
December	--	--	57
Construction Period Average	752	657	57

Source: Data from Washington Department of Fish and Wildlife 2014.

Table 10. Estimated Level B and Level A Take Calculations for Pinnipeds at River Mile (RM) 4.01 and 6.37.

Species	Density (animals/km^2)	Activity Type	Level B Isopleth area RM 4.01	Level B Isopleth area RM 6.37	Take/ day RM 4.01	Take/ day RM 6.37	Total Take RM 4.01	Total Take RM 6.37	Estimated Total Takes (Level B)
Stellar Sea lion	2.73	Impact Installation[1]	3	4	8.19	10.92	82	109	3,563
		Vibratory Installation/Removal[2]	64	73	174.72	199.29	1572	1794	
		Timber Vibratory Removal[3]	0.6	0.7	1.64	1.91	2	3	
							1657	1906	
California Sea lion	2.39	Impact Installation	3	4	7.17	9.56	72	96	3,119
		Vibratory Installation/Removal	64	73	152.96	174.47	1377	1570	
		Timber Vibratory Removal	0.6	0.7	1.43	1.67	2	3	
							1450	1668	
		Impact Installation	0.8	0.9	0.15	0.11	2	1	

[1]Assumes 10 days each at RM 4.01 and RM 6.37 for all pinniped species
[2]Assumes 9 days each at RM 4.01 and RM 6.37 for all pinniped species
[3]Assumes 1.5 days each at RM 4.01 and RM 6.37 for all pinniped species.

Table 11 illustrates the stocks NMFS has authorize for take and the percentage of the stock taken.

Table 11. Level A and Level B Harassment Take Estimates for the Sand Island Pile Dikes Test Piles.

Species	Level A Take	Level B Take	Stock Abundance	Percentage of Stock Taken
Harbor porpoise	20	42	21,487	0.3
California Sea Lion	--	3,119	296,750	1.1
Stellar Sea Lion	--	3,563	61,746	5.8
Harbor Seal	76	2,337	24,732	9.7

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.

In addition to the measures described later in this section, the Corps must employ the following standard mitigation measures:

- Conduct briefings between construction supervisors and crews and the marine mammal monitoring team prior to the start of all pile driving activity, and when new personnel join the work, to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures;
- For in-water heavy machinery work other than pile driving/removal (*e.g.*, standard barges, tug boats), if a marine mammal comes within 25 m, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions. This type of work could include the following activities: (1) Movement of the barge to the pile location; or (2) positioning of the pile on the substrate via a crane (*i.e.*, stabbing the pile);
- Work may only occur during daylight hours, when visual monitoring of marine mammals can be conducted;

- For any marine mammal species for which take by Level B harassment has not been requested or authorized, in-water pile installation/removal will shut down immediately when the animals are sighted;
- If take by Level B harassment reaches the authorized limit for an authorized species, pile installation will be stopped as these species approach the Level B harassment zone to avoid additional take of them.

Establishment of Shutdown Zones and Level A Harassment Zones—For all pile driving/removal and activities, the Corps establish a shutdown zone. The purpose of a shutdown zone is generally to define an area within which shutdown of activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). Shutdown zones will vary based on the type of driving/removal activity type and by marine mammal hearing group, (See Table 10). Here, shutdown zones are larger than the calculated Level A harassment isopleth shown in Table 7, except for harbor seals during impact driving when a 100-m shutdown zone and a 475-m Level A harassment zone will be visually monitored. The largest shutdown zones are generally for low frequency and high frequency cetaceans. The placement of (PSOs) during all pile driving/removal activities (described in detail in the Monitoring and Reporting Section) will ensure that the entirety of all shutdown zones are visible during pile installation.

Table 12. Shutdown Zones during Project Activities.

Activity	Distance (meters)				
	LF Cetacean	**MF Cetacean**	**HF Cetacean**	**Phocid Pinniped**	**Otariid Pinniped**
24” Steel Pipe Pile Impact Installation	890	35	1050	100	35
24” Steel Pipe Vibratory Installation	25	25	25	25	25

24” Steel Pipe Vibratory Removal	25	25	25	25	25
24” Timber Pile Removal Vibratory	25	25	25	25	25

Establishment of Monitoring Zones for Level B Harassment—The Corps will establish monitoring zones, based on the Level B harassment zones which are areas where SPLs are equal to or exceed the 160 dB rms threshold for impact driving and the 120 dB rms threshold during vibratory driving/removal. Monitoring zones provide utility for observing by establishing monitoring protocols for areas adjacent to the shutdown zones. Monitoring zones enable observers to be aware of and communicate the presence of marine mammals in the project area outside the shutdown zone and thus prepare for a potential cease of activity should the animal enter the shutdown zone. Due to the large size of the Level B harassment zones, it is impracticable for the PSOs to consistently view the entire harassment area. Therefore, takes by Level B harassment will be recorded and extrapolated based upon the number of observed takes and the percentage of the Level B harassment zone that was not visible. Distances to the Level B harassment zones are depicted in Table 13.

Table 13. Distances to Level B Harassment Zones During Project Activities.

Activity	Distance (m)
24” Steel Pipe Pile Impact Installation	1,000
24” Steel Pipe Vibratory Installation	5,420
24” Steel Pipe Vibratory Removal	5,420
24” Timber Pile Removal Vibratory	1,360

Soft Start—The use of a soft-start procedures is believed to provide additional protection to marine mammals by providing warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. For impact pile driving, contractors will be required to provide an initial set of strikes from the hammer at reduced percent energy, each strike followed by no less than a 30-second waiting period. This procedure will be conducted a total of three times before impact pile driving begins. Soft Start is not required during vibratory pile driving and removal activities. A soft start must be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of thirty minutes or longer. If a marine mammal is present within the Level A harassment zone, soft start will be delayed until the animal leaves the Level A harassment zone. Soft start will begin only after the PSO has determined, through sighting, that the animal has moved outside the Level A harassment zone. If a marine mammal is present in the Level B harassment zone, soft start may begin and a Level B take will be recorded. Soft start up may occur when these species are in the Level B harassment zone, whether they enter the Level B zone from the Level A zone or from outside the monitoring area.

Pre-Activity Monitoring—Prior to the start of daily in-water construction activity, or whenever a break in pile driving of 30 minutes or longer occurs, PSOs will observe the shutdown and monitoring zones for a period of 30 minutes. The shutdown zone will be cleared when a marine mammal has not been observed within the zone for that 30-minute period. If a marine mammal is observed within the shutdown zone, a soft-start cannot proceed until the animal has left the zone or has not been observed for 15 minutes. If the Level B harassment zone has been observed for 30 minutes and marine mammals are not present within the zone, soft start procedures can commence and work can continue even if visibility becomes impaired within the

Level B harassment zone. When a marine mammal permitted for take by Level B harassment is present in the Level B harassment zone, piling activities may begin and take by Level B will be recorded. As stated above, if the entire Level B harassment zone is not visible at the start of construction, pile driving/removal activities can begin. If work ceases for more than 30 minutes, the pre-activity monitoring of both the Level B harassment and shutdown zone will commence.

Based on our evaluation of the applicant's proposed measures, as well as other measures considered by NMFS, we have determined that the 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.

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 action area. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

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

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density);

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

Visual Monitoring

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

There will be at least two PSOs employed during all pile driving/removal activities. PSO will not perform duties for more than 12 hours in a 24-hour period. One PSO would be positioned close to pile driving/removal activities at the best practical vantage point. A second

PSO would be vessel-based to provide best coverage of the appropriate Level A and Level B harassment zones. If waters exceed a sea-state which restricts the observers' ability to make boat-based observations for the full Level A shutdown zone (e.g., excessive wind, wave action, or fog), impact pile installation will cease until conditions allow monitoring to resume. Contractors should ensure compliance with NOAA advisories for safe boat operations based on the size of vessel to be used by the marine mammal observer.

As part of monitoring, PSOs would scan the waters using binoculars, and/or spotting scopes, and would use a handheld GPS or range-finder device to verify the distance to each sighting from the project site. All PSOs would be trained in marine mammal identification and behaviors and are required to have no other project-related tasks while conducting monitoring. In addition, monitoring will be conducted by qualified observers, who will be placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown/delay procedures when applicable by calling for the shutdown to the hammer operator. Qualified observers are trained and/or experienced professionals, with the following minimum qualifications:

- Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance; use of binoculars may be necessary to correctly identify the target;
- Independent observers (*i.e.*, not construction personnel);
- Observers must have their CVs/resumes submitted to and approved by NMFS;
- Advanced education in biological science or related field (*i.e.*, undergraduate degree or higher). Observers may substitute education or training for experience;
- Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience);

- At least one observer must have prior experience working as an observer;
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates and times when in-water construction activities were suspended to avoid potential incidental injury from construction sound of marine mammals observed within a defined shutdown zone; and marine mammal behavior; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

Reporting

A draft marine mammal monitoring report must be submitted to NMFS within 90 days after the completion of pile driving/removal activities. This reports will include an overall description of work completed, a narrative regarding marine mammal sightings, and associated PSO data sheets. Specifically, the reports must include:

- Date and time that monitored activity begins or ends;
- Construction activities occurring during each observation period;
- Weather parameters (*e.g.*, percent cover, visibility);
- Water conditions (*e.g.*, sea state, tide state);
- Species, numbers, and, if possible, sex and age class of marine mammals;

- Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;
- Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
- Locations of all marine mammal observations;
- An estimate of total take based on proportion of the monitoring zone that was observed;
- Other human activity in the area; and
- Marine mammal PSO observational datasheets or raw data.

If no comments are received from NMFS within 30 days, that phase's draft final report will constitute the final report. If comments are received, a final report for the given phase addressing NMFS comments must be submitted within 30 days after receipt of comments.
In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by the IHA, such as an injury, serious injury or mortality, the Corps would immediately cease the specified activities and report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the West Coast Regional Stranding Coordinator. The report would include the following information:

- Description of the incident;
- Environmental conditions (*e.g.,* Beaufort sea state, visibility);
- Description of all marine mammal observations 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) (if equipment is available).

Activities would not resume until NMFS is able to review the circumstances of the prohibited take. NMFS would work with the Corps to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. The Corps would not be able to resume their activities until notified by NMFS via letter, email, or telephone.

In the event that the Corps discovers an injured or dead marine mammal, and the lead PSO 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 as described in the next paragraph), the Corps would immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the West Coast Regional Stranding Coordinator. The report would include the same information identified in the paragraph above. Activities would be able to continue while NMFS reviews the circumstances of the incident. NMFS would work with the Corps to determine whether modifications in the activities are appropriate.

In the event that the Corps discovers an injured or dead marine mammal and the lead PSO determines that the injury or death is not associated with or related to the activities authorized in these IHAs (*e.g.*, previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), the Corps would report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the West Coast Regional Stranding Coordinator, within 24 hours of the discovery. The Corps would provide photographs, video footage (if available), or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network.

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, our analysis applies to all species listed in Table 11, given that NMFS expects the anticipated effects of the planned pile driving/removal to be similar in nature. Where there are meaningful differences between species or stocks, or groups of species, in anticipated individual responses to activities, impact of expected take on the population due to differences in population status, or impacts on habitat, NMFS has identified species-specific factors to inform the analysis.

NMFS does not anticipate that serious injury or mortality would occur as a result of the Corps' planned activity. As stated in the mitigation section, shutdown zones that equal or exceed Level A harassment isopleths shown in Table 12 will be implemented. Take by Level A harassment is authorized for some species (harbor seals, harbor porpoises) to account for the slight possibility that these species escape observation by the PSOs within the Level A harassment zone. Further, any take by Level A harassment is expected to arise from, at most, a small degree of PTS because animals would need to be exposed to higher levels and/or longer duration than are expected to occur here in order to incur any more than a small degree of PTS. Additionally, as noted previously, some subset of the individuals that are behaviorally harassed could also simultaneously incur some small degree of TTS for a short duration of time. Because of the small degree anticipated, though, any PTS or TTS potentially incurred here would not be expected to adversely impact individual fitness.

Behavioral responses of marine mammals to pile driving and removal at the planned test piles project sites are expected to be mild, short term, and temporary. Marine mammals within the Level B harassment zone may not show any visual cues they are disturbed by activities or they could become alert, avoid the area, leave the area, or display other mild responses that are not observable such as changes in vocalization patterns. Given the short duration of noise-generating activities (between 6-41 days over 3-month period), any harassment would be likely be intermittent and temporary. Furthermore, many of the species occurring near the MCR or in the Columbia River estuary would only be present temporarily based on seasonal patterns or during transit between other habitats. These temporarily present species would be exposed to even smaller periods of noise-generating activity, further decreasing the impacts.

In addition, for all species there are no known biologically important areas (BIAs) within the MCR or Columbia River estuary and there is no ESA-designated marine mammal critical habitat. The estuary represents a very small portion of the total available habitat to marine mammal species.

More generally, there are no known calving or rookery grounds within the project area, but anecdotal evidence from local experts shows that marine mammals are more prevalent during spring and summer associated with feeding on aggregations of fish. Because the Corps' activities would occur in the fall months, the project area represents a small portion of available foraging habitat, and the duration of noise-producing activities relatively is short, meaning impacts on marine mammal feeding for all species should be minimal.

Any impacts on marine mammal prey that would occur during the Corps' planned activity would have at most short-terms effects on foraging of individual marine mammals, and likely no effect on the populations of marine mammals as a whole. Therefore, indirect effects on marine mammal prey during the construction are not expected to be substantial, and these insubstantial effects would therefore be unlikely to cause substantial effects on marine mammals.

In summary and as described above, the following factors primarily support our determination that the impacts resulting from this activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival:

- No mortality is anticipated or authorized;

- The Corps would implement mitigation measures including soft-starts for impact pile driving and shutdown zones that exceed Level A harassment zones for authorized species, except for harbor seals which will help to ensure that take by Level A harassment is at most a small degree of PTS;

- Anticipated incidents of Level B harassment consist of, at worst, temporary modifications in behavior;
- There are no BIAs within the MCR and Columbia River estuary or other known areas of particular biological importance to any of the affected stocks are impacted by the activity;
- The project area represents a very small portion of the available foraging area for all marine mammal species and anticipated habitat impacts are minimal; and
- The required mitigation measures (e.g. shutdown zones, soft-start) are expected to be effective in reducing the effects of the specified activity.

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 monitoring and mitigation measures, NMFS finds that the total marine mammal take from the planned 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.

Table 11 in the *Marine Mammal Occurrence and Take Calculation and Estimation* section, present the number of animals that could be exposed to received noise levels

that may result in take by Level A harassment or Level B harassment from the Corps' planned activities. Our analysis shows that 9.7 percent or less of the best population estimates of each affected stock could be taken. Additionally, the planned test piles project is located near the pinniped haulout at the South Jetty. Therefore, it is likely that many of these takes will be repeated takes of the same animals over multiple days. As such, the take estimate serves as a good estimate of instances of take, but is likely an overestimate of individuals taken, so actual percentage of stocks taken would be even lower.

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

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 determined that the issuance of the IHA qualifies to be categorically excluded from further NEPA review

Endangered Species Act (ESA)

No incidental take of ESA-listed species is authorized 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.

Authorization

NMFS has issued an IHA to the Corps for conducting test pile installation and removal at the Sand Island Pile Dike system near the MCR, for one year from the date of issuance, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated.

Dated: November 5, 2019.

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Donna S. Wieting,

Director, Office of Protected Resources,

National Marine Fisheries Service.

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