



DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648-XD241]

Taking of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to City of Cordova Harbor Rebuild Project, Cordova, Alaska

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 two incidental harassment authorizations (IHAs) to the City of Cordova (Cordova) to incidentally harass marine mammals during construction activities associated with a with the City of Cordova, Cordova Harbor Rebuild project, in Cordova, Alaska.

DATES: These Authorizations are effective from October 1, 2023 through September 30, 2024 and October 1, 2024 through September 30, 2025.

ADDRESSES: 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/national/marine-mammal-protection/incidental-take-authorizations-construction-activities>. In case of problems accessing these documents, please call the contact listed below.

FOR FURTHER INFORMATION CONTACT: Rachel Wachtendonk, Office of Protected Resources, NMFS, (301) 427-8401.

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 United States (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 proposed or, if the taking is limited to harassment, a notice of a proposed IHA is 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 the 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 the takings are set forth. The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below.

Summary of Request

On February 16, 2023, NMFS received a request from the Cordova for two IHAs to take marine mammals incidental to pile driving and removal activities associated with the City of Cordova, Cordova Harbor Rebuild project, in Cordova, Alaska over the course of 2 years. Following NMFS’ review of the application, The City of Cordova (Cordova) submitted a revised version on April 19, 2023. The application was deemed adequate and complete on May 12, 2023. Cordova’s request for the first IHA is for take

of 4 species of marine mammals by Level B harassment and, for a subset of these species, Level A harassment. For the second IHA, Cordova is requesting take of only Steller sea lion (*Eumetopias jubatus*) and harbor seal (*Phocoena phocoena*) by Level A and Level B harassment. Neither Cordova nor NMFS expect serious injury or mortality to result from this activity and, therefore, IHAs are appropriate.

There are no changes from the proposed IHAs to the final IHAs.

Description of Activity

Cordova plans to replace existing structures in the Cordova Harbor in Cordova, Alaska. Over the course of 2 years spanning September 2023-April 2024 and September 2024-April 2025, Cordova will use a variety of methods, including vibratory, impact, and down-the-hole (DTH) pile driving to remove existing piles and to install new ones.

Phase I will involve the removal of existing piles, the installation and removal of temporary piles, and the installation of permanent piles in the south harbor. During Phase I, 130 timber (12-inch (in) diameter; 0.3-meter (m) diameter) and 61 old steel (12-in (0.3-m) diameter) piles will be removed. Once the existing piles are removed, 155 16-in (0.4-m), 70 18-in (0.5-m), and 30 30-in (0.8-m) permanent steel piles will be installed. The installation and removal of 61 temporary 24-in (0.6-m) steel pipe piles will be completed to support permanent pile installation. Vibratory hammers, impact hammers, and DTH drilling will be used for the installation and removal of all piles. Piles will be removed by dead-pull or vibratory methods. The installation and removal of temporary piles will be conducted using vibratory hammers. All permanent piles will be initially installed with a vibratory hammer. After vibratory driving, if needed, piles will be impacted into the bedrock with an impact hammer. For some piles, a DTH drill will be needed to drive piles the final few inches of embedment.

Phase II will involve the removal of existing piles, the installation and removal of temporary piles, and the installation of permanent piles in the north and south harbor.

During Phase II, 268 12-in (0.3-m) timber piles will be removed. Then, 24 24-in (0.6-m) steel piles, 80 steel H-piles, and 80 steel sheet piles will be installed. The installation and removal of 31 temporary 24-in (0.6-m) steel pipe piles will be completed to support permanent pile installation. As in Phase I, vibratory hammers, impact hammers, and DTH drilling will be used for the installation and removal of all piles. Piles will be removed by dead-pull or vibratory methods. The installation and removal of temporary piles will be conducted using vibratory hammers. All permanent piles would be initially installed with a vibratory hammer. After vibratory driving, if needed, piles will be impacted into the bedrock with an impact hammer. For some piles, a DTH drill will be needed to drive piles the final few inches of embedment.

A further detailed description of the planned construction project is provided in the **Federal Register** notice for the proposed IHAs (88 FR 45149, July 14, 2023). Since that time, no changes have been made to the planned activities. Therefore, a detailed description is not provided here. Please refer to that **Federal Register** notice for the description of the specified activity. Mitigation, monitoring, and reporting measures are described in detail later in this document (please see **Mitigation and Monitoring and Reporting**).

Comments and Responses

A notice of NMFS' proposal to issue two IHAs to Cordova was published in the **Federal Register** on July 14, 2023 (88 FR 45149). That notice described, in detail, Cordova's activity, the marine mammal species that may be affected by the activity, and the anticipated effects on marine mammals. During the 30-day public comment period, no public comments were received.

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. NMFS fully considered all of this information, and we refer the reader to these descriptions, instead of reprinting the information. Additional information regarding population trends and threats may be found in NMFS' 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' website (<https://www.fisheries.noaa.gov/find-species>).

Table 1 lists all species or stocks for which take is expected and authorized for this activity, and summarizes information related to the population or stock, including regulatory status under the MMPA and Endangered Species Act (ESA) and potential biological removal (PBR), where known. 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' SARs). While no serious injury or 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 or stocks 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' 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' Alaska Marine Mammal SARs. All values presented in Table 1 are the most recent available at the time of publication (including from the 2022 SARs) and are available online at:

Table 1 -- Species Likely Impacted by the Specified Activities¹

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N) ²	Stock abundance (CV, N _{min} , most recent abundance survey) ³	PBR	Annual M/SI ⁴
Odontoceti (toothed whales, dolphins, and porpoises)						
<i>Family Delphinidae</i>						
Killer whale	<i>Orcinus orca</i>	Alaska Resident	-/ -; N	1,920 (N/A, 1,920, 2019)	19	1.3
		Gulf of Alaska/Aleutian Islands/Bering Sea Transient	-/ -; N	587 (N/A, 587, 2012)	5.9	0.8
		AT1 Transient	-/D; N	7 (N/A, 7, 2019)	0.1	0
<i>Family Phocoenidae (porpoises)</i>						
Dall's porpoise	<i>Phocoenoides dalli</i>	Alaska	-/ -; N	UND (UND, UND, 2015) ⁵	UND	37
Order Carnivora – Pinnipedia						
<i>Family Otariidae (eared seals and sea lions)</i>						
Steller sea lion	<i>Eumetopias jubatus</i>	Western DPS	E/D; Y	52,932 (N/A, 52,932, 2019)	318	254
<i>Family Phocidae (earless seals)</i>						
Harbor seal	<i>Phoca vitulina</i>	Prince William Sound	-/ -; N	44,756 (N/A, 41,776, 2015)	1253	413

¹Information on the classification of marine mammal species can be found on the web page for The Society for Marine Mammalogy's Committee on Taxonomy (<https://www.marinemammalscience.org/science-and-publications/list-marine-mammal-species-subspecies>; Committee on Taxonomy, 2022).

²Endangered 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.

³NMFS marine mammal stock assessment reports online at: <https://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.

⁴These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (e.g., commercial fisheries, vessel 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.

⁵Population estimate of 13,110 based on surveys from western Prince William Sound, as abundance estimates for the Alaska stock are more than 8 years old and are no longer considered reliable (Muto *et al.*, 2022). This population estimate will be used for small numbers calculations.

As indicated above, all four species (with six managed stocks) in Table 1 temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur. All species that could potentially occur in the planned project areas are included in Table 10 of the IHA application. While northern fur seal, Pacific white-sided dolphin, harbor porpoise, humpback whale, fin whale, minke whale, and gray whale have been documented in Prince William Sound, the temporal and/or spatial occurrence of these species is such that take is not expected to occur, and they are not discussed further beyond the explanation provided here. These species are all considered to be rare (no sightings in recent years) or very rare (no local knowledge of sightings within the project vicinity) within Orca Bay according to the Prince William Sound Science Center in Cordova (Prince William Sound Science Center, 2022; Schinella, 2022). Given the shallow depths of the waters surrounding Cordova Harbor, it would also be unusual for many of these species to enter the project area. The take of these species has not been requested nor authorized and these species are not considered further in this document.

A detailed description of the species likely to be affected by Cordova's construction 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 IHAs (88 FR 45149, July 14, 2023); 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. Please also refer to the NMFS website (<https://www.fisheries.noaa.gov/find-species>) for generalized species accounts.

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. 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, 2019) recommended that marine mammals be divided into hearing groups based on directly measured (behavioral or auditory evoked potential techniques) or estimated hearing ranges (behavioral response data, anatomical modeling, *etc.*). Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e.*, low-frequency cetaceans). Subsequently, NMFS (2018) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65-decibel (dB) threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. Marine mammal hearing groups and their associated hearing ranges are provided in Table 2.

Table 2 -- 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, <i>Kogia</i> , river dolphins, <i>Cephalorhynchid</i> , <i>Lagenorhynchus cruciger</i> & <i>L. australis</i>)	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>i.e.</i> , all species within the group), where individual species' hearing ranges are typically not as broad. Generalized hearing range chosen based on a ~65-dB threshold from normalized composite audiogram, with the exception for lower limits for LF cetaceans (Southall <i>et al.</i> , 2007) and PW pinniped (approximation).	

The 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.

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

The effects of underwater noise from Cordova's pile driving activities have the potential to result in behavioral harassment of marine mammals in the vicinity of the project area. The notice of the proposed IHAs (88 FR 45149, July 14, 2023) included a discussion of the effects of anthropogenic noise on marine mammals and the potential effects of underwater noise from Cordova's pile driving activities on marine mammals and their habitat. That information and analysis is incorporated by reference into this final IHA determination and is not repeated here; please refer to the notice of the proposed IHAs (88 FR 45149, July 14, 2023).

Estimated Take of Marine Mammals

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

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "harassment" as any act of pursuit, torment, or annoyance, which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment), or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes will primarily be by Level B harassment, as use of the acoustic sources (*i.e.*, vibratory or impact pile driving and DTH drilling) 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 Dall's porpoise and harbor seals, due to the cryptic nature of these species in context of larger predicted auditory injury zones. Auditory injury is unlikely to occur for mid-frequency species and otariids, based on the likelihood of the species in the action area, the ability to monitor the entire smaller shutdown zone, and because of the expected ease of detection for the former groups. The mitigation and monitoring measures are expected to minimize the severity of the taking to the extent practicable.

As described previously, no serious injury or mortality is anticipated or authorized for this activity. Below we describe how the take numbers are estimated.

For acoustic impacts, generally speaking, we estimate take by considering: (1) acoustic thresholds above which NMFS believes the best available science indicates marine mammals would be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that would be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) the number of days of activities. We note that while these factors can contribute to a basic calculation to provide an initial prediction of potential 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 estimates.

Acoustic Thresholds

NMFS recommends the use of 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

permanent threshold shift (PTS) of some degree (equated to Level A harassment).

Thresholds have also been developed identifying the received level of in-air sound above which exposed pinnipeds would likely be behaviorally harassed.

Level B Harassment – Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source or exposure context (*e.g.*, frequency, predictability, duty cycle, duration of the exposure, signal-to-noise ratio, distance to the source), the environment (*e.g.*, bathymetry, other noises in the area, predators in the area), and the receiving animals (hearing, motivation, experience, demography, life stage, depth) and can be difficult to predict (*e.g.*, Southall *et al.*, 2007, 2021; Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a metric that is both predictable and measurable for most activities, NMFS typically uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS generally predicts that marine mammals are likely to be behaviorally harassed in a manner considered to be Level B harassment when exposed to underwater anthropogenic noise above root-mean-squared pressure received levels (RMS SPL) of 120 dB (referenced to 1 micropascal (re 1 μ Pa)) for continuous (*e.g.*, vibratory pile driving, drilling) and above RMS SPL 160 dB re 1 μ Pa for non-explosive impulsive (*e.g.*, seismic airguns) or intermittent (*e.g.*, scientific sonar) sources. For in-air sounds, NMFS predicts that harbor seals exposed above received levels of 90 dB re 20 μ Pa (RMS) would be behaviorally harassed, and other pinnipeds would be harassed when exposed above 100 dB re 20 μ Pa (RMS). Generally speaking, Level B harassment take estimates based on these behavioral harassment thresholds are expected to include any likely takes by temporary threshold shift (TTS) as, in most cases, the likelihood of TTS occurs at distances from the source less than those at which behavioral harassment is likely. TTS of a sufficient degree can manifest as behavioral harassment, as

reduced hearing sensitivity and the potential reduced opportunities to detect important signals (conspecific communication, predators, prey) may result in changes in behavior patterns that would not otherwise occur.

Cordova’s planned activity includes the use of continuous (vibratory hammer and DTH drilling) and impulsive (DTH drilling and impact pile driving) sources, and therefore the 120- and 160-dB re 1 μ Pa (RMS) thresholds are applicable.

Level A harassment – NMFS’ Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). Cordova’s planned activity includes the use of impulsive (impact pile driving and DTH drilling) and non-impulsive (vibratory hammer and DTH drilling) sources.

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 3 -- Thresholds Identifying the Onset of Permanent Threshold Shift

Hearing Group	PTS Onset Acoustic Thresholds* (Received Level)	
	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	<i>Cell 1</i> $L_{pk,flat}$: 219 dB $L_{E,LF,24h}$: 183 dB	<i>Cell 2</i> $L_{E,LF,24h}$: 199 dB
Mid-Frequency (MF) Cetaceans	<i>Cell 3</i> $L_{pk,flat}$: 230 dB $L_{E,MF,24h}$: 185 dB	<i>Cell 4</i> $L_{E,MF,24h}$: 198 dB
High-Frequency (HF) Cetaceans	<i>Cell 5</i> $L_{pk,flat}$: 202 dB $L_{E,HF,24h}$: 155 dB	<i>Cell 6</i> $L_{E,HF,24h}$: 173 dB

Phocid Pinnipeds (PW) (Underwater)	<i>Cell 7</i> $L_{pk,flat}$: 218 dB $L_{E,PW,24h}$: 185 dB	<i>Cell 8</i> $L_{E,PW,24h}$: 201 dB
Otariid Pinnipeds (OW) (Underwater)	<i>Cell 9</i> $L_{pk,flat}$: 232 dB $L_{E,OW,24h}$: 203 dB	<i>Cell 10</i> $L_{E,OW,24h}$: 219 dB
<p>* 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.</p> <p>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 1 μPa²s. 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>i.e.</i>, 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.</p>		

Ensonified Area

Here, we describe operational and environmental parameters of the activity that are used in estimating the area ensonified above the acoustic thresholds, including source levels and transmission loss coefficient.

The sound field in the project area is the existing background noise plus additional construction noise from the planned project. Marine mammals are expected to be affected via sound generated by the primary components of the project (*i.e.*, impact pile driving, vibratory pile driving and removal, and DTH).

In order to calculate distances to the Level A harassment and Level B harassment thresholds for the methods and piles being used in this project, NMFS used acoustic monitoring data from other locations to develop source levels for the various pile types, sizes and methods (Table 4). This analysis uses the practical spreading loss model, a standard assumption regarding sound propagation for similar environments, to estimate

transmission of sound through water. For this analysis, the transmission loss factor of 15 (4.5 dB per doubling of distance) is used. A weighting adjustment factor of 2.5 or 2, a standard default value for vibratory pile driving and removal or impact driving and DTH respectively, were used to calculate Level A harassment areas.

NMFS recommends treating DTH systems as both impulsive and continuous, non-impulsive sound source types simultaneously. Thus, impulsive thresholds are used to evaluate Level A harassment, and continuous thresholds are used to evaluate Level B harassment. With regards to DTH mono-hammers, NMFS recommends proxy levels for Level A harassment based on available data regarding DTH systems of similar sized piles and holes (Denes *et al.*, 2019; Guan and Miner, 2020; Reyff and Heyvaert, 2019; Reyff, 2020; Heyvaert and Reyff, 2021).

Table 4 -- Estimated Underwater Proxy Source Levels for Pile Installation and Removal

Pile Type	Phase	Proxy Source Levels (dB) at 10 m			Reference
		Peak	RMS	SEL	
Vibratory Pile Driving					
12- to 24-in timber pile removal	I, II		162		Greenbusch <i>et al.</i> , 2018; CALTRANS, 2020
12- to 24-in steel pile removal	I		161		NAVFAC (2013, 2015)
24-in steel template pile install/removal	I, II				
16-in steel pile	I				
18-in steel pile	I				
24-in steel pile	II				
30-in steel pile	I		161.9		Denes <i>et al.</i> , 2016
Steel H-pile	II		165		CALTRANS, 2015
Steel sheet pile	II		162		Buehler <i>et al.</i> , 2015
Impact Pile Driving					
16-in steel pile	I	192.8	181.1	168.3	Denes <i>et al.</i> , 2016
18-in steel pile	I				
24-in steel pile	II				
30-in steel pile	I	210	190	177	NMFS 2023 analysis*
Steel H-pile	II	200	177	170	CALTRANS, 2015
Steel sheet pile	II	205	190	180	CALTRANS, 2015
DTH Drilling					
16-in steel pile	I		167	159	Heyvaert and Reyff, 2021
18- to 24-in steel pile	I,II				
30-in steel pile	I		174	164	Denes <i>et al.</i> , 2019); Reyff and

Steel H-pile	II			Heyvaert, 2019; Reyff, 2020
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Note: SEL= sound exposure level; RMS= root mean square.

*NMFS used the mean of regionally relevant measurements to determine suitable proxy source values for these pile types. Projects included in the analysis were Navy (2012, 2013) and Miner (2020), following the methodology of Navy (2015).

Table 5 -- Estimated In-Air Proxy Source Levels for Pile Installation and Removal

Pile Type	Phase	Proxy Source Levels (dB) at 15 m	Reference
		RMS	
Vibratory Pile Driving			
24-in steel template pile install/removal	I	103.2	Laughlin, 2010
18-in steel pile			
Steel H-pile			
Impact Pile Driving			
18-in steel pile	I	101	Ghebreghzabiher <i>et al.</i> , 2017
Steel H-pile			
DTH Drilling ¹			
18-in steel pile	I	101	Ghebreghzabiher <i>et al.</i> , 2017
Steel H-pile			

Note: SEL= sound exposure level; RMS= root mean square.

¹We conservatively assume that the proxy value for DTH driving is the same as for impact driving.

Level B Harassment Zones

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:

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

TL = transmission loss in dB

B = transmission loss coefficient; for practical spreading equals 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.

The recommended *TL* coefficient for most nearshore environments is the practical spreading value of 15. This value results in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions, which is the most

appropriate assumption for Cordova's planned underwater activities. The Level B harassment zones and approximate amount of area encompassed for the planned underwater activities are shown in Table 6. The Level B harassment zones for the planned upland pile driving activities that may generate airborne noise are shown in Table 5.

Level A Harassment Zones

The encompassed area associated with Level A harassment is more technically challenging to predict due to the need to account for a duration component. Therefore, NMFS developed an optional User Spreadsheet tool to accompany the Technical Guidance that can be used to relatively simply predict an isopleth distance for use in conjunction with marine mammal density or occurrence to help predict potential takes. We note that because of some of the assumptions included in the methods underlying this optional tool, we anticipate that the resulting isopleth estimates are typically going to be overestimates of some degree, which may result in an overestimate of potential take by Level A harassment. However, this optional tool offers the best way to estimate isopleth distances when more sophisticated modeling methods are not available or practical. For stationary sources, such as pile installation or removal, the optional User Spreadsheet tool predicts the distance at which, if a marine mammal remained at that distance for the duration of the activity, it would be expected to incur PTS. The isopleths generated by the User Spreadsheet used the same *TL* coefficient as the Level B harassment zone calculations (*i.e.*, the practical spreading value of 15). Inputs used in the User Spreadsheet (*e.g.*, number of piles per day, duration and/or strikes per pile) are presented in Tables 1 and 2 in the **Federal Register Notice** of the proposed IHAs (88 FR 45149, July 14, 2023). The maximum RMS SPL, sound exposure level (SEL), and resulting isopleths are reported in Tables 4, 5, and 6.

Table 6 -- Level A and Level B Harassment Isoleths for Pile Driving Activities

Pile Type	Phase	Distances to Level A and Level B thresholds (m)				Level B	Ensonified Area ^{1,2} for Level B (km ²)
		Level A					
		MF	HF	Phocid	Otariid		
Vibratory Pile Driving							
12- to 24-in timber pile removal	I, II	1.8	30.5	12.5	0.9	6,309.6	125
12- to 24-in steel pile removal	I	1.6	26.1	10.7	0.8	5,411.7	92
24-in steel template pile install/removal	I, II	0.9	14.2	5.8	0.4		
16-in steel pile	I	1.1	18.6	7.6	0.5		
18-in steel pile	I	1.4	22.5	9.3	0.7		
24-in steel pile	II						
30-in steel pile	I	1.4	24.1	9.9	0.7	6,213.5	121.2
Steel H-pile	II	1.1	18.7	7.7	0.5	10,000	314
Steel sheet pile	II	0.7	11.8	4.8	0.3	6,310	125
In-air pile installation/removal	I	-	-	-	-	68.6 (Phocid) / 22.8 (Otariid)	0.01 (Phocid) / 0.002 (Otariid)
Impact Pile Driving							
16-in steel pile	I	4.7	158.8	71.4	5.2	255	0.2
18-in steel pile	I						
24-in steel pile	II						
30-in steel pile	I	23.6	791.3	355.5	25.9	1,000	3.14
Steel H-pile	II	12.1	405.3	182.1	13.3	341.5	0.37
Steel sheet pile	II	56.2	1881.2	845.2	61.5	1,000	3.14
In-air pile installation/removal	I	-	-	-	-	53.2 (Phocid) / 16.8 (Otariid)	0.009 (Phocid) / 0.0009 (Otariid)
DTH Drilling							
16-in steel pile	I	32.1	1075.7	483.3	35.2	13,593.6	580.2
18- to 24-in steel pile	I,II						
30-in steel pile	I	61.3	2,052.20	922	67.1	39,810.7	4976.6
Steel H-pile	II						
In-air pile installation/removal	I	-	-	-	-	53.2 (Phocid) /	0.009 (Phocid) /

						16.8 (Otariid)	0.0009 (Otariid)
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¹Areas were calculated based on areas of a circle with the specified radius from Table 4 and 5 and realized ensonified areas will be smaller due to truncation by land masses

²The ensonified area within Cordova Harbor will be no more than 0.19 kilometers² (km²)

Marine Mammal Occurrence

In this section we provide information about the occurrence of marine mammals, including presence, density, local knowledge, or other relevant information which will inform the take calculations.

Daily occurrence probability of each marine mammal species in the action area is based on consultation with local researchers and marine professionals. Occurrence probability estimates are based on conservative density approximations for each species and factor in historic data of occurrence, seasonality, and group size in Orca Bay, Orca Inlet, and/or Prince William Sound. A summary of planned take is shown in Table 7. To accurately describe species occurrence near the action area, marine mammals were described as either common (multiple sightings every month, could occur each day), frequent (multiple sightings every year, could occur each month), or infrequent (few sightings every year, could occur each month).

Table 7 -- Estimated Occurrence of Group Sightings of Marine Mammals

Species	Frequency	Seasonality	Occurrence	Group size ^a
Steller sea lion (within harbor)	Common	Year-round	1 group per day	4.1 ^b
(outside harbor)	Common	Year-round	2 groups per day	4.1 ^b
Harbor seal (within harbor)	Frequent	Year-round	1 group per day	3.5 ^c
(outside harbor)	Common	Year-round	2 groups per day	3.5 ^c
Killer whale	Infrequent	Year-round	1 group per 10 days	14 ^d
Dall's porpoise	Infrequent	Year-round	1 group per 10 days	4.3 ^e

^a Group size was averaged from seasonal data (Steller sea lions and harbor seals), pod size (killer whales), and observational data (Dall's porpoise) for more information see application.

^b Leonard and Wisdom, 2020; Sigler *et al.*, 2017

^c ADF&G, 2022a

^d Muto *et al.*, 2022

^e Moran *et al.*, 2018

Take Estimation

Here we describe how the information provided above is synthesized to produce a quantitative estimate of the take that is reasonably likely to occur and are authorized.

For total underwater take estimate, the daily occurrence probability for a species was multiplied by the estimated group size and by the number of days of each type of pile driving activity. Group size is based on the best available published research for these species and their presence in this area.

Estimated take = Group size x Groups per day x Days of pile driving activity

Take of pinnipeds by Level B harassment due to airborne noise was calculated based on the proportion of area within the harbor likely to be ensonified above the thresholds for harbor seals and other pinnipeds, respectively. The percent of the harbor ensonified was then multiplied by the number of days of pile driving, the group size, and groups per day, as done for underwater take estimates. The total numbers of takes by Level B harassment due to airborne noise authorized for harbor seal and Steller sea lion are seven and zero, respectively.

Take by Level A harassment is authorized for Steller sea lions and harbor seals given that these species are known to spend extended periods of time within Cordova Harbor and most Level A harassment isopleths are contained within Cordova Harbor. The take by Level A harassment calculations are based on lower daily occurrence estimates for each species than take by Level B harassment calculations based on input from marine professionals in the community about their presence in within the smaller ensonified zone of the harbor (Table 7; Greenwood 2022). Take by Level A harassment is also authorized for Dall's porpoise for impact driving of sheet piles and DTH drilling of 30 in and H-piles as it is not practicable to observe and shut down for porpoises throughout the entire Level A harassment zone (1,885 m for impact driving and 2,050 m for DTH drilling). Additionally, Level A harassment isopleths for most hearing groups and pile types were less than 10 m (Table 6) which is the minimum shutdown zone for

this project (see **Mitigation**). Because the Level A harassment isopleths for those piles are within the minimum 10-m shutdown zone, no takes by Level A harassment are expected to occur from those activities, and therefore the predicted take by Level A harassment were removed from the total take calculations (Table 8).

During Phase II, killer whale and Dall’s porpoise are not expected to occur within any harassment zones due to the relatively shallow water that will be ensonified (south of Spike Island into tidal mud flats) and therefore no take is authorized for these species.

Table 8 -- Take of Marine Mammals by Level A and Level B Harassment and Percent of Stock to be Taken by Phase

Species	Stock/DPS	Authorized Take			Stock size ¹	Percent of stock
		Level A	Level B	Total Take		
Phase I						
Steller sea lion	Western DPS	107	788	895	52,932	1.69
Harbor seal	Prince William Sound	154	681	835	44,756	1.87
Killer whale ²	Alaska Resident	-	83	83	1,920	4.35
	Gulf of Alaska/Aleutian Islands/Bering Sea Transient	-	26	26	587	4.35
Dall's porpoise	Alaska	10	32	42	13,110	0.32
Phase II						
Steller sea lion	Western DPS	98	730	828	52,932	1.56
Harbor seal	Prince William Sound	133	623	756	44,756	1.69

¹Stock size comes from the most recent SARs except for Dall’s porpoise whose stock estimate is based on surveys from western Prince William Sound only, as abundance estimates for the Alaska stock are more than 8 years old and no longer considered reliable (Muto *et al.*, 2022).

²AT1 transient stock take calculation resulted in 0.3 takes, therefore no takes were requested or are authorized.

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 the activity, and other means of effecting the least practicable impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on

the availability of the species or stock for taking for certain subsistence. 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 the 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, NMFS considers 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, as well as subsistence uses. 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, and impact on operations.

Mitigation Measures

Cordova must follow mitigation measures as specified below:

- Ensure that construction supervisors and crews, the monitoring team, and relevant Cordova staff are trained prior to the start of all pile driving and DTH drilling activity, so that responsibilities, communication procedures, monitoring protocols, and operational procedures are clearly understood. New personnel joining during the project must be trained prior to commencing work;

- Employ Protected Species Observers (PSOs) and establish monitoring locations as described in the application and the IHAs. The Holder must monitor the project area to the maximum extent possible based on the required number of PSOs, required monitoring locations, and environmental conditions. For all pile driving and removal at least one PSO must be used. The PSO will be stationed as close to the activity as possible;

- The placement of the PSOs during all pile driving and removal and DTH drilling activities will ensure that the entire shutdown zone is visible during pile installation;

- Monitoring must take place from 30 minutes prior to initiation of pile driving or DTH drilling activity (*i.e.*, pre-clearance monitoring) through 30 minutes post-completion of pile driving or DTH drilling activity;

- Pre-start clearance monitoring must be conducted during periods of visibility sufficient for the lead PSO to determine that the shutdown zones indicated in Table 9 are clear of marine mammals. Pile driving and DTH drilling may commence following 30 minutes of observation when the determination is made that the shutdown zones are clear of marine mammals;

- Cordova must use soft start techniques when impact pile driving. Soft start requires contractors to provide an initial set of three strikes at reduced energy, followed by a 30-second waiting period, then two subsequent reduced-energy strike sets. 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 30 minutes or longer;

- If a marine mammal is observed entering or within the shutdown zones indicated in Table 9, pile driving and DTH drilling must be delayed or halted. If pile driving is delayed or halted due to the presence of a marine mammal, the activity may not commence or resume until either the animal has voluntarily exited and been visually

confirmed beyond the shutdown zone (Table 9) or 15 minutes have passed without re-detection of the animal; and

- As planned by the applicant, in water activities will take place only between civil dawn and civil dusk when PSOs can effectively monitor for the presence of marine mammals; during conditions with a Beaufort Sea State of 4 or less. Pile driving and DTH drilling may continue for up to 30 minutes after sunset during evening civil twilight, as necessary to secure a pile for safety prior to demobilization during this time. The length of the post- activity monitoring period may be reduced if darkness precludes visibility of the shutdown and monitoring zones.

Shutdown Zones

Cordova will establish shutdown zones for all pile driving and DTH drilling activities. The purpose of a shutdown zone is generally to define an area within which shutdown of the activity will occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). Shutdown zones will be based upon the Level A harassment isopleth for each pile size/type and driving method where applicable, as shown in Table 9.

For in-water heavy machinery activities other than pile driving, if a marine mammal comes within 10 m, work will stop and vessels will reduce speed to the minimum level required to maintain steerage and safe working conditions. A 10-m shutdown zone serves to protect marine mammals from physical interactions with project vessels during pile driving and other construction activities, such as barge positioning or drilling. If an activity is delayed or halted due to the presence of a marine mammal, the activity may not commence or resume until either the animal has voluntarily exited and been visually confirmed beyond the shutdown zone indicated in Table 9 or 15 minutes have passed without re-detection of the animal. Construction activities must be halted upon observation of a species for which incidental take is not authorized or a species for

which incidental take has been authorized but the authorized number of takes has been met entering or within the harassment zone.

All marine mammals will be monitored in the Level B harassment zones and throughout the area as far as visual monitoring can take place. If a marine mammal enters the Level B harassment zone, construction activities including in-water work will continue and the animal's presence within the estimated harassment zone will be documented.

Cordova will also establish shutdown zones for all marine mammals for which take has not been authorized or for which incidental take has been authorized but the authorized number of takes has been met. These zones are equivalent to the Level B harassment zones for each activity. If a marine mammal species not covered under these IHAs enters the shutdown zone, all in-water activities will cease until the animal leaves the zone or has not been observed for at least 15 minutes, and NMFS will be notified about species and precautions taken. Pile driving will proceed if the non-IHA species is observed to leave the Level B harassment zone or if 15 minutes have passed since the last observation.

If shutdown and/or clearance procedures will result in an imminent safety concern, as determined by Cordova or its designated officials, the in-water activity will be allowed to continue until the safety concern has been addressed, and the animal will be continuously monitored.

Table 9 -- Shutdown and Monitoring Zones

Pile type	Phase	Minimum shutdown zone (m)				Monitoring zone (m)
		MF	HF	Phocid	Otariid	
Barge movements, pile positioning, <i>etc.</i>	I,II	10	10	10	10	10
Vibratory Pile Driving						
12- to 24-in timber pile removal	I, II	10	35	25	10	6,310
12- to 24-in steel pile removal	I	10	35	20	10	5,425
24-in steel template pile install/removal	I, II	10	25	10	10	5,425

16- to 24-in steel pile						
30-in steel pile	I	10	25	10	10	6,225
Steel H-pile	II	10	35	25	10	10,000
Steel sheet pile	II	10	25	10	10	6,310
In-air pile install/removal	I	-	-	-	-	70 (phocids)/ 25 (otariids)
Impact Pile Driving						
16- to 24-in steel pile	I	10	185	75	10	255
30-in steel pile	I	25	800	360	25	1,000
Steel H-pile	II	25	410	185	25	350
Steel sheet pile	II	75	1,000	500	75	1,000
In-air pile install	I	-	-	-	-	55 (phocids)/ 20 (otariids)
DTH Drilling						
16- to 24-in pile	I, II	35	1,000	500	40	13,594
30-in pile	I	75	1,000	500	75	39,811
Steel H-pile	II	75	1,000	500	75	39,811
In-air pile install	I	-	-	-	-	55 (phocids)/ 20 (otariids)

Protected Species Observers

The placement of PSOs during all construction activities (described in the **Monitoring and Reporting** section) will ensure that the entire shutdown zone is visible. Should environmental conditions deteriorate such that the entire shutdown zone would not be visible (*e.g.*, fog, heavy rain), pile driving would be delayed until the PSO is confident marine mammals within the shutdown zone could be detected.

PSOs will monitor the full shutdown zones and the remaining Level A harassment and the Level B harassment zones to the extent practicable. 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 areas outside the shutdown zones and thus prepare for a potential cessation of activity should the animal enter the shutdown zone.

Pre-Activity Monitoring

Prior to the start of daily in-water construction activity, or whenever a break in pile driving or DTH drilling 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 considered 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 zones listed in Table 9, pile driving activity will be delayed or halted. If work ceases for more than 30 minutes, the pre-activity monitoring of the shutdown zones would commence. A determination that the shutdown zone is clear must be made during a period of good visibility (*i.e.*, the entire shutdown zone and surrounding waters must be visible to the naked eye).

Soft-Start Procedures

Soft-start procedures 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 three strikes from the hammer at reduced energy, followed by a 30-second waiting period, then two subsequent reduced-energy strike sets. Soft-start will 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 30 minutes or longer.

Based on our evaluation of the applicant's planned measures NMFS has determined that the mitigation measures provide the means of 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 while conducting the activities. 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 activity, 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

Marine mammal monitoring must be conducted in accordance with the conditions in this section and the IHAs. Marine mammal monitoring during pile driving activities will be conducted by PSOs meeting NMFS' following requirements:

- Independent PSOs (*i.e.*, not construction personnel) who have no other assigned tasks during monitoring periods will be used;
- At least one PSO will have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization;
- Other PSOs may substitute education (degree in biological science or related field) or training for experience; and
- Where a team of three or more PSOs is required, a lead observer or monitoring coordinator will be designated. The lead observer will be required to have prior experience working as a marine mammal observer during construction.

PSOs must have the following additional qualifications:

- Ability to conduct field observations and collect data according to assigned protocols;
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates, times and reason for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior;

- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary;
- Cordova must employ up to five PSOs depending on the size of the monitoring and shutdown zones. A minimum of two PSOs (including the lead PSO) must be assigned to the active pile driving location to monitor the shutdown zones and as much of the Level B harassment zones as possible;
- Cordova must establish monitoring locations with the best views of monitoring zones as described in the IHAs and Application;
- Up to five monitors will be used at a time depending on the size of the monitoring area. PSOs will be deployed in strategic locations around the area of potential effects at all times during in-water pile driving and removal. PSOs will be positioned at locations that provide full views of the impact hammering monitoring zone and the Level A harassment Shutdown Zones. All PSOs will have access to high-quality binoculars, range finders to monitor distances, and a compass to record bearing to animals as well as radios or cell phones for maintaining contact with work crews;
- During work in the south harbor, up to three PSOs will be stationed at the following locations: along the south harbor parking area, on the Breakwater Trail, and at a viewpoint along New England Cannery Road; and
- During work in the north harbor, up to five PSOs will be stationed at the following locations: along the north harbor parking area, on the Breakwater Trail, at the viewpoint along the shore near Saddle Point, at a viewpoint along Whitshed Road, and on a vessel in Orca Inlet.

Monitoring will be conducted 30 minutes before, during, and 30 minutes after all in water construction activities. In addition, PSOs will record all incidents of marine mammal occurrence, regardless of distance from activity, and will 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 30 minutes.

Cordova shall conduct briefings between construction supervisors and crews, PSOs, Cordova staff prior to the start of all pile driving activities and when new personnel join the work. These briefings will explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures.

Reporting

A draft marine mammal monitoring report will be submitted to NMFS within 90 days after the completion of pile driving and removal activities for each IHA, or 60 days prior to a requested date of issuance from any future IHAs for projects at the same location, whichever comes first. The report will include an overall description of work completed, a narrative regarding marine mammal sightings, and associated PSO data sheets. Specifically, the report must include:

- 1) Dates and times (begin and end) of all marine mammal monitoring;
- 2) Construction activities occurring during each daily observation period, including the number and type of piles driven or removed and by what method (*i.e.*, impact, vibratory, or DTH drilling) and the total equipment duration for vibratory removal for each pile or total number of strikes for each pile (impact driving);
- 3) PSO locations during marine mammal monitoring;
- 4) Environmental conditions during monitoring periods (at beginning and end of PSO shift and whenever conditions change significantly), including Beaufort sea state and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon, and estimated observable distance; and
- 5) Upon observation of a marine mammal, the following information:

- a) Name of PSO who sighted the animal(s) and PSO location and activity at the time of sighting;
- b) Time of sighting;
- c) Identification of the animal(s) (*e.g.*, genus/species, lowest possible taxonomic level, or unidentifiable), PSO confidence in identification, and the composition of the group if there is a mix of species;
- d) Distance and bearing of each marine mammal observed relative to the pile being driven for each sightings (if pile driving was occurring at time of sighting);
- e) Estimated number of animals (min/max/best estimate);
- f) Estimated number of animals by cohort (adults, juveniles, neonates, group composition, sex class, *etc.*);
- g) Animal's closest point of approach and estimated time spent within the harassment zone;
- h) Description of any marine mammal behavioral observations (*e.g.*, observed behaviors such as feeding or traveling), including an assessment of behavioral responses thought to have resulted from the activity (*e.g.*, no response or changes in behavioral state such as ceasing feeding, changing direction, flushing, or breaching);
- i) Number of marine mammals detected within the harassment zones and shutdown zones; by species; and
- j) Detailed information about any implementation of any mitigation triggered (*e.g.*, shutdowns and delays), a description of specific actions that ensued, and resulting changes in behavior of the animal(s), if any.

If no comments are received from NMFS within 30 days, the draft reports will constitute the final reports. If comments are received, a final report addressing NMFS comments must be submitted within 30 days after receipt of comments.

Reporting Injured or Dead Marine Mammals

In the event that personnel involved in the construction activities discover an injured or dead marine mammal, the IHA-holder must immediately cease the specified activities and report the incident to the Office of Protected Resources (OPR) (PR.ITP.MonitoringReports@noaa.gov), NMFS and to the Alaska Regional Stranding Coordinator as soon as feasible. If the death or injury was clearly caused by the specified activity, Cordova must immediately cease the specified activities until NMFS is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the IHAs. The IHA-holder must not resume their activities until notified by NMFS. The report must include the following information:

- Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
- Species identification (if known) or description of the animal(s) involved;
- Condition of the animal(s) (including carcass condition if the animal is dead);
- Observed behaviors of the animal(s), if alive;
- If available, photographs or video footage of the animal(s); and
- General circumstances under which the animal was discovered.

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 impacts or responses (*e.g.*, intensity, duration), the context of any impacts or responses (*e.g.*, critical reproductive time or location, foraging impacts affecting energetics), 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’ 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 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 discussion of our analysis applies to all the species listed in Table 1, given that the anticipated effects of this activity on these different marine mammal stocks are expected to be similar. There is little information about the nature or severity of the impacts, or the size, status, or structure of any of these species or stocks that would lead to a different analysis for this activity. Also, because both the number and nature of the estimated takes anticipated to occur are identical in Phase I and Phase II, the analysis below applies to each of the IHAs.

Pile driving and DTH drilling activities associated with the project, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level B harassment and, for some species, Level A harassment from underwater sounds generated by pile driving. Potential takes could occur if individuals are present in the ensonified zone when these activities are underway.

No serious injury or mortality is expected, even in the absence of required mitigation measures, given the nature of the activities. Further, no take by Level A harassment is anticipated for killer whales due to the application of planned mitigation measures, such as shutdown zones that encompass the Level A harassment zones for the species, the rarity of the species near the action area, and the shallow depths of the harbor. The potential for harassment will be minimized through the construction method and the implementation of the planned mitigation measures (see **Mitigation** section).

Take by Level A harassment is authorized for three species (Steller sea lion, harbor seal, and Dall's porpoise) as the Level A harassment isopleths exceed the size of the shutdown zones for specific construction scenarios. Additionally, the two pinniped species are common in and around the action area. Therefore, there is the possibility that an animal could enter a Level A harassment zone and remain within that zone for a duration long enough to incur PTS. Take by Level A harassment of these species is therefore authorized. Any take by Level A harassment is expected to arise from, at most, a small degree of PTS (*i.e.*, minor degradation of hearing capabilities within regions of hearing that align most completely with the energy produced by impact pile driving such as the low-frequency region below 2 kilohertz (kHz)), not severe hearing impairment or impairment within the ranges of greatest hearing sensitivity. 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.

Further, the amount of authorized take by Level A harassment is very low for the marine mammal stocks and species. If hearing impairment occurs, it is most likely that the affected animal would lose only a few decibels in its hearing sensitivity. Due to the small degree anticipated, any PTS potential incurred would not be expected to affect the reproductive success or survival of any individuals, much less result in adverse impacts on the species or stock.

The Level A harassment zones identified in Table 6 are based upon an animal exposed to pile driving or DTH drilling of several piles per day (up to 25 piles per day for vibratory removal, 10 piles per day of vibratory installation, 6 piles per day of impact driving, and 4 piles per day of DTH drilling). Given the short duration to impact drive or vibratory install or extract, or use DTH drilling, each pile and break between pile installations (to reset equipment and move piles into place), an animal would have to remain within the area estimated to be ensonified above the Level A harassment threshold for multiple hours. This is highly unlikely given marine mammal movement patterns in the area. If an animal was exposed to accumulated sound energy, the resulting PTS would likely be small (*e.g.*, PTS onset) at lower frequencies where pile driving energy is concentrated, and unlikely to result in impacts to individual fitness, reproduction, or survival.

Additionally, some subset of the individuals that are behaviorally harassed could also simultaneously incur some small degree of TTS for a short duration of time. However, since the hearing sensitivity of individuals that incur TTS is expected to recover completely within minutes to hours, it is unlikely that the brief hearing impairment would affect the individual's long-term ability to forage and communicate with conspecifics, and will therefore not likely impact reproduction or survival of any individual marine mammal, let alone adversely affect rates of recruitment or survival of the species or stock.

The nature of the pile driving project precludes the likelihood of serious injury or mortality. For all species and stocks, take would occur within a limited, confined area (adjacent to the project site) of the stock's range. Take by Level A and Level B harassment will be reduced to the level of least practicable adverse impact through use of mitigation measures described herein. Further, the amount of take authorized is extremely small when compared to stock abundance.

Behavioral responses of marine mammals to pile driving, pile removal, and DTH drilling in Cordova Harbor and the surrounding Orca Inlet are expected to be mild, short term, and temporary. Marine mammals within the Level B harassment zones 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 that pile driving, pile removal, and DTH drilling are temporary activities and effects will cease when equipment is not operating, any harassment occurring will be temporary. Additionally, many of the species present in region will only be present temporarily based on seasonal patterns or during transit between other habitats. These species will be exposed to even smaller periods of noise-generating activity, further decreasing the impacts.

The same regions are also a part of the western distinct population segment (DPS) Steller sea lion ESA critical habitat. While Steller sea lions are common in the project area, there are no essential physical and biological habitat features, such as haulouts or rookeries, within the planned project area. The nearest haulout and rookery are over 30 km away from the planned project area. Therefore, the planned project is not expected to have significant adverse effects on the critical habitat of Western DPS Steller sea lions. No areas of specific biological importance (*e.g.*, ESA critical habitat, other BIAs, or other areas) for any other species are known to co-occur with the project area.

In addition, it is unlikely that minor noise effects in a small, localized area of habitat will have any effect on each stock's ability to recover. In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activities will have only minor, short-term effects on individuals. The specified activities are not expected to impact rates of recruitment or survival and will therefore not result in population-level impacts.

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 any of the species or stocks through effects on annual rates of recruitment or survival:

- No serious injury or mortality is anticipated or authorized;
- Take by Level A harassment will be very small amounts and of low degree;
- Take by Level A harassment is authorized only for Steller sea lions, harbor seals, and Dall's porpoise;
 - For all species, the Orca Inlet and the Cordova Harbor is a very small and peripheral part of their range;
 - Anticipated takes by Level B harassment are relatively low for all stocks. Level B harassment will be primarily in the form of behavioral disturbance, resulting in avoidance of the project areas around where impact or vibratory pile driving is occurring, with some low-level TTS that may limit the detection of acoustic cues for relatively brief amounts of time in relatively confined footprints of the activities;
 - Effects on species that serve as prey for marine mammals from the activities are expected to be short-term and, therefore, any associated impacts on marine mammal feeding are not expected to result in significant or long-term consequences for individuals, or to accrue to adverse impacts on their populations;
 - The ensonified areas are very small relative to the overall habitat ranges of all species and stocks, and will not adversely affect ESA-designated critical habitat for any species or any areas of known biological importance;
 - The lack of anticipated significant or long-term negative effects to marine mammal habitat; and

- Cordova will implement mitigation measures including soft-starts and shutdown zones to minimize the numbers of marine mammals exposed to injurious levels of sound, and to ensure that take by Level A harassment is, at most, a small degree of PTS.

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, specific to each of the 2 consecutive years of planned activity, will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted previously, only take of small numbers of marine mammals 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. When the predicted number of individuals to be taken is fewer than one-third of the species or stock abundance, the take is considered to be of small numbers. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

The amount of take NMFS plans to authorize, specific to each of the 2 consecutive years of planned activity, is below one-third of the estimated stock abundance for all species (in fact, take of individuals is less than 5 percent of the abundance of the affected stocks, see Table 8). This is likely a conservative estimate because we assume all takes are of different individual animals, which is likely not the

case. Some individuals may return multiple times in a day, but PSOs will count them as separate takes if they cannot be individually identified.

The most recent estimate for the Alaska stock of Dall's porpoise was 13,110 animals; however this number accounts for only a portion of the stock's range. Therefore, the 42 authorized takes (including 10 Level A takes) of this stock are believed to be an even smaller portion of the overall stock abundance.

Based on the analysis contained herein of the planned activity (including the mitigation and monitoring measures) and the anticipated take of marine mammals, for each of the 2 consecutive years of planned activity, NMFS finds that small numbers of marine mammals would be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

In order to issue an IHA, NMFS must find that the specified activity will not have an “unmitigable adverse impact” on the subsistence uses of the affected marine mammal species or stocks by Alaskan Natives. NMFS has defined “unmitigable adverse impact” in 50 CFR 216.103 as an impact resulting from the specified activity: (1) That is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by (i) causing the marine mammals to abandon or avoid hunting areas, (ii) directly displacing subsistence users, or (iii) placing physical barriers between the marine mammals and the subsistence hunters; and (2) That cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.

The Alutiiq and Eyak people of Prince William Sound traditionally harvested marine mammals, however the last recorded subsistence harvest in Cordova was in 2014 as part of a regional effort to update the status of subsistence uses in Exxon Valdez Oil

Spill communities, during which no marine mammals were harvested in Cordova (Fall and Zimpelman 2016).

In the decades since the Exxon Valdez Oil Spill, there have been declines in the number of households hunting and harvesting larger marine mammals in Prince William Sound. Surveys gathering subsistence data found that 10 percent or fewer households harvest or use harbor seals or sea lions (Poe *et al.*, 2010). Subsistence hunters in Prince William Sound report having to travel farther from their home communities to be successful when harvesting marine mammals (Keating *et al.*, 2020).

The planned project is not likely to adversely impact the availability of any marine mammal species or stocks that are commonly used for subsistence purposes or to impact subsistence harvest of marine mammals in the region because:

- There is no recent recorded subsistence harvest of marine mammals in the area;
- Construction activities are localized and temporary;
- Mitigation measures will be implemented to minimize disturbance of marine mammals in the action area; and,
- The project will not result in significant changes to availability of subsistence resources.

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 planned mitigation and monitoring measures, NMFS has determined that there will not be an unmitigable adverse impact on subsistence uses from Cordova's planned activities.

Endangered Species Act

There is one marine mammal species (western DPS Steller sea lion) with confirmed occurrence in the project area that is listed as endangered under the ESA. The

NMFS Alaska Regional Office issued a Biological Opinion on September 28, 2023 under section 7 of the ESA on the issuance of two IHAs to Cordova under section 101(a)(5)(D) of the MMPA by the NMFS Office of Protected Resources. The Biological Opinion concluded that this action is not likely to jeopardize the continued existence of Western Distinct Population Segment (DPS) Steller sea lions. In addition, the proposed action is not likely to adversely affect Western North Pacific DPS humpback whales, Mexico DPS humpback whales, fin whales, or Steller sea lion critical habitat.

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 evaluate our proposed action (*i.e.*, the issuance of two IHAs) and alternatives with respect to potential impacts on the human environment.

This action is consistent with categories of activities identified in Categorical Exclusion B4 (IHAs with no anticipated serious injury or mortality) of the Companion Manual for NAO 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 these IHAs qualifies to be categorically excluded from further NEPA review.

Authorizations

NMFS has issued two consecutive IHAs to Cordova for the potential harassment of small numbers of marine mammal species incidental to the Cordova Harbor Rebuild project, in Cordova, Alaska, that includes the previously explained mitigation, monitoring and reporting requirements.

Dated: September 29, 2023.

Kimberly Damon-Randall,

Director, Office of Protected Resources,

National Marine Fisheries Service.

[FR Doc. 2023-22096 Filed: 10/4/2023 8:45 am; Publication Date: 10/5/2023]