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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XR029

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Erickson Residence Marine Access Project in Juneau, Alaska

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

ACTION: Notice; Issuance of an Incidental Harassment Authorization (IHA).

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that NMFS has issued an IHA to Jim Erickson to incidentally harass, by Level A and Level B harassment, marine mammals during pile driving activities associated with the Erickson Residence Marine Access Project in Juneau, Alaska.

DATES: This Authorization is effective from January 1, 2020 through December 31, 2020.

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

SUPPLEMENTARY INFORMATION:

Background

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

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 May 8, 2019, NMFS received a request from Jim Erickson for an IHA to take marine mammals incidental to pile driving activities associated with a dock replacement project in Auke Bay, north of Juneau, Alaska. The application was deemed adequate and complete on August 13, 2019. Mr. Erickson's request was for take of a small number of eight species of marine mammal by Level A and Level B harassment. Neither Mr. Erickson nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

Description of Activity

Mr. Erickson plans to replace his private moorage facility in Auke Bay in Juneau, Alaska to provide a safer, more accessible and secure dock. Six 12- to 16-inch (in) timber piles will be removed using a vibratory hammer, and six steel pipe piles (four 12.75-in steel pipe piles and two 20-in steel pipe piles) will be installed using vibratory and impact hammers over the course of up to eight days. Of those eight days, impact pile driving may occur on up to four days and vibratory pile removal and installation may occur on up to six days. Drilling may be required to install the larger diameter steel piles. If required, drilling may occur on up to two days. Vibratory pile removal and installation, impact pile installation, and drilling would introduce underwater sounds at levels that may result in take, by Level A and Level B harassment, of marine mammals in Auke Bay.

A detailed description of the planned project is provided in the ***Federal Register*** notice for the proposed IHA (84 FR 50387; September 25, 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

A notice of NMFS's proposal to issue an IHA to Mr. Erickson was published in the ***Federal Register*** on September 25, 2019 (84 FR 50387). That notice described, in detail, Mr. Erickson'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, NMFS received a comment letter from the Marine Mammal Commission (Commission). The Commission recommended that NMFS issue the IHA, subject to the inclusion of the proposed mitigation, monitoring, and reporting measures.

Comment 1: The Commission recommended that NMFS require Mr. Erickson to keep a running tally of the total (extrapolated) takes for each species to ensure takes remain within the authorized limits.

Response: We agree that the applicant must ensure they do not exceed authorized takes. We have included in the authorization that the applicant must include extrapolation of the estimated takes by Level B harassment based on the number of observed exposures within the Level B harassment zone and the percentage of the Level B harassment zone that was not visible in the draft and final reports.

Comment 2: The Commission noted that the Level A harassment takes were subtracted from the Level B harassment takes but that harbor seals and harbor porpoises may be taken by both types of harassment during the proposed activities. The Commission recommended that NMFS clarify that the number of Level A takes authorized could apply to either Level A or Level B harassment.

Response: NMFS has noted in the Estimated Take section below that harbor seals and harbor porpoises taken by Level A harassment may also be taken by Level B harassment.

Comment 3: The Commission noted that the source level used for impact installation of 12.75-in piles is from water depths less than 5 m (in Caltrans 2015) but water depths near Mr. Erickson's dock range from approximately 2 to 13 m in depth. The Commission noted that source levels in deeper water may be 2 to 6 decibels (dB) greater than those in shallow water. As Caltrans (2015) does not include data for impact pile driving of 12-in steel pipe piles, the Commission recommended NMFS finish any outstanding internal reviews of source level data and make the source level data available to all NMFS analysts and relevant action proponents as soon as possible.

Response: NMFS agrees that source levels in deeper water are greater than those of the same size piles in shallow water. However, absent specific data on source levels for 12-in steel pipe piles in deeper water, NMFS is using the best available data and is proceeding with the available Caltrans source levels for 12-in steel piles as proxy for Mr. Erickson's 12.75-in piles. NMFS will make our comprehensive pile driving source level compendium available once the document is finalized.

Comment 4: The Commission recommended that NMFS refrain from using the proposed renewal process for Mr. Erickson's authorization. The renewal process should be used sparingly and selectively, by limiting its use only to those proposed incidental harassment authorizations that are expected to have the lowest levels of impacts on marine mammals and that require the least complex analyses. If NMFS elects to use the renewal process frequently or for authorizations that require a more complex review or for which much new information has been generated the Commission recommended that NMFS 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: We appreciate the Commission's input and direct the reader to our recent response to a similar comment, which can be found at 84 FR 52464 (October 2, 2019), pg. 52466.

Changes from the Proposed IHA to Final IHA

NMFS has updated the pulse duration for impact driving of 12.75-in piles from 50 milliseconds (msec) to 100 msec, consistent with the NMFS 2018 Technical Guidance. As a result, the calculated Level A harassment zones from impact driving of 12.75-in piles have increased. Additionally, NMFS has revised the shutdown and monitoring zones for vibratory driving of 12.75-in piles and the monitoring zone for impact installation of 12.75-in piles to

round up to the nearest 5 m. NMFS has also added requirements for Mr. Erickson to conduct pile installation and removal only during daylight hours and to delay pile installation and removal in times of poor visibility until the entire shutdown zone is visible. Finally, NMFS has added a requirement to report total takes extrapolated from observed takes and to provide field observation data sheets with the monitoring report.

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*) and more general information about these species (*e.g.*, physical and behavioral descriptions) may be found on NMFS's website (*https://www.fisheries.noaa.gov/find-species*).

Table 1 lists all species with expected potential for occurrence in Auke Bay and summarizes information related to the population or stock, including regulatory status under the MMPA and ESA and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2018). 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. Alaska and U.S. Pacific SARs. All values presented in Table 1 are the most recent available at the time of publication and are available in the 2018 SARs (Muto *et al.*, 2019; Caretta *et al.*, 2019).

Table 1--Marine Mammals That Could Occur in the Project Area

Common name	**Scientific name**	**Stock**	**ESA/MMPA status; Strategic (Y/N)[1]**	**Stock abundance (CV, N_{min}, most recent abundance survey)[2]**	**PBR**	**Annual M/SI[3]**
Order Cetartiodactyla – Cetacea – Superfamily Mysticeti (baleen whales)						
Family Eschrichtiidae						
Gray whale	Eschrichtius robustus	Eastern North Pacific	-/-; N	26,960 (0.05, 25,849, 2016)	801	138
Family Balaenopteridae (rorquals)						
Humpback whale	Megaptera novaeangliae	Central North Pacific	T/D; Y	10,103 (0.3, 7,890, 2006)	83	26
Minke whale	Balaenoptera acutorostrada	Alaska	-/-; N	N/A (see SAR, N/A, see SAR)	UND	0
Fin whale	Balaenoptera physalus	Northeast Pacific	E/D; Y	see SAR (see SAR, see SAR, 2013)	5.1	0.6
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						

Killer whale	Orcinus orca	Alaska Resident	-/-; N	2,347 (N/A, 2347, 2012)	24	1
Killer whale	Orcinus orca	Northern Resident	-/-; N	261 (N/A, 261, 2011)	1.96	0
Killer whale	Orcinus orca	West Coast Transient	-/-; N	243 (N/A, 243, 2009)	2.4	0
Family Phocoenidae (porpoises)						
Harbor porpoise	Phocoena phocoena	Southeast Alaska	-/-; Y	975 (0.10; 896; 2012)	8.9	34
Dall's porpoise	Phocoenoides dalli	Alaska	-/-; N	83,400 (0.097, N/A, 1991)	UND	38
Order Carnivora – Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions)						
Steller sea lion	Eumetopias jubatus	Eastern DPS	E/D; Y	54,267 (see SAR, 54,267, 2017)	326	252
Steller sea lion	Eumetopias jubatus	Western DPS	-/-; N	41,638 (see SAR, 41,638, 2015)	2,498	108
California sea lion	Zalophus californianus	U.S.	-/-; N	257,606 (N/A, 233,515, 2014)	14,011	> 321
Family Phocidae (earless seals)						
Harbor seal	Phoca vitulina	Lynn Canal/Stephens Passage	-/-; N	9,478 (see SAR, 8,605, 2011)	155	50

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.

NOTE - Italicized species are not expected to be taken or proposed for authorization

All species that could potentially occur in the area of the Erickson Residence are included in Table 1. However, the spatial and temporal occurrence of gray whales and fin whales in the area is such that take is not expected to occur, and they are not discussed further beyond the explanation provided here. Sightings of gray whales and fin whales are uncommon in the inland waters of southeast Alaska. These species are typically seen closer to the open waters of the Gulf of Alaska. Take of gray whales and fin whales was not requested and has not been authorized, and these species are not considered further in this document.

A detailed description of the of the species likely to be affected by Mr. Erickson's planned 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 50387; September 25, 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. Please also refer to NMFS' website (*https://www.fisheries.noaa.gov/find-species*) for generalized species accounts.

Potential Effects of Specified Activities on Marine Mammals and their Habitat

The effects of underwater noise from pile installation and removal activities for the Erickson Residence Marine Access Project have the potential to result in behavioral harassment of marine mammals in the vicinity of the action area. The ***Federal Register*** notice for the proposed IHA (84 FR 50387; September 25, 2019) included a discussion of the effects of anthropogenic noise on marine mammals, therefore that information is not repeated here; please refer to the ***Federal Register*** notice (84 FR 50387; September 25, 2019) for that information.

Marine Mammal Habitat Effects

The main impact associated with the Erickson Residence Marine Access Project would be temporarily elevated sound levels and the associated direct effects on marine mammals. The project would not result in permanent impacts to habitats used directly by marine mammals, such as haulout sites, but may have potential short-term impacts to food sources such as forage fish, and minor impacts to the immediate substrate during installation and removal of piles during the planned project. These potential effects are discussed in detail in the ***Federal Register*** notice for the proposed IHA (84 FR 50387; September 25, 2019), therefore that information is not repeated here; please refer to that ***Federal Register*** notice for that information.

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 use of the vibratory and impact pile hammers and drill 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 cetacean species and phocids because

predicted auditory injury zones are larger than for other hearing groups. Auditory injury is unlikely to occur for other groups. The required 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 authorized take.

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 permanent threshold shift (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.

Mr. Erickson's planned activity includes the use of continuous (vibratory pile driving and removal, drilling) and impulsive (impact pile driving) sources, and therefore the 120 and 160 dB re 1 μPa (rms) thresholds 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). Mr. Erickson's planned activity includes the use of impulsive (impact pile driving) and non-impulsive (vibratory pile driving and removal, drilling) source.

These thresholds are provided in Table 2. 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 2--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.

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). The area ensonified above the thresholds for harassment is governed by the topography of Auke Bay and the various islands located within and around the bay. The eastern part of Auke Bay is acoustically shadowed by Auke Cape, while Portland Island, Coghlan Island, Suedla Island, and Spuhn Island would inhibit sound transmission from reaching the more open waters toward Mansfield Peninsula (see Figure 2 in the IHA application). Additionally, vessel traffic and other commercial and industrial activities in the project area may contribute to elevated background noise levels which may mask sounds produced by the project.

The project includes vibratory removal of timber piles, vibratory and impact installation of steel pipe piles, and drilling. Source levels for these activities are based on reviews of measurements of the same or similar types and dimensions of piles available in the literature. Source levels for each activity are presented in Table 3 The source level for vibratory removal of timber piles is from in-water measurements generated by the Greenbusch Group (2018) from the Seattle Pier 62 project (83 FR 39709; April 10, 2018). Hydroacoustic monitoring results from Pier 62 determined unweighted rms ranging from 140 dB to 169 dB. NMFS analyzed source measurements at different distances for all 63 individual timber piles that were removed at Pier 62 and normalized the values to 10 m. The results showed that the median is 152 dB SPLrms. There are no literature source levels for vibratory installation of 12.75-in steel piles so source levels from vibratory installation of 12-in steel piles from the Caltrans Compendium of Pile Driving Sound Data were used as a proxy (Caltrans 2015). Similarly, as no literature source levels exist for vibratory installation of 20-in steel piles, hydroacoustic measurements of

vibratory installation of 24-in steel piles from the U.S. Navy's Test Pile Project were used as a proxy (Navy, 2015). Source levels for impact installation of 12.75-in piles were determined by using Caltrans measurements of impact installation of 12-in steel piles as a proxy (Caltrans 2015). Source levels for impact installation of 20-in piles are from installation of 20-in piles in the Columbia River, in similar water depths (Yurk *et al.*, 2016). Source levels for drilling are proxy from median measured source level from drilling of 24-in diameter piles at the Kodiak Ferry Terminal (Denes *et al*., 2016, Table 72).

Table 3--Sound Source Levels for Pile Sizes and Driving Methods

Pile size	**Method**	**Source level (at 10 m)**			**Literature source**
		dB RMS	**dB Peak**	**dB SEL**	
12.75-in steel	Vibratory	155	171	155	Caltrans 2015 (proxy from 12-in)
20-in steel	Vibratory	161	--	--	Navy 2015 (proxy from 24-in)
12- to 16-in timber	Vibratory	152	--	--	Greenbusch Group 2018
20-in steel	Drilling	166.2	--	--	Denes *et al.*, 2016 (proxy from 24-in)
12.75-in steel	Impact	177	192	--	Caltrans 2015 (proxy from 12-in)
20-in steel	Impact	190	205	175	Yurk *et al*., 2016

-- indicates source level not reported

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

TL = transmission loss in dB

B = transmission loss coefficient

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

A practical spreading value of fifteen is often used under conditions, such as Auke Bay, where water increases with depth as the receiver moves away from the shoreline, resulting in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions. Practical spreading loss is assumed here.

Table 4--Pile Driving Source Levels and Distances to Level B Harassment Thresholds

Pile Size and Type	Method	Source Level at 10 m (dB re 1 µPa rms)	Level B Threshold (dB re 1 µPa rms)	Distance to Level B Threshold (m)
12.75-in steel	Vibratory	155	120	2,154
20-in steel	Vibratory	161	120	5,412
12- to 16-in timber	Vibratory	152	120	1,359
20-in steel	Drilling	166.2	120	12,023
12.75-in steel	Impact	177	160	136
20-in steel	Impact	190	160	1,000

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 drivers), 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 (Table 5). Mr. Erickson anticipates that the number of piles installed or removed per day may vary due to environmental conditions and equipment availability. To calculate the Level A harassment isopleths in the User Spreadsheet, Mr. Erickson conservatively entered the maximum number of piles that may be installed in a day and the maximum potential duration per pile.

Table 5--User Spreadsheet Input Parameters Used for Calculating Level A Harassment Isopleths

Activity	Spreadsheet Tab Used	Weighting factor adjustment (kHz)	Source level at 10 m	Propagation (xLogR)	Strike Duration (sec)	Strikes per pile	Driving duration for single pile (hours)	Max piles per day
Timber vibratory removal	A.1	2.5	152 dB rms	15	N/A	N/A	0.25	6
12.75-in vibratory install	A.1	2.5	155 dB rms	15	N/A	N/A	1	4
20-in vibratory install	A.1	2.5	161 dB rms	15	N/A	N/A	2	2
DTH Drilling	A.1	2.5	166.2 dB rms	15	N/A	N/A	5	2
12.75-in impact	E.1	2	177 dB rms	15	0.1	150	N/A	4
20-in impact	E.1	2	175 dB SEL	15	N/A	150	N/A	2

N/A indicates not applicable

Table 6--Calculated Distances to Level A Harassment Isopleths

Activity	Level A Harassment Zone (m)				
	LF cetaceans	MF cetaceans	HF cetaceans	Phocids	Otariids
Timber vibratory removal	2.2	0.2	3.3	1.4	0.1
12.75-in vibratory install	6.9	0.6	10.1	4.2	0.3
20-in vibratory install	17.2	1.5	25.4	10.5	0.7
DTH Drilling	70.4	6.2	104.1	42.8	3.0
12.75-in impact	60.9	2.2	72.6	32.6	2.4
20-in impact	131.1	4.7	156.1	70.1	5.1

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 and describe how it is brought together with the information above to produce a quantitative take estimate. When available, peer-reviewed scientific publications were used to estimate marine mammal abundance in the project area. However, scientific surveys and resulting data such as population estimates, densities, and other quantitative information are lacking for most marine mammal populations and most areas of southeast Alaska, including Auke Bay. Therefore, Mr. Erickson gathered qualitative information from discussions with knowledgeable local people in the Auke Bay area, including biologists, the harbormaster, a tour operator, and other individuals familiar with marine mammals in the Auke Bay area.

Here we describe how the information provided above is brought together to produce a quantitative take estimate. Because reliable densities are not available, the applicant requests take based on the maximum number of animals that may occur in the harbor per day multiplied by the number of days of the activity.

Steller Sea Lion

Steller sea lions are common within Auke Bay but generally only occur in the area during winter. Most individuals that frequent Auke Bay haul out at Benjamin Island in Lynn Canal. The Auke Bay boating community observes Steller sea lions transiting between Auke Bay and Benjamin Island regularly during winter. Steller sea lions are not known to haul out on any beaches or structures within Auke Bay, but animals have been observed foraging within Auke Bay, and may rest in large raft groups in the water. Groups as large as 121 individuals have been observed in Auke Bay (Ridgway pers. observ.).

Mr. Erickson estimates that one large group (121 individuals) may be exposed to project-related underwater noise daily on 8 days of pile installation and removal activities, for a total of 968 exposures. As stated above, approximately 18.1 percent of Steller sea lions present in Auke Bay are expected to belong to the wDPS, for a total of 175 exposures of wDPS Steller sea lions and 793 exposures of eDPS Steller sea lions.

The largest Level A harassment zone for otariid pinnipeds extends 5.1 m from the source (Table 6). Mr. Erickson is planning to implement a minimum shutdown zone of 10 m during all pile driving activities, (see *Mitigation* section), which is expected to eliminate the potential for Level A take of Steller sea lions. Therefore, no takes of Steller sea lions by Level A harassment were requested and no takes by Level A harassment have been authorized.

California Sea Lion

California sea lions are rare in Southeast Alaska, but a single California sea lion was observed hauled out in Statter Harbor in September of 2017. While Statter Harbor is acoustically shadowed by the topography of Auke Bay and will not be ensonified above the Level B behavioral harassment threshold, a California sea lion could enter the Level B harassment zone within Auke Bay to forage. Therefore, Mr. Erickson estimates that a single California sea lion may enter the Level B harassment zone on each of the eight days of pile driving, for a total of eight exposures.

The largest Level A harassment zone for otariid pinnipeds extends 5.1 m from the source (Table 6). Mr. Erickson is planning to implement a minimum shutdown zone of 10 m during all pile driving activities, (see *Mitigation* section), which is expected to eliminate the potential for Level A take of California sea lions. Therefore, no takes of California sea lions by Level A harassment were requested or authorized.

Harbor Seal

Harbor seals are commonly sighted in the waters of the inside passages throughout southeast Alaska. Seals occur year-round within the project area and are regularly sighted in Auke Bay, including Statter Harbor.

Up to 52 seals have been observed hauled out on a dock at Fisherman's Bend within Statter Harbor (Ridgway unpubl. data) which is acoustically sheltered from the planned pile driving activities, but it is assumed that these animals may leave the dock to forage within Auke Bay and may be exposed to noise levels in excess of the Level B harassment thresholds upon entering the water. Mr. Erickson estimates up to 52 harbor seals could be exposed to elevated sound levels on each day of pile driving, for a total of 416 exposures.

The largest Level A harassment zone for phocid pinnipeds results from impact installation of 20-in piles and extends 70.1 m from the pile (Table 6). There are no haulouts located within the Level A harassment zone and although it is unlikely that harbor seals will enter this area without detection while pile driving activities are underway, it is possible that harbor seals may approach and enter the Level A harassment zone undetected. Mr. Erickson has observed up to four harbor seals in the water near the existing dock. Therefore, Mr. Erickson estimates that up to four harbor seals may approach the site within 70 m of the source each day. Impact pile driving is expected to occur on up to four days. For this reason, NMFS authorized take of 16 harbor seals by Level A harassment. Harbor seals taken by Level A harassment may also be taken by Level B harassment.

Harbor Porpoise

Although there have been no systematic studies or observations of harbor porpoises specific to Auke Bay, there is the potential for them to occur within the project area. Abundance

data for harbor porpoises in southeast Alaska were collected during 18 seasonal surveys spanning 22 years, from 1991 to 2012. During that study, a total of 398 harbor porpoises were observed in the northern inland waters of southeast Alaska, including Lynn Canal (Dahlheim *et al.*, 2015). Mean group size of harbor porpoises in southeast Alaska varies by season. In the fall, mean group size was determined to be 1.88 harbor porpoises (Dahlheim *et al.*, 2009). However, groups of five to six harbor porpoises have been observed in Auke Bay (B. Lambert, pers. comm.). Therefore, Mr. Erickson estimates that up to six harbor porpoises may enter the Level B harassment zone on each of the eight days of pile driving, for a total of 48 exposures.

The largest Level A harassment zone extends 156.1 m from the source (Table 6). Mr. Erickson is planning to implement shutdown zones that encompass the Level A harassment zones (see *Mitigation* section). However, harbor porpoises are known to be an inconspicuous species and are challenging for protected species observers (PSOs) to sight, making any approach to a specific area potentially difficult to detect. Because harbor porpoises move quickly and elusively, it is possible that they may enter the Level A harassment zone without detection. Mr. Erickson estimates that one pair of harbor porpoises may enter the Level A harassment zone on each of the four days of impact pile driving for a total of eight potential takes by Level A harassment. Harbor porpoises taken by Level A harassment may also be taken by Level B harassment.

Dall's Porpoise

Dall's porpoises are not expected to occur within Auke Bay because the shallow water habitat of the bay is atypical of areas where Dall's porpoises usually occur. However, Dall's porpoises may opportunistically inhabit nearshore habitat. The largest group of Dall's porpoises observed in Auke Bay was 10 individuals in 1994. Therefore, Mr. Erickson estimates that one

group of ten Dall's porpoises may enter the Level B harassment zone once during construction, for a total of ten exposures.

Mr. Erickson is required to implement shutdown zones for porpoises that encompass the Level A harassment zones for each pile driving activities. The largest Level A harassment zone for Dall's porpoise extends 156.1 m from the source during impact installation of 20-in steel piles (Table 6). Given the larger group size and more conspicuous rooster-tail generated by swimming Dall's porpoises, which makes them more noticeable than harbor porpoises, PSOs are expected to detect Dall's porpoises prior to them entering the Level A harassment zone. Therefore, takes of Dall's porpoises by Level A harassment have not been requested and have not been authorized.

Killer Whale

Killer whales are known visitors of the Lynn Canal area, and occasionally enter Auke Bay. Oceanus Alaska compiled sightings records reported by Juneau residents and reported an average of 25 killer whales in the area per year between 2010 and 2017. Killer whales in the project area may be of the Northern Resident, Alaska Resident, or West Coast Transient stocks. The Alaska Resident group AG pod is known to frequent the Juneau Area in groups of up to 25 individuals (B. Lambert, pers. comm.). Mr. Erickson estimates that one group of up to 25 killer whales may enter the Level B harassment zone during the eight days of pile driving for a total of 25 exposures.

Mr. Erickson is required to implement shutdown zones that encompass the largest Level A harassment zones for killer whales during all pile driving activities. Killer whales are generally conspicuous and PSOs are expected to detect killer whales and implement a shutdown before the

animals enter the Level A harassment zone. Therefore, takes by Level A harassment have not been requested and have not been authorized.

Humpback Whale

Use of Auke Bay by humpback whales is intermittent and irregular year-round. During winter, researchers have documented 1 to 19 individual humpback whales per month in waters close to the project area, including Lynn Canal (Moran *et al.*, 2018a; Straley *et al.*, 2018). Group sizes in southeast Alaska generally range from one to four individuals (Dahlheim *et al.*, 2009). Mr. Erickson estimates that one group of up to four individuals may be present in the Level B harassment zone per day during the eight days of pile driving, for a total of 32 takes by Level B harassment.

The largest Level A harassment zone for humpback whales extends 131.1 m from the source during impact installation of 20-in piles (Table 6). Given the irregular and small presence of humpback whales in Auke Bay, along with the fact that PSOs are expected to detect humpback whales before they enter the Level A harassment zone and implement shutdowns to prevent take by Level A harassment, no Level A takes have been requested or authorized.

Minke Whale

Dedicated surveys for cetaceans in southeast Alaska found that minke whales were scattered throughout inland waters from Glacier Bay and Icy Strait to Clarence Strait, with small concentrations near the entrance of Glacier Bay. All sightings were of single minke whales, except for a single sighting of multiple minke whales. Surveys took place in spring, summer, and fall, and minke whales were present in low numbers in all seasons and years (Dahlheim *et al.*, 2009). Anecdotal reports have not included minke whales near Auke Bay. However, minke whales are distributed throughout a wide variety of habitats and have been observed in nearby

Glacier Bay, indicating they may potentially occur within the Level B harassment zone. Therefore, Mr. Erickson estimates that one minke whale may enter the Level B harassment zone once during the eight days of pile driving activities, for a total of one take by Level B harassment.

The Level A harassment zones for minke whales are the same as for humpback whales, and the shutdown protocols will be the same as well. Therefore, given the low occurrence of minke whales combined with the mitigation, takes by Level A harassment have not been requested or authorized.

Table 7--Authorized Take by Level A and Level B Harassment, by Species and Stock

Common name	Stock	Stock abundance[a]	Level A	Level B	Total authorized take	Authorized take as percentage of stock
Humpback whale	Central North Pacific	10,103	0	32	32[b]	0.32
Minke Whale	Alaska	N/A	0	1	1	N/A
Killer whale	Alaska Resident	2,347	0	25	25	1.06[d]
	Northern Resident	261				9.58[d]
	West Coast Transient	243				10.3[d]
Harbor porpoise	Southeast Alaska	975	8	40	48	4.92
Dall's porpoise	Alaska	83,400	0	10	10	< 0.1
Steller sea lion	Western U.S.	54,267	0	175	175[c]	0.32
	Eastern U.S.	41,638	0	793	793	1.90
California sea lion	U.S.	257,606	0	8	8	< 0.01
Harbor seal	Lynn Canal/ Stephens Passage	9,478	16	400	416	4.39

[a] Stock or DPS size is N_{best} according to NMFS 2018 Draft Stock Assessment Reports.

[b] For ESA section 7 consultation purposes, 6.1 percent are designated to the Mexico DPS and the remaining are designated to the Hawaii DPS; therefore, we assigned 2 Level B takes to the Mexico DPS.
[c] Based on numbers reported in Hastings *et al.* (2019) and in consultation with the Alaska Regional Office, we used an 18.1 percent distinction factor to determine the number of animals potentially from the western DPS.
[d] These percentages assume all 25 takes may occur to each individual stock, thus the percentage of one or more stocks are likely inflated as the takes would be divided among multiple stocks

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, 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, 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.

Mitigation for Marine Mammals and their Habitat

In addition to the measures described later in this section, Mr. Erickson is required to 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 (*e.g.,* standard barges, etc.), if a marine mammal comes within 10 m, operations must cease and vessels must 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 those marine mammals for which Level B harassment take has not been requested, in-water pile installation/removal and drilling must shut down immediately if such species are observed within or on a path towards the monitoring zone (i.e., Level B harassment zone); and

- If take reaches the authorized limit for an authorized species, pile installation and removal must be stopped as these species approach the Level B harassment zone to avoid additional take.

Establishment of Shutdown Zone for Level A Harassment - For all pile driving/removal and drilling activities, Mr. Erickson must 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). These shutdown zones would be used to prevent incidental Level A exposures from impact pile driving for Steller sea lions, California sea lions, Dall's porpoises, killer whales, humpback whales, and minke whales, and to reduce the potential for such take for harbor seals and harbor porpoises. During all pile driving and removal activities, a minimum shutdown zone of 10 m must be enforced (Table 8). Shutdown zones for each specific activity are based on the Level A harassment zones and therefore vary by pile-size, type, driving method, and marine mammal hearing group (Table 8). If poor environmental conditions restrict full visibility of the shutdown zone(s), pile driving must be delayed until the entire shutdown zone is visible.

Table 8--Shutdown Zones for Pile Driving Activities

Activity	**Shutdown Zone (m)**				
	LF Cetaceans	**MF Cetaceans**	**HF Cetaceans**	**Phocid Pinnipeds**	**Otariid Pinnipeds**
Vibratory Timber Pile Removal	10	10	10	10	10
Vibratory Pile Driving (12.75-in)	10	10	15	10	10
Vibratory Pile Driving (20-in)	20	10	30	15	10

Drilling	75	10	105	45	10
Impact Pile Driving 12.75-in	65	10	75	35	10
Impact Pile Driving 20-in	135	10	160	75	10

Establishment of Monitoring Zones for Level B Harassment – Mr. Erickson is required to establish monitoring zones to correlate with Level B disturbance zones or zones of influence 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 and drilling. 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. The required monitoring zones are described in Table 9. Should PSOs determine the monitoring zone cannot be effectively observed in its entirety, Level B harassment exposures must be recorded and extrapolated based upon the number of observed takes and the percentage of the Level B zone that was not visible.

Table 9--Marine Mammal Monitoring Zones

Activity	**Monitoring zone (m)**
Impact installation of 12.75-in piles	140
Impact installation of 20-in piles	1,000
Vibratory timber pile removal	1,360
Vibratory installation of 21.75-in piles	2,155
Vibratory installation of 20-in piles	5,415
Drilling	12,100

Soft Start - The use of soft-start procedures are 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 are required to provide an initial set of strikes from the hammer at reduced energy, with each strike followed by a 30-second waiting period. This procedure must be conducted a total of three times before impact pile driving begins. 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. Soft start is not required during vibratory pile driving and removal activities.

Pre-Activity Monitoring - Prior to the start of daily in-water construction activity, or whenever a break in pile driving/removal or drilling of 30 minutes or longer occurs, PSOs must observe the shutdown and monitoring zones for a period of 30 minutes. The shutdown zone is considered cleared when a marine mammal has not been observed within the zone for a 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 non-permitted species are not present within the zone, soft start procedures can commence and work can continue even if visibility becomes impaired within the Level B monitoring zone. If a marine mammal permitted for Level B take is present in the Level B harassment zone, activities may begin and Level B take must be recorded. As stated above, if the entire Level B zone is not visible at the start of construction, piling or drilling activities can begin. If work ceases for more than 30 minutes, the pre-activity monitoring of both the Level B and shutdown zone must commence.

Based on our evaluation of the applicant's planned measures, NMFS has determined that the required 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 planned 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.

Marine Mammal Visual Monitoring

Monitoring must be conducted by NMFS-approved observers. Trained observers must be placed from the best vantage point(s) practicable to monitor for marine mammals and implement shutdown or delay procedures when applicable through communication with the equipment operator. Observer training must be provided prior to project start, and shall include instruction on species identification (sufficient to distinguish the species in the project area), description and categorization of observed behaviors and interpretation of behaviors that may be construed as being reactions to the specified activity, proper completion of data forms, and other basic components of biological monitoring, including tracking of observed animals or groups of animals such that repeat sound exposures may be attributed to individuals (to the extent possible).

Monitoring must be conducted beginning 30 minutes before, during, and continuing through 30 minutes after pile driving/removal and drilling activities. In addition, observers must record all incidents of marine mammal occurrence, regardless of distance from activity, and must document any behavioral reactions in concert with distance from piles being driven or removed.

Pile driving/removal and drilling 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.

At least two PSOs must be on duty during all pile driving activities. One PSO must be stationed at the dock site to allow full monitoring of the waters within the shutdown zones and the closest waters of the Level B harassment monitoring zones. An additional PSO must be positioned in a vessel in Auke Bay to observe the larger monitoring zones. Most of the shoreline of Auke Bay is privately owned and unavailable for PSOs to access. Additionally, PSOs cannot be stationed on the shore of the various islands in Auke Bay due to safety concerns. Therefore, a vessel-based PSO is the most practicable position for this project. Potential PSO locations are shown in Figure 2 in Mr. Erickson's Marine Mammal Monitoring Plan.

PSOs must scan the waters using binoculars, and/or spotting scopes, and must use a handheld GPS or range-finder device to verify the distance to each sighting from the project site. All PSOs must be trained in marine mammal identification and behaviors and are required to have no other project-related tasks while conducting monitoring. In addition, monitoring must be conducted by qualified observers, 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. Mr. Erickson must adhere to the following observer qualifications:

(i) Independent observers (i.e., not construction personnel) are required;

(ii) At least one observer must have prior experience working as an observer;

(iii) Other observers may substitute education (degree in biological science or related field) or training for experience; and

(iv) Mr. Erickson must submit observer CVs for approval by NMFS.

Additional standard observer qualifications include:

- 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 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.

A draft marine mammal monitoring report must be submitted to NMFS within 90 days after the completion of pile driving and removal and drilling activities. It must include an overall description of work completed, a narrative regarding marine mammal sightings, and associated PSO data sheets. Specifically, the report 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 observed;
- 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;
- Other human activity in the area; and
- A summary of the total number of individuals of each species detected within the Level B Harassment Zone, and estimated as taken if correction factor appropriate, and the total number of individuals of each species detected within the Level A Harassment Zone and the average amount of time that they remained in that zone.

If no comments are received from NMFS within 30 days, the draft final report will constitute the final report. If comments are received, a final report 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 (if issued), such as an injury, serious injury or mortality, Mr. Erickson must 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 Alaska Regional Stranding Coordinator. The report must 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 must not resume until NMFS is able to review the circumstances of the prohibited take. NMFS would work with Mr. Erickson to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. Mr. Erickson would not be able to resume pile driving activities until notified by NMFS via letter, email, or telephone.

In the event that Mr. Erickson 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), Mr. Erickson must immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the NMFS Alaska Stranding Hotline and/or by email to the Alaska Regional Stranding Coordinator. The report must 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 Mr. Erickson to determine whether modifications in the activities are appropriate.

In the event that Mr. Erickson 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 the IHA (*e.g.*, previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), Mr. Erickson must report the incident to the Chief of the

Permits and Conservation Division, Office of Protected Resources, NMFS, and the NMFS Alaska Stranding Hotline and/or by email to the Alaska Regional Stranding Coordinator, within 24 hours of the discovery. Mr. Erickson must 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).

Pile driving/removal and 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 A harassment and Level B harassment from underwater sounds generated from pile driving and removal. Potential takes could occur if individuals of these species are present in zones ensonified above the thresholds for Level A or Level B harassment identified above when these activities are underway.

The takes from Level A and Level B harassment would be due to potential behavioral disturbance, temporary threshold shift (TTS), and PTS. No mortality is anticipated given the nature of the activity and measures designed to minimize the possibility of injury to marine mammals. Level A harassment is only anticipated for harbor porpoise and harbor seal. The potential for harassment is minimized through the construction method and the implementation of the planned mitigation measures (see *Mitigation* section).

Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (*e.g.*, Thorson and Reyff 2006; HDR, Inc. 2012; Lerma 2014; ABR 2016). Most likely for pile driving, individuals will simply move away from the sound source and be temporarily displaced from the areas of pile driving and drilling, although even this reaction has been observed primarily only in association with impact pile driving. The pile driving activities analyzed here are similar to, or less impactful than, numerous other construction activities conducted in southeast Alaska, which have taken place with no known long-term adverse consequences from behavioral harassment. Level B harassment will be reduced to the level of least practicable adverse impact through use of mitigation measures

described herein and, if sound produced by project activities is sufficiently disturbing, animals are likely to simply avoid the area while the activity is occurring. While vibratory driving and drilling associated with the planned project may produce sound at distances of many kilometers from the project site, thus intruding on some habitat, the project site itself is located in a busy harbor and the majority of sound fields produced by the specified activities are close to the harbor. Therefore, we expect that animals annoyed by project sound would simply avoid the area and use more-preferred habitats.

In addition to the expected effects resulting from authorized Level B harassment, we anticipate that harbor porpoises and harbor seals may sustain some limited Level A harassment in the form of auditory injury. However, given the relatively small size of the Level A harassment zones and the anticipated effectiveness of mitigation, animals in these locations that experience PTS would likely only receive slight PTS, i.e. minor degradation of hearing capabilities within regions of hearing that align most completely with the energy produced by pile driving, i.e. the low-frequency region below 2 kHz, not severe hearing impairment or impairment in the regions of greatest hearing sensitivity. If hearing impairment occurs, it is most likely that the affected animal would lose a few decibels in its hearing sensitivity, which in most cases is not likely to meaningfully affect its ability to forage and communicate with conspecifics. As described above, we expect that marine mammals would be likely to move away from a sound source that represents an aversive stimulus, especially at levels that would be expected to result in PTS, given sufficient notice through use of soft start.

Nearly all inland waters of southeast Alaska, including Auke Bay, are included in the southeast Alaska humpback whale feeding BIA (Ferguson *et al.*, 2015), though humpback whale distribution in southeast Alaska varies by season and waterway (Dahlheim *et al.*, 2009).

Humpback whales are present within Auke Bay intermittently and in low numbers. The area of the BIA that may be affected by the planned project is small relative to the overall area of the BIA, and the area of suitable humpback whale habitat that is not included in the BIA. The southeast Alaska humpback whale feeding BIA is active between March and November. While the exact timing of the planned project is unknown, Mr. Erickson's pile driving activities are expected to take only eight days. If the project were to occur between March and November, the days of activity represent a small fraction of the time the BIA is active and, thus, even if humpback whale feeding behaviors were interrupted by the activity, the disturbance would be short-term and alternative habitat and foraging opportunities are available nearby. Further, only a very small portion of the humpback stock is expected to enter the area and potentially be disturbed. Therefore, any adverse effects on humpback whales resulting from disturbances occurring in the southeast Alaska humpback whale feeding BIA are expected to be short-term and minor and not adversely impact reproduction or survival, much less the stock.

The project also is not expected to have significant adverse effects on affected marine mammals' habitat. The project activities would not modify existing marine mammal habitat for a significant amount of time. The activities may cause some fish to leave the area of disturbance, thus temporarily impacting marine mammals' foraging opportunities in a limited portion of the foraging range; but, because of the short duration of the activities and the relatively small area of the habitat that may be affected, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

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 Level A harassment exposures are anticipated to result only in slight PTS, within the lower frequencies associated with pile driving;
- The anticipated incidents of Level B harassment would consist of, at worst, temporary modifications in behavior that would not result in fitness impacts to individuals;
- The area impacted by the specified activity is very small relative to the overall habitat ranges of all species, does not include ESA-designated critical habitat, and only temporally overlaps with the southeast Alaska humpback whale feeding BIA for two months of the planned six months of activity; and
- The required mitigation measures are expected to reduce the effects of the specified activity to the level of least practicable adverse impact.

In addition, although affected humpback whales and Steller sea lions may be from a DPS that is listed under the ESA, it is unlikely that minor noise effects in a small, localized area of habitat would have any effect on the stocks' 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.

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 required 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 8 indicates the number of animals that could be exposed to received noise levels that could cause Level A and Level B harassment for the planned work in Auke Bay. Our analysis shows that less than 11 percent of each affected stock could be taken by harassment. The numbers of animals authorized to be taken for these stocks would be considered small relative to the relevant stock's abundances even if each estimated taking occurred to a new individual – an extremely unlikely scenario.

Based on the analysis contained herein of the planned activity (including the required 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

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 planned project is not known to occur in an important subsistence hunting area. Auke Bay is a developed area with regular marine vessel traffic. Of the marine mammals considered in this IHA, only harbor seals are known to be used for subsistence in the project area. In a previous consultation with ADF&G, the Douglas Indian Association, Sealaska Heritage Institute, and the Central Council of the Tlingit and Haida Indian Tribes of Alaska, representatives indicated that the primary concern with construction activities in Statter Harbor was impacts to herring fisheries, not marine mammals. As stated above, impacts to fish from the planned project are expected to be localized and temporary, so are not likely to impact herring fisheries. If any tribes express concerns regarding project impacts to subsistence hunting of marine mammals, further communication between will take place, including provision of any project information, and clarification of any mitigation and minimization measures that may reduce potential impacts to marine mammals.

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

Endangered Species Act (ESA)

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

NMFS Alaska Region issued a Biological Opinion to NMFS Office of Protected Resources on November 15, 2019, which concluded the issuance of an IHA to Mr. Erickson is not likely to jeopardize the continued existence of wDPS Steller sea lions or Mexico DPS humpback whales or adversely modify 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 review our 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.

Authorization

NMFS has issued an IHA to Mr. Erickson for conducting pile installation and removal activities at the Erickson Residence between January 1, 2020 and December 31, 2020, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated.

Dated: November 21, 2019.

Donna S. Wieting,

Director, Office of Protected Resources,

National Marine Fisheries Service.

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