BILLING CODE 3510-22-P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648-XR097]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Gastineau Channel Historical Society Sentinel Island Moorage Float Project, Juneau, Alaska

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

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

SUMMARY: NMFS has received a request from Gastineau Channel Historical Society (GCHS) for authorization to take marine mammals incidental to Sentinel Island Moorage Float project near Juneau, Alaska. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an incidental harassment authorization (IHA) to incidentally take marine mammals during the specified activities. NMFS is also requesting comments on a possible one-year renewal that could be issued under certain circumstances and if all requirements are met, as described in **Request for Public Comments** at the end of this notice. NMFS will consider public comments prior to making any final decision on the issuance of the requested MMPA authorizations and agency responses will be summarized in the final notice of our decision.

DATES: Comments and information must be received no later than [*insert date 30 days after date of publication in the FEDERAL REGISTER*].

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

Instructions: NMFS is not responsible for comments sent by any other method, to any other address or individual, or received after the end of the comment period. All comments received are a part of the public record and will generally be posted online at *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection*-act without change. All personal identifying information (*e.g.*, name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Dwayne Meadows, Ph.D., 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 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.

National Environmental Policy Act

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

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

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

Summary of Request

On 24 October 2019, NMFS received a request from GCHS for an IHA to take marine mammals incidental to Sentinel Island Moorage Float project near Juneau, Alaska. The application was deemed adequate and complete on February 7, 2020. GCHS's request is for take of seven species (consisting of eight stocks) of marine mammals by Level B harassment and/or Level A harassment. Neither GCHS nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

Description of Proposed Activity

Overview

The project consists of the construction of an access float to more easily access Sentinel Island within Favorite Channel/Lynn Canal near Juneau, Alaska. GCHS would install a pile supported marine float with a metal gangway spanning from the float to a

timber platform on Sentinel Island. The project includes the following in-water components: driving six 24-inch diameter steel pipe piles to support the float and seaward end of the gangway. Pile driving would be by vibratory pile driving to install the piles until down-the-hole (DTH) drilling is needed to rock socket the piles. Impact pile driving will only be used for piles that encounter soils too dense to penetrate with the vibratory equipment, which is not expected.

The pile driving or DTH drilling can result in take of marine mammals from sound in the water which results in behavioral harassment (Level B harassment) or auditory injury (Level A harassment). The footprint of the project is approximately one square mile around the project site. The project will take no more than 6 days of pile-driving/DTH drilling.

Dates and Duration

The work for which take will be authorized will occur between July 15, 2020 and September 20, 2020. Noise generating activities will not overlap with high densities of marine mammal prey that occur March 1 through May 31. The daily construction window for pile driving would begin no sooner than 30 minutes after sunrise and would end 30 minutes prior to sunset to allow for marine mammal monitoring.

Specific Geographic Region

The project site is located at Sentinel Island at the northern end of Favorite Channel at its convergence with Lynn Canal near Juneau, Alaska (Figure 1). In 2004 the Sentinel Island Lighthouse was transferred to the Gastineau Channel Historical Society from the U.S. Coast Guard. The proposed mooring float is adjacent to the lighthouse on

the island. In a similar location to the proposed float there was an old timber dock with a hoist house that was demolished in 2004.

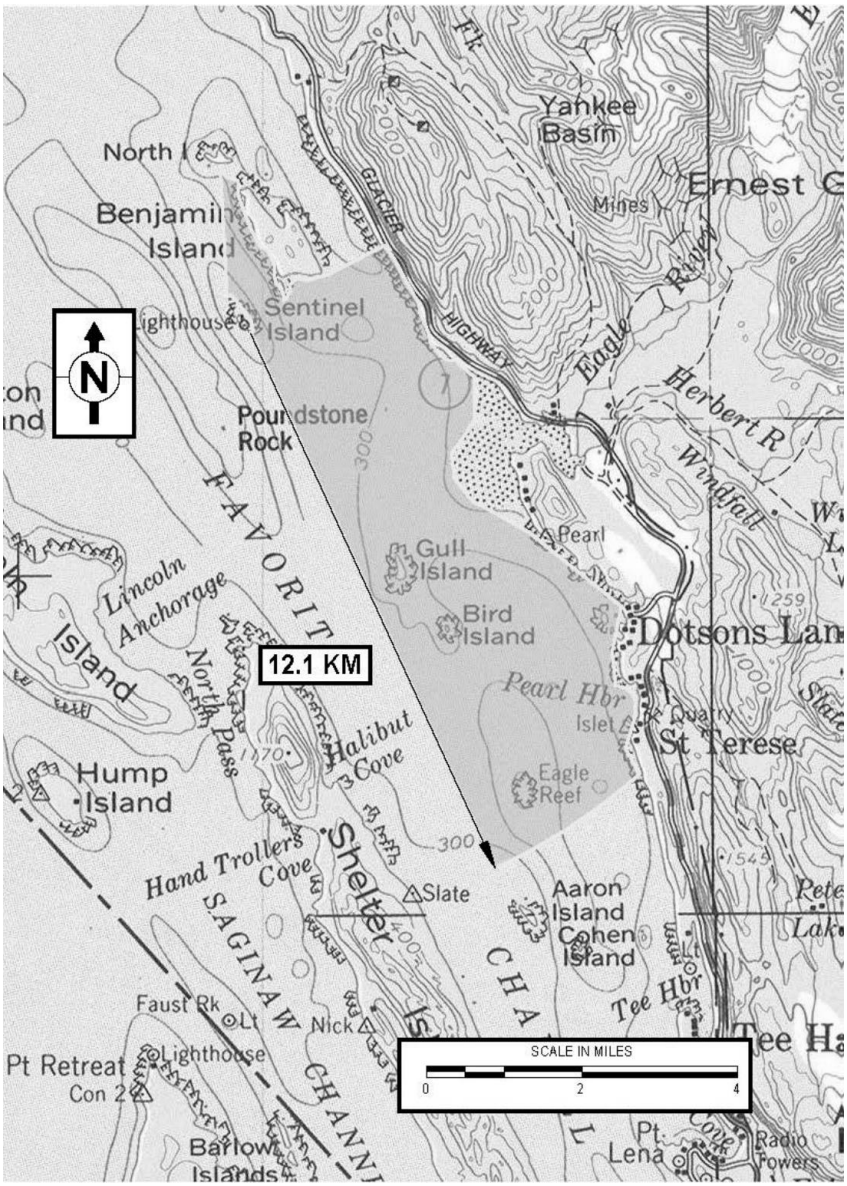

Figure 1. Topographic Map Showing Project Location and Level B Harassment Zone (gray)

Several seasonally available prey species are abundant within the project area. Herring (*Clupea pallasii*) are abundant in dense aggregations in the spring and fall, coinciding with when Steller sea lion numbers peak at Benjamin Island to the north

(Womble 2003). In Southeast Alaska, spawning of eulachon (*Thaleichtys pacificus*) and capelin (*Mallotus villosus*) also occurs in the spring (Womble *et al*. 2009).

The underwater acoustic environment in the project area is dominated by ambient noise from day-to-day vessel activities.

Detailed Description of Specific Activity

The 16 by 60 foot float and 8 by 88 foot gangway will be fabricated and moved to the installation site. To support these structures, six 24-inch diameter steel pipes would be driven into the substrate at the project location. The pipe piles would be installed to a depth of at least 15 feet or more below the surface using a crane-mounted vibratory and/or impact hammer located on a barge. It may take up to about 60 minutes per pile of vibratory driving to set each pile. If impact hammering is used, about 250 strikes would be needed to drive each of the piles to a sufficient depth which may require about 15 minutes of hammering. Installation will begin with use of the vibratory hammer, then drilling will begin at the bedrock interface and at the end the final setting of the pile in the drilled socket will be done with the vibratory hammer. DTH drilling will be used to install the rock sockets. It is estimated that about 6 hours (maximum) would be required to drive each pile and they would be proofed the same day.

Multiple piles would not be concurrently driven. Under the best-case scenario, using solely vibratory and DTH drilling, two piles would be set in a day. Therefore, the duration of drilling activity for the four piles could be as short as 3 days or as long as 6 days. Thus in the worst case, the entire project would take a total of 6 days of pile driving/drilling.

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

Description of Marine Mammals in the Area of Specified Activities

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 Juneau, Alaska 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 (2019). 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 SARs (*e.g.*, Muto *et al*., 2019). All values presented in Table 1 are the most recent available at the time of publication and are available in the draft 2019 SARs (Muto *et al*., 2019).

Table 1. Marine Mammals Potentially Present in the Vicinity of the Study Areas

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 Physeteridae						
Sperm whale	*Physeter macrocephalus*	North Pacific	-; N	N/A (see SAR, N/A, 2015), see text	See SAR	4.4
Family Balaenopteridae (rorquals)						
Humpback Whale	*Megaptera novaeangliae*	Central North Pacific	-;N (Hawaii DPS)	10,103 (0.3, 7,890, 2006)	83	25
		Central North Pacific	T,D,Y (Mexico DPS)	3264	N/A	N/A
Minke whale[4]	*Balaenoptera acutorostrata*	Alaska	-; N	N/A, see text	N/A	0
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						
Killer whale[5]	*Orcinus orca*	Alaska Resident Northern Resident West Coast transient	-; Y	2347 261 243	24 1.96 2.4	1 0 0
Family Phocoenidae (porpoises)						
Dall's porpoise[4]	*Phocoenoides dalli*	Alaska	-;N	83,400 (0.097, N/A, 1991)	N/A	38
Harbor porpoise	*Phocoena phocoena*	Southeast Alaska	-; Y	975 (2012)	8.9	34
Order Carnivora – Superfamily Pinnipedia						

Family Otariidae (eared seals and sea lions)						
Steller sea lion	*Eumetopias jubatus*	Eastern U.S.	-; N	41,638 (n/a; 41,638; 2015)	2,498	108
Steller sea lion	*Eumetopias jubatus*	Western U.S.	E,D,Y	54,268 (see SAR, 54,267, 2017)	326	247
Family Phocidae (earless seals)						
Harbor seal	*Phoca vitulina richardii*	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: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments. 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.

4 - The most recent abundance estimate is >8 years old, there is no official current estimate of abundance available for this stock.

5 - NMFS has preliminary genetic information on killer whales in Alaska which indicates that the current stock structure of killer whales in Alaska needs to be reassessed. NMFS is evaluating the new genetic information. A complete revision of the killer whale stock assessments will be postponed until the stock structure evaluation is completed and any new stocks are identified" (Muto, Helker *et al.* 2018). For the purposes of this IHA application, the existing stocks are used to estimate potential takes.

All species that could potentially occur in the proposed survey areas are included in Table 1. As described below, seven species (with eight managed stocks) temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur, and we have proposed authorizing it. Sperm whales are considered extra-limital and will not be considered further.

In addition, the northern sea otter may be found in the project vicinity. However, that species is managed by the U.S. Fish and Wildlife Service and is not considered further in this document.

Humpback Whale

Humpback whales (*Megaptera novaeangliae*) in the North Pacific migrate from low-latitude breeding and calving grounds to form geographically distinct aggregations on higher-latitude feeding grounds. They occur in Lynn Canal where they feed on aggregations of herring in lower Lynn Canal.

In 2016 NMFS revised the ESA listing of humpback whales (81 FR 62259; September 8, 2016). NMFS is in the process of reviewing humpback whale stock structure and abundance under the MMPA in light of the ESA revisions. The MMPA stock in Alaska is considered to be the Central North Pacific stock. Humpbacks from 2 of the 14 newly identified Distinct Population Segments (DPSs) occur in the project area: the Mexico DPS, which is a threatened species; and the Hawaii DPS, which is not protected under the ESA. NMFS considers humpback whales in Southeast Alaska to be 94 percent comprised of the Hawaii DPS and 6 percent of the Mexico DPS (Wade *et al*., 2016). While the range of the Mexico DPS extends up to Southeast Alaska, this DPS has never been reported as far north as Sitka. The likelihood that an individual from the Mexico DPS is part of the relatively few humpback whales that move to Lynn Canal is extremely low; nevertheless, we use the 6 percent estimate to be conservative in this analysis.

On October 9, 2019, NMFS published a proposed rule to designate critical habitat for the humpback whale (84 FR 54354). Areas proposed as critical habitat include specific marine areas off the coasts of California, Oregon, Washington and Alaska, including near the project area. GCHS expects to complete this project before the critical habitat designation is effective, therefore we do not consider it further in this analysis.

Estimates of humpback whale abundance for the Mexico DPS are from the ESA listing process. Some whale researchers, resource managers, and whale watching guides track the presence of individual humpback whales in the Juneau area by unique fluke patterns (Teerlink, 2017). Based on fluke pattern identification from fluke photographs taken between 2006 and 2014, 179 individual humpback whales were identified from the

Juneau area (Teerlink, 2017). For Lynn Canal/Favorite Channel and other waters in the project vicinity including Stephens Passage, and Saginaw Channel, researchers have documented 4 to 18 humpback whales in winter (Krieger and Wing, 1986; Moran *et al.*, 2018). Straley *et al.* (2011) surveyed humpback whales in Lynn Canal from September 15-October 14 in 2007/2008 and during the same months in 2000/2009. During both years a total of 55 whale sighting (average of approximately 2 whales per day) were recorded, however in 2007/2008 there were 30 unique whales identified and in 2008/2009 there were 22 unique whales identified in the project vicinity.

Dahlheim *et al*. (2009) found significant difference in the mean group size of humpback whales from year to year and also found that the average group size was largest in the fall (September/October), however no surveys were conducted in August. Information from the fall surveys is thus utilized, and is conservative because humpback numbers were found to peak during the fall in Lynn Canal (Straley *et al.*, 2011).

Minke Whale

There are three stocks of minke whales (*Balaenopera acutorostrata*) recognized in U.S. waters of the Pacific Ocean; only members of the Alaska stock could potentially occur within the project area. This stock has seasonal movements associated with feeding areas that are generally located at the edge of the pack ice (Muto *et al*., 2019). Minke whales are considered to be rare in Lynn Canal (Dahlheim *et al*., 2009). However, minke whales forage on schooling fish and may rarely enter the project area. In 2015, one minke whale was sighted in Taiya Inlet, northeast of the Project Area (K. Gross, personal communication, as cited in 84 FR 4777, February 19, 2019).

No comprehensive estimates of abundance have been made for the Alaska stock or near the project area, but a 2010 survey conducted on the eastern Bering Sea shelf produced a provisional abundance estimate of 2,020 whales (Friday *et al.*, 2013).

Killer Whale

NMFS recognizes eight killer whale (*Orcinus orca*) stocks throughout the Pacific Ocean. However, only three of these stocks can be found in Southeast Alaska: 1) the Alaska Resident stock ranges from southeastern Alaska to the Aleutian Islands and Bering Sea; 2) the Northern Resident stock occurs from Washington State through part of southeastern Alaska; and 3) the West Coast Transient stock ranges from California through southeastern Alaska (Muto *et al*., 2019). Resident and transient killer whales are sporadically and seasonally attracted to Lutak Inlet during the spring to feed on the large aggregations of fishes and pinnipeds.

Killer whale abundance estimates are determined by a direct count of individually identifiable animals. Killer whales are observed within the project area several times annually. Data compiled by Oceanus Alaska found an average of 25 killer whales in the Statter Harbor area of Auke Bay each year. While killer whales occurring in Lynn Canal can belong to one of three stocks, photoidentification studies since 1970 have catalogued most individuals observed in this area as belonging to the Northern Resident stock. The AG resident pod is one pod known to frequent the Juneau area (Dahlheim *et al.*, 2009; B. Lambert personal observation) and has 41 members. This pod is seen in the area intermittently in groups of up to approximately 25 individuals (B. Lambert personal observation). The occurrence of transient killer whales in Lynn Canal increases in summer, with lower numbers observed in spring and fall. Dahlheim *et al.* (2009) found

the average group size of resident orcas to be approximately 33 individuals during the summer (June/July) and 20 during the fall (September/October).

Dall's Porpoise

Dall's porpoise (*Phocoenoides dalli*) are widely distributed throughout the region and have been observed in Lynn Canal (Dahlheim *et al*., 2009). They were observed more frequently in the spring, tapering off in summer and fall in southeast Alaska (Jefferson *et al*., 2019). The Alaska stock is the only Dall's porpoise stock found in Alaska waters. Group sizes were generally small, under 5 individuals, and during the summer months the mean group size was 2.6.

Harbor Porpoise

Harbor porpoise (*Phocoena phocoena*) are common in coastal waters of Alaska. There are three harbor porpoise stocks in Alaska, but only the Southeast Alaska stock occurs in the project area (Muto *et al*., 2019). Individuals from the Southeast Alaska stock of harbor porpoise are infrequently observed in Lynn Canal, though they have been observed as far north as Haines during the summer months (Dahlheim *et al*., 2015).

Steller Sea Lion

Steller sea lions (*Eumetopias jubatus*) range along the North Pacific Rim from northern Japan to California, with centers of abundance and distribution in the Gulf of Alaska and Aleutian Islands. Large numbers of individuals widely disperse when not breeding (late May to early July) to access seasonally important prey resources (Muto *et al*., 2019). In 1997 NMFS identified two DPSs of Steller sea lions under the ESA: a Western DPS and an Eastern DPS (62 FR 24345, May 5, 1997). The Eastern DPS is not ESA-listed, the Western DPS is. For MMPA purposes the Eastern DPS is called the

Eastern U.S. stock and the Western DPS is called the Western U.S. stock. For simplicity we will refer to them by their DPS name in this analysis. Most of the Steller sea lions in southeastern Alaska have been determined to be part of the Eastern DPS, however, in recent years there has been an increasing trend of the Western DPS animals occurring and breeding in southeastern Alaska (Muto *et al*., 2019).

Steller sea lions have been observed in the project vicinity throughout the year. Salmon increase in importance as prey for sea lions from late-October and December. The closest haulout to the project area is Benjamin Island, about 1 mile northeast. Typically the sea lions vacate Benjamin Island mid-July through late-September, however some years individuals have remained. In surveys conducted from 2004 to 2018, Steller sea lions were absent from July 17 through September 28 at Benjamin Island with the exception of 2005 and 2013. On July 16, 2005 560 non-pups were observed; on August 9, 2013, 40 non-pups were counted; and on September 24, 2013, 144 non-pups were observed (Jemison, Alaska Fish and Game, personal communication).

Individuals from the Western DPS have been observed in the Lynn Canal area. The percentage of Western DPS animals estimated to occur in the project area in the summer is estimated to be 1.4 percent (Hastings *et al*., in press); for the rest of this analysis we assume that 1.4 percent of the Steller sea lions in the project area are from the Western DPS.

Harbor Seal

Harbor seals (*Phoca vitulina*) inhabit coastal and estuarine waters off Alaska. They haul out on rocks, reefs, beaches, and drifting glacial ice. Up to 44 percent of their time is spent hauled out, with hauling out occurring more often during the summer

(Pitcher and Calkins, 1979; Klinkhart *et al.*, 2008). They are opportunistic feeders and often adjust their distribution to take advantage of locally and seasonally abundant prey (Womble *et al*., 2009; Allen and Angliss, 2015). Harbor seals occurring in the project area belong to the Lynn Canal/Stephens Passage (LC/SP) stock. NOAA 2018 abundance estimates for the unit in which the action area is located is 42.06 harbor seals at a haulout on the east coast of Sentinel Island with the 95 percent confidence interval for that estimate at 134 seals.

Marine Mammal Hearing

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

was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. Marine mammal hearing groups and their associated hearing ranges are provided in Table 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, *Kogia*, river dolphins, cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*)	275 Hz to 160 kHz
Phocid pinnipeds (PW) (underwater) (true seals)	50 Hz to 86 kHz
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 39 kHz

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

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

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information. Seven marine mammal species (five cetacean and two pinniped (one otariid and one phocid) species have the reasonable potential to co-occur with the proposed survey activities (see Table 1). Of the cetacean species that may be present, two are classified as low-frequency cetaceans (*i.e.*, all mysticete species), one is classified as a mid-frequency cetacean (*i.e.*, all delphinid and

ziphiid species and the sperm whale), and two are classified as high-frequency cetaceans (*i.e.*, harbor porpoise and Dall's porpoise).

Potential Effects of Specified Activities on Marine Mammals and their Habitat

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

Description of Sound Sources

The marine soundscape is comprised of both ambient and anthropogenic sounds. Ambient sound is defined as the all-encompassing sound in a given place and is usually a composite of sound from many sources both near and far (ANSI 1994, 1995). The sound level of an area is defined by the total acoustical energy being generated by known and unknown sources. These sources may include physical (*e.g.*, waves, wind, precipitation, earthquakes, ice, atmospheric sound), biological (*e.g.*, sounds produced by marine mammals, fish, and invertebrates), and anthropogenic sound (*e.g.*, vessels, dredging, aircraft, construction).

The sum of the various natural and anthropogenic sound sources at any given location and time – which comprise "ambient" or "background" sound – depends not

only on the source levels (as determined by current weather conditions and levels of biological and shipping activity) but also on the ability of sound to propagate through the environment. In turn, sound propagation is dependent on the spatially and temporally varying properties of the water column and sea floor, and is frequency-dependent. As a result of the dependence on a large number of varying factors, ambient sound levels can be expected to vary widely over both coarse and fine spatial and temporal scales. Sound levels at a given frequency and location can vary by 10-20 dB from day to day (Richardson *et al*., 1995). The result is that, depending on the source type and its intensity, sound from the specified activity may be a negligible addition to the local environment or could form a distinctive signal that may affect marine mammals.

In-water construction activities associated with the project would include impact pile driving, vibratory pile driving, and DTH drilling. The sounds produced by these activities fall into one of two general sound types: impulsive and non-impulsive. Impulsive sounds (*e.g*., explosions, gunshots, sonic booms, impact pile driving) are typically transient, brief (less than 1 second), broadband, and consist of high peak sound pressure with rapid rise time and rapid decay (ANSI, 1986; NIOSH, 1998; ANSI, 2005; NMFS, 2018). Non-impulsive sounds (*e.g.*, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems) can be broadband, narrowband or tonal, brief or prolonged (continuous or intermittent), and typically do not have the high peak sound pressure with raid rise/decay time that impulsive sounds do (ANSI 1995; NIOSH 1998; NMFS 2018). The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (*e.g*., Ward 1997 in Southall *et al*., 2007).

Two types of pile hammers would be used on this project: impact and vibratory. Impact hammers operate by repeatedly dropping a heavy piston onto a pile to drive the pile into the substrate. Sound generated by impact hammers is characterized by rapid rise times and high peak levels, a potentially injurious combination (Hastings and Popper, 2005). Vibratory hammers install piles by vibrating them and allowing the weight of the hammer to push them into the sediment. Vibratory hammers produce significantly less sound than impact hammers. Peak Sound pressure Levels (SPLs) may be 180 dB or greater, but are generally 10 to 20 dB lower than SPLs generated during impact pile driving of the same-sized pile (Oestman *et al*., 2009). Rise time is slower, reducing the probability and severity of injury, and sound energy is distributed over a greater amount of time (Nedwell and Edwards, 2002; Carlson *et al*., 2005).

DTH drilling would be conducted using a down-the-hole drill inserted through the hollow steel piles. A DTH drill is a drill bit that drills through the bedrock using a pulse mechanism that functions at the bottom of the hole. This pulsing bit breaks up rock to allow removal of debris and insertion of the pile. The head extends so that the drilling takes place just below the pile. The pulsing sounds produced by the DTH drilling method occur in a range of frequencies that depends on the size and type of the bit and the hammering pressure applied. Smaller diameter DTH drilling produces sounds that are generally continuous while larger and ring-type DTH drills produce sounds that can be a combination of continuous and impulsive. The DTH hammering for this project falls in the continuous range. In addition, this method likely increases sound attenuation because the noise is primarily contained within the steel pile and below ground as opposed to impact hammer driving methods which occur at the top of the pile and introduce sound

into the water column to a greater degree. See also our detailed discussion of this sound source in the notice of issuance of an IHA for Ferry Berth Improvements in Tongass Narrows, Alaska *https://www.govinfo.gov/content/pkg/FR-2020-01-07/pdf/2020-00038.pdf*.

The likely or possible impacts of GCHS's proposed activity on marine mammals could involve both non-acoustic and acoustic stressors. Potential non-acoustic stressors could result from the physical presence of the equipment and personnel; however, any impacts to marine mammals are expected to primarily be acoustic in nature. Acoustic stressors include effects of heavy equipment operation during pile installation and drilling.

Acoustic Impacts

The introduction of anthropogenic noise into the aquatic environment from pile driving and DTH drilling is the primary means by which marine mammals may be harassed from GCHS's specified activity. In general, animals exposed to natural or anthropogenic sound may experience physical and psychological effects, ranging in magnitude from none to severe (Southall *et al*., 2007). *G*enerally, exposure to pile driving and drilling noise has the potential to result in auditory threshold shifts and behavioral reactions (*e.g.*, avoidance, temporary cessation of foraging and vocalizing, changes in dive behavior). Exposure to anthropogenic noise can also lead to non-observable physiological responses such an increase in stress hormones. Additional noise in a marine mammal's habitat can mask acoustic cues used by marine mammals to carry out daily functions such as communication and predator and prey detection. The effects of pile driving and drilling noise on marine mammals are dependent on several factors,

including, but not limited to, sound type (*e.g.*, impulsive vs. non-impulsive), the species, age and sex class (*e.g.*, adult male vs. mom with calf), duration of exposure, the distance between the pile and the animal, received levels, behavior at time of exposure, and previous history with exposure (Wartzok *et al.*, 2003; Southall *et al*., 2007). Here we discuss physical auditory effects (threshold shifts) followed by behavioral effects and potential impacts on habitat.

NMFS defines a noise-induced threshold shift (TS) as a change, usually an increase, in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS, 2018). The amount of threshold shift is customarily expressed in dB. A TS can be permanent or temporary. As described in NMFS (2018), there are numerous factors to consider when examining the consequence of TS, including, but not limited to, the signal temporal pattern (*e.g.*, impulsive or non-impulsive), likelihood an individual would be exposed for a long enough duration or to a high enough level to induce a TS, the magnitude of the TS, time to recovery (seconds to minutes or hours to days), the frequency range of the exposure (*i.e.*, spectral content), the hearing and vocalization frequency range of the exposed species relative to the signal's frequency spectrum (*i.e.*, how animal uses sound within the frequency band of the signal; *e.g.*, Kastelein *et al.*, 2014), and the overlap between the animal and the source (*e.g.*, spatial, temporal, and spectral).

Permanent Threshold Shift (PTS) - NMFS defines PTS as a permanent, irreversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS 2018). Available data from humans and other terrestrial mammals indicate that a 40 dB

threshold shift approximates PTS onset (see Ward *et al*., 1958, 1959; Ward, 1960; Kryter *et al.,* 1966; Miller, 1974; Ahroon *et al*., 1996; Henderson and Hu, 2008). PTS levels for marine mammals are estimates, with the exception of a single study unintentionally inducing PTS in a harbor seal (Kastak *et al.,* 2008), there are no empirical data measuring PTS in marine mammals, largely due to the fact that, for various ethical reasons, experiments involving anthropogenic noise exposure at levels inducing PTS are not typically pursued or authorized (NMFS, 2018).

Temporary Threshold Shift (TTS) - A temporary, reversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS, 2018). Based on data from cetacean TTS measurements (see Southall *et al.,* 2007), a TTS of 6 dB is considered the minimum threshold shift clearly larger than any day-to-day or session-to-session variation in a subject's normal hearing ability (Schlundt *et al*., 2000; Finneran *et al*., 2000, 2002). As described in Finneran (2016), marine mammal studies have shown the amount of TTS increases with cumulative sound exposure level (SEL_{cum}) in an accelerating fashion: At low exposures with lower SEL_{cum}, the amount of TTS is typically small and the growth curves have shallow slopes. At exposures with higher SEL_{cum}, the growth curves become steeper and approach linear relationships with the noise SEL.

Depending on the degree (elevation of threshold in dB), duration (*i.e*., recovery time), and frequency range of TTS, and the context in which it is experienced, TTS can have effects on marine mammals ranging from discountable to serious (similar to those discussed in auditory masking, below). For example, a marine mammal may be able to

readily compensate for a brief, relatively small amount of TTS in a non-critical frequency range that takes place during a time when the animal is traveling through the open ocean, where ambient noise is lower and there are not as many competing sounds present. Alternatively, a larger amount and longer duration of TTS sustained during time when communication is critical for successful mother/calf interactions could have more serious impacts. We note that reduced hearing sensitivity as a simple function of aging has been observed in marine mammals, as well as humans and other taxa (Southall *et al.*, 2007), so we can infer that strategies exist for coping with this condition to some degree, though likely not without cost.

Currently, TTS data only exist for four species of cetaceans (bottlenose dolphin (*Tursiops truncatus*), beluga whale (*Delphinapterus leucas*), harbor porpoise, and Yangtze finless porpoise (*Neophocoena asiaeorientalis*)) and five species of pinnipeds exposed to a limited number of sound sources (*i.e.*, mostly tones and octave-band noise) in laboratory settings (Finneran, 2015). TTS was not observed in trained spotted (*Phoca largha*) and ringed (*Pusa hispida*) seals exposed to impulsive noise at levels matching previous predictions of TTS onset (Reichmuth *et al*., 2016). In general, harbor seals and harbor porpoises have a lower TTS onset than other measured pinniped or cetacean species (Finneran, 2015). The potential for TTS from impact pile driving exists. After exposure to playbacks of impact pile driving sounds (rate 2760 strikes/hour) in captivity, mean TTS increased from 0 dB after 15 minute exposure to 5 dB after 360 minute exposure; recovery occurred within 60 minutes (Kastelein *et al*., 2016). Additionally, the existing marine mammal TTS data come from a limited number of individuals within these species. No data are available on noise-induced hearing loss for mysticetes. For

summaries of data on TTS in marine mammals or for further discussion of TTS onset thresholds, please see Southall *et al*. (2007), Finneran and Jenkins (2012), Finneran (2015), and Table 5 in NMFS (2018).

Installing piles requires a combination of impact pile driving, vibratory pile driving, and DTH drilling. For the project, these activities would not occur at the same time and there would likely be pauses in activities producing the sound during each day. Given these pauses and that many marine mammals are likely moving through the action area and not remaining for extended periods of time, the potential for TS declines.

Behavioral Harassment - Exposure to noise from pile driving and removal and drilling also has the potential to behaviorally disturb marine mammals. Available studies show wide variation in response to underwater sound; therefore, it is difficult to predict specifically how any given sound in a particular instance might affect marine mammals perceiving the signal. If a marine mammal does react briefly to an underwater sound by changing its behavior or moving a small distance, the impacts of the change are unlikely to be significant to the individual, let alone the stock or population. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on individuals and populations could be significant (*e.g*., Lusseau and Bejder, 2007; Weilgart, 2007; NRC, 2005).

Disturbance may result in changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); avoidance of areas where sound sources are located. Pinnipeds may increase their haul-

out time, possibly to avoid in-water disturbance (Thorson and Reyff, 2006). Behavioral responses to sound are highly variable and context-specific and any reactions depend on numerous intrinsic and extrinsic factors (*e.g.*, species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day), as well as the interplay between factors (*e.g.*, Richardson *et al.*, 1995; Wartzok *et al.*, 2003; Southall *et al.*, 2007; Weilgart, 2007; Archer *et al.*, 2010). Behavioral reactions can vary not only among individuals but also within an individual, depending on previous experience with a sound source, context, and numerous other factors (Ellison *et al.*, 2012), and can vary depending on characteristics associated with the sound source (*e.g.*, whether it is moving or stationary, number of sources, distance from the source). In general, pinnipeds seem more tolerant of, or at least habituate more quickly to, potentially disturbing underwater sound than do cetaceans, and generally seem to be less responsive to exposure to industrial sound than most cetaceans. Please see Appendices B and C of Southall *et al.* (2007) for a review of studies involving marine mammal behavioral responses to sound.

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

the affected individuals and the relationship between prey availability, foraging effort and success, and the life history stage of the animal.

In 2016, the Alaska Department of Transportation and Public Facilities (ADOT&PF) documented observations of marine mammals during construction activities (*i.e.*, pile driving and down-hole drilling) at the Kodiak Ferry Dock (see 80 FR 60636, October 7, 2015). In the marine mammal monitoring report for that project (ABR 2016), 1,281 Steller sea lions were observed within the Level B disturbance zone during pile driving or drilling (*i.e.*, documented as Level B harassment take). Of these, 19 individuals demonstrated an alert behavior, 7 were fleeing, and 19 swam away from the project site. All other animals (98 percent) were engaged in activities such as milling, foraging, or fighting and did not change their behavior. In addition, two sea lions approached within 20 meters of active vibratory pile driving activities. Three harbor seals were observed within the disturbance zone during pile driving activities; none of them displayed disturbance behaviors. Fifteen killer whales and three harbor porpoise were also observed within the Level B harassment zone during pile driving. The killer whales were travelling or milling while all harbor porpoises were travelling. No signs of disturbance were noted for either of these species. Given the similarities in activities and habitat and the fact the same species are involved, we expect similar behavioral responses of marine mammals to GCHS's specified activity. That is, disturbance, if any, is likely to be temporary and localized (*e.g.*, small area movements). Monitoring reports from other recent pile driving and DTH drilling projects in Alaska have observed similar behaviors (for example, the Biorka Island Dock Replacement Project).

Masking - Sound can disrupt behavior through masking, or interfering with, an animal's ability to detect, recognize, or discriminate between acoustic signals of interest (*e.g.*, those used for intraspecific communication and social interactions, prey detection, predator avoidance, navigation) (Richardson *et al*., 1995). Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher intensity, and may occur whether the sound is natural (*e.g.*, snapping shrimp, wind, waves, precipitation) or anthropogenic (*e.g.*, pile driving, shipping, sonar, seismic exploration) in origin. The ability of a noise source to mask biologically important sounds depends on the characteristics of both the noise source and the signal of interest (*e.g.*, signal-to-noise ratio, temporal variability, direction), in relation to each other and to an animal's hearing abilities (*e.g.*, sensitivity, frequency range, critical ratios, frequency discrimination, directional discrimination, age or TTS hearing loss), and existing ambient noise and propagation conditions. Masking of natural sounds can result when human activities produce high levels of background sound at frequencies important to marine mammals. Conversely, if the background level of underwater sound is high (*e.g.* on a day with strong wind and high waves), an anthropogenic sound source would not be detectable as far away as would be possible under quieter conditions and would itself be masked. The Juneau area contains active commercial shipping and ferry operations as well as numerous recreational and commercial vessels; therefore, background sound levels in the area are already elevated.

Airborne Acoustic Effects - Pinnipeds that occur near the project site could be exposed to airborne sounds associated with pile driving and DTH drilling that have the potential to cause behavioral harassment, depending on their distance from pile driving

activities. Cetaceans are not expected to be exposed to airborne sounds that would result in harassment as defined under the MMPA.

Airborne noise would primarily be an issue for pinnipeds that are swimming or hauled out near the project site within the range of noise levels elevated above the acoustic criteria. We recognize that pinnipeds in the water could be exposed to airborne sound that may result in behavioral harassment when looking with their heads above water. Most likely, airborne sound would cause behavioral responses similar to those discussed above in relation to underwater sound. For instance, anthropogenic sound could cause hauled out pinnipeds to exhibit changes in their normal behavior, such as reduction in vocalizations, or cause them to temporarily abandon the area and move further from the source. However, these animals would previously have been 'taken' because of exposure to underwater sound above the behavioral harassment thresholds, which are in all cases larger than those associated with airborne sound. Thus, the behavioral harassment of these animals is already accounted for in these estimates of potential take. Therefore, we do not believe that authorization of incidental take resulting from airborne sound for pinnipeds is warranted, and airborne sound is not discussed further here.

Marine Mammal Habitat Effects

GCHS's construction activities at Sentinel Island could have localized, temporary impacts on marine mammal habitat and their prey by increasing in-water sound pressure levels and slightly decreasing water quality. Increased noise levels may affect acoustic habitat (see masking discussion above) and adversely affect marine mammal prey in the vicinity of the project area (see discussion below). During impact pile driving, elevated levels of underwater noise would ensonify Lynn Canal where both fishes and mammals

occur and could affect foraging success. Currently, there are a few dozen annual vessel landings at Sentinel Island. With the new dock there would be up to two tour landings daily during the summer.

Construction activities are of short duration and would likely have temporary impacts on marine mammal habitat through increases in underwater and airborne sound.

In-water pile driving, and drilling activities would also cause short-term effects on water quality due to increased turbidity. Local strong currents are anticipated to disburse suspended sediments produced by project activities at moderate to rapid rates depending on tidal stage. GCHS would employ standard construction best management practices (BMPs; see section 11 in application), thereby reducing any impacts. Therefore, the impact from increased turbidity levels is expected to be discountable.

In-water Construction Effects on Potential Foraging Habitat

The area likely impacted by the project is relatively small compared to the available habitat in Lynn Canal (*e.g.*, most of the impacted area is limited to the east side of Sentinel Island in the Favorite Channel) and does not include any BIAs. One ESA-designated critical habitat area for Steller sea lions is nearby on Benjamin Island and would be within the Level B harassment zone for sound but there would be no direct effects on the critical habitat. Pile installation and drilling may temporarily increase turbidity resulting from suspended sediments. Any increases would be temporary, localized, and minimal. GCHS must comply with state water quality standards during these operations by limiting the extent of turbidity to the immediate project area. In general, turbidity associated with pile installation is localized to about a 25-foot radius around the pile (Everitt *et al.*, 1980). Cetaceans are not expected to be close enough to the

project pile driving areas to experience effects of turbidity, and any pinnipeds would be transiting the area and could avoid localized areas of turbidity. Therefore, the impact from increased turbidity levels is expected to be discountable to marine mammals. Furthermore, pile driving at the project site would not obstruct movements or migration of marine mammals.

Avoidance by potential prey (*i.e.*, fish) of the immediate area due to the temporary loss of this foraging habitat is also possible. The duration of fish avoidance of this area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution and behavior is anticipated. Any behavioral avoidance by fish of the disturbed area would still leave significantly large areas of fish and marine mammal foraging habitat in the nearby vicinity in Lynn Canal and the project would occur outside the peak eulachon, capelin and salmonid runs.

The duration of the construction activities is relatively short. The construction window is for a maximum of 4-5 months with only a maximum of 6 days of pile driving. During each day, construction activities would only occur during daylight hours. Impacts to habitat and prey are expected to be minimal based on the short duration of activities.

In-water Construction Effects on Potential Prey (Fish) - Construction activities would produce continuous (*i.e*., vibratory pile driving and DTH drilling) and pulsed (*i.e*. impact driving) sounds. Fish react to sounds that are especially strong and/or intermittent low-frequency sounds. Short duration, sharp sounds can cause overt or subtle changes in fish behavior and local distribution. Hastings and Popper (2005) identified several studies that suggest fish may relocate to avoid certain areas of sound energy. Additional studies have documented effects of pile driving on fish, although several are based on studies in

support of large, multiyear bridge construction projects (*e.g.*, Scholik and Yan, 2001, 2002; Popper and Hastings, 2009). Sound pulses at received levels of 160 dB may cause subtle changes in fish behavior. SPLs of 180 dB may cause noticeable changes in behavior (Pearson *et al.*, 1992; Skalski *et al.*, 1992). SPLs of sufficient strength have been known to cause injury to fish and fish mortality.

The most likely impact to fish from pile driving and drilling activities at the project area would be temporary behavioral avoidance of the area. The duration of fish avoidance of this area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution and behavior is anticipated. In general, impacts to marine mammal prey species are expected to be minor and temporary due to the short timeframe for the project.

Construction activities, in the form of increased turbidity, have the potential to adversely affect forage fish and juvenile salmonid outmigratory routes in the project area. Both herring and salmon form a significant prey base for Steller sea lions, herring is a primary prey species of humpback whales, and herring, capelin and salmon are components of the diet of many other marine mammal species that occur in the project area. Increased turbidity is expected to occur in the immediate vicinity (on the order of 10 feet or less) of construction activities. However, suspended sediments and particulates are expected to dissipate quickly within a single tidal cycle. Given the limited area affected and high tidal dilution rates any effects on forage fish and salmon are expected to be minor or negligible. In addition, best management practices would be in effect, which would limit the extent of turbidity to the immediate project area. Finally, exposure to turbid waters from construction activities is not expected to be different from the current

exposure; fish and marine mammals in the Lynn Canal region are routinely exposed to substantial levels of suspended sediment from glacial sources.

In summary, given the short daily duration of sound associated with individual pile driving and drilling events, the small number of total piles, and the relatively small areas being affected, pile driving and drilling activities associated with the proposed action are not likely to have a permanent, adverse effect on any fish habitat, or populations of fish species. Thus, we conclude that impacts of the specified activity are not likely to have more than short-term adverse effects on any prey habitat or populations of prey species. Further, any impacts to marine mammal habitat are not expected to result in significant or long-term consequences for individual marine mammals, or to contribute to adverse impacts on their populations.

Estimated Take

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

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

Authorized takes would primarily be by Level B harassment, as use of the acoustic source (*i.e.*, vibratory or impact pile driving or 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 mysticetes, high frequency species and pinnipeds because predicted auditory injury zones are larger than for mid-frequency species. Auditory injury is unlikely to occur for mid-frequency species and otariids. The proposed mitigation and monitoring measures are expected to minimize the severity of the taking to the extent practicable.

As described previously, no mortality is anticipated or proposed to be authorized for this activity. Below we describe how the take is estimated.

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

Acoustic Thresholds

Using the best available science, NMFS has developed acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals

would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment).

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

GCHS's proposed activity includes the use of continuous (vibratory pile-driving, 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). GCHS's activity includes the use of impulsive (impact pile-driving) sources.

These thresholds are provided in Table 3. 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

	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 1µPa^{2}s. 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.

For vibratory pile driving we determined a source level of 161 dB (RMS SPL) at 10m was most appropriate. The closest known measurements of sound levels for vibratory pile installation of 16-inch steel piles are from the U.S. Navy Proxy Sound Source Study for projects in Puget Sound (U.S. Navy 2015). Based on the projects analyzed it was determined that 16- to 24-inch piles exhibited similar sound source levels. For DTH drilling we used a source level of 166.2 dB (RMS SPL); this is derived from Denes *et al*. (2016), where they drilled 24-inch piles near Kodiak, AK. To be conservative, since DTH drilling and vibratory pile driving would occur on the same day, the applicant used the higher of the vibratory and DTH source levels (166.2dB) and assumed all drilling/driving time in a day was at this higher level. For impact pile driving of 24-inch piles, sound measurements were used from the literature review in Appendix

H of the AKDOT&PF study (Yurk *et al*. 2015) for 24-inch piles driven in the Columbia River with a diesel impact hammer (190 dB RMS, 205 dB Peak, 175 dB SS SEL).

We assumed no more than two piles per day with DTH drilling as the duration per pile was assumed to be 6 hours. For impact pile driving activities we also assumed no more than 2 piles per day and 250 strikes per pile. In all cases we used a propagation loss coefficient of 15 logR as most appropriate for these stationary, in-shore sources.

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

NMFS User spreadsheet input scenarios for vibratory pile driving/DTH drilling and impact pile driving are shown in Table 4. These input scenarios lead to PTS isopleth

distances (Level A thresholds) of anywhere from 7 to 220 meters (22 to 720 ft), depending on the marine mammal group and scenario (Table 5).

Table 4. NMFS User Spreadsheet Inputs

USER SPREADSHEET INPUT		
	Vibratory pile driving/DTH drilling	**Impact pile driving**
Spreadsheet Tab Used	A.1) Vibratory pile driving	E.1) Impact pile driving
Source Level	166.2 dB RMS	175 dB SS SEL
Weighting Factor Adjustment (kHz)	2.5	2
a) Number of strikes per pile	N/A	250
a) Activity Duration (h:min) within 24-h period	12:00	N/A
Propagation (xLogR)	15	15
Distance of source level measurement (meters)	10	10
Number of piles per day	2	2

Table 5. NMFS User Spreadsheet Outputs: Level B and Level A (PTS) Isopleths

Activity	**Behavioral Disturbance (Level B)**	**PTS isopleths (meters) (Level A)**				
	All Species	**Humpback + Minke Whales**	**Killer Whales**	**Harbor + Dall's Porpoise**	**Harbor Seals**	**Stellar Sea Lions**
Vibratory Driving/ DTH drilling	12.1 km (7.5 miles)*	80 m (263 feet)	7 m (23 feet)	118 m (387 feet)	48.3 m (159 feet)	4 m (13 feet)
Impact Driving	1 km (3280 ft)	184 m (605 ft)	6.6 m (22 feet)	220 m (720 ft)	99 m (325 ft)	8 m (25 ft)

*Lynn Canal is smaller than this, therefore extent of actual impacts will be constrained by land.

The distances to the Level B harassment threshold of 120 dB RMS are 12.1 km (7.5 miles) miles for vibratory pile driving and 1 km (3280 ft) for impact driving. The enclosed nature of Lutak Inlet restricts the propagation of noise in all directions before noise levels reduce below the Level B harassment threshold for vibratory pile

driving/DTH) Therefore, the area ensonified to the Level B harassment threshold is truncated by land in all directions. The ensonified area of the vibratory/drilling Level B harassment zone is 47km^2 (18.15 mi^2). Note that thresholds for behavioral disturbance are unweighted with respect to marine mammal hearing and therefore the thresholds apply to all species.

Marine Mammal Occurrence and Take Calculation and Estimation

In this section we provide the information about the presence, density, or group dynamics of marine mammals that will inform the take calculations. We have density information for two species: Dall's porpoise and harbor porpoise. For the other five species we have information on presence, group size, and dive durations that we use to derive take estimates.

In this section we then describe for each species how the marine mammal occurrence and/or density information is brought together to produce a quantitative take estimate. Level A harassment takes are requested for Dall's porpoise and harbor porpoise only as they are more cryptic and could enter a Level A harassment zone undetected. For the other species, the Level A harassment zones are small and shutdown measures can be implemented prior to any individual entering the Level A harassment zones. Take estimates for all stocks are shown in Table 6.

Humpback Whale

Based on local information and Dahlheim *et al*. (2009) we estimate that up to eight individuals could be exposed to underwater noise each day. While individual humpback whales can generally be identified, due to the size of the monitoring zone it is possible this won't be the case in some instances. Further, it is possible that different

monitors will sight the same whale, given the size of the monitoring zones and the distances humpback whales can move in a day. Thus it is conservatively assumed that there could be up to three interactions with each individual daily. Our take estimate is then the product of the number of individuals per day times the number of interactions per individual per day times the 6 days of the project, or 144 Level B takes.

For purposes of estimating effects and ESA takes of the Mexico DPS of humpback whales, we acknowledge that Mexico DPS whales cannot be readily distinguished from non-listed humpback whales in the project area. Based on Wade *et al*. (2016) we estimate that 9 of the 144 takes will be of the Mexico DPS. However, the average group size in the area during the fall months was two whales (Dahlheim *et al*. 2009) and it is possible that a mother calf pair of the Mexico DPS, or other group of two Mexico DPS whales, may occur within the project area each day. Thus it is conservatively assumed that 12 individuals (2 individuals per day) of the threatened Mexico DPS population may be taken and 132 of the Hawaiian DPS.

Steller Sea Lions

As discussed above Steller sea lions are typically absent in the project area from mid-July through September. On the off chance that Steller sea lions will be present during construction for this project we used an average of the three sightings discussed above from 2005 and 2013 to estimate the possible number of animals in the area. This average was 248 individuals. We assume that no more than 248 individual Steller sea lions will enter the action area on a given day of the project and calculate expected take as 248 times the 6 days of the project, or 1,488 takes. As discussed above, some of these takes will be eastern DPS Steller sea lions and some will be western DPS. We use the

estimate from Hastings *et al*. (2020) that 1.4 percent of the animals in the project area are from the western DPS to allot 21 of the 1,488 Level B takes to the western DPS and 1,467 of the takes to the eastern DPS.

Harbor Seal

As discussed above, researchers estimate that they are 95 percent confident the population size of harbor seals in the area is not greater than 134 individuals. We use that estimate as the number of animals expected in the Level B harassment zone daily. We know from Klinkhart *et al*. (2008) that animals dive and resurface every 4 minutes. That translates to potentially 15 sightings per hour. We also use the estimate that they spend 50 percent of their time hauled out. The project involved 36 hours of pile driving/drilling total. Take is estimated to be 134 seals times 7.5 in-water sightings per hour times 36 hours of work, or 36,180 Level B takes.

Dall's Porpoise

Density estimates were determined for Dall's porpoises for areas in Southeast Alaska, however densities specific to the Lynn Canal/Favorite Channel area are not available. However, surveys occurred closest to the project area in 1991, 1992, and 2007. These surveys found densities (porpoises/100km^2) during summer months of 18.5, 14.3, and 17.8 (Dahlheim *et al*., 2009). We used the average of these densities (16.9 porpoises/100 km^2) to calculate take. As noted above the ensonified area is 47 km^2. Thus estimated take is 16.9/100 km^2 times 47 km^2 times 6 days, or 48 takes.

Due to the size of the Level A harassment zone associated with drilling, and the cryptic nature of Dall's porpoises, it is possible Dall's porpoises may enter the Level A harassment zone undetected. It is conservatively assumed that up to four harbor porpoises

(the mean group size from Dahlheim *et al.* 2009) may enter the Level A harassment once during the duration of the project. Thus we allot the 48 takes above to 4 Level A takes and 44 Level B takes.

Harbor Porpoise

Density was estimated for harbor porpoises in Lynn Canal by Dahlhein *et al*. (2015) to be 0.2 individuals/km^2. As noted above the ensonified area is 47 km^2. Thus estimated take is 0.2/km^2 times 47 km^2 times 6 days, or 57 takes.

Due to the size of the Level A harassment zone associated with drilling, and the stealthy nature of harbor porpoises with no visible blow and a low profile, it is possible harbor porpoises may enter the Level A harassment zone undetected. Because they are most commonly observed in pairs (Dahlheim *et al.* 2009), it is conservatively assumed that one pair of harbor porpoises may enter the Level A harassment zone every other day of pile driving. Thus we allot the 57 takes above to 6 Level A takes and 51 Level B takes.

Killer Whale

Based on the information available as discussed above, it is conservatively estimated that 2 interactions with the average group size of residents (33) and 2 interactions with the average group size of transients (5) may be occur during the 6 days of the project. Thus we expect 76 Level B takes of killer whales.

Minke Whale

There are no known occurrences of minke whales within the project area, however since their ranges extend into the project area and they have been observed in southeast Alaska (Dahlheim *et al.,* 2009), it is possible minke whales could occur near

the project. It is estimated up to one minke whale could be exposed to elevated noise levels from the project. Therefore, 1 Level B take is proposed to be authorized.

Table 6. Proposed Authorized Level A and B Take and Percent of MMPA Stock Proposed to Be Taken

	Proposed Authorized Take		
Species	**Level B**	**Level A**	**% of Stock**
Humpback Whale[1]	144	0	1.4
Minke Whale	1	0	N/A
Killer Whale	76	0	2.9
Harbor Porpoise	51	6	5.9
Dall's Porpoise	44	4	N/A
Harbor Seal[2]	36,180	0	8.5
Steller Sea Lion (Eastern DPS)[3]	1467	0	3.5
Steller Sea Lion (Western DPS)[3]	21	0	0.04

1 – Distribution of proposed take by ESA status is 88 Level B takes for Hawaii DPS and 8 Level B take for Mexico DPS.
2 – Percent of stock taken is calculated assuming 804 unique individuals exposed, individuals are likely to be repeatedly counted as takes because of dive times of species.
3- Total estimated take of Steller sea lions was 992. Distribution between the stocks was calculated assuming 1.4% Western DPS and rounding to nearest whole number.

Effects of Specified Activities on Subsistence Uses of Marine Mammals

The availability of the affected marine mammal stocks or species for subsistence uses may be impacted by this activity. The subsistence uses that may be affected and the potential impacts of the activity on those uses are described below. The information from this section is analyzed to determine whether the necessary findings may be made in the **Unmitigable Adverse Impact Analysis and Determination** section.

Subsistence harvest of harbor seals and Steller sea lions by Alaska Natives is not prohibited by the MMPA. No records exist of subsistence harvests of whales and

porpoises in Lynn Canal (Haines, 2007). The ADF&G has regularly conducted surveys of harbor seal and Steller sea lion subsistence harvest in Alaska and the number of Steller sea lions taken for subsistence in this immediate area from 1992-2008, and 2012 is only two (Wolfe *et al*. 2013). Subsequent to the 2012 reporting year through 2017, an estimated one to three Steller sea lions have been taken annually outside Sitka Sound (personal communication with Lauren Sill, ADF&G, 83 FR 52394; October 17, 2018). Based upon data for harbor seal harvests, hunters in Southeast Alaska took from 523 to 719 harbor seals annually in the years 1992-2008. In 2012 an estimated 595 harbor seals were taken for subsistence uses (Wolfe *et al.* 2013). Seals were harvested across the year, with peak harvests in March, May, and October. Most recent reported data for the Juneau area indicates that in 2012, an estimated 26 harbor seal were harvested for food (Wolfe *et al.* 2013). From 2013 through 2019, Juneau area harbor seal hunting has continued, with several cultural heritage programs teaching students how to harvest, cut and store seal meat. However, there is no information on take numbers from 2013-2019 (personal communication with Lauren Sill, ADF&G).

Since there is very little sea lion hunting in the Juneau area, short term displacement of animals from the project area is anticipated to have no effect on abundance or availability of Steller sea lions to subsistence hunters. Further, due to the project timing, Steller sea lions are typically absent from the project area and it is possible none will be displaced. The Douglas Indian Association, Sealaska Heritage Institute, and the Central Council of the Tlingit and Haida Indian Tribes of Alaska (Central Council) were contacted during December 2019 to discuss this project. The Douglas Indian Association responded that they did not see any impacts that may affect

their subsistence use. Chuck Smythe, with the Sealaska Heritage Institute, responded indicating that there is known harbor seal hunting in the project area. The other groups have not responded.

Construction activities at the project site would be expected to cause only short term, non-lethal disturbance of marine mammals. 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. Impacts on the abundance or availability of either species to subsistence hunters in the region are thus not anticipated.

Proposed Mitigation

In order to issue an IHA under Section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to 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 uses. 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, 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.

The following mitigation measures are proposed in the IHA:

- *Schedule*: Pile driving or removal would occur during daylight hours. If poor environmental conditions restrict visibility (*e.g.*, from excessive wind or fog, high Beaufort state), pile installation would be delayed. No pile driving would occur from March 1 through May 31 to avoid peak marine mammal abundance periods and critical foraging periods;

- *Pile Driving Delay/Shut-Down*: For use of in-water heavy machinery/vessel (*e.g*., dredge), GCHS will implement a minimum shutdown zone of 10 m radius around the pile/vessel. For vessels, GCHS must cease operations and reduce vessel speed to the minimum required to maintain steerage and safe working conditions. In addition, if an animal comes within the shutdown zone (see Table 7) of a pile being driven or removed, GCHS would shut down. The shutdown zone would only be reopened

when a marine mammal has not been observed within the shutdown zone for a 30-minute period. If pile driving is stopped, pile installation would not commence if pile any marine mammals are observed anywhere within the Level A harassment zone. Pile driving activities would only be conducted during daylight hours when it is possible to visually monitor for marine mammals. If a species for which authorization has not been granted, or if a species for which authorization has been granted but the authorized takes are met, GCHS would delay or shut-down pile driving if the marine mammal approaches or is observed within the Level A and/or B harassment zones. In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by the IHA, such as serious injury or mortality, the protected species observer (PSO) on watch would immediately call for the cessation of the specified activities and immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and NMFS Alaska Regional Office;

- *Soft-start*: For all impact pile driving, a ‘‘soft start’’ technique will be used at the beginning of each pile installation day, or if pile driving has ceased for more than 30 minutes, to allow any marine mammal that may be in the immediate area to leave before hammering at full energy. The soft start requires GCHS to provide an initial set of three strikes from the impact hammer at reduced energy, followed by a 30 second waiting period, then two subsequent 3–strike sets. If any marine mammal is sighted within the Level A shutdown zone prior to pile-driving, or during the soft start, GCHS will delay pile-driving until the animal is confirmed to have moved outside and is on a path away from the Level A harassment zone or if 15 minutes have elapsed since the last sighting; and

- *Other best management practices*: GCHS will drive all piles with a vibratory hammer to the maximum extent possible (*i.e.*, until a desired depth is achieved or to refusal) prior to using an impact hammer and will use DTH drilling prior to using an impact hammer. GCHS will also use the minimum hammer energy needed to safely install the piles.

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

Table 7. Shutdown Zones for Each Activity Type and Stock

Source	Shutdown Zone – Permitted Species					Level B Harassment Zone
	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocids	Otariids	All Species
Vibratory/ Drilling	80 m (265 ft)	7 m (25 ft)	120 m (395 ft)	50 m (165 ft)	10 m (35 ft)	12.1 km (7.5 miles)
Impact Pile Driving	185 m (605 ft)	10 m (35 ft)	220 m (720 ft)	100 m (325 ft)	10 m (35 ft)	1000 m (3280 ft)

Proposed Monitoring and Reporting

In order to issue an IHA for an activity, Section 101(a)(5)(D) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species

and of the level of taking or impacts on populations of marine mammals that are expected to be present in the proposed action area. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

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

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

Visual Monitoring

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

A primary PSO would be placed at the project site where pile driving would occur. The primary purpose of this observer is to monitor and implement the Level A shutdown zones. Two additional observers would focus on monitoring large parts of the Level B harassment zone as well as visible parts of the Level A shutdown and harassment zones. The locations are shown in Figure 2 of the monitoring plan. Since not all of the Level B harassment zone will be observable by PSOs, they will calculate take for the project by extrapolating the observable area to the total size of the Level B harassment zone. PSOs would scan the waters using binoculars, and/or spotting scopes, and would use a handheld GPS or range-finder device to verify the distance to each sighting from the project site. All PSOs would be trained in marine mammal identification and behaviors and are required to have no other project-related tasks while conducting monitoring. The following measures also apply to visual monitoring:

(1) Monitoring will be conducted by qualified observers, who will be placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown/delay procedures when applicable by calling for the shutdown to the hammer operator. Qualified observers are trained biologists, with the following minimum qualifications:

(a) Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance; use of binoculars may be necessary to correctly identify the target;

(b) Advanced education in biological science or related field (undergraduate degree or higher required);

(c) Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience);

(d) Experience or training in the field identification of marine mammals, including the identification of behaviors;

(e) Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;

(f) 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

(g) Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary; and

(2) GCHS shall submit observer CVs for approval by NMFS.

A draft marine mammal monitoring report would be submitted to NMFS within 90 days after the completion of pile driving activities, or 60 days prior to a requested date of issuance of any future IHAs for projects at the same location, whichever comes first. It

will include an overall description of work completed, a narrative regarding marine mammal sightings, and associated marine mammal observation data sheets. Specifically, the report must include:

- Dates and times (begin and end) of all marine mammal monitoring;

- Construction activities occurring during each daily observation period, including how many and what type of piles were driven or removed and by what method (i.e., impact or vibratory);

- Weather parameters and water conditions during each monitoring period (e.g., wind speed, percent cover, visibility, sea state);

- The number of marine mammals observed, by species, relative to the pile location and if pile driving or removal was occurring at time of sighting;

- Age and sex class, if possible, of all marine mammals observed;

- PSO locations during marine mammal monitoring;

- Distances and bearings of each marine mammal observed to the pile being driven or removed for each sighting (if pile driving or removal was occurring at time of sighting);

- Description of any marine mammal behavior patterns during obsevation, including direction of travel and estimated time spent within the Level A and Level B harassment zones while the source was active;

- Number of individuals of each species (differentiated by month as appropriate) detected within the monitoring zone, and estimates of number of marine mammals taken, by species (a correction factor may be applied to total take numbers, as appropriate;

- Detailed information about any implementation of any mitigation triggered (e.g., shutdowns and delays), a description of specific actions that ensued, and resulting behavior of the animal, if any;

- Description of attempts to distinguish between the number of individual animals taken and the number of incidences of take, such as ability to track groups or individuals; and

- Submit all PSO datasheets and/or raw sighting data (in a separate file from the Final Report referenced immediately above).

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 event that personnel involved in the construction activities discover an injured or dead marine mammal, the IHA-holder shall report the incident to the Office of Protected Resources (OPR) (301-427-8401), NMFS and to the Alaska Regional Stranding Coordinator as soon as feasible. 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 responses (*e.g.*, intensity, duration), the context of any responses (*e.g.*, critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS's implementing regulations (54 FR 40338;

September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

To avoid repetition, the discussion of our analyses applies to all the species listed in Table 6, 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. Pile driving and drilling activities have the potential to disturb or displace marine mammals. Specifically, the project activities may result in take, in the form of Level A harassment and Level B harassment from underwater sounds generated from pile driving and DTH drilling. Potential takes could occur if individuals of these species are present in the ensonified zone when these activities are underway.

The takes from Level A and Level B harassment would be due to potential behavioral disturbance, 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 authorized for Dall's porpoise and harbor porpoise. The potential for harassment is minimized through the construction method and the implementation of the planned mitigation measures (see **Proposed Mitigation** section).

Behavioral responses of marine mammals to pile driving at the project site, if any, are expected to be mild and temporary. Marine mammals within the Level B harassment zone may not show any visual cues they are disturbed by activities (as noted during

modification to the Kodiak Ferry Dock) or could become alert, avoid the area, leave the area, or display other mild responses that are not observable such as changes in vocalization patterns. Given the short duration of noise-generating activities per day and that pile driving would occur on no more than 4 days, any harassment would be temporary. In addition, GCHS would not conduct pile driving during the spring eulachon and herring runs, when marine mammals are in greatest abundance and engaging in concentrated foraging behavior. There are no other areas or times of known biological importance for any of the affected species.

In addition, although some 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.

In summary and as described above, the following factors primarily support our preliminary 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;
- Authorized Level A harassment would be very small amounts and of low degree for two cryptic species;

- GCHS would avoid pile driving during peak periods of marine mammal abundance and foraging (*i.e.*, March 1 through May 31 eulachon and herring runs);
- GCHS would implement mitigation measures such as vibratory driving piles to the maximum extent practicable, soft-starts, and shut downs; and
- Monitoring reports from similar work in Alaska have documented little to no effect on individuals of the same species impacted by the specified activities.

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

Small Numbers

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

The amount of take NMFS proposes to authorize is less than one-third of any stock's best population estimate. These are all likely conservative estimates because we

assume all takes are of different individual animals which is likely not the case, especially for harbor seals which have the largest take. The Alaska stock of Dall's porpoise has no official NMFS abundance estimate as the most recent estimate is greater than eight years old. Nevertheless, the most recent estimate was 83,400 animals and it is highly unlikely this number has drastically declined. Therefore, the 48 authorized takes of this stock clearly represent small numbers of this stock. The Alaska stock of minke whale has no stock-wide abundance estimate. The stock ranges from the Bering and Chukchi seas south through the Gulf of Alaska. Surveys in portions of the range have estimated abundances of 2,020 on the eastern Bering Sea shelf and 1,233 from the Kenai Fjords in the Gulf of Alaska to the central Aleutian Islands. Thus there appears to be thousands of animals at least in the stock and clearly the 1 authorized takes of this stock represent small numbers of this stock.

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

Unmitigable Adverse Impact Analysis and Determination

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.

As discussed above in the subsistence uses section, subsistence harvest of harbor seals and other marine mammals is rare in the area and local subsistence users have not expressed concern about this project. All project activities will take place within the Favorite Channel area where subsistence activities do not generally occur. The project also will not have an adverse impact on the availability of marine mammals for subsistence use at locations farther away, where these construction activities are not expected to take place. Some minor, short-term harassment of the harbor seals and Steller sea lions could occur, but any effects on subsistence harvest activities in the region will be minimal, and not have an adverse impact.

Based on the effects and location of the specified activity, and the mitigation and monitoring measures, NMFS has preliminarily determined that there will not be an unmitigable adverse impact on subsistence uses from GCHS'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 Region Protected Resources Division Office, whenever we propose to authorize take for endangered or threatened species.

NMFS is proposing to authorize take of Western DPS Steller sea lion (*Eumetopias jubatus*) and Mexico DPS of humpback whales (*Megaptera novaeangliae*), which are listed under the ESA. The Permits and Conservation Division has requested initiation of Section 7 consultation with the Alaska Region for the issuance of this IHA. NMFS will conclude the ESA consultation prior to reaching a determination regarding the proposed issuance of the authorization.

Proposed Authorization

As a result of these preliminary determinations, NMFS proposes to issue an IHA to GCHS for conducting the Sentinel Island Moorage Float project near Juneau, Alaska between July 20, 2020 and July 19, 2021, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. A draft of the proposed IHA can be found at *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act*.

Request for Public Comments

We request comment on our analyses, the proposed authorization, and any other aspect of this Notice of Proposed IHA for the proposed Sentinel Island Moorage Float project. We also request at this time comment on the potential renewal of this proposed IHA as described in the paragraph below. Please include with your comments any supporting data or literature citations to help inform decisions on the request for this IHA or a subsequent Renewal IHA.

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

- A request for renewal is received no later than 60 days prior to the needed Renewal IHA effective date (recognizing that Renewal IHA expiration date cannot extend beyond one year from expiration of the initial IHA).
- The request for renewal must include the following:

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

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

- Upon review of the request for Renewal, the status of the affected species or stocks, and any other pertinent information, NMFS determines that there are no more

than minor changes in the activities, the mitigation and monitoring measures will remain the same and appropriate, and the findings in the initial IHA remain valid.

Dated: March 27, 2020.

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Donna S. Wieting,

Director, Office of Protected Resources,

National Marine Fisheries Service.

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