E 3510-22-P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648-XA569]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Berth III New Mooring Dolphins Project in Ketchikan, Alaska.

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

ACTION: Notice; proposed incidental harassment authorization.

SUMMARY: NMFS has received a request from the City of Ketchikan, Alaska (COK) for authorization to take marine mammals incidental to the Berth III New Mooring Dolphins Project in Ketchikan, AK. 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-time, 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. Written comments should be submitted via email to *ITP.Pauline@noaa.gov*.

Instructions: NMFS is not responsible for comments sent by any other method, to any other address or individual, or received after the end of the comment period. Comments, including all attachments, must not exceed a 25-megabyte file size. All comments received are a part of the public record and will generally be posted online at *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: Robert Pauline, 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.

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 IHA) with respect to potential impacts on the human environment.

This action is consistent with categories of activities identified in Categorical Exclusion B4 (IHAs with no anticipated serious injury or mortality) of the Companion Manual for 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 May 14, 2020, NMFS received a request from COK for an IHA to take marine mammals incidental to construction activities associated with the Berth III Mooring

Dolphin Project in Ketchikan, Alaska. After several revisions, the application was deemed adequate and complete on September 22, 2021. COK's request is for take of nine species of marine mammals by Level B harassment, including Level A harassment of three of these species. Neither COK nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

Description of Proposed Activity

Overview

COK is proposing improvements to Berth III, in order to accommodate a new fleet of large cruise ships (*i.e.* Bliss class) and to meet the needs of the growing cruise ship industry and its vessels in Southeast Alaska. Expansion activities would include vibratory pile removal, vibratory pile driving, impact pile driving and down-the-hole (DTH) pile installation. Underwater sound generated by these in-water activities may result in harassment including Level B harassment and Level A harassment of marine mammal species. In-water work is proposed to occur on approximately 120 days between October 1, 2021 and March 13, 2022 although the IHA would be effective until September 30, 2022.

While Bliss class vessels started calling to Ketchikan during the 2018 cruise ship season and were able to moor at Berth III, operational wind speed restrictions were established to safely moor the vessel to prevent damage to Berth III structures. To safely moor a Bliss class vessel, additional tie up locations are needed to the north and south ends of the berth. Without the proposed improvements, vessels may be unable to safely moor at Berth III.

Dates and Duration

Construction is expected to take place over a 200-day period between October 1, 2021 and May 1, 2022. Actual in-water work is estimated to take a total of 4 months, 120 days or 17 weeks and is expected to be completed by March 13, 2022. In case of

unanticipated delays, the effective dates of the proposed IHA are from October 1, 2021, to September 30, 2022. The daily duration of construction activities will vary based on the daylight hours available. In winter months, shorter 7-hour to 10-hour workdays in available daylight are anticipated and in the early fall and early spring longer daylight workdays of up to 14-hour days are anticipated. While COK may work these hours, not all activity in a workday will generate in-water noise. Work may not begin without sufficient daylight to conduct pre-activity monitoring, and may extend into twilight hours as needed to embed the pile far enough to safely leave piles in place until installation can resume. This is because, during the winter, the shortest days are approximately 7 hours of daylight; however, a portion of the daylight hours consists of civil twilight and it can get darker earlier due to the tall mountains surrounding Ketchikan and the frequent cloudy conditions.

Specific Geographic Region

COK is located in Southeast Alaska on the western coast of Revillagigedo Island, near the southernmost boundary of Alaska. Ketchikan encompasses an area of approximately 3 square miles of land and 1 square mile of water. The site is located on the east side of Tongass Narrows, a marine channel in-between Revillagigedo and Gravina Islands that consists of a long narrow water body approximately 11 miles (17.7 kilometers) in length (See Figure 1). The berth is part of the Port of Ketchikan, an active marine commercial and industrial area.

At the project site where piles will be driven, water depths range between approximately 60 feet (18.3 meters) to 160 feet (48.8 meters) (PND 2006). Tidal currents generally range from 0.3 to 1.6 miles per hour during flood and ebb tides (PND 2006). The tide range in Ketchikan is significant, with highest observed tides of 21.4 feet (6.5 meters) and lowest observed tides of -5.2 feet (-6.5 meters) based on a mean lower low water (MLLW) elevation of 0.0. Water depths in the area of Tongass Narrows that will

be ensonified are generally 160 feet or shallower, but get deeper past the southern end of Pennock Island reaching depths up to 625 feet.

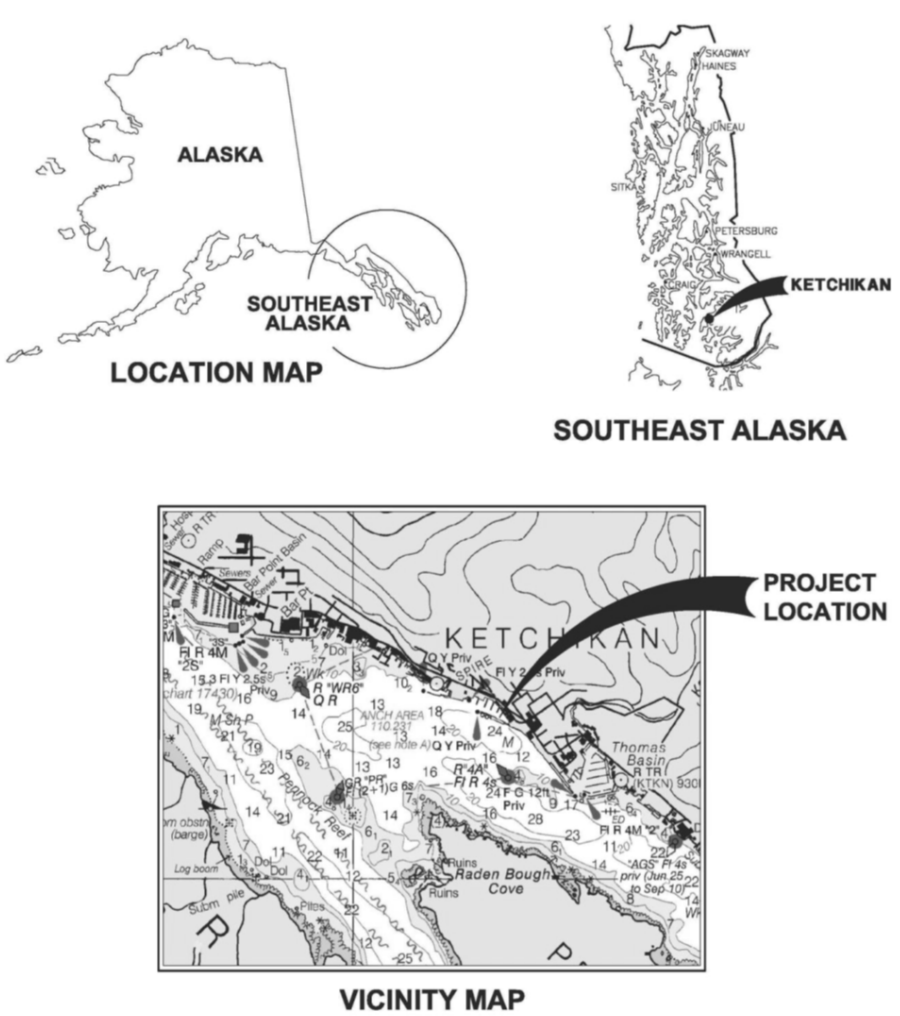

Figure 1. Berth III Project Area

Detailed Description of Specific Activity

The proposed project would install three new mooring dolphins (MD) with one at the north end of Berth III (MD#2) and two at the south end (MD#3 & MD#4) as shown in Figure 2 in COK's IHA application (available online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities*). A total of 20 piles will be installed. Eight of the piles are temporary template piles and would be removed as shown in Table 1. Pile driving will be conducted from an anchored barge, utilizing vibratory and impact hammers to install and remove piles and DTH pile installation to position rock sockets and tension anchors. Rock socketing is a process where a pile is driven by conventional vibratory and impact hammers until reaching solid bedrock. If at that point the pile cannot support the needed load, a hole can be drilled into the rock with a DTH system to allow the pile to be anchored up to 10 or more feet into the solid rock. Tension anchoring involves creating an anchor hole that is smaller in diameter than the pile. The holes extend 10 to 20 feet or more below the bottom of the pile. A steel bar or other anchoring structure (*e.g.*, rebar frame) is then grouted or cemented in place from the bottom of the anchor hole and extending up to the top of the pile. Attaching the anchor bar or frame to the pile then helps anchor the pile in place to support the required project loads.

Table 1—Project Pile Types and Quantities

Location	Item	Size and Type	Qty
MD#2	Dolphin and Fender Piles	48-inch (1.22 m) steel pipe piles	6
	Temporary Template Piles	30-inch (0.76 m) steel pipe piles	8
MD#3	Dolphin Piles	36-inch (0.9 m) steel pipe piles	3
MD#4	Dolphin Piles	36-inch (0.9 m) steel pipe piles	3

MD#2 will require six 48-inch diameter steel pipe piles up to 180 feet in length each. MD#3 and MD#4 will each require three 36-inch diameter steel pipe piles up to 180 feet in length each. These piles will be installed in water depths up to 110 feet deep and will be driven through approximately 10 feet of loose overburden substrate.

Due to the nature of deep-water pile installation in loose sediment, a variety of means and methods are required to install a single pile. Each pile will be installed using a combination of installation methods: vibratory hammer, impact hammer, and DTH pile installation. COK may alternate between installation methods depending on the conditions encountered. Only one installation method will occur at a time. COK may also be required to splice on additional lengths of pile (*i.e.* weld piles together to make them longer) with up to three splices expected per pile. Piles will be initially driven with a vibratory hammer from a barge-based crane. Following vibratory driving, an impact hammer will be used to seat the piles firmly into bedrock.

COK will initially vibratory drive all permanent piles to first refusal which occurs when they are unable to advance the pile tip any further with a vibratory hammer. This will likely occur at bedrock elevation. COK will seat (or secure) tip of pile into bedrock with an impact hammer usually to a depth of 1 to 2 feet info fractured bedrock. Once the pile has been seated (or secured) into bedrock with the impact hammer, DTH equipment will be employed to create hammered rock sockets. Due to limited overburden, all piles will require hammered rock sockets using DTH equipment**.** Sockets up to 20 feet deep will be hammered through the pile shaft to the width of the associated pile. COK will then socket hammer the pile up to 20 feet into bedrock. The pile will be drawn into the hammered socket through the hammering action. Finally, on 4 of the 6 piles, a smaller 12-inch diameter DTH device will be used to drill a rock anchor hole into bedrock 60-feet past the pile tip. A 14-inch casing will be inserted into the pile and a 12-inch hole will be hammered up to 60 feet in depth from the base of the rock socket. The 12-inch

hole for the rock anchor is hammered beneath the pile tip from within the hollow pipe pile. Three anchor rods will be inserted inside the casing; extending all the way from the top of pile to the tip of the hammered 12-inch hole. The hammered 12-inch hole and casing will be filled with grout after component installation.

Temporary template piles will be required for installation of the permanent piles at MD#2 and will be removed after permanent dolphin piles have been installed. Template piles are not necessary at the MD#3 and MD#4 because the dock structure can be used in lieu of temporary template piles. Temporary template piles will include up to eight 30-inch (0.76 m) diameter piles or smaller. Once installed, each temporary template pile will measure around 150-feet (46 m) in length and will consist of up to two sections that will be spliced together as they are installed. Installation methods for the temporary template piles will be similar to those applied for installation of permanent dolphin piles. COK will initially vibratory drive all temporary piles to first refusal. COK will then seat the tip of pile into bedrock with an impact hammer advancing the tip 1 to 2 feet into fractured bedrock. Once a pile has been seated into bedrock with an impact hammer, COK may elect to socket hammer the pile up to 10 feet into bedrock. COK will use the vibratory hammer to remove the temporary template piles at the MD#2 after the permanent piles have been installed.

Installation of permanent piles at both MD#3 and MD#4 is identical to that described for installation of permanent piles MD#2. Although additional construction actions will be required, the final installation of piles at MD#3 and MD#4 represents the end of all in-water construction activities.

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 2 lists all species or stocks for which take is expected and proposed to be authorized for this action, and summarizes information related to the population or stock, including regulatory status under the MMPA and Endangered Species Act (ESA) and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2020). 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 (Muto *et al.* 2020). All values presented in Table 2 are the most recent available at the time of publication and are available in the 2019 SARs (Muto *et al.*, 2020).

Table 2 —Marine Mammals that Could Occur in the Proposed Project Area

Common name	Scientific name	MMPA Stock	ESA/MMPA status; Strategic (Y/N)[1]	Stock abundance Nbest, (CV, N_{min}, most recent abundance survey)[2]	PBR	Annual M/SI[3]
Order Cetartiodactyla – Cetacea – Superfamily Mysticeti (baleen whales)						
Family Eschrichtiidae						
Gray Whale	*Eschrichtius robustus*	Eastern North Pacific	-, -, N	26,960 (0.05, 25,849, 2016)	801	139
Family Balaenidae						
Humpback whale	*Megaptera novaeangliae*	Central North Pacific	-, -,Y	10,103 (0.3; 7,891; 2006)	83	25
Minke whale	*Balaenoptera acutorostrata*	Alaska	-, -, N	N.A.	N.A.	0
Order Cetartiodactyla – Cetacea – Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						
Killer whale	*Orcinus orca*	Alaska Resident	-, -, N	2,347 (N.A.; 2,347; 2012)	24	1
		West Coast Transient	-, -, N	243 (N.A, 243, 2009)	2.4	0
		Northern Resident	-, -, N	302 (N.A.; 302, 2018)	2.2	0.2
		Gulf of Alaska, Aleutian Islands, and Bering Sea Transient	-, -, N	587 (N.A.;587; 2012	5.87	1
Pacific white-sided dolphin	*Lagenorhynchus obliquidens*	North Pacific	-, -, N	26,880 (N.A.; N.A.; 1990)	N.A.	0
Family Phocoenidae						

Harbor porpoise	*Phocoena phocoena*	Southeast Alaska	-, -, Y	1,354 (0.10; 896; 2012)	8.95	34
Dall's porpoise	*Phocoenoides dalli*	Alaska	-, -, N	83,400 (0.097; N.A.; 1991	N.A.	38
Order Carnivora – Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions)						
Steller sea lion	*Eumetopias jubatus*	Eastern U.S.	-, -, N	43,201 (N.A.; 43,201; 2017)	2,592	112
Family Phocidae (earless seals)						
Harbor seal	*Phoca vitulina richardii*	Clarence Strait	-, -, N	27,659 (N.A.; 24,854; 2015)	746	40

[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 (N.A.).
[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.

As indicated above, all nine species (with 12 managed stocks) in Table 2 temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur, and we have proposed authorizing it.

Gray Whale

Gray whales are distributed throughout the North Pacific Ocean and are found primarily in shallow coastal waters (NMFS 2020f; Muto *et al.* 2020). Gray whales in the Eastern North Pacific stock range from the southern Gulf of California, Mexico to the arctic waters of the Bering and Chukchi Seas. Gray whales are generally solitary creatures and travel together alone or in small groups (NMFS 2020f).

Gray whales are rare in the action area and unlikely to occur in Tongass Narrows. They were not observed during the Dahlheim *et al.* (2009) surveys of Alaska's inland

waters with surveys conducted in the spring, summer and fall months. No gray whales were reported during the COK Rock Pinnacle Blasting Project (Sitkiewicz 2020). However a gray whale could migrate through or near the Dixon Entrance during November, and possibly travel up the Nichols Channel into the action area as it extends into the Revillagigedo Channel.

Humpback whale

The humpback whale is distributed worldwide in all ocean basins. Relatively high densities of humpback whales are found in feeding grounds in Southeast Alaska and northern British Columbia, particularly during summer months. Based on extensive photo identification data,

Humpbacks migrate to Alaska to feed after months of fasting in low latitude breeding grounds. The timing of migration varies among individuals: most humpbacks begin returning to Alaska in spring and most depart Alaska for southern breeding grounds in fall or winter. Peak numbers of humpbacks in Southeast Alaska occur during late summer to early fall, but because there is significant overlap between departing and returning whales, humpbacks can be found in Alaska feeding grounds in every month of the year (Baker *et al.* 1985, Straley 1990, Witteveen and Wynne 2009). There is also an apparent increase in the number of humpbacks overwintering in feeding grounds in Alaska, including reports in Ketchikan during some years in the winter (Straley *et al.* 2017, Liddle 2015, 84 FR 36891; July 30, 2019).

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 southeast 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 listed 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). Humpback whales occur frequently in Tongass Narrows and the adjacent Clarence Strait during summer and fall months to feed. Data on the distribution suggests that both the Mexico and Hawaii Distinct Population Segments (DPS) of humpback whales may be present in the Tongass Narrows area. The Alaska Department of Fish and Game reports that humpback whales occur in Clarence Strait year-round, with numbers peaking in May and June and falling off from July to September (ADF&G 2020). Local anecdotal reports indicate that humpback whales are becoming more common and abundant in Tongass Narrows during

August and September, which is consistent with research in Southeast Alaska.

The COK Rock Pinnacle project reported one humpback whale sighting of one individual during the project (December 2019 through January 2020). The sighting was 55 minutes post-blast and not recorded as a take (Sitkiewicz 2020).

Southeast Alaska is considered a biologically important area (BIA) for feeding humpback whales between March and May (Ferguson *et al.*, 2015). Most humpback whales migrate to other regions during the winter to breed, but rare events of over-wintering humpbacks have been noted (Straley 1990). It is thought that those humpbacks that remain in Southeast Alaska do so in response to the availability of winter schools of fish prey (Straley 1990).Critical habitat was proposed for designation on October 9, 2019 by NMFS (84 FR 54354). A final determination was not issued at the time of this writing. Proposed Critical Habitat Unit 10 Southeast Alaska encompasses the action area; however, the Department of Defense petitioned for an exclusion of a portion of the Unit 10 due to national security reasons. As a result, the boundary of Unit 10 was redefined to exclude Tongass Narrows and vicinity from the proposed critical habitat designation, including the proposed action area.

Minke whale

Minke whales are widely distributed throughout the northern hemisphere and are found in both the Pacific and Atlantic oceans. Minke whales in Alaska are considered migratory. During summer months are typically found in the Arctic and during winter months found near the equator (NMFS 2020e). There are no known occurrences of minke whales within the action area. Since their ranges extend into the project area and they have been observed in southeast Alaska, including in Clarence Strait (Dahlheim *et al.* 2009), it is possible the species could occur near the project area. During the surveys by Dalheim *et al.* (2009), all but one encounter was with a single whale and, although infrequent, minke whales were observed during all seasons surveyed (spring, summer and fall). No minke whales where reported during the COK Rock Pinnacle Blasting Project (Sitkiewicz 2020).

Killer whale

No systematic studies of killer whales have been conducted in or around Tongass Narrows. Killer whales have been observed in Tongass Narrows year-round and are most common during the summer Chinook salmon run (May-July). During the Chinook salmon run, Ketchikan residents have reported pods of 20-30 whales and during the 2016/2017 winter a pod of 5 whales was observed in Tongass Narrows (84 FR 36891; July 30, 2019). Typical pod sizes observed within the project vicinity range from 1 to 10 animals and the frequency of killer whales passing through the action area is estimated to be once per month (Frietag 2017)

Killer whales occurring near Ketchikan could belong to one of four different stocks: Eastern North Pacific Alaska resident stock (Alaska residents); Eastern North Pacific Northern resident stock (Northern residents); Gulf of Alaska, Aleutian Islands, and Bering Sea transient stock (Gulf of Alaska transients); or West Coast transient stock (Muto *et al.,* 2020). The Northern resident stock is a transboundary stock, and includes

killer whales that frequent British Columbia, Canada, and southeastern Alaska (Muto *et al.,* 2018).

In recent years, a small number of the Gulf of Alaska transients (identified by genetics and association) have been seen in southeastern Alaska; previously only West Coast transients had been seen in southeastern Alaska (Muto *et al.,* 2020). Therefore, the Gulf of Alaska transient stock occupies a range that includes southeastern Alaska. The West Coast transient stock includes animals that occur in California, Oregon, Washington, British Columbia and southeastern (Muto *et al.,* 2020).

Despite being rare in occurrence during the proposed time of construction (pods expected to absent more often than present), it must be acknowledged that killer whales often travel in pods and would occur as such if they were to occur at all in the project area. While killer whales can be common, they are not known to linger in Tongass Narrows or other similar environments. During the COK's monitoring for the Rock Pinnacle Removal project in December 2019 and January 2020, no killer whales were observed.

Pacific white-sided dolphin

There are three stocks of the Pacific white-sided dolphin in U.S. waters. Only the North Pacific stock is found within the action area. The Pacific white-sided dolphin is distributed throughout the temperate north Pacific Ocean, north of Baja California to Alaska's southern coastline and Aleutian Islands. The North Pacific Stock ranges from Canada into Alaska (Muto *et al.* 2019).

Dalheim *et al.* (2009) frequently encountered Pacific white-sided dolphin in Clarence Strait with significant differences in mean group size and rare enough encounters to limit the seasonality investigation to a qualitative note that spring featured the highest number of animals observed. These observations were noted most typically in open strait environments, near the open ocean. Mean group size was over 20, with no

recorded winter observations nor observations made in the Nichols Passage or Behm Canal, located on either side of the Tongass Narrows. Though generally preferring more pelagic, open-water environments, Pacific white-sided dolphin could be present within the action area during the construction period.

There were no sightings of Pacific white-sided dolphins during the COK Rock Pinnacle Blasting Project during monitoring surveys conducted in December 2019 and January 2020 (Sitkiewicz 2020).

Harbor Porpoise

In the eastern North Pacific Ocean, the harbor porpoise ranges from Point Barrow, along the Alaska coast, and down the west coast of North America to Point Conception, California. The Southeast Alaska stock ranges from Cape Suckling to the Canadian border (Muto *et al.* 2019). Harbor porpoises frequent primarily coastal waters in Southeast Alaska (Dahlheim *et al.* 2009) and occur most frequently in waters less than 100 meters (328 feet) deep (Dahlheim *et al.* 2015). The mean group size of harbor porpoise in Southeast Alaska is estimated at two individuals (Dahlheim *et al.,* 2009). They tend to avoid areas with elevated levels of vessel activity and noise such as Tongass Narrows.

Studies of harbor porpoises reported no evidence of seasonal changes in distribution for the inland waters of Southeast Alaska (Dahlheim *et al.* 2009). Ketchikan area densities are expected to be low. While less common within the Tongass Narrows than nearby areas, harbor porpoise could potentially pass through the area and/or occupy the Revillagigedo Channel year-round. Note that their small overall size, lack of a visible blow, low dorsal fins and overall low profile, and short surfacing time make them difficult to spot (Dahlheim *et al.* 2015).

Marine mammal monitoring associated with the COK Rock Pinnacle Removal project did not observe any harbor porpoise during surveys conducted in December 2019 and January 2020 (Sitkiewicz 2020).

Dall's Porpoise

Dall's porpoises are found throughout the North Pacific, from southern Japan to southern California north to the Bering Sea. All Dall's porpoises in Alaska are members of the Alaska stock. This species can be found in offshore, inshore, and nearshore habitat.

Jefferson *et al.* (2019) presents historical survey data showing few sightings in the Ketchikan area. The mean group size of Dall's porpoise in Southeast Alaska is estimated at approximately three individuals (Dahlheim *et al.,* 2009; Jefferson *et al.,* 2019). However, in the Ketchikan vicinity, Dall's porpoises are reported to typically occur in groups of 10-15 animals, with an estimated maximum group size of 20 animals (Freitag 2017). Jefferson *et al.* (2019) presents historical survey data showing few sightings in the Ketchikan area, and based on these occurrence patterns, concludes that Dall's porpoise rarely come into narrow waterways, like Tongass Narrows. Anecdotal reports suggest that Dall's porpoises are found northwest of Ketchikan near the Guard Islands, where waters are deeper, as well as in deeper waters to the southeast of Tongass Narrows. Overall, sightings of Dall's porpoise are infrequent near Ketchikan, but they could be present on any given day during the construction period.

Harbor Seal

Harbor seals inhabit coastal and estuarine waters off Alaska. They haul out on rocks, reefs, beaches, and drifting glacial ice. 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 Clarence Strait stock. Distribution of the Clarence Strait stock ranges from the east coast of Prince of Wales

Island from Cape Chacon north through Clarence Strait to Point Baker and along the east coast of Mitkof and Kupreanof Islands north to Bay Point, including Ernest Sound, Behm Canal, and Pearse Canal (Muto *et al.* 2020). The latest stock assessment analysis indicates that the current 8-year estimate of the Clarence Strait population trend is +138 seals per year, with a probability that the stock is decreasing of 0.413 (Muto *et al.,* 2020). In the project area, they tend to be more abundant during spring, summer and fall months when salmon are present in Ward Creek. Anecdotal evidence indicates that harbor seals typically occur in groups of 1-3 animals in Ward Cove (Spokely 2019). They were not observed in Tongass Narrows during a combined 63.5 hours of marine mammal monitoring that took place in 2001 and 2016 (OSSA 2001, Turnagain 2016). The COK conducted pinnacle rock blasting in December 2019 and January 2020 near the vicinity of the proposed project and recorded a total of 21 harbor seal sightings of 24 individuals over 76.2 hours of pre- and post-blast monitoring (Sitkiewicz 2020). There are no known harbor seal haulouts within the project area. According to the list of harbor seal haulout locations, the closest listed haulouts are located off the tip of Gravina Island, approximately 8 kilometers (5 miles) northwest of Ward Cove (AFSC 2018).

Steller sea lion

The Steller sea lion is the largest of the eared seals, ranging along the North Pacific Rim from northern Japan to California, with centers of abundance and distribution in the Gulf of Alaska and Aleutian Islands. They are common throughout the inside waters of southeast Alaska and reside in areas nearby Tongass Narrows, but are not commonly observed in Tongass Narrows outside of the Chinook salmon run.

There are several mapped and regularly monitored long-term Steller sea lion haulouts surrounding Ketchikan, such as Grindall island (approximately 20 miles (58 km) from Ketchikan), West Rocks (36 miles/58 km), or Nose Point (37 miles/60 km), but none within Tongass Narrows (Fritz *et al.,* 2015). Sea lions are rarely observed in the

Tongass narrows during the winter. Fritz *et al.* (2015) reported adult counts at Grindall Island, located approximately 20 miles (32 km) away from the project area, averaged about 190 between 2002 and 2015. No pups were recorded during this timeframe. West Rock averaged over 650 adults with 0 to 3 pups observed over the same timeframe. These long-term and seasonal haulouts are important habitat for Steller sea lions, but all are outside of the action area. However, due to the proximity of the Grindall Island haulout and the possibility of Steller sea lion movement around this haulout, they are potentially present year-round within the action area.

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 based on 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 3.

Table 3 — 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. Nine mammal species (seven cetacean and two pinniped (one otariid and one phocid) species) have the reasonable potential to co-occur with the proposed survey activities. Please refer to Table 2. Of the cetacean species that may be present, three are classified as low-frequency cetaceans (*i.e.*, all mysticete species), two are classified as mid-frequency cetaceans (*i.e.*, all delphinid and ziphiid species and the sperm whale), and two are classified as high-frequency cetaceans (*i.e.*, porpoise and Kogia *spp*.).

Potential Effects of Specified Activities on Marine Mammals and their Habitat

This section includes a summary and discussion of the ways that components of the specified activity may impact marine mammals and their habitat. The **Estimated Take** 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. 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 vibratory pile driving and pile removal, impact pile driving, and DTH pile installation. 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 one 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*. aircraft, 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).

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). A DTH hammer is used to place hollow steel piles or casings by drilling. A DTH hammer 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 below the pile. The sounds produced by DTH hammers were previously thought to be continuous. However, recent sound source verification (SSV) monitoring has shown that DTH hammer can create sound that can be considered impulsive (Denes *et al.* 2019). Since sound from DTH activities has both impulsive and continuous components, NMFS characterizes sound from DTH pile installation as being impulsive when evaluating potential Level A harassment (*i.e.* injury) impacts and as being non-impulsive when assessing potential Level B harassment (*i.e.* behavior) effects.

The likely or possible impacts of COK'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 removal.

Acoustic Impacts

The introduction of anthropogenic noise into the aquatic environment from pile driving and removal is the primary means by which marine mammals may be harassed from COK'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). In general, exposure to pile driving and removal 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 removal

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.,* 2004; 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 an 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 *et al.,* 2008). PTS levels for marine mammals are estimates, as 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 (2015), marine mammal studies have shown the amount of TTS increases with cumulative sound exposure level (SELcum) in an accelerating fashion: At low exposures with lower SELcum, the amount of TTS is typically small and the growth curves have shallow slopes. At exposures with higher SELcum, the growth curves become steeper and approach linear relationships with the noise sound exposure level (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). 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).

Behavioral Harassment—Exposure to noise from pile driving and removal 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-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 DTH 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 that many of the same species are involved, we expect similar behavioral responses of marine mammals to COK'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; see *https://www.fisheries.noaa.gov/action/incidental-take-authorization-faa-biorka-island-dock-replacement-project-sitka-ak*).

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 Ketchikan area contains active commercial shipping, cruise ship and ferry operations, as well as numerous recreational and other 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, pile removal and DTH pile installation 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 exceeding the acoustic thresholds. 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 by Level B harassment because of exposure to underwater sound above the behavioral harassment thresholds, which are, in all cases, larger than those associated with airborne sound. 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

COK's construction activities could have localized, temporary impacts on marine mammal habitat by increasing in-water sound pressure levels and slightly decreasing water quality. Construction activities are of short duration and would likely have temporary impacts on marine mammal habitat through increases in underwater sound. 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 pile driving, elevated levels of underwater noise would ensonify the area where both fish and mammals may occur and could affect foraging success. Additionally, marine mammals may avoid the area during construction, however, displacement due to noise is expected to be temporary and is not expected to result in long-term effects to the individuals or populations.

In-water pile driving, pile removal, and DTH pile installation 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. COK would employ other standard construction best management practices, 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 (*e.g.,* most of the impacted area is limited to Tongass Narrows) and does not contain habitat of known importance, other than being designated as a feeding BIA for humpback whales during the spring. However, the entirety of southeast Alaska is considered a feeding BIA for humpback whales of which Tongass Narrows represents only a small segment. Additionally, the project area is highly influenced by anthropogenic activities.

Pile installation/removal and drilling may temporarily increase turbidity resulting from suspended sediments. Any increases would be temporary, localized, and minimal. COK must comply with state water quality standards during these operations by using silt curtains and removing all sediments captured as drill cutting discharge to upland disposal sites. In general, turbidity associated with pile installation is localized to about a 25-foot (7.6 m) radius around the pile (Everitt *et al.,* 1980). 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 and removal 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-Water Construction Effects on Potential Prey (Fish)

Construction activities would produce continuous (*i.e.,* vibratory pile driving and DTH pile installation) and pulsed (*i.e.* impact driving, DTH pile installation) 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. There are times of known seasonal marine mammal foraging in Tongass Narrows around fish processing/hatchery infrastructure or when fish are congregating, but the impacted areas of Tongass Narrows are a small portion of the total foraging habitat available in the region. In general, impacts to marine mammal prey species are expected to be minor and temporary due to the short timeframe of the project and the small project footprint.

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 both herring 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 25 feet (7.6 m) 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 Tongass Narrows region are routinely exposed to substantial levels of suspended sediment from glacial sources.

In summary, given the temporary nature of the construction project and relatively small areas being affected, pile driving and removal 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 sources (*i.e.*, vibratory or impact pile driving or DTH pile installation) has the potential to result in disruption of behavioral patterns for individual marine mammals. There is also some potential for auditory injury (Level A harassment) to result, primarily for high frequency cetacean species and phocid pinnipeds. Auditory injury is unlikely to occur in low-frequency and mid-frequency cetacean species and otariid pinnipeds. 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

NMFS recommends the use of acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur 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 (*e.g.,* hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et al.,* 2007, Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 dB re 1 μPa (rms) for continuous (*e.g.,* vibratory pile-driving, drilling) and above 160 dB re 1 μPa (rms) for non-explosive impulsive (*e.g.*, seismic airguns) or intermittent (*e.g.*, scientific sonar) sources.

COK's proposed activity includes the use of continuous (vibratory pile driving, DTH pile installation) and impulsive (impact pile driving), sources, and therefore the 120 and 160 dB re 1 μPa (rms) criteria 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). COK's proposed activity includes the use of impulsive (impact pile driving, DTH pile installation) and non-impulsive (vibratory pile driving/removal, DTH pile installation) sources.

These thresholds are provided in Table 4. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2018 Technical Guidance, which may be accessed at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance*.

Table 4 — Thresholds Identifying the Onset of Permanent Threshold Shift

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

* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.
Note: Peak sound pressure (L_{pk}) has a reference value of 1 μPa, and cumulative sound exposure level (L_E) has a reference value of 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.

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

Vibratory hammers produce constant sound when operating, and produce vibrations that liquefy the sediment surrounding the pile, allowing it to penetrate to the required seating depth. An impact hammer would then generally be used to place the pile at its intended depth through rock or harder substrates. An impact hammer is a steel device that works like a piston, producing a series of independent strikes to drive the pile. Impact hammering typically generates the loudest noise associated with pile installation. The actual durations of each installation method vary depending on the type of pile, size of the pile, and substrate characteristics (e.g. bedrock)

In order to calculate distances to the Level A harassment and Level B harassment sound thresholds for piles of various sizes being used in this project, NMFS used acoustic

monitoring data from other locations to inform selection of representative source levels (see Table 5).

Sound source levels for vibratory installation of 30-inch steel piles were obtained by Denes *et al.* (2016) during the installation of 30-inch steel pipe piles at the Ketchikan Ferry Terminal. Vibratory removal of 30-inch piles is expected to be quieter than installation, so this value is used as a proxy. Sound levels for vibratory installation of 48-inch steel piles were obtained by Austin *et al.* (2016) during the installation of test piles at the Port of Anchorage. The applicant elected to conservatively employ sound source levels for the 48-inch piles as a proxy to calculate harassment isopleths for 36-inch piles.

Sound levels for impact installation of 30-inch steel piles were taken from Denes *et al.* (2016) during the installation of piles at the Ketchikan Ferry Terminal. Sound levels for impact installation of 48-inch steel piles were obtained by Austin *et al.* (2016) during the installation of test piles at the Port of Anchorage. Overall median levels were not reported for peak and single strike SEL values. Therefore, the highest values reported for peak and single strike SEL were used. The highest levels reported were a peak of 213.2 dB re: 1 μPa at 14 m and a single strike SEL of 186.7 dB re: 1 μPa2–sec on pile IP5 at 11 m (Austin *et al.* 2016). Sound source levels for 48-inch piles are used as a proxy to calculate harassment isopleths for 36-inch piles.

DTH pile installation includes drilling (non-impulsive sound) and hammering (impulsive sound) to penetrate rocky substrates (Denes *et al.* 2016; Denes *et al.* 2019; Reyff and Heyvaert 2019). DTH pile installation was initially thought be a primarily non-impulsive noise source. However, Denes *et al.*(2019) concluded from their study in Virginia that DTH should be characterized as impulsive based on a >3 dB difference in sound pressure level in a 0.035-second window (Southall *et al.* 2007) compared to a 1-second window. Therefore, DTH pile installation is treated as both an impulsive and non-impulsive noise source. In order to evaluate Level A harassment, DTH pile installation

activities are evaluated according to the impulsive criteria and the User Spreadsheet may be employed. Level B harassment isopleths are determined by applying non-impulsive criteria and using the 120 dB threshold which is also used for vibratory driving. This approach ensures that the largest ranges to effect for both Level A and Level B harassment are accounted for in the take estimation process.

The source level employed to derive Level B harassment isopleths for DTH pile installation (both socketing and anchoring) of all pile sizes was derived from the Denes *et al.* (2016) study at Kodiak, Alaska. The reported median source value for drilling was determined to be 166.2 dB RMS.

For DTH anchoring of 12-inch holes, COK used a sound source level from Guan and Miner (2020) of 146 dB SEL for Level A harassment calculations. For DTH installation of 30 and 36-inch sockets, source levels from Reyff & Heyvaert (2019), Reyff (2020), and Denes *et al.* (2019) were employed.

Table 5 — Estimates of Mean Underwater Sound Levels Generated During Vibratory Pile Removal, Vibratory Pile Installation, Impact Pile Installation, and DTH Pile Installation

Method and Pile Type	Sound Source Level at 10 meters			Literature Source
	SPL rms	SPL_{PK}	SS_{SEL}	
Vibratory Hammer				
30-inch steel piles	161.9	--	--	Denes *et al.* 2016,
36-and 48-inch steel piles	168.2	--	--	Austin *et al.* 2016
Impact Hammer				
30-inch diameters	195	208.5	180.7	Austin *et al.* 2016
36- and 48-inch	198.6	213.2[1]	186.7[2]	Austin *et al.* 2016
DTH Pile Installation				
DTH Sockets (48-inch)	166.2	--	168	Extrapolated from DTH SSV studies listed below; Denes *et al.* (2016)
DTH Sockets (30-, 36-inch)	166.2	194	164	Reyff & Heyvaert (2019); Reyff (2020); Denes *et al.* (2019); Denes *et al.* (2016)

DTH Anchors (12-inch)	166.2	172	146	Guan and Miner (2020); Denes *et al.* (2016)

[1]Represents maximum value measured at 14 m
[2]Represents maximum value measured at 11 m
SS SEL = single strike sound exposure level; dB peak = peak sound level; rms = root mean square

Level A harassment Zones

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 impact driving, vibratory driving and DTH pile installation example from 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 (Table 6) and the resulting isopleths are reported below (Table 7). Level A harassment thresholds for impulsive sound sources (impact pile driving, DTH pile installation) are defined for both SELcum and Peak SPL, with the threshold that results in the largest modeled isopleth for each marine mammal hearing group used to establish the effective Level A harassment isopleth. Note that the peak SPL for DTH installation of 48-in piles is unknown as no sound source verification testing has been conducted on piles of that size. The single strike SEL was extrapolated

using data points measured for smaller piles during DTH installation. In this project, Level A harassment isopleths based on SELcum were always larger than those based on Peak SPL.

Table 6 — Parameters of Pile Driving and Drilling Activity used in User Spreadsheet

Equipment Type	Vibratory Pile Driver (Installation/ Removal of 30-in steel piles)	Vibratory Pile Driver (Installation of 36 and 48-in steel piles)	Impact Pile Driver (30-in steel piles)	Impact Pile Driver (36 and 48-in steel piles)	DTH Sockets		DTH Anchor (12-in steel piles)
					30-, 36-in	48-in	
Spreadsheet Tab Used	Non-impulsive, continuous	Non-impulsive, continuous	Impulsive, Non-continuous	Impulsive, Non-continuous	Impulsive, Non-continuous		Impulsive, Non-continuous
Source Level	161.9 RMS	168.2 RMS	180.7 SS SEL	186.7 SS SEL	164 SS SEL/ 194 SPL pk	168 SS SEL	146 SS SEL/172 SPLpk
Weighting Factor Adjustment (kHz)	2.5	2.5	2	2	2		2
(a)Activity duration (time) within 24 hours (b) Number of strikes per pile (impact) (c) Number of piles per day	(a) Up to 6 hrs OR >6-8 hrs (c) 1	(a) Up to 6 hrs OR >6-8 hrs (c) 1	(a) 1-10 minutes (b) Up to 500 strikes (c) 1 (a) 11-20 minutes (b) 501-1,000 strikes (c) 1 (a) 21-30 minutes (b) 1,001-1,500 strikes (c) 1	(a) 1-10 minutes (b) Up to 500 strikes (c) 1 (a) 11-20 minutes (b) 501-1,000 strikes (c) 1 (a) 21-30 minutes (b) 1,001-1,500 strikes (c) 1	(a) Up to 3 hrs OR >3-6 hrs (c) 1	(a) Up to 2 hrs OR >2-3 hrs OR >3-4 hrs (c) 1	(a) Up to 6 hrs OR >6-8 hrs (c) 1
Propagation (xLogR)	15	15	15	15	15		15
Distance of source level measurement (meters)	10	10	10	10	10		10

Table 7 — Calculated Distances to Level A Harassment Isopleths (m) During Vibratory Pile Installation/Removal, Impact Installation and DTH Pile Installation for each Hearing Group

Source	Daily Duration	PTS Onset Isopleth (m)	
		Cetaceans	Pinnipeds

		Low-Frequency	Mid-Frequency	High-Frequency	Phocid	Otariid
30-inch Vibratory (Installation or Removal)	Up to 6 hours	25.9	2.3	38.3	15.7	1.1
	7 to 8 hours	31.4	2.8	46.4	19.1	1.3
36- and 48-inch Vibratory	Up to 6 hours	68.1	6	100.7	41.4	2.9
	7 to 8 hours	82.5	7.3	122	50.1	3.5
Down-the-Hole Socket (30-, 36-inch)	Up to 3 hours	1,225.6.	43.6	1,459.9	655.9	47.8
	4 to 6 hours	1,945.5	69.3	2,317.4	1,041.2	75.8
Down-the-Hole Socket (48-inch)	Up to 2	1,728.3	61.5	2,058.7	924.9	67.3
	>2 to 3 hours	2,264.8	80.5	2,697.7	1,212	88.2
	>3 to 4 hours	2,743.6	97.6	3,268	1,468.2	106.9
Down the Hole Anchor (12-inch)	Up to 6 hours	122.8	4.4	146.2	65.7	4.8
	7 to 8 hours	148.7	5.3	177.1	79.6	5.8
30-inch Diesel Impact	Up to 500 strikes (1-10 minutes)	442	15.7	526.4	236.5	17.2
	501-1,000 strikes (11-20 minutes)	701.6	25	835.7	375.4	27.3
	1,001-1,500 strikes (21-30 minutes)	919.3	32.7	1,095	492	35.8
36- and 48-inch Diesel Impact	Up to 500 strikes (1-10 minutes)	1,221	43	1,455	654	48
	501-1,000 strikes (11-20 minutes)	1,938.5	68.9	2,309	1,037.4	75.5
	1,001-1,500 strikes (21-30 minutes)	2,540.1	90.3	3,025.7	1,359.4	99

Level B Harassment Zones

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

TL = B * Log10 (R1/R2),

Where

TL = transmission loss in dB

B = transmission loss coefficient; for practical spreading equals 15

R1 = the distance of the modeled SPL from the driven pile, and

R2 = the distance from the driven pile of the initial measurement

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

Using the practical spreading model, COK determined underwater noise would fall below the behavioral effects threshold of 120 dB rms for marine mammals at a maximum radial distance of 16,343 m for vibratory pile driving of 36 and 48-inch diameter piles. Other activities, including rock anchoring and impact pile driving, have smaller Level B harassment zones. All Level B harassment isopleths are reported in Table 8 below. It should be noted that based on the geography of Tongass Narrows and the surrounding islands, sound will not reach the full distance of the Level B harassment isopleth. The largest Level B Harassment isopleth will be truncated by land masses at approximately 12,500 meters to the southeast and approximately 3,590 meters northwest of the project area. Constraining land masses include Revillagigedo Island, Gravina Island, Pennock Island and Spire Island.

Table 8 — Calculated Level B Harassment Isopleths

Source	Behavioral Disturbance Isopleth (m) 120 dB
30-inch Vibratory (Installation or Removal)	6,213

36- and 48-inch Vibratory	16,343
DTH installation (Socket, Anchor)	11,660
30-inch Diesel Impact	2,154
36- and 48-inch Diesel Impact	3,744

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. Note that there is no density data for any of the species near the Berth III mooring dolphin project area, therefore the take estimate is informed by qualitative data.

The number of marine mammals that may be exposed to harassment thresholds is calculated by estimating the likelihood of a marine mammal being present within a harassment zone during the associated activities. Estimated marine mammal abundance is determined by reviewing local and regional reports, surveys, permits and observations of abundance and frequency near the proposed project action. For example, for species that are common with the potential to occur daily, the take calculations are based on the group size multiplied by the projected number of days of underwater noise activities. For species that are less common, take estimates are based on group size multiplied by the frequency (*e.g.* weekly, monthly). The estimated number of takes are based upon reasonable ranges from the best information currently available for these species near the project area.

Authorization of Level A harassment takes was requested by COK for harbor seal, harbor porpoise, and Dall's porpoise. Harbor seals are habituated to fishing vessels and may follow vessels that enter the marina. Dall's and harbor porpoises' small size and

speed make it possible that these animals could occur within the Level A harassment zones and potentially incur injury prior to detection.

Humpback whale

Humpback whales occur frequently in Tongass Narrows and the adjacent Clarence Strait during summer and fall months to feed, but are less common during winter and spring. The average group size during the fall surveys was two whales according to Dalheim *et al.* (2009). Local reports of humpback whale group size in Tongass Narrows are similar, with the typical size being between 1 and 3. During the spring months, humpback whales tend to congregate in areas outside of the Ketchikan area, such as Lynn Canal and Fredrick Sound. Therefore, it is assumed that the occurrence of humpback whales in the project area is two individuals twice per week throughout the project. A group size of two was also assumed in the Biological Opinion provided to the US Army Corp of Engineers (USACE) for the Alaska Department of Transportation & Public Ferries (ADOT&PF) Berth improvement project in Tongass Narrows (NMFS 2019).

Therefore, it is estimated that up to 2 individuals could be exposed to underwater noise twice a week during the 17 weeks of the project's in-water work, for a total of 68 incidents of take from the Central North Pacific stock. Given that 6.1 percent of all humpback whales in Southeast Alaska and northern British Columbia are assumed to be members of the Mexico DPS, while all others are assumed to be members of the Hawaii DPS (Wade *et al.* 2016), NMFS proposes to authorize 68 incidents of take by Level B harassment with 64 instances from the Hawaii DPS and 4 instances from the endangered Mexico DPS.

Take by Level A harassment is not expected for humpback whales because of the expected effectiveness of the monitoring and mitigation measures. While calculated Level A harassment zones are up to 2,800 m, multiple protected species observers (PSOs)

will monitoring Tongass Narrows which is < less than 600 m in width and represents a much smaller effective Level A harassment zone. Humpbacks are usually readily visible, therefore, shutdown measures can be implemented prior to any humpback whales incurring PTS within Level A harassment zones.

Steller sea lion

Steller sea lion abundance in the Tongass Narrows area is not well known and no systematic studies of Steller sea lions have been conducted in or near the Tongass Narrows area. However, sea lions are known to occur in the Tongass Narrows area throughout the year with peak numbers March through September (ADOT 2019). Sea lions may be present during salmon and herring runs and are known to visit hatcheries and fish processing facilities in the vicinity.

Group sizes are generally 6 to 10 individuals (Freitag 2017) but have been reported to reach 80 animals (Freitag 2017). COK assumed one large group of 10 individuals could be present each day in the project vicinity based on HDR (2019) and Freitag (2017) (as cited in 83 FR 22009; May 11, 2018). NMFS agrees that this daily estimate is appropriate and therefore proposes to authorize up to 1,200 takes by Level B harassment.

Take by Level A harassment is not expected for Steller sea lions because of the relatively small Level A harassment zones for otariids (Table 7) and the expected effectiveness of the monitoring and mitigation measures discussed below.

Harbor seal

Harbor seal densities in the Tongass Narrows area are not well known. No systematic studies of harbor seals have been conducted in or near Tongass Narrows. Seals are known to occur year-round with little seasonal variation in abundance (Freitag 2017) and local experts estimate that there are about 1 to 3 harbor seals in Tongass Narrows every day, in addition to those that congregate near the seafood processing plants and fish

hatcheries. COK conducted pinnacle rock blasting in December 2019 and January 2020 near the vicinity of the proposed project and recorded a total of 21 harbor seal sightings of 24 individuals over 76.2 hours of pre- and post-blast monitoring (Sitkiewicz 2020). Harbor seals were observed in groups ranging from 1-3 animals throughout the 0.70-mile (1.12-kilometer) observation zone. Based on this knowledge, COK assumed an average group size in Tongass Narrows of three individuals. They anticipated that three groups of 3 harbor seals per group could be exposed to project-related underwater noise each day for 120 days of in-water work. Given that harbor seals are known to follow fishing vessels into the marina and may be difficult to detect, COK assumed that one group of three seals could be taken by Level A harassment daily, resulting in 360 Level A harassment takes. NMFS agreed with these assumptions and, therefore, proposes to authorize 720 takes by Level B harassment and 360 takes by Level A harassment.

Dall's porpoise

The mean group size of Dall's porpoise in Southeast Alaska is estimated at approximately three individuals (Dahlheim *et al.,* 2009; Jefferson *et al.,* 2019). However, in the Ketchikan vicinity, Dall's porpoises are reported to typically occur in groups of 10-15 animals, with an estimated maximum group size of 20 animals (Freitag 2017, as cited in 83 FR 22009, May 11, 2018). Overall, sightings of Dall's porpoise are infrequent near Ketchikan, but they could be present on any given day during the construction period.

COK assumed that a maximum group size of 20 Dall's porpoise could occur in the project area each month. NMFS concurs with this assessment and proposes to authorize 80 takes of Dall's porpoise over the anticipated four-month project duration.

Given the large size of the Level A harassment zone associated with impact pile driving for high-frequency cetaceans, it is possible Dall's porpoises may enter the Level A harassment zone undetected. Therefore, NMFs proposes to authorize a total of 60 takes

of Dall's porpoise by Level B harassment and 20 takes by Level A harassment over the course of the project.

Harbor porpoise

Harbor porpoises are non-migratory; therefore, occurrence estimates are not dependent on season. Freitag (2017 as cited in 83 FR 37473; August 1, 2018) observed harbor porpoises in Tongass Narrows zero to one time per month. Harbor porpoises observed in the project vicinity typically occur in groups of one to five animals with an estimated maximum group size of eight animals (83 FR 37473, August 1, 2018, Solstice 2018). Based on this previous information from the Ketchikan Berth IV Expansion project and the AKDOT Tongass Narrows project, COK estimated that two groups of five harbor porpoise may enter the Tongass Narrows twice per month. NMFS agrees with this estimate and, therefore, proposes to authorize take of 40 harbor porpoises during the duration of the project.

Given that harbor porpoises are stealthy, having no visible blow and a low profile in the water making the species difficult for monitors to detect (Dahlheim *et al.* 2015), COK requested that a total of 10 takes of harbor porpoises by Level A harassment be authorized. Therefore, NMFS proposes to authorize 10 takes of harbor porpoise by Level A harassment and 30 takes by Level B harassment

Killer whale

Typical pod sizes observed within the project vicinity range from 1 to 10 animals. COK assumed that the frequency of killer whales passing through the action area is estimated to be once per month and also conservatively assumed a pod size of 10.

Therefore NMFS proposes to authorize 40 takes of killer whales by Level B harassment.

Take by Level A harassment is not expected for killer whales because of the small Level A harassment zones for mid-frequency cetaceans and the expected effectiveness of the monitoring and mitigation measures discussed below.

Gray whale

Gray whales have not been reported within the Tongass Narrows; however, their presence cannot be entirely discounted. Since the largest Level B harassment zone extends beyond Tongass Narrows, COK assumed that up to two gray whales may be taken per month. Therefore, NMFS proposes to authorize take by Level B harassment of up to 8 gray whales.

Due to the unlikely occurrence of gray whales and the ability to shut down pile driving activities prior to a whale entering the Level A harassment zone, no Level A harassment takes of gray whales were requested or are proposed for authorization.

Minke whale

There are no known occurrences of minke whales within the project area although they may be present in Tongass Narrows and Clarence Strait year-round. Their abundance throughout Southeast Alaska is low. However, minke whales are distributed throughout a wide variety of habitats and could occur near the project area. Minke whales are generally sighted as individuals (Dahlheim *et al.* 2009).

Therefore, NMFS proposes to authorize two takes of minke whale by Level B harassment. No Level A harassment takes of minke whales are anticipated due to the very limited occurrence of minke whales and the ability to shut down pile driving activities prior to a whale entering the Level A harassment zone.

Pacific white-sided dolphin

Pacific white-sided dolphins have not been reported within the Tongass Narrows; however, the dolphin is within its range and thus its presence cannot be discounted. Pacific white-sided dolphin group sizes generally range from between 20 and 164

animals. For the purposes of this assessment, COK assumed one group of 30 dolphins may be present within the Level B harassment zone every tenth day, or about every other week, similar to what was estimated for a prior IHA (84 FR 36891; July 30, 2019). Therefore, NMFS proposes to authorize 360 takes of Pacific white-sided dolphin by Level B harassment.

No Level A takes are expected due to the relatively small size of Level A harassment zone for mid-frequency cetaceans which can be readily monitored.

Table 9 below summarizes the proposed authorized take for all the species described above as a percentage of stock abundance.

Table 9 — Proposed Take by Level A and B Harassment and as a Percentage of Stock Abundance

Species		Level B Takes	Level A Takes	Stock Abundance	Percent of Stock
Humpback whale[1]		68	N/A	10,103	0.67
Steller sea lion eDPS		1,200	N/A	43,201	2.8
Harbor seal		720	360	27,659	3.9
Dall's porpoise		60	20	83,400	0.09
Harbor porpoise		30	10	1,354	2.9
Killer whale[2]	AK resident	40	N/A	2,347	1.7
	West coast transient			243	16.46
	Northern resident			302	13.25
	Gulf of Alaska, Aleutian Islands, and Bering Sea transient			587	6.81
Gray whale		8	N/A	26,960	0.03
Pacific white-sided Dolphin		360	N/A	26,880	1.34
Minke whale		2	N/A	N/A	N/A

[1]Assumes that 6.1 percent of humpback whales exposed are members of the Mexico DPS (Wade *et al.* 2016). Distribution of proposed take by ESA status is 64 Level B takes for Hawaii DPS and 4 Level B take for Mexico DPS.
[2]These percentages assume all takes come from the same killer whale stock, thus the percentage should be adjusted down if multiple stocks are actually affected.

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 for this IHA:

- For in-water heavy machinery work other than pile driving, if a marine mammal comes within 10 m, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions. This type of work could include the following activities: (1) Movement of the barge to the pile location; or (2) positioning of the pile on the substrate via a crane (i.e., stabbing the pile);
- Briefings must be conducted between construction supervisors and crews and the marine mammal monitoring team prior to the start of all pile driving activity and when new personnel join the work, to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures;
- For those marine mammals for which take has not been authorized, in-water pile installation/removal will shut down immediately if such species are observed within or entering the Level B harassment zone; and
- If take reaches the authorized limit for an authorized species, pile installation will be stopped as these species approach the harassment zone to avoid additional take.

The following mitigation measures would apply to COK's in-water construction activities.

- *Establishment of Shutdown Zones*—COK will establish shutdown zones for all pile driving and removal activities. The purpose of a shutdown zone is generally to define an area within which shutdown of the activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). Shutdown zones will vary based on the activity type and marine mammal hearing group (Table 10). Due to sediment characteristics and variation in pile sizes, COK does not know how much time will be required for vibratory driving/removal and DTH installation at each pile or how many strikes will be

required for impact installation. Given this uncertainty, COK will utilize a tiered system to identify and monitor appropriate shutdown zones based on activity duration or the number of strikes required for pile installation or removal. During vibratory driving/removal and DTH pile installation, the shutdown zone size will initially be set at the lowest tier, which represents the least amount of active installation/removal time. Shutdown zones will be expanded to the next largest zone after Tier 1 time period has elapsed. For those activities with three specified tiers (*i.e.,* impact driving, DTH socketing), the shutdown zone will be expanded to the largest isopleths identified in Tier 3 if the activity extends beyond the Tier 2 active time period. During impact driving, the shutdown zones associated with 0-500 strikes will be monitored until 500 strikes have occurred. The shutdown zones will increase to the next tier between 501-1,000 strikes. After 1,000 strikes the shutdown zones will subsequently be increased to the largest zone sizes.

- If a marine mammal is entering or is observed within an established shutdown zone, pile driving must be halted or delayed. Pile driving may not commence or resume until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or 15 minutes have passed without subsequent detections of marine mammals.
- The placement of PSOs during all pile driving and removal activities (described in detail in the **Proposed Monitoring and Reporting** section) will ensure that the entire shutdown zone is visible during pile installation. Should environmental conditions deteriorate such that marine mammals within the entire shutdown zone would not be visible (*e.g.,* fog, heavy rain), pile driving and removal must be delayed until the PSO is confident marine mammals within the shutdown zone could be detected.

- *PSOs*—COK will employ PSOs who will be able to fully monitor Level A harassment zones. Placement of PSOs will allow observation of marine mammals within the large segments of the Level B harassment zones. However, due to the large size of some of the Level B harassment zones (Table 8), PSOs will not be able to effectively observe the entire zone.
- *Pre-activity Monitoring*—Prior to the start of daily in-water construction activity, or whenever a break in pile driving/removal of 30 minutes or longer occurs, PSOs will observe the shutdown and monitoring zones for a period of 30 minutes. The shutdown zone will be considered cleared when a marine mammal has not been observed within the zone for that 30-minute period. If a marine mammal is observed within the shutdown zone, a soft-start cannot proceed until the animal has left the zone or has not been observed for 15 minutes. When a marine mammal for which take is authorized is present in the harassment zone, activities may begin. If work ceases for more than 30 minutes, the pre-activity monitoring of the shutdown zones will commence.
- *Soft Start*—Soft-start procedures are believed to provide additional protection to marine mammals by providing warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. For impact pile driving, COK will be required to provide an initial set of three strikes from the hammer at reduced energy, followed by a thirty-second waiting period. This procedure will be conducted three times before impact pile driving begins. Soft start will be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of thirty minutes or longer.
- *Scheduling*—Pile driving or removal activities must occur during daylight hours. If poor environmental conditions restrict visibility of the shutdown zones (*e.g.,*

from excessive wind or fog, high Beaufort state), pile installation may not be initiated. Work that has begun with a fully cleared Level B harassment zone may continue during inclement weather (*e.g.,* fog, heavy rain) or periods of limited visibility.

Table 10 — Shutdown and Monitoring Zones for Each Driving/Removal Activity

<table>
<tr><th>Pile Size</th><th>Low Frequency Cetacean Shutdown Area (m)</th><th>Mid Frequency Cetacean Shutdown Area (m)</th><th>High Frequency Shutdown Area (m) (Harbor Porpoise, Dall's Porpoise)[1]</th><th>Phocid Pinniped Shutdown Area(m) (Harbor Seal)</th><th>Otariid Pinniped Shutdown Area (m) (Steller Sea Lion)</th><th>Level B Harassment Zone (m)</th></tr>
<tr><td colspan="7">Vibratory Pile Driving/Removal</td></tr>
<tr><td>30-inch piles up to 6 hrs</td><td rowspan="2">40</td><td rowspan="2">10</td><td rowspan="2">50</td><td colspan="2" rowspan="2">10</td><td rowspan="2">6,300</td></tr>
<tr><td>30-inch piles 7 hrs – 8 hrs</td></tr>
<tr><td>36- and 48-inch piles up to 6 hrs</td><td rowspan="2">90</td><td rowspan="2">10</td><td rowspan="2">50</td><td colspan="2" rowspan="2">10</td><td rowspan="2">12,500[1]</td></tr>
<tr><td>36- and 48-inch piles 7 hrs – 8 hrs</td></tr>
<tr><td colspan="7">Impact Pile Driving</td></tr>
<tr><td>30-inch piles up to 500 strikes</td><td>500</td><td rowspan="3">40</td><td rowspan="3">50</td><td rowspan="3">10</td><td rowspan="3">40</td><td rowspan="3">2,200</td></tr>
<tr><td>30-inch piles 501 to 1,000 strikes</td><td>700</td></tr>
<tr><td>30-inch piles 1,001 to 1,500 strikes</td><td>1,000</td></tr>
<tr><td>36- and 48-inch piles up to 500 strikes</td><td>1,300</td><td>50</td><td rowspan="2">50</td><td rowspan="2">10</td><td rowspan="2">50</td><td rowspan="2">3,800</td></tr>
<tr><td>36- and 48-inch piles 501 to 1,000 strikes</td><td>2,000</td><td>70</td></tr>
</table>

36- and 48-inch piles 1,001 to 1,500 strikes	2,600	90			100	
DTH Socket						
30-, 36-inch piles up to 3 hrs	1,300	50	50	10	50	11,700
30-, 36-inch piles 4 hrs – 6 hrs	2,000	70				
48-inch piles up to 2 hours	1,750	65			70	
48-inch piles >2 to 3 hrs	2,300	85			100	
48-inch piles >3 to 4 hours.	2,750	100			110	
DTH Anchor						
12-inch hole up to 6 hours	150	10	50	10		6,350
12-inch hole 7hrs – 8hrs						

[1] Represents largest Level B Harassment isopleth. Note that isopleth is truncated by land masses at 12,500 meters

To minimize impacts to marine mammals and their prey vibratory installation and/or hammering will be used as the primary methods of pile installation. Impact driving will be minimized and used only as needed to seat the pile in its final position or to penetrate material that is too dense for a vibratory hammer.

Based on our evaluation of the applicant's proposed measures, as well as other measures considered by NMFS, NMFS has preliminarily determined that the proposed mitigation measures provide the means effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Proposed Monitoring and Reporting

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such

taking. The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the proposed action area. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

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

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

Visual Monitoring

Monitoring must be conducted 30 minutes before, during, and 30 minutes after pile driving and removal activities. In addition, observers shall record all incidents of marine mammal occurrence, regardless of distance from activity, and shall document any behavioral reactions in concert with distance from piles being driven or removed. Marine mammal monitoring during pile driving and removal must be conducted by NMFS-approved PSOs in a manner consistent with the following:

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

PSOs should have the following additional qualifications:

- Ability to conduct field observations and collect data according to assigned protocols;
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;

- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

A minimum of three onshore observers will be stationed along Tongass Narrows at locations that provide optimal visual coverage for shutdown and monitoring zones (see Figures 3 in COK's Marine Mammal Monitoring Plan). To maximize the visual coverage of shutdown and monitoring zones, observers will use elevated platforms at observation points to the extent practicable. Observers will be in contact with each other via two-way radio and with a cellular phone used as back-up communications. The primary purpose of this observer is to implement the shutdown zones and monitor the Level B harassment zones. PSOs must be positioned in order to focus on monitoring these zones. PSOs would scan the waters using binoculars, and/or spotting scopes, and would use a handheld global positioning system (GPS) or range-finder device to verify the distance to each sighting from the project site.

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

Reporting

A draft marine mammal monitoring report would be submitted to NMFS within 90 days after the completion of pile driving and removal 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) and estimated observable distance (if less than the harassment zone distance).
- 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 observation, 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 harassment zones,;

- 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.

Reporting Injured or Dead Marine Mammals

In the event that personnel involved in the construction activities discover an injured or dead marine mammal, the IHA-holder shall report the incident to the Office of Protected Resources (OPR) (301-427-8401), NMFS and to the Alaska regional stranding coordinator (907-586-7209) as soon as feasible. If the death or injury was clearly caused by the specified activity, the IHA-holder must immediately cease the specified activities until NMFS is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the IHA. The IHA-holder must not resume their activities until notified by NMFS.

The report must include the following information:

- Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
- Species identification (if known) or description of the animal(s) involved;
- Condition of the animal(s) (including carcass condition if the animal is dead);
- Observed behaviors of the animal(s), if alive;

- If available, photographs or video footage of the animal(s); and
- General circumstances under which the animal was discovered.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be "taken" through harassment, NMFS considers other factors, such as the likely nature of any 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).

Vibratory pile removal, vibratory pile driving, impact pile driving, and DTH pile installation have the potential to disturb or displace marine mammals. Specifically, these proposed project activities may result in take, in the form of Level A harassment and Level B harassment. Potential takes could occur if individuals are present in the ensonified zone when these activities are underway. No mortality is anticipated given the

nature of the activity and measures designed to minimize the possibility of injury to marine mammals.

The Level A harassment zones identified in Table 7 are based upon an animal exposed to vibratory pile driving, impact pile driving, and DTH pile installation for periods of time ranging from 30 minutes for impact driving, up to 8 hours for vibratory driving, up to 6 hours for DTH socketing and 8 hours for DTH anchoring. Exposures of this length are unlikely for vibratory driving/removal and DTH pile installation scenarios given marine mammal movement throughout the area. Even during impact driving scenarios, an animal exposed to the accumulated sound energy would likely only experience only limited PTS at the lower frequencies where pile driving energy is concentrated.

Behavioral responses of marine mammals to pile driving at the project site, if any, are expected to be mild and temporary. Given that the installation of 12 permanent piles and 8 temporary piles would occur over 4 months, any harassment would be temporary and intermittent. Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (Southall *et al*. 2007, ABR 2016). Most likely, individuals will simply move away from the sound source and be temporarily displaced from the areas of pile driving. These reactions and behavioral changes are expected to subside quickly when the exposures cease.

The potential for harassment is minimized through the implementation of the proposed mitigation measures. During all impact driving, implementation of soft start procedures and monitoring of established shutdown zones shall be required, significantly reducing any possibility of injury. Given sufficient notice through use of soft start (for impact driving), marine mammals are expected to move away from an irritating sound

source prior to it becoming potentially injurious. To reduce the severity of in-water noise, vibratory pile driving will be the primary installation method for the project and impact hammers will only be used to seat pile tips into fractured bedrock ahead of the hammering operations or if material is encountered that is too dense to penetrate with a vibratory hammer.

The proposed project is located within an active marine commercial and industrial area with no known pinniped haulouts or rookeries near the project area. While construction of mooring dolphins at Berth III would have some permanent removal of habitat available to marine mammals, the area lost is relatively small and not of particular importance to any marine mammals.

Any impacts on prey that would occur during in-water construction would have at most short-terms effects on foraging of individual marine mammals, and likely no effect on the populations of marine mammals as a whole. Therefore, effects on marine mammal prey during the construction are expected to be minimal and, therefore, are unlikely to cause substantial effects on marine mammals at the individual or population level.

In addition, 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.

For all species except humpback whales, there are no known BIAs near the project zone that would be impacted by COK's proposed activities. For humpback whales, the whole of Southeast Alaska is a seasonal BIA from spring through late fall (Ferguson *et al.,* 2015). However, Tongass Narrows and Clarence Strait are not important portions of this habitat due to development and human presence. Tongass Narrows is also

a small passageway and represents a very small portion of the total available habitat for humpback whales. Finally, there is no ESA-designated critical habitat for humpback whales.

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 limited and of low degree;
- Mitigation measures such as employing vibratory driving to the maximum extent practicable, soft-starts, and shut downs will be implemented;
- Impacts to marine mammal habitat are anticipated to be minimal;
- The project area is located in an industrialized and commercial marina;
- The project area does not include any rookeries, or known areas or features of special significance for foraging or reproduction; and
- The anticipated incidents of Level B harassment consist of, at worst, temporary modifications in behavior.

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

Small Numbers

As noted above, only small numbers of incidental take may be authorized under sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice,

where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. When the predicted number of individuals to be taken is fewer than one third of the species or stock abundance, the take is considered to be of small numbers. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

The number of instances of take for each species or stock proposed to be taken as a result of this project is included in Table 9. Our analysis shows that less than one-third of the best available population abundance estimate of each species or stock could be taken by harassment. The number of animals proposed to be taken for each authorized stock would be considered small relative to the relevant stock's abundances even if each estimated taking occurred to a new individual, which is an unlikely scenario.

The west coast transient stock of killer whales represents the highest percentage of a single stock (<17 percent) that is proposed for authorized take. This take percentage also assumes that all authorized killer whale takes would be from this stock, which is highly unlikely given the expansive range of the stock.

A lack of an accepted stock abundance value for the Alaska stock of minke whale did not allow for the calculation of an expected percentage of the population that would be affected. The most relevant estimate of partial stock abundance is 1,232 minke whales in coastal waters of the Alaska Peninsula and Aleutian Islands (Zerbini *et al.*, 2006). Given that two takes by Level B harassment are proposed for the stock, comparison to the best estimate of stock abundance shows less than 0.2 percent of the stock is expected to be impacted.

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.

Alaska Native hunters in the Ketchikan vicinity do not traditionally harvest cetaceans (Muto *et al.* 2019). Harbor seals are the most commonly targeted marine mammal that is hunted by Alaska Native subsistence hunters within the Ketchikan area. In 2012 an estimated 595 harbor seals were taken for subsistence uses, with 22 of those occurring in Ketchikan (Wolfe *et al.* 2012). This is the most recent data available. The harbor seal harvest per capita in both communities was low, at 0.02 for Ketchikan. ADF&G subsistence data for Southeast Alaska shows that from 1992 through 2008, plus 2012, from zero to 19 Steller sea lions were taken by Alaska Native hunters per year with typical harvest years ranging from zero to five animals (Wolfe *et al.* 2013) In 2012, it is estimated nine sea lions were taken in all of Southeast Alaska and only from Hoonah and Sitka. There are no known haulout locations in the project area. Both the harbor seal and the Steller sea lion may be temporarily displaced from the action area. However, neither the local population nor any individual pinnipeds are likely to be adversely impacted by

the proposed action beyond noise-induced harassment or slight injury. The proposed project is anticipated to have no long-term impact on Steller sea lion or harbor seal populations, or their habitat no long term impacts on the availability of marine mammals for subsistence uses is anticipated.

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

Endangered Species Act

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 Office of Protected Resources consults internally whenever we propose to authorize take for endangered or threatened species, in this case with the NMFS Alaska Regional Office.

NMFS is proposing to authorize take of the Mexico DPS of humpback whales, which are listed under the ESA.

The NMFS Office of Protected Resources has requested initiation of Section 7 consultation with the NMFS Alaska Regional Office 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 the City of Ketchikan for conducting in-water construction activities as part of the

Berth III Expansion Project in Ketchikan between October 1, 2021 and May 1, 2022, 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 Berth III New Mooring Dolphins 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-time, 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, or nearly identical, activities as described in the **Description of Proposed Activity** section of this notice is planned or (2) the activities as described in the **Description of Proposed 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 the 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: November 4, 2020.

Donna S. Wieting,

Director, Office of Protected Resources,

National Marine Fisheries Service.

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