DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

Evaluation of Padilla Bay National Estuarine Research Reserve; Notice of Public Meeting; Request for Comments

AGENCY: Office for Coastal Management, National Ocean Service, National Oceanic and Atmospheric Administration, Department of Commerce.

ACTION: Notice of public meeting and opportunity to comment.

SUMMARY: The National Oceanic and Atmospheric Administration (NOAA), Office for Coastal Management, will hold an in-person public meeting to solicit input on the performance evaluation of the Padilla Bay National Estuarine Research Reserve. NOAA also invites the public to submit written comments.

DATES: NOAA will hold an in-person public meeting at 5 p.m. Pacific Daylight Time (PDT) on Tuesday, September 10, 2024. NOAA may close the meeting 10 minutes after the conclusion of public testimony and after responding to any clarifying questions from hearing participants. NOAA will consider all relevant written comments received by Friday, September 20, 2024.

ADDRESSES: Comments may be submitted by one of the following methods:

- *In-Person Public Meeting:* Provide oral comments during the in-person public meeting on Tuesday, September 10, 2024 at 5 p.m. PDT at the Steven Center Conference Room at the Padilla Bay National Estuarine Research Reserve, 10441 Bayview Edison Road, Mount Vernon, WA 98273.
- *Email:* Send written comments to Michael Migliori, Evaluator, NOAA Office for Coastal Management, at *czma.evaluations@noaa.gov.* Include ''Comments on Performance Evaluation of Padilla Bay National Estuarine Research Reserve'' in the subject line. NOAA will accept anonymous comments; however, the written comments NOAA receives are considered part of the public record, and the entirety of the comment, including the name of the commenter, email address, attachments, and other supporting materials, will be publicly accessible. Sensitive personally identifiable information, such as account numbers and Social Security numbers, should not be included with the comments. Comments that are not related to the performance evaluation of the Padilla Bay National Estuarine Research Reserve or that contain profanity, vulgarity, threats, or other inappropriate language will not be considered.

FOR FURTHER INFORMATION CONTACT: Michael Migliori, Evaluator, NOAA Office for Coastal Management, by email at *Michael.Migliori@noaa.gov* or by phone at (443) 332–8936. Copies of the previous evaluation findings, reserve management plan, and reserve site profile may be viewed and downloaded at *https://coast.noaa.gov/czm/evaluations/.* A copy of the evaluation notification letter and most recent progress report may be obtained upon request by contacting Michael Migliori.

SUPPLEMENTARY INFORMATION: Section 315(f) of the Coastal Zone Management Act (CZMA) requires NOAA to conduct periodic evaluations of federally approved national estuarine research reserves. The evaluation process includes holding one or more public meetings, considering public comments, and consulting with interested Federal, State, and local agencies and members of the public. During the evaluation, NOAA will consider the extent to which the State of Washington has met the national objectives and has adhered to the management plan approved by the Secretary of Commerce, the requirements of section 315(b)(2) of the CZMA, and the terms of financial assistance under the CZMA. When the evaluation is complete, NOAA's Office for Coastal Management will place a notice in the **Federal Register** announcing the availability of the final evaluation findings.

Authority: 16 U.S.C. 1461.

Keelin Kuipers,

Deputy Director, Office for Coastal Management, National Ocean Service, National Oceanic and Atmospheric Administration.

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648–XD855]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Gary Paxton Industrial Park Vessel Haulout Project in Sitka, Alaska

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

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

SUMMARY: NMFS has received a request from the City and Borough of Sitka (CBS) for authorization to take marine mammals incidental to the Gary Paxton Industrial Park Vessel Haulout Project in Sawmill Cove in Sitka, Alaska. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an incidental harassment authorization (IHA) to incidentally take marine mammals during the specified activities. NMFS is also requesting comments on a possible one-time, 1-year renewal that could be issued under certain circumstances and if all requirements are met, as described in the Request for Public Comments section at the end of this notice. NMFS will consider public comments prior to making any final decision on the issuance of the requested MMPA authorization and agency responses will be summarized in the final notice of our decision.

DATES: Comments and information must be received no later than August 8, 2024.

ADDRESSES: Comments should be addressed to Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service and should be submitted via email to *ITP.Fleming@noaa.gov.* Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities.* In case of problems accessing these documents, please call the contact listed below.

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 *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act* without change. All personal identifying information (*e.g.,* name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Kate Fleming, Office of Protected Resources (OPR), NMFS, (301) 427–8401.

SUPPLEMENTARY INFORMATION:

Background

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

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other ''means of effecting the least practicable adverse impact'' on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stocks for taking for certain subsistence uses (referred to in shorthand as ''mitigation''); and requirements pertaining to the mitigation, monitoring and reporting of the takings are set forth. The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below.

National Environmental Policy Act (NEPA)

To comply with the NEPA of 1969 (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 NAO 216–6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has 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 January 18, 2024, NMFS received a request from CBS for an IHA to take marine mammals incidental to construction associated with the Gary Paxton Industrial Park Vessel Haulout Project in Sawmill Cove in Sitka, Alaska. Following NMFS' review of the application, CBS submitted a revised version on March 20, 2024, and another on April 27, 2024. The application was deemed adequate and complete on May 20, 2024. CBS's request is for take of nine species of marine mammals by Level B harassment and, for a subset of those species, by Level A harassment. Neither CBS nor NMFS expect serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

NMFS previously issued an IHA to CBS for similar work (82 FR 47717, October 13, 2017). CBS complied with all the requirements (*e.g.,* mitigation, monitoring, and reporting) of the previous IHA, and information regarding their monitoring results may be found in the Potential Effects of Specified Activities on Marine Mammals and Their Habitat section.

This proposed IHA would cover 1 year of a larger project; CBS intends to request a future take authorization for subsequent facets of the project. In year 1, construction of the following elements would be completed: 150-ton capacity vessel haulout piers, expanded uplands including stormwater collection and treatment, and a vessel washdown pad. The larger multi-year project involves construction of a queuing float, approach dock and gangway, a pile-supported deck area, vessel haulout ramp, an uplands shipyard, and pile anodes. While not proposed to be constructed as part of this project, CBS's goal is to eventually construct additional haulout piers to accommodate removal of vessels up to 300 tons.

Description of Proposed Activity

Overview

The CBS is proposing to construct a vessel haulout facility at Gary Paxton Industrial Park in Sawmill Cove in Sitka, Alaska. Sitka is home to one of the largest fishing fleets in Alaska, but no public vessel haulout facility has existed in Sitka since March 2022. The project would enable vessels to be hauled out for maintenance, ensuring safety of operating fleet traffic and boosting the local economy through jobs and enterprise at nearby marine service providers. Over the course of 1 year between October 2024 and September 2025, CBS would use vibratory and impact pile driving and vibratory removal to install and extract piles. These methods of pile driving would introduce underwater sounds that may result in take, by Levels A and B harassment, of marine mammals.

Dates and Duration

The proposed IHA would be effective from October 1, 2024, to September 30, 2025. The project would require approximately 62 days of pile driving between October 15 and March 15. In-water construction activities would only occur during daylight hours, and typically over a 10- to 12-hour work day.

Specific Geographic Region

Sawmill Cove is a small body of water located near Sitka, Alaska, at the mouth of Silver Bay, which opens to the Sitka Sound and Gulf of Alaska (see figures 1 and 2 in CBS's IHA application). Sawmill Cove has a fairly even and shallow seafloor that gradually falls to a depth of approximately 40 meters (m) (131 feet (ft)). To the southeast, Silver Bay is approximately 0.8 kilometers (km) (0.5 miles (mi)) wide, 8.9 km (5.5 mi) long, and 40–85 m (131–279 ft) deep. The bay is uniform with few rock outcroppings or islands. To the southwest, the Eastern Channel opens to Sitka Sound, dropping off to depths of 120 m (400 ft) approximately 1.6 km (1 mi) southwest of the project site.

Sawmill Cove is an active marine commercial and industrial area, which includes a multipurpose, deep-water dock constructed in 2017 to accommodate large vessel services, Silver Bay Seafoods' processing plant, a Northern Southeast Regional Aquaculture Association hatchery, and other tenants such as Northline Seafoods, Serka Welding and Boat Fabrication, and Island Fever Diving.

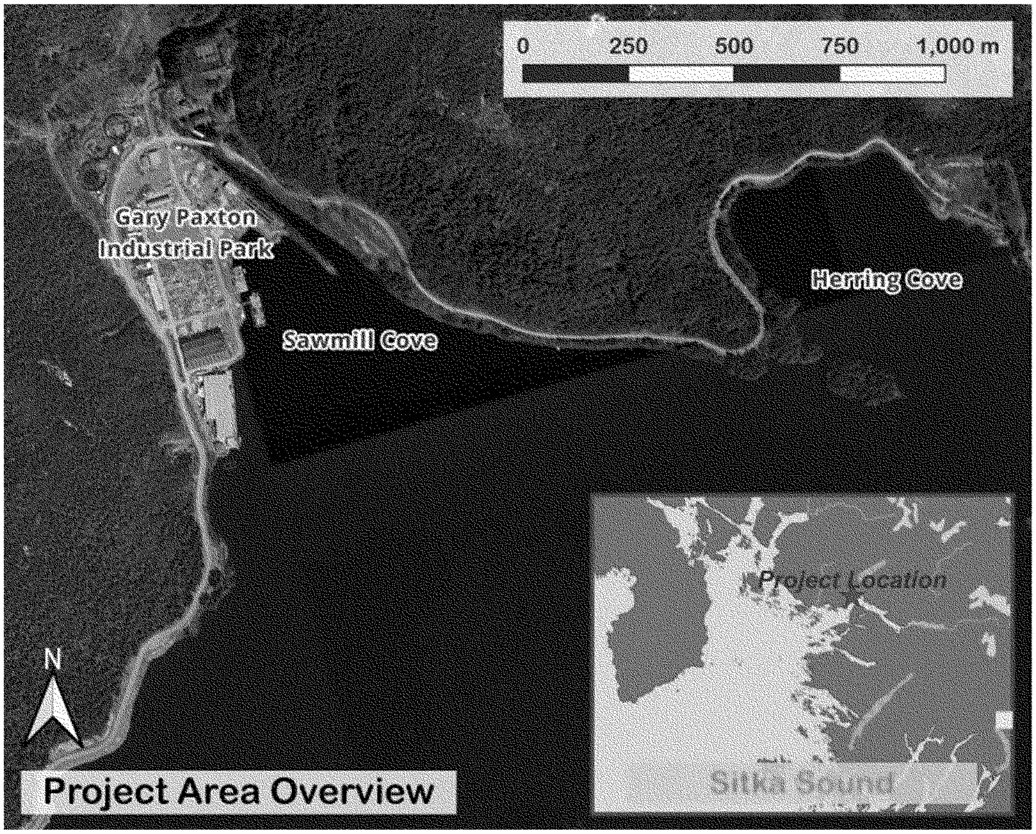

Figure 1. Gary Paxton Industrial Park (GPIP) project area overview (background image from Google Earth 2023).

Detailed Description of the Specified Activity

CBS proposes to construct a vessel haulout facility within the Gary Paxton Industrial Park in Sawmill Cove, Sitka Alaska. Activities to be completed during the period of the proposed IHA include the construction of 150-ton capacity vessel haulout piers, expanded uplands including stormwater collection and treatment, and a vessel washdown pad. Major equipment and materials associated with construction would most likely be mobilized to the project site from Juneau, another southeast Alaska location, or Seattle, Washington. The larger multi-year project involves construction of a queuing float, approach dock and gangway, a pile-supported deck area, vessel haulout ramp, an uplands shipyard, and pile anodes.

150-Ton Capacity Vessel Haulout Piers

To construct the 150-ton capacity boat haulout piers, 36-inch (in) [91 centimeter (cm)] steel haulout pier support piles, both vertical and battered, would be installed primarily with a vibratory hammer (an American Piledriving Equipment 200–6 or comparable vibratory hammer from another manufacturer). Following vibratory installation, piles would be proofed with an impact hammer in order to achieve design bearing capacity (a Delmag D–62 diesel impact hammer or equivalent). Up to 24-in (61 cm) diameter steel temporary template pipe piles would be installed to facilitate accurate installation of permanent piles. Temporary piles would be installed and removed using a vibratory hammer. Temporary template piles would only be necessary for vertical support piles; batter piles would be installed utilizing permanent vertical support piles as a template. Following construction of pier superstructures, 24-in diameter steel fender piles would be installed with a vibratory hammer.

TABLE 1—PILE TYPES, INSTALLATION METHODS, AND DURATIONS

Pile size/type	Method	Number of piles	Duration per pile (min)	Strikes per pile	Max piles per day	Days of installation or removal
Haulout Pier Support Pile						
36-in Steel Pipe Pile	Vibratory Installation	20	60	N/A	2	20
	Impact Installation		N/A	2,000	2	

TABLE 1—PILE TYPES, INSTALLATION METHODS, AND DURATIONS—Continued

Pile size/type	Method	Number of piles	Duration per pile (min)	Strikes per pile	Max piles per day	Days of installation or removal
Haulout Pier Batter Pile						
36-in Steel Pipe Pile	Vibratory Installation Impact Installation	4	120 N/A	N/A 3,000	2 2	10
Haulout Pier Fender Pile						
24-in Steel Pipe Pile	Vibratory Installation	6	30	N/A	4	6
Template Pile						
24-in Steel Pipe Pile	Vibratory Installation and Removal.	52	20	N/A	8	26

Expanded Uplands

Uplands expansion would facilitate the construction of the pile-supported 150-ton capacity haulout piers. Expanded uplands would be constructed with armor rock, shot rock borrow (bulk fill), and crushed aggregate base course. Bulk fill would be placed directly on the existing ground surface. When possible, materials would be placed in the dry during low tidal conditions, however, initial fill operations are planned to continue regardless of the level of tide. The bulk fill material would be delivered to the project site by trucks which would end-dump the material into on-site stockpiles for spreading. Bulk fill placement and spreading would be accomplished by track-mounted excavator, bulldozer, or motor grader. Above Mean Low Low Water, material would be placed in lifts of specified thickness. Each lift of material would be compacted with a vibratory drum roller compactor; all compaction operations would be performed when the tide is below the elevation of the work. As each lift of bulk fill material is placed, armor rock would be concurrently placed to protect the embankments from erosion during construction. As with the bulk fill materials, armor rock would be delivered to the project site by trucks and end-dumped into on-site stockpiles. Armor rock would be individually handled, manipulated, and placed on the bulk fill side slopes by a track-mounted excavator, or crane.

A layer of base course would be placed atop the expanded uplands area and compacted, using similar methods to the placement of bulk fill materials.

Stormwater Improvements

Stormwater improvements consisting of storm drain catch basins, utility holes, and associated piping would be installed to control stormwater within the expanded uplands. The uplands would be graded to facilitate stormwater drainage towards the catch basins installed in various locations throughout the site.

Vessel Washdown Pad and Utility Building

A permanent vessel washdown pad would be installed adjacent to the expanded uplands. A heated piping system would be incorporated into the concrete pad and the washdown pad would be equipped with drainage for vessel wash water. The drainage system would collect wash water used for vessel cleaning in a catch basin incorporated into the washdown pad and send it to a storm filter system containing a grit chamber for filtration of the effluent. All wash water would be discharged into the Sitka municipal sewer.

A 960-ft^2 utility building would be installed on-site, adjacent to the vessel washdown pad, which would house the water treatment equipment and hydronic boilers for the heat piping system.

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

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of CBS's application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history of the potentially affected species. NMFS fully considered all of this information, and we refer the reader to these descriptions, instead of reprinting the information. Additional information regarding population trends and threats may be found in NMFS' Stock Assessment Reports (SARs; *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*) and more general information about these species (*e.g.,* physical and behavioral descriptions) may be found on NMFS' website (*https://www.fisheries.noaa.gov/find-species*).

Table 2 lists all species or stocks for which take is expected and proposed to be authorized for this activity and summarizes information related to the population or stock, including regulatory status under the MMPA and Endangered Species Act (ESA) and potential biological removal (PBR), where known. PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS' SARs). While no serious injury or mortality is anticipated or proposed to be authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species or stocks and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS' stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS' U.S. Alaska and Pacific SARs. All values presented in table 2 are the most recent available at the time of publication (including from the draft 2023 SARs) and are available online at: *https://www.fisheries.noaa.gov/*

national/marine-mammal-protection/marine-mammal-stock-assessments.

TABLE 2—MARINE MAMMAL SPECIES [1] LIKELY TO OCCUR NEAR THE PROJECT AREA THAT MAY BE TAKEN BY CBS'S ACTIVITIES

Common name	Scientific name	Stock	ESA/MMPA status; strategic (Y/N) [2]	Stock abundance (CV, N_{min}, most recent abundance survey) [3]	PBR	Annual M/SI [4]
Order Artiodactyla—Cetacea—Mysticeti (baleen whales)						
Family Eschrichtiidae:						
Gray Whale	*Eschrichtius robustus*	Eastern N Pacific	-, -, N	26,960 (0.05, 25,849, 2016).	801	131
Family Balaenopteridae (rorquals):						
Humpback Whale	*Megaptera novaeangliae*	Hawai'i	-, -, N	11,278 (0.56, 7,265, 2020).	127	27.09
		Mexico-North Pacific	T, D, Y	N/A (N/A, N/A, 2006) [5]	UND	0.57
Family Delphinidae:						
Killer Whale	*Orcinus orca*	Eastern North Pacific Alaska Resident.	-, -, N	1,920 (N/A, 1,920, 2019) [6].	19	1.3
		Eastern North Pacific Gulf of Alaska, Aleutian Islands and Bering Sea Transient.	-, -, N	587 (N/A, 587, 2012) [6]	5.9	0.8
		Eastern Northern Pacific Northern Resident.	-, -, N	302 (N/A, 302, 2018) [6]	2.2	0.2
		West Coast Transient	-, -, N	349 (N/A, 349, 2018) [6]	3.5	0.4
Pacific White-Sided Dolphin	*Lagenorhynchus obliquidens*	N Pacific	-, -, N	26,880 (N/A, N/A, 1990)	UND	0
Family Phocoenidae (porpoises):						
Harbor Porpoise	*Phocoena phocoena*	Yakutat/Southeast Alaska Offshore Waters.	-, -, N	N/A (N/A, N/A, 1997) [7]	UND	22.2
Order Carnivora—Pinnipedia						
Family Otariidae (eared seals and sea lions):						
CA Sea Lion	*Zalophus californianus*	U.S	-, -, N	257,606 (N/A, 233,515, 2014).	14,011	>321
Northern Fur Seal	*Callorhinus ursinus*	Eastern Pacific	-, D, Y	626,618 (0.2, 530,376, 2019).	11,403	373
Steller Sea Lion	*Eumetopias jubatus*	Western	E, D, Y	49,837 (N/A, 49,837, 2022) [8].	299	267
		Eastern	-, -, N	36,308 (N/A, 36,308, 2022) [9].	2,178	93.2
Family Phocidae (earless seals):						
Harbor Seal	*Phoca vitulina*	Sitka/Chatham Strait	-, -, N	13,289 (N/A, 11,883, 2015).	356	77

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

[2] 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.

[3] NMFS marine mammal SARs online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region. CV* is coefficient of variation; N_{min} is the minimum estimate of stock abundance. In some cases, *CV* is not applicable [explain if this is the case].

[4] 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.

[5] Abundance estimates are based upon data collected more than 8 years ago and, therefore, current estimates are considered unknown.

[6] N_{est} is based upon counts of individuals identified from photo-ID catalogs.

[7] New stock split from Southeast Alaska stock.

[8] N_{est} is best estimate of counts, which have not been corrected for animals at sea during abundance surveys. Estimates provided are for the U.S. only. The overall N_{min} is 73,211 and overall PBR is 439.

[9] N_{est} is best estimate of counts, which have not been corrected for animals at sea during abundance surveys. Estimates provided are for the U.S. only.

As indicated above, all 9 species (with 14 managed stocks) in table 2 temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur. All species that could potentially occur in the proposed project areas are included in table 1 of the IHA application. Sperm whale, fin whale, North Pacific right whale, minke whale, and Dall's porpoise are other marine mammals that occur in the greater southeast Alaska area, but they are unlikely to be encountered at the Gary Paxton Industrial Park and thus are not addressed further in this notice.

In addition, the northern sea otter may be found in Sawmill Cove. However, northern sea otter are managed by the U.S. Fish and Wildlife Service and are not considered further in this document.

Gray Whale

The migration pattern of gray whales appears to follow a route along the western coast of Southeast Alaska, traveling northward from British Columbia through Hecate Strait and Dixon Entrance, passing the west coast of Baranof Island from late March to May and then return south in October and November (Jones *et al.,* 1984; Ford *et al.,* 2013). Gray whales are generally solitary, traveling alone or in small groups (NMFS, 2022b).

Historically, sightings of gray whales within Sitka Sound were common during the spring herring spawn; however, unusually large numbers of gray whales have been documented in western Sitka Sound near Kruzof Island since 2014 and 2015 [Alaska Department of Fish & Game (ADF&G), 2023; Wild *et al.,* 2023]. It is unclear what has triggered this increase, but researchers believe it may be due to reduced prey availability in other parts of their range. Historical maps show that herring spawn in the eastern channel and Silver Bay in some years (ADF&G, 2023b). Additional historical records from 1964 to 2011 indicate that herring spawn in the Sitka Sound vicinity approximately every 1–3 years (Sill and Lemons, 2019). The most recent report of herring spawning in Sawmill Cove that NMFS is aware of occurred in 2011 (ADF&G, 2023b).

Records of gray whales in the Global Biodiversity Information Facility (GBIF) show 69 sightings reported by the public within and immediately offshore of Sitka Sound in the past 20 years (GBIF, 2023a). Spanning from 1995 to 2000, weekly land-based surveys of marine mammals from Sitka's Whale Park, located at the entrance to Silver Bay, were completed between September and May (Straley and Pendell, 2017). Across 190 hours of monitoring, three gray whales were observed in November. During recent marine mammal surveys associated with construction projects near the project area in Sitka Sound and in Silver Bay, no gray whales were sighted [Turnagain Marine Construction (TMC), 2017; CBS, 2019; Solstice, 2023].

Humpback Whale

Humpback whales congregate in Sitka Sound in the spring to feed on spawning herring (Wild *et al.,* 2023) and again in September through December to feed on more diverse forage (Straley *et al.,* 2018; Wild *et al.,* 2023). During the summer, both herring and humpback whales disperse throughout Sitka Sound and away from the project area (Straley, 2017 pers comm. in Solstice, 2017).

During weekly surveys completed at Sitka's Whale Park between 1995 and 2000, Humpback whales were frequently observed in groups of one to four at a rate of 2.18 individuals per day, with peak sightings in November and December (Straley and Pendell, 2017). Similar group sizes were documented during studies assessing the potential influence of humpback whales on wintering pacific herring populations, completed in the fall (Straley *et al.,* 2018). Groups of 25–30 whales were occasionally recorded in areas outside Silver Bay in the Eastern Channel (Straley and Pendell, 2017). During construction of the Gary Paxton Industrial Park Multipurpose Dock Project in 2017, humpback whales were typically observed in group sizes of two (TMC, 2017. PSOs reported humpbacks whales most frequently between 1,800–2,000 m away, but distances recorded ranged from 500 m to 5,000 m (TMC, 2017).

During monitoring in June 2019 for the O'Connell Bridge Lightering Float Pile Replacement Project (CBS, 2019) within Crescent Bay and the Eastern Channel, no humpback whales observed. Observations during the offshore geotechnical investigation for this project resulted in four sightings of nine total humpback whales during 80 hours of drilling operations between September 20 and 29, 2023. Sightings consisted of one to four whales travelling, foraging, and swimming throughout Silver Bay and into Herring Cove (Solstice, 2023).

Humpback whales in the project area are predominantly of the Hawaii Distinct Population Segment (DPS), which is not ESA-listed. However, based on a comprehensive photo-identification study, individuals from the Mexico DPS, which is listed as threatened, are known to occur in Southeast Alaska. Individuals of different DPSs are known to intermix on feeding grounds; therefore, all waters off the coast of Alaska should be considered to have ESA-listed humpback whales. Approximately 2 percent of all humpback whales in Southeast Alaska and northern British Columbia are of the Mexico DPS, while all others are of the Hawaii DPS (NMFS, 2021).

Killer Whale

Killer whales have been observed in all oceans and seas of the world, but the highest densities occur in colder and more productive waters found at high latitudes. Killer whales are found throughout the North Pacific, and occur along the entire Alaska coast, in British Columbia and Washington inland waterways, and along the outer coasts of Washington, Oregon, and California.

Of the eight recognized killer whale stocks, only the Alaska resident; Northern resident; Gulf of Alaska, Aleutian Islands, and Bering Sea Transient (Gulf of Alaska transient); and the West coast transient stocks are considered in this application because other stocks occur outside the geographic area under consideration. It is estimated that the majority of killer whales in the project area would be from the Alaska Resident stock, (60.7 percent), followed by the Gulf of Alaska, Aleutian Islands, and Bering Sea stock (18.6 percent), then the West Coast Transient (11.1 percent) and finally the Northern Residents stock (9.6 percent) (Young *et al.,* 2023). The probability of occurrence is estimated by dividing the population of each stock by their combined total population.

Records of killer whales in the GBIF show 84 sightings reported by the public within and immediately outside of Sitka Sound in the past 20 years. During weekly surveys at Whale Park in Sitka between 1995 and 2000, killer whales were ''unpredictably'' observed in groups of four to eight at a rate of 0.22 individuals per day, with all sightings most frequent in fall and spring (Straley and Pendell, 2017). During recent marine mammal surveys associated with construction projects near the project area in Sitka Sound and in Silver Bay, no killer whales were sighted (TMC, 2017; CBS, 2019; Solstice, 2023).

Pacific White-Sided Dolphin

Pacific white-sided dolphins typically inhabit the open ocean and coastal waters away from shore (NMFS, 2022b). Pacific white-sided dolphins are rare in the inside passageways of Southeast Alaska. Most observations occur off the outer coast or in inland waterways near entrances to the open ocean. However, there are records of pacific white sided dolphins observations in protected inland waters of British Columbia since at least the late 1980s (Morton, 2000; Ashe, 2015) It is thought that Pacific white-sided dolphins could be experiencing a poleward shift in their distribution in response to climate change (Salvadeo *et al.,* 2010; Rone *et al.,* 2017).

During weekly surveys completed at Sitka's Whale Park between 1995 and 2000, Pacific white sided dolphin were rarely observed in groups of around four at a rate of 0.02 individuals per day, with all recorded sightings in February (Straley and Pendell, 2017).

Recent construction monitoring reports of monitoring in Sitka Sound and in Silver Bay show no occurrence of Pacific white-sided dolphins in the project area (TMC, 2017; CBS, 2019; Solstice, 2023).

Harbor Porpoise

The harbor porpoise inhabits temperate, subarctic, and arctic waters. In the eastern North Pacific, harbor porpoises range from Point Barrow, Alaska, to Point Conception, California. Harbor porpoise primarily frequent coastal waters and occur most frequently in waters less than 100 m deep (Hobbs and Waite, 2010). They may occasionally be found in deeper offshore waters.

Harbor porpoise frequent nearshore waters, but are not common in the project vicinity. During weekly surveys completed at Sitka's Whale Park between 1995 and 2000, harbor porpoises were infrequently observed in groups of about five to eight at a rate of 0.09 individuals per day, with peak sightings in fall and late spring (Straley and Pendell, 2017). During recent marine mammal surveys associated with construction projects near the project area in Sitka Sound and in Silver Bay, no harbor porpoise were sighted (TMC, 2017; CBS, 2019; Solstice, 2023).

California Sea Lion

California sea lions live in coastal waters and on beaches, docks, buoys, and jetties. During the winter, male California sea lions commonly migrate to feeding grounds typically off California, Oregon, Washington, British Columbia, and recently and more rarely, in southeast Alaska (Woodford 2020). Females and pups typically stay close to breeding colonies until the pups have weened (NMFS 2022b). California sea lions are occasionally sighted across the Gulf of Alaska north to the Pribilof Islands during all seasons of the year (Maniscalco *et al.* 2004).

No research or monitoring reports have indicated sightings of California Sea Lions in the project area (Straley and Pendell, 2017; TMC, 2017; CBS, 2019; Solstice, 2023). However, records of California sea lions in the GBIF show 22 sightings reported by the public within and immediately offshore of Sitka Sound in the past 20 years, suggesting a rare possibility of occurrence.

Northern Fur Seal

Northern fur seals are typically found in offshore waters outside of the breeding season, although females and young males may be found closer to shore as they move to southern waters. In Southeast Alaska and British Columbia, they are known to occasionally haul out at sea lion rookeries (Carretta *et al.,* 2022; Committee on Endangered Wildlife in Canada (COSEWIC), 2010).

Northern fur seals are considered rare in the project area. Only four sightings were included GBIF records within Sitka Sound and nearby offshore waters in the past 20 years, largely from agency surveys reported in Ocean Biodiversity Information System-Spatial Ecology Analysis of Megavertebrate Populations (GBIF, 2023a). Additionally, during weekly surveys at Whale Park in Sitka between 1995 and 2000, no occurrences of northern fur seals were reported (Straley and Pendell, 2017), nor were they documented during monitoring completed for recent construction Sitka Sound and in Silver Bay show (TMC, 2017; CBS, 2019; Solstice, 2023). However, a female northern fur seal pup was reported swimming ''erratically'' near the shore in Sitka in January 2023 before being transported to the Alaska Sea Life Center for medical treatment (McKenney, 2023).

Steller Sea Lion

The majority of Steller sea lions that inhabit Southeast Alaska are part of the eastern DPS; however, branded individuals from the western DPS make regular movements across the 144° longitude boundary to the northern ''mixing zone'' haulouts and rookeries within southeast Alaska (Jemison *et al.,* 2013). While haulouts and rookeries in the northern portion of Southeast Alaska may be important areas for western DPS animals, there continues to be little evidence that their regular range extends to the southern haulouts and rookeries in Southeast Alaska (Jemison *et al.,* 2018). However, genetic data analyzed in Hastings *et al.* (2020) indicated that up to 1.2 percent of Steller sea lions near the project area may be members of the western DPS.

Steller sea lions are common within Sitka Sound and are likely to be found within the project area year-round. Steller sea lions were observed every month of monitoring (September to May) conducted at Whale Park between 1995 and 2000 (Straley and Pendell, 2017). Typical group sizes ranged from 1–2 (though sometimes over 100) at a rate of 3.46 individuals per day, with peak sightings in November, January, and February.

In 2017, during construction of the Gary Paxton Industrial Park Multipurpose Dock Project in the same area, an average of more than six Steller sea lions per day were observed during 22 days of in-water construction per day in October and November. Mean group sizes recorded were two individuals. During approximately 30 hours of monitoring in June 2019 for the O'Connell Bridge Lightering Float Pile Replacement Project, a total of 42 Steller sea lions were observed within Crescent Bay and the Eastern Channel in group sizes of 1 to 3 individuals. Several of these individuals were recorded as approaching or leaving Silver Bay (CBS, 2019). Finally, observations during the offshore geotechnical investigation for this project resulted in 79 sightings of 99 total Steller sea lions during 80 hours of drilling operations between September 20 and 29, 2023. Sightings generally consisted of one to three sea lions swimming largely within Sawmill Cove (Solstice, 2023). PSOs observed Steller sea lions at distances ranging between 30 m to as far as 700 m from the project site, with 10 percent of individuals coming within less than 60 m of the project site, and over a third of sightings occurring between 60 m and 130 m Solstice, 2023).

The project action area does not overlap Steller sea lion critical habitat. The Biorka Island haulout is the closest designated critical habitat and is well over 25 km southwest of the project area. There are no known haulouts within the project area.

Harbor Seal

Harbor seals are common in the inside waters of southeastern Alaska, including within the vicinity of the project area. The species were observed during most months of monitoring (September through May) from data collected at Whale Park between 1995 and 2000, except in December and May (Straley and Pendell, 2017). Harbor seals were frequently observed in groups of one to two. Harbor seals were also commonly observed during recent construction projects completed in the area, in similar group sizes (one to two) (TMS, 2017; CBS, 2019; Solstice, 2023). Similar to Steller sea lions, harbor seals may linger in the project area for multiple days. However, no designated haulouts are within close proximity.

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Not all marine mammal species have equal hearing capabilities (*e.g.,* Richardson *et al.,* 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007, 2019) recommended that marine mammals be divided into hearing groups based on directly measured (behavioral or auditory evoked potential techniques) or estimated hearing ranges (behavioral response data, anatomical modeling, *etc.*). 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, Cephalorhynchids, *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 *et al.,* 2013). This division between phocid and otariid pinnipeds is now reflected in the updated hearing groups proposed in Southall *et al.* 2019.

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information.

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

This section provides a discussion of the ways in which components of the specified activity may impact marine mammals and their habitat. The Estimated Take of Marine Mammals 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 of Marine Mammals 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 whether those impacts are reasonably expected to, or reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.

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 [American National Standards Institute (ANSI), 1995]. The sound level of an area is defined by the total acoustical energy being generated by known and unknown sources. These sources may include physical (*e.g.,* waves, wind, precipitation, earthquakes, ice, atmospheric sound), biological (*e.g.,* sounds produced by marine mammals, fish, and invertebrates), and anthropogenic sound (*e.g.,* vessels, dredging, aircraft, construction).

The sum of the various natural and anthropogenic sound sources at any given location and time—which comprise ''ambient'' or ''background'' sound—depends not only on the source levels (as determined by current weather conditions and levels of biological and shipping activity) but also on the ability of sound to propagate through the environment. In turn, sound propagation is dependent on the spatially and temporally varying properties of the water column and sea floor, and is frequency-dependent. As a result of the dependence on a large number of varying factors, ambient sound levels can be expected to vary widely over both coarse and fine spatial and temporal scales. Sound levels at a given frequency and location can vary by 10–20 dB from day to day (Richardson *et al.,* 1995). The result is that, depending on the source type and its intensity, sound from the specified activity may be a negligible addition to the local environment or could form a distinctive signal that may affect marine mammals.

In-water construction activities associated with the project would include impact and vibratory pile driving and removal. The sounds produced by these activities fall into one of two general sound types: impulsive and non-impulsive. Impulsive sounds (*e.g.,* explosions, gunshots, sonic booms, impact pile driving) are typically transient, brief (less than 1 second), broadband, and consist of high peak sound pressure with rapid rise time and rapid decay (ANSI, 1986; National Institute of Occupational Safety and Health (NIOSH), 1998; 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 rapid rise/decay time that impulsive sounds do (ANSI, 1995; NIOSH, 1998; NMFS, 2018). The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (*e.g.,* Ward, 1997, in Southall *et al.,* 2007).

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

The likely or possible impacts of CBS'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 equipment and personnel; however, any impacts to marine mammals are expected to be primarily acoustic in nature. Acoustic stressors include effects of heavy equipment operation during pile installation and removal.

Acoustic Effects

The introduction of anthropogenic noise into the aquatic environment from pile driving and removal is the means by which marine mammals may be harassed from CBS's specified activity. In general, animals exposed to natural or anthropogenic sound may experience behavioral, physiological, and/or physical effects, ranging in magnitude from none to severe (Southall *et al.,* 2007, 2019). In general, exposure to pile driving noise has the potential to result in behavioral reactions (*e.g.,* avoidance, temporary cessation of foraging and vocalizing, changes in dive behavior) and, in limited cases, an auditory threshold shift (TS). 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 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 (TSs) followed by behavioral effects and potential impacts on habitat.

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

Permanent Threshold Shift (PTS)—NMFS defines PTS as a permanent, irreversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS, 2018). Available data from humans and other terrestrial mammals indicate that a 40-dB TS approximates PTS onset (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 (Southall *et al.,* 2007), a TTS of 6 dB is considered the minimum TS 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 (SEL_{cum}) in an accelerating fashion: At low exposures with lower SEL_{cum}, the amount of TTS is typically small and the growth curves have shallow slopes. At exposures with higher SEL_{cum}, the growth curves become steeper and approach linear relationships with the noise SEL.

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

Many studies have examined noise-induced hearing loss in marine mammals (see Finneran (2015) and Southall *et al.* (2019) for summaries). TTS is the mildest form of hearing impairment that can occur during exposure to sound (Kryter, 2013). While experiencing TTS, the hearing threshold rises, and a sound must be at a higher level in order to be heard. In terrestrial and marine mammals, TTS can last from minutes or hours to days (in cases of strong TTS). In many cases, hearing sensitivity recovers rapidly after exposure to the sound ends. For cetaceans, published data on the onset of TTS are limited to captive bottlenose dolphin (*Tursiops truncatus*), beluga whale, harbor porpoise, and Yangtze finless porpoise (*Neophocoena asiaeorientalis*) (Southall *et al.,* 2019). For pinnipeds in water, measurements of TTS are limited to harbor seals, elephant seals (*Mirounga angustirostris*), bearded seals (*Erignathus barbatus*) and California sea lions (*Zalophus californianus*) (Kastak *et al.,* 1999, 2007; Kastelein *et al.,* 2019b, 2019c, 2021, 2022a, 2022b; Reichmuth *et al.,* 2019; Sills *et al.,* 2020). TTS was not observed in spotted (*Phoca largha*) and ringed (*Pusa hispida*) seals exposed to single airgun impulse sounds at levels matching previous predictions of TTS onset (Reichmuth *et al.,* 2016). These studies examine hearing thresholds measured in marine mammals before and after exposure to intense or long-duration sound exposures. The difference between the pre-exposure and post-exposure thresholds can be used to determine the amount of threshold shift at various post-exposure times.

The amount and onset of TTS depends on the exposure frequency.

Sounds at low frequencies, well below the region of best sensitivity for a species or hearing group, are less hazardous than those at higher frequencies, near the region of best sensitivity (Finneran and Schlundt, 2013). At low frequencies, onset-TTS exposure levels are higher compared to those in the region of best sensitivity (*i.e.,* a low frequency noise would need to be louder to cause TTS onset when TTS exposure level is higher), as shown for harbor porpoises and harbor seals (Kastelein *et al.,* 2019a, 2019c). Note that in general, harbor seals and harbor porpoises have a lower TTS onset than other measured pinniped or cetacean species (Finneran, 2015). In addition, TTS can accumulate across multiple exposures, but the resulting TTS will be less than the TTS from a single, continuous exposure with the same SEL (Mooney *et al.,* 2009; Finneran *et al.,* 2010; Kastelein *et al.,* 2014, 2015). This means that TTS predictions based on the total, cumulative SEL will overestimate the amount of TTS from intermittent exposures, such as sonars and impulsive sources. Nachtigall *et al.* (2018) describe measurements of hearing sensitivity of multiple odontocete species (bottlenose dolphin, harbor porpoise, beluga, and false killer whale (*Pseudorca crassidens*)) when a relatively loud sound was preceded by a warning sound. These captive animals were shown to reduce hearing sensitivity when warned of an impending intense sound. Based on these experimental observations of captive animals, the authors suggest that wild animals may dampen their hearing during prolonged exposures or if conditioned to anticipate intense sounds. Another study showed that echolocating animals (including odontocetes) might have anatomical specializations that might allow for conditioned hearing reduction and filtering of low-frequency ambient noise, including increased stiffness and control of middle ear structures and placement of inner ear structures (Ketten *et al.,* 2021). Data available on noise-induced hearing loss for mysticetes are currently lacking (NMFS, 2018). Additionally, the existing marine mammal TTS data come from a limited number of individuals within these species.

Relationships between TTS and PTS thresholds have not been studied in marine mammals, and there is no PTS data for cetaceans, but such relationships are assumed to be similar to those in humans and other terrestrial mammals. PTS typically occurs at exposure levels at least several decibels above that inducing mild TTS (*e.g.,* a 40-dB threshold shift approximates PTS onset (Kryter *et al.,* 1966; Miller, 1974), while a 6-dB threshold shift approximates TTS onset (Southall *et al.,* 2007, 2019). Based on data from terrestrial mammals, a precautionary assumption is that the PTS thresholds for impulsive sounds (such as impact pile driving pulses as received close to the source) are at least 6 dB higher than the TTS threshold on a peak-pressure basis and PTS cumulative sound exposure level thresholds are 15 to 20 dB higher than TTS cumulative sound exposure level thresholds (Southall *et al.,* 2007, 2019). Given the higher level of sound or longer exposure duration necessary to cause PTS as compared with TTS, it is considerably less likely that PTS could occur.

Activities for this project include impact and vibratory pile driving and removal. There would likely be pauses in activities producing the sound during each day. Given these pauses and the fact that many marine mammals are likely moving through the project areas and not remaining for extended periods of time, the potential for TS declines.

Behavioral Harassment—Exposure to noise from pile driving also has the potential to behaviorally disturb marine mammals. Generally speaking, NMFS considers a behavioral disturbance that rises to the level of harassment under the MMPA a non-minor response—in other words, not every response qualifies as behavioral disturbance, and for responses that do, those of a higher level, or accrued across a longer duration, have the potential to affect foraging, reproduction, or survival. Behavioral disturbance may include a variety of effects, including subtle changes in behavior (*e.g.,* minor or brief avoidance of an area or changes in vocalizations), more conspicuous changes in similar behavioral activities, and more sustained and/or potentially severe reactions, such as displacement from or abandonment of high-quality habitat. Behavioral responses may include changing durations of surfacing and dives, changing direction and/or speed; reducing/increasing vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); eliciting a visible startle response or aggressive behavior (such as tail/fin 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.,* 2004; Southall *et al.,* 2007, 2019; Weilgart, 2007; Archer *et al.,* 2010). Behavioral reactions can vary not only among individuals but also within an individual, depending on previous experience with a sound source, context, and numerous other factors (Ellison *et al.,* 2012), and can vary depending on characteristics associated with the sound source (*e.g.,* whether it is moving or stationary, number of sources, distance from the source). In general, pinnipeds seem more tolerant of, or at least habituate more quickly to, potentially disturbing underwater sound than do cetaceans, and generally seem to be less responsive to exposure to industrial sound than most cetaceans. Please see Appendices B and C of Southall *et al.* (2007) and Gomez *et al.* (2016) for reviews of studies involving marine mammal behavioral responses to sound.

Habituation can occur when an animal's response to a stimulus wanes with repeated exposure, usually in the absence of unpleasant associated events (Wartzok *et al.,* 2004). Animals are most likely to habituate to sounds that are predictable and unvarying. It is important to note that habituation is appropriately considered as a ''progressive reduction in response to stimuli that are perceived as neither aversive nor beneficial,'' rather than as, more generally, moderation in response to human disturbance (Bejder *et al.,* 2009). The opposite process is sensitization, when an unpleasant experience leads to subsequent responses, often in the form of avoidance, at a lower level of exposure.

As noted above, behavioral state may affect the type of response. For example, animals that are resting may show greater behavioral change in response to disturbing sound levels than animals that are highly motivated to remain in an area for feeding (Richardson *et al.,* 1995; Wartzok *et al.,* 2004; National Research Council (NRC), 2005). Controlled experiments with captive marine mammals have showed pronounced behavioral reactions, including avoidance of loud sound sources (Ridgway *et al.,* 1997; Finneran *et al.,* 2003). Observed responses of wild marine mammals to loud pulsed sound sources (*e.g.,* seismic airguns) have been varied but often consist of avoidance behavior or other behavioral changes (Richardson *et al.,* 1995; Morton and Symonds, 2002; Nowacek *et al.,* 2007).

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). However, there are broad categories of potential response, which we describe in greater detail here, that include alteration of dive behavior, alteration of foraging behavior, effects to breathing, interference with or alteration of vocalization, avoidance, and flight.

Changes in dive behavior can vary widely and may consist of increased or decreased dive times and surface intervals as well as changes in the rates of ascent and descent during a dive (*e.g.,* Frankel and Clark, 2000; Costa *et al.,* 2003; Ng and Leung, 2003; Nowacek *et al.,* 2004; Goldbogen *et al.,* 2013a, 2013b). Variations in dive behavior may reflect interruptions in biologically significant activities (*e.g.,* foraging) or they may be of little biological significance. The impact of an alteration to dive behavior resulting from an acoustic exposure depends on what the animal is doing at the time of the exposure and the type and magnitude of the response.

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.

Variations in respiration naturally vary with different behaviors and alterations to breathing rate as a function of acoustic exposure can be expected to co-occur with other behavioral reactions, such as a flight response or an alteration in diving. However, respiration rates in and of themselves may be representative of annoyance or an acute stress response. Various studies have shown that respiration rates may either be unaffected or could increase, depending on the species and signal characteristics, again highlighting the importance in understanding species differences in the tolerance of underwater noise when determining the potential for impacts resulting from anthropogenic sound exposure (*e.g.,* Kastelein *et al.,* 2001, 2005, 2006; Gailey *et al.,* 2007). For example, harbor porpoise' respiration rate increased in response to pile driving sounds at and above a received broadband SPL of 136 dB (zero-peak SPL: 151 dB re 1 μPa; SEL of a single strike: 127 dB re 1 μPa^2-s) (Kastelein *et al.,* 2013).

Marine mammals vocalize for different purposes and across multiple modes, such as whistling, echolocation click production, calling, and singing. Changes in vocalization behavior in response to anthropogenic noise can occur for any of these modes and may result from a need to compete with an increase in background noise or may reflect increased vigilance or a startle response. For example, in the presence of potentially masking signals, humpback whales and killer whales have been observed to increase the length of their songs (Miller *et al.,* 2000; Fristrup *et al.,* 2003) or vocalizations (Foote *et al.,* 2004), respectively, while North Atlantic right whales (*Eubalaena glacialis*) have been observed to shift the frequency content of their calls upward while reducing the rate of calling in areas of increased anthropogenic noise (Parks *et al.,* 2007). In some cases, animals may cease sound production during production of aversive signals (Bowles *et al.,* 1994).

Avoidance is the displacement of an individual from an area or migration path as a result of the presence of a sound or other stressors, and is one of the most obvious manifestations of disturbance in marine mammals (Richardson *et al.,* 1995). For example, gray whales are known to change direction—deflecting from customary migratory paths—in order to avoid noise from seismic surveys (Malme *et al.,* 1984). Avoidance may be short-term, with animals returning to the area once the noise has ceased (*e.g.,* Bowles *et al.,* 1994; Goold, 1996; Stone *et al.,* 2000; Morton and Symonds, 2002; Gailey *et al.,* 2007). Longer-term displacement is possible, however, which may lead to changes in abundance or distribution patterns of the affected species in the affected region if habituation to the presence of the sound does not occur (*e.g.,* Blackwell *et al.,* 2004; Bejder *et al.,* 2006; Teilmann *et al.,* 2006).

A flight response is a dramatic change in normal movement to a directed and rapid movement away from the perceived location of a sound source. The flight response differs from other avoidance responses in the intensity of the response (*e.g.,* directed movement, rate of travel). Relatively little information on flight responses of marine mammals to anthropogenic signals exist, although observations of flight responses to the presence of predators have occurred (Connor and Heithaus, 1996; Bowers *et al.,* 2018). The result of a flight response could range from brief, temporary exertion and displacement from the area where the signal provokes flight to, in extreme cases, marine mammal strandings (England *et al.,* 2001). However, it should be noted that response to a perceived predator does not necessarily invoke flight (Ford and Reeves, 2008), and whether individuals are solitary or in groups may influence the response.

Behavioral disturbance can also impact marine mammals in more subtle ways. Increased vigilance may result in costs related to diversion of focus and attention (*i.e.,* when a response consists of increased vigilance, it may come at the cost of decreased attention to other critical behaviors such as foraging or resting). These effects have generally not been demonstrated for marine mammals, but studies involving fishes and terrestrial animals have shown that increased vigilance may substantially reduce feeding rates (*e.g.,* Beauchamp and Livoreil, 1997; Fritz *et al.,* 2002; Purser and Radford, 2011). In addition, chronic disturbance can cause population declines through reduction of fitness (*e.g.,* decline in body condition) and subsequent reduction in reproductive success, survival, or both (*e.g.,* Harrington and Veitch, 1992; Daan *et al.,* 1996; Bradshaw *et al.,* 1998). However, Ridgway *et al.* (2006) reported that increased vigilance in bottlenose dolphins exposed to sound over a 5-day period did not cause any sleep deprivation or stress effects.

Many animals perform vital functions, such as feeding, resting, traveling, and socializing, on a diel cycle (24-hour cycle). Disruption of such functions resulting from reactions to stressors such as sound exposure are more likely to be significant if they last more than one diel cycle or recur on subsequent days (Southall *et al.,* 2007). Consequently, a behavioral response lasting less than 1 day and not recurring on subsequent days is not considered particularly severe unless it could directly affect reproduction or survival (Southall *et al.,* 2007). Note that there is a difference between multi-day substantive (*i.e.,* meaningful) behavioral reactions and multi-day anthropogenic activities. For example, just because an activity lasts for multiple days does not necessarily mean that individual animals are either exposed to activity-related stressors for multiple days or, further, exposed in a manner resulting in sustained multi-day substantive behavioral responses.

During a dock replacement project completed at this site in 2017, monitors observed marine mammals during construction activities (*i.e.,* vibratory or impact installation 30-in and 48-in steel piles; and vibratory removal of 16-in wood piles) on 22 days between October 9 and November 9 (TMC, 2017). In most cases behaviors were not reported, but there is some information to indicate that during pile driving a Steller sea lion was observed feeding, and humpback whales were observed moving through the project area to the mouth of the bay or to the inner bay. We expect similar behavioral responses of marine mammals to CBS's specified activity for this proposed project. That is, disturbance, if any, is likely to be temporary and localized (*e.g.,* small area movements).

Stress Responses—An animal's perception of a threat may be sufficient to trigger stress responses consisting of some combination of behavioral responses, autonomic nervous system responses, neuroendocrine responses, or immune responses (*e.g.,* Seyle, 1950; Moberg, 2000). In many cases, an animal's first and sometimes most economical (in terms of energetic costs) response is behavioral avoidance of the potential stressor. Autonomic nervous system responses to stress typically involve changes in heart rate, blood pressure, and gastrointestinal activity. These responses have a relatively short duration and may or may not have a significant long-term effect on an animal's fitness.

Neuroendocrine stress responses often involve the hypothalamus-pituitary-adrenal system. Virtually all neuroendocrine functions that are affected by stress—including immune competence, reproduction, metabolism, and behavior—are regulated by pituitary hormones. Stress-induced changes in the secretion of pituitary hormones have been implicated in failed reproduction, altered metabolism, reduced immune competence, and behavioral disturbance (*e.g.,* Moberg, 1987; Blecha, 2000). Increases in the circulation of glucocorticoids are also equated with stress (Romano *et al.,* 2004).

The primary distinction between stress (which is adaptive and does not normally place an animal at risk) and ''distress'' is the cost of the response. During a stress response, an animal uses glycogen stores that can be quickly replenished once the stress is alleviated. In such circumstances, the cost of the stress response would not pose serious fitness consequences. However, when an animal does not have sufficient energy reserves to satisfy the energetic costs of a stress response, energy resources must be diverted from other functions. This state of distress will last until the animal replenishes its energetic reserves sufficient to restore normal function.

Relationships between these physiological mechanisms, animal behavior, and the costs of stress responses are well-studied through controlled experiments and for both laboratory and free-ranging animals (*e.g.,* Holberton *et al.,* 1996; Hood *et al.,* 1998; Jessop *et al.,* 2003; Krausman *et al.,* 2004; Lankford *et al.,* 2005). Stress responses due to exposure to anthropogenic sounds or other stressors and their effects on marine mammals have also been reviewed (Fair and Becker, 2000; Romano *et al.,* 2002b) and, more rarely, studied in wild populations (*e.g.,* Romano *et al.,* 2002a). For example, Rolland *et al.* (2012) found that noise reduction from reduced ship traffic in the Bay of Fundy was associated with decreased stress in North Atlantic right whales. These and other studies lead to a reasonable expectation that some marine mammals will experience physiological stress responses upon exposure to acoustic stressors and that it is possible that some of these would be classified as ''distress.'' In addition, any animal experiencing TTS would likely also experience stress responses (NRC, 2003), however distress is an unlikely result of this project based on observations of marine mammals during previous, similar projects in the area.

Auditory Masking. Since many marine mammals rely on sound to find prey, moderate social interactions, and facilitate mating (Tyack, 2008), noise from anthropogenic sound sources can interfere with these functions, but only if the noise spectrum overlaps with the hearing sensitivity of the receiving marine mammal (Southall *et al.,* 2007; Clark *et al.,* 2009; Hatch *et al.,* 2012). Chronic exposure to excessive, though not high-intensity, noise could cause masking at particular frequencies for marine mammals that utilize sound for vital biological functions (Clark *et al.,* 2009). Acoustic masking is when other noises such as from human sources interfere 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; Erbe *et al.,* 2016). Therefore, under certain circumstances, marine mammals whose acoustical sensors or environment are being severely masked could also be impaired from maximizing their performance fitness in survival and reproduction. 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 (Hotchkin and Parks, 2013).

Under certain circumstances, marine mammals experiencing significant masking could also be impaired from maximizing their performance fitness in survival and reproduction. Therefore, when the coincident (masking) sound is human-made, it may be considered harassment when disrupting or altering critical behaviors. It is important to distinguish TTS and PTS, which persist after the sound exposure, from masking, which occurs during the sound exposure. Because masking (without resulting in TS) is not associated with abnormal physiological function, it is not considered a physiological effect, but rather a potential behavioral effect (though not necessarily one that would be associated with harassment).

The frequency range of the potentially masking sound is important in determining any potential behavioral impacts. For example, low-frequency signals may have less effect on high-frequency echolocation sounds produced by odontocetes but are more likely to affect detection of mysticete communication calls and other potentially important natural sounds such as those produced by surf and some prey species. The masking of communication signals by anthropogenic noise may be considered as a reduction in the communication space of animals (*e.g.,* Clark *et al.,* 2009) and may result in energetic or other costs as animals change their vocalization behavior (*e.g.,* Miller *et al.,* 2000; Foote *et al.,* 2004; Parks *et al.,* 2007; Di Iorio and Clark, 2010; Holt *et al.,* 2009). Masking can be reduced in situations where the signal and noise come from different directions (Richardson *et al.,* 1995), through amplitude modulation of the signal, or through other compensatory behaviors (Hotchkin and Parks, 2013). Masking can be tested directly in captive species (*e.g.,* Erbe, 2008), but in wild populations it must be either modeled or inferred from evidence of masking compensation. There are few studies addressing real-world masking sounds likely to be experienced by marine mammals in the wild (*e.g.,* Branstetter *et al.,* 2013).

Marine mammals at or near the proposed CBS project site may be exposed to anthropogenic noise which may be a source of masking. Vocalization changes may result from a need to compete with an increase in background noise and include increasing the source level, modifying the frequency, increasing the call repetition rate of vocalizations, or ceasing to vocalize in the presence of increased noise (Hotchkin and Parks, 2013). For example, in response to loud noise, beluga whales may shift the frequency of their echolocation clicks to prevent masking by anthropogenic noise (Tyack, 2000; Eickmeier and Vallarta, 2022).

Masking is more likely to occur in the presence of broadband, relatively continuous noise sources such as vibratory pile driving. Energy distribution of pile driving covers a broad frequency spectrum, and sound from pile driving would be within the audible range of pinnipeds and cetaceans present in the proposed action area. While some construction during the CBS's activities may mask some acoustic signals that are relevant to the daily behavior of marine mammals, the short-term duration and limited areas affected make it very unlikely that the fitness of individual marine mammals would be impacted.

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

Marine Mammal Habitat Effects

The project would occur in an active marine commercial and industrial area. The new facility will consist primarily of new structures though an existing boat ramp will be filled. Construction activities at the Gary Paxton Industrial Park could have localized, temporary impacts on marine mammal habitat and their prey by increasing in-water SPLs and slightly decreasing water quality. Increased noise levels may affect acoustic habitat (see *Masking* discussion above) and adversely affect marine mammal prey in the vicinity of the project area (see discussion below). During vibratory and impact pile driving, elevated levels of underwater noise would ensonify a portion of Eastern Channel and Silver Bay, where both fish and mammals occur and could affect foraging success.

Construction activities are of short duration and would likely have temporary impacts on marine mammal habitat through increases in underwater and airborne sound. These sounds would not be detectable at the nearest known Steller sea lion and harbor sea haulouts, which are well beyond the maximum distance of predicted in-air acoustical disturbance.

Water Quality—Temporary and localized reduction in water quality would occur as a result of in-water construction activities. Most of this effect would occur during the installation and removal of piles when bottom sediments are disturbed. The installation and removal of piles would disturb bottom sediments and may cause a temporary increase in suspended sediment in the project area. During pile removal, sediment attached to the pile moves vertically through the water column until gravitational forces cause it to slough off under its own weight. The small resulting sediment plume is expected to settle out of the water column within a few hours. Studies of the effects of turbid water on fish (marine mammal prey) suggest that concentrations of suspended sediment can reach thousands of milligrams per liter before an acute toxic reaction is expected (Burton, 1993).

Effects to turbidity and sedimentation are expected to be short-term, minor, and localized. Suspended sediments in the water column should dissipate and quickly return to background levels in all construction scenarios. Turbidity within the water column has the potential to reduce the level of oxygen in the water and irritate the gills of prey fish species in the proposed project area. However, turbidity plumes associated with the project would be temporary and localized, and fish in the proposed project area would be able to move away from and avoid the areas where plumes may occur. Therefore, it is expected that the impacts on prey fish species from turbidity, and therefore on marine mammals, would be minimal and temporary. In general, the area likely impacted by the proposed construction activities is relatively small compared to the available marine mammal habitat in Silver Bay, and does not include any areas of particular importance.

In-Water Construction Effects on Potential Prey—Sound may affect marine mammals through impacts on the abundance, behavior, or distribution of prey species (*e.g.,* crustaceans, cephalopods, fish, zooplankton). Marine mammal prey varies by species, season, and location and, for some, is not well documented. Here, we describe studies regarding the effects of noise on known marine mammal prey.

Fish utilize the soundscape and components of sound in their environment to perform important functions such as foraging, predator avoidance, mating, and spawning (*e.g.,* Zelick *et al.,* 1999; Fay, 2009). Depending on their hearing anatomy and peripheral sensory structures, which vary among species, fishes hear sounds using pressure and particle motion sensitivity capabilities and detect the motion of surrounding water (Fay *et al.,* 2008). The potential effects of noise on fishes depends on the overlapping frequency range, distance from the sound source, water depth of exposure, and species-specific hearing sensitivity, anatomy, and physiology. Key impacts to fishes may include behavioral responses, hearing damage, barotrauma (pressure-related injuries), and mortality.

Fish react to sounds which are especially strong and/or intermittent low-frequency sounds, and behavioral responses such as flight or avoidance are the most likely effects. Short duration, sharp sounds can cause overt or subtle changes in fish behavior and local distribution. The reaction of fish to noise depends on the physiological state of the fish, past exposures, motivation (*e.g.,* feeding, spawning, migration), and other environmental factors. 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). Several studies have demonstrated that impulse sounds might affect the distribution and behavior of some fishes, potentially impacting foraging opportunities or increasing energetic costs (*e.g.,* Fewtrell and McCauley, 2012; Pearson *et al.,* 1992; Skalski *et al.,* 1992; Santulli *et al.,* 1999; Paxton *et al.,* 2017). However, some studies have shown no or slight reaction to impulse sounds (*e.g.,* Pena *et al.,* 2013; Wardle *et al.,* 2001; Jorgenson and Gyselman, 2009; Cott *et al.,* 2012). More commonly, though, the impacts of noise on fish are temporary.

SPLs of sufficient strength have been known to cause injury to fish and fish mortality. However, in most fish species, hair cells in the ear continuously regenerate and loss of auditory function likely is restored when damaged cells are replaced with new cells. Halvorsen *et al.* (2012a) showed that a TTS of 4–6 dB was recoverable within 24 hours for one species. Impacts would be most severe when the individual fish is close to the source and when the duration of exposure is long. Injury caused by barotrauma can range from slight to severe and can cause death, and is most likely for fish with swim bladders. Barotrauma injuries have been documented during controlled exposure to impact pile driving (Halvorsen *et al.,* 2012b; Casper *et al.,* 2013).

The greatest potential impact to fishes during construction would occur during impact pile installation of 24-in and 36-in steel pipe piles, which is estimated to occur on up to 30 days for a maximum of 6,000 strikes per day. In-water construction activities would only occur during daylight hours, allowing fish to forage and transit the project area in the evening. Vibratory pile driving would possibly elicit behavioral reactions from fishes such as temporary avoidance of the area but is unlikely to cause injuries to fishes or have persistent effects on local fish populations. Construction also would have minimal permanent and temporary impacts on benthic invertebrate species, a marine mammal prey source. In addition, it should be noted that the area in question is low-quality habitat since it is already highly developed and experiences a high level of anthropogenic noise from normal operations and other vessel traffic. In general, any negative impacts on marine mammal prey species are expected to be minor and temporary.

Fish populations in the proposed project area that serve as marine mammal prey could be temporarily affected by noise from pile installation and removal. The frequency range in which fishes generally perceive underwater sounds is 50 to 2,000 Hz, with peak sensitivities below 800 Hz (Popper and Hastings, 2009). Fish behavior or distribution may change, especially with strong and/or intermittent sounds that could harm fishes. High underwater SPLs have been documented to alter behavior, cause hearing loss, and injure or kill individual fish by causing serious internal injury (Hastings and Popper, 2005).

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

In-Water Construction Effects on Potential Foraging Habitat—The areas likely impacted by the project are relatively small compared to the available habitat in adjacent Sitka Sound and does not include any BIAs or ESA-designated critical habitat. The total seafloor area affected by pile installation and removal and the new dock footprints is a small area compared to the vast foraging area available to marine mammals in the area. Pile driving and removal at the project site would not obstruct long-term movements or migration of marine mammals.

Avoidance by potential prey (*i.e.,* fish or, in the case of transient killer whales, other marine mammals) of the immediate area due to the temporary loss of this foraging habitat is also possible. The duration of fish and marine mammal 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 or marine mammals of the disturbed area would still leave significantly large areas of fish and marine mammal foraging habitat in the nearby vicinity.

In summary, given the short daily duration of sound associated with individual pile driving events and the relatively small areas being affected, pile driving activities associated with the proposed action are not likely to have a permanent adverse effect on any fish habitat, or populations of fish species. 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. 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 of Marine Mammals

This section provides an estimate of the number of incidental takes proposed for authorization through the IHA, which will inform NMFS' consideration of ''small numbers,'' the negligible impact determinations, and impacts on subsistence uses.

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.,* pile driving) has the potential to result in disruption of behavioral patterns for individual marine mammals. There is also some potential for auditory injury (Level A harassment) to result, primarily for mysticetes, high frequency species and phocids because predicted auditory injury zones are larger than for mid-frequency species and otariids. Auditory injury is unlikely to occur for other groups except Steller sea lions because this species is expected to commonly occur in close proximity to the project area. The proposed mitigation and monitoring measures are expected to minimize the severity of the taking to the extent practicable.

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

For acoustic impacts, generally speaking, we estimate take by considering: (1) acoustic thresholds above which NMFS believes the best available science indicates marine mammals 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) the number of days of activities. We note that while these factors can contribute to a basic calculation to provide an initial prediction of potential takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.,* previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the proposed take estimates.

Acoustic Thresholds

NMFS recommends the use of acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment).

Level B Harassment—Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source or exposure context (*e.g.,* frequency, predictability, duty cycle, duration of the exposure, signal-to-noise ratio, distance to the source), the environment (*e.g.,* bathymetry, other noises in the area, predators in the area), and the receiving animals (hearing, motivation, experience, demography, life stage, depth) and can be difficult to predict (*e.g.,* Southall *et al.,* 2007, 2021; Ellison *et al.,* 2012). Based on what the available science indicates and the practical need to use a threshold based on a metric that is both predictable and measurable for most activities, NMFS typically uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS generally predicts that marine mammals are likely to be behaviorally harassed in a manner considered to be Level B harassment when exposed to underwater anthropogenic noise above root-mean-squared pressure received levels (RMS SPL) of 120 dB (referenced to 1 micropascal (re 1 μPa)) for continuous (*e.g.,* vibratory pile driving, drilling) and above RMS SPL 160 dB re 1 μPa for non-explosive impulsive (*e.g.,* seismic airguns) or intermittent (*e.g.,* scientific sonar) sources. Generally speaking, Level B harassment take estimates based on these behavioral harassment thresholds are expected to include any likely takes by TTS as, in most cases, the likelihood of TTS occurs at distances from the source less than those at which behavioral harassment is likely. TTS of a sufficient degree can manifest as behavioral harassment, as reduced hearing sensitivity and the potential reduced opportunities to detect important signals (conspecific communication, predators, prey) may result in changes in behavior patterns that would not otherwise occur.

CBS's proposed activity includes the use of continuous (vibratory pile driving) and impulsive (impact pile driving) sources, and therefore the RMS SPL thresholds of 120 and 160 dB re 1 μPa is/are applicable.

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

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

TABLE 4—THRESHOLDS IDENTIFYING THE ONSET OF PTS

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

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

Note: Peak sound pressure (L_{pk}) has a reference value of 1 μPa, and cumulative sound exposure level (L_E) has a reference value of 1μPa²s. In this table, thresholds are abbreviated to reflect ANSI 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 are used in estimating the area ensonified above the acoustic thresholds, including source levels and transmission loss coefficient.

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

The project includes vibratory pile installation and removal, and impact pile driving. Source levels for these activities are based on reviews of measurements of the same or similar types and dimensions of piles available in the literature. Source levels for each pile size and activity each year are presented in table 5. Source levels for vibratory installation and removal of piles of the same diameter are assumed to be the same.

TABLE 5—ESTIMATES OF MEAN UNDERWATER SOUND LEVELS * GENERATED DURING VIBRATORY AND IMPACT PILE INSTALLATION AND VIBRATORY PILE REMOVAL

Pile driving method	Pile type	Pile size (in.)	dB RMS	dB peak	dB SEL	Reference
Impact	Steel Pipe Support Pile Steel Pipe Batter Pile	36	193	210	183	Caltrans 2015, 2020.
Vibratory Installation and Extraction.	Steel Pipe Support Steel Pipe Batter	36	166	N/A	N/A	NMFS 2023 Calculations.
	Steel Pipe Fender Steel Pipe Template	24	163	N/A	N/A	NMFS 2023 Calculations.

Note: dB peak = peak sound level; rms = root mean square; SEL = sound exposure level.
* All sound levels are referenced at 10 m.

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:

$$TL = B \times \text{Log}10\ (R_1/R_2),$$

where

TL = transmission loss in dB
B = transmission loss coefficient
R_1 = the distance of the modeled SPL from the driven pile, and
R_2 = the distance from the driven pile of the initial measurement

Absent site-specific acoustical monitoring with differing measured *TL,* a practical spreading value of 15 is used as the *TL* coefficient in the above formula. Site-specific *TL* data for the Sitka Sound are not available; therefore, the default coefficient of 15 is used to determine the distances to the Level A harassment and Level B harassment thresholds.

The ensonified area associated with Level A harassment is more technically challenging to predict due to the need to account for a duration component. Therefore, NMFS developed an optional User Spreadsheet tool to accompany the Technical Guidance that can be used to relatively simply predict an isopleth distance for use in conjunction with marine mammal density or occurrence to help predict potential takes. We note that because of some of the assumptions included in the methods underlying this optional tool, we anticipate that the resulting isopleth estimates are typically going to be overestimates of some degree, which may result in an overestimate of potential take by Level A harassment. However, this optional tool offers the best way to estimate isopleth distances when more sophisticated modeling methods are not available or practical. For stationary sources such as pile driving, the optional User Spreadsheet tool predicts the distance at which, if a marine mammal remained at that distance for the duration of the activity, it would be expected to incur PTS. Inputs used in the optional User Spreadsheet tool, and the resulting estimated isopleths, are reported below.

TABLE 6—USER SPREADSHEET INPUTS

	Vibratory				Impact	
	36-in haulout pier support pile	36-in haulout pier batter pile	24-in haulout pier fender pile	24-in template pile	36-in haulout pier support pile	36-in haulout pier batter pile
	Installation			Installation or removal	Installation	
Spreadsheet Tab Used	A.1) Vibratory Pile Driving				E.1) Impact Pile Driving	
Source Level (SPL)	166 RMS		163 RMS		183 SEL	
Transmission Loss Coefficient	15					
Weighting Factor Adjustment (kHz)	2.5				2	
Activity Duration per day (minutes)	60	120	30	20		
Number of strikes per pile					2,000	3,000
Number of piles per day	2				4	8
Distance of sound pressure level measurement	10					

TABLE 7—LEVEL A HARASSMENT AND LEVEL B HARASSMENT ISOPLETHS AND ASSOCIATED AREAS FROM VIBRATORY AND IMPACT PILE DRIVING AND VIBRATORY REMOVAL

Pile size/type	Method	Level A harassment: isopleths (m), areas *(km²)*					Level B harassment: isopleth (m). areas (km²)
		LF	MF	HF	PW	OW	
Haulout Pier Support Pile							
36-in steel pipe pile	Vibratory Installation	23.4, (*0.006*)	2.1, (*0.001*)	34.5, (*0.009*)	14.2, (*0.004*)	1.0, (*0.001*)	11,659, (*9.41*)
	Impact Installation	2,516, (*3.13*)	89.5, (*0.022*)	2,997, (*3.64*)	1,347, (*1.49*)	98, (*0.024*)	1,585, (*1.94*)
Haulout Pier Batter Pile							
36-in Steel Pipe Pile	Vibratory Installation	37.1, (*0.010*)	3.3, (*0.003*)	54.8, (*0.013*)	22.5, (*0.006*)	1.6, (*0.001*)	11,659, (*9.41*)
	Impact Installation	3,297, (3.97)	117.3, (*0.029*)	3,928, (*4.64*)	1,765, (*2.24*)	128, (*0.032*)	1,585, (*1.94*)
Haulout Pier Fender Pile							
24-in Steel Pipe Pile	Vibratory Installation	14.7, (*0.004*)	1.3, (*0.001*)	21.8, (*0.006*)	9.0, (*0.003*)	0.6, (*0.001*)	7,356, (*7.61*)
Template Pile							
24-in Steel Pipe Pile	Vibratory Installation and Removal.	17.9, (*0.005*)	1.6, (*0.001*)	26.4, (*0.008*)	10.9, (*0.003*)	0.8, (*0.001*)	7,356, (*7.61*)

Marine Mammal Occurrence and Take Estimation

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

Additionally, we describe how the occurrence information is synthesized to produce a quantitative estimate of the take that is reasonably likely to occur and proposed for authorization. Available information regarding marine mammal occurrence in the vicinity of the project area includes site-specific and nearby survey information and historic data sets. Prior data sets consulted included: (1) Protected Species Observer (PSO) monitoring completed at the project site on 8 days between September 20 and 29, 2023 during the geotechnical investigation preceding this project (Solstice, 2023), (2) PSO monitoring completed at the project site on 22 days between October and November 2017 during the Multipurpose Dock Project (TMC, 2017), (3) PSO monitoring completed at O'Connell Bridge (approximately 7 km to the east of the project site) on 4 days in June 2019 (CBS, 2019); (4) Land-based surveys conducted at Sitka's Whale Park completed weekly between September and May 1995–2000 (Straley and Pendell (2017)); and, (5) data available on the GBIF (see IHA application for further details).

To estimate take, CBS referred to the above referenced data sets to estimate takes per day for each species and multiplied this factor by the total number of construction days. NMFS finds it more appropriate to describe the take estimate inputs according to a daily occurrence probability in which groups per day and group size are estimated for each species and multiplied by the number of days of each type of pile driving activity. The equation used to estimate take by Level B harassment for all species is:

Exposure Estimate = group size × groups per day × days of pile driving activity.

CBS proposes to implement shutdown zones for mid-frequency cetaceans and otariids (except Steller sea lions) that meet or exceed the Level A harassment isopleths for all activities. For phocids, high frequency cetaceans, and low-frequency cetaceans, the calculated Level A harassment zones exceed the proposed shutdown zones during impact installation of 36-in steel piles, planned to occur on 30 construction days. Because the best available abundance estimates for these species cover the general region of Sitka Sound and Silver Bay, estimates of take by Level A harassment were based on the maximum predicted Level B isopleth for each pile type, typically from vibratory pile driving. In the absence of density data, best available monitoring data for the general area were used to estimate take by Level A harassment. Specifically, to calculate estimated take by Level A harassment for these species, we proportionally compared, by hearing group, the portion of the largest Level A harassment area (km²) that exceeds the planned shutdown zone area (km²) to the area (km²) of the largest Level B harassment zone across that pile type (typically from vibratory pile driving). This ratio was then multiplied by the group size, daily sightings, and number of construction days, according to the following equation:

Take by Level A harassment = Level A harassment area (km²)/Level B harassment area (km²) × group size × groups per day × days of pile driving.

For Steller sea lions, during impact pile driving of 24-in and 36-in steel pipe piles, the shutdown zone would be established at 60 m rather than the larger Level A harassment isopleths (100 m and 130 m, respectively) due to practicability; local monitoring data suggests that Steller sea lions frequently occur within close proximity of the project site. The method described above did not produce an estimate of take by Level A harassment consistent with the best available data for this species at the project location. Therefore, recent monitoring data collected at this site (Solstice, 2023), were used as the basis of calculating take by Level A harassment. The proportion of Steller sea lions detected between 60 m and 130 m was multiplied by group size, number of daily sightings, and multiplied by the number of construction days when impact pile driving is proposed according to this equation:

Take by Level A harassment = group size × groups per day × days of impact pile driving activity x proportion of Steller sea lions observed occurring between 60–130 m during geotechnical drilling.

Proposed take estimates were rounded up to the nearest whole number in table 8.

Gray Whale

CBS requested take by Level B harassment of 31 gray whales, based on an estimated 1 gray whale every 2 days for 62 construction days. However, during weekly surveys conducted from September to May between 1995 and 2000, gray whales were infrequently observed in groups of three from Whale Park. As such, NMFS finds it more appropriate to propose to authorize 1 group of 3 gray whales every 14 construction days (62/14 construction days = 4.4 2-week construction week periods), resulting in 14 takes by Level B harassment (1 group × 3 gray whales × 4.4 construction periods = 13.2 takes by Level B harassment).

The proposed shutdown zone exceeds the calculated Level A harassment zone except during impact pile driving of 36-in steel piles (support and battered), estimated across 30 construction days. As such, it is possible that gray whales may occur in the Level A harassment zone and stay long enough to incur PTS before exiting. For 36-in support piles, the ratio of the Level A harassment area (km^2) that exceeds the shutdown zone to the maximum predicted Level B harassment area (km^2) is 0.06. This activity is estimated to take place on 20 construction days. For 36-in batter piles, the ratio of the Level A harassment area (km^2) that exceeds the shutdown zone to the Level B harassment area is 0.16. This activity is estimated to take place on 10 construction days. As such, 3 takes by Level A harassment are estimated [(0.06 × 4.4 construction periods × 1 group × 3 gray whales) + (0.16 × 4.4 construction periods × 1 group × 3 gray whales) = 2.9 takes by Level A harassment].

Any individuals exposed to the higher levels associated with the potential for PTS closer to the source might also be behaviorally disturbed, however, for the purposes of quantifying take we do not count those exposures of one individual as a take by both Level A harassment take and Level B harassment. Therefore, takes by Level B harassment calculated as described above were further modified to deduct the proposed amount of take by Level A harassment. Therefore, NMFS proposes to authorize 3 takes by Level A harassment and 11 takes by Level B harassment for gray whale, for a total of 14 takes. When allocating take across stocks, take estimates are rounded up to the nearest whole number.

Humpback Whale

CBS requested take by Level B harassment of 248 humpback whales, based on an estimated 4 humpback whales occurring every 1 construction day for 62 construction days. NMFS concurs with this take estimate, acknowledging that two groups of two humpback whales occurring each construction day is reasonable based on previous monitoring data (2 groups × 2 humpback whales × 62 construction days = 248 takes by Level B harassment of humpback whale).

The proposed shutdown zone exceeds the calculated Level A harassment zone except during impact pile driving of 36-in steel piles (support and battered), estimated across 30 construction days. As such, it is possible that humpback whales may occur in the Level A harassment zone and stay long enough to incur PTS before exiting. For 36-in support piles, the ratio of the Level A harassment area (km^2) that exceeds the shutdown zone to the maximum predicted Level B harassment area (km^2) is 0.06. This activity is estimated to take place on 20 construction days. For 36-in batter piles, the ratio of the Level A harassment area (km^2) that exceeds the shutdown zone to the Level B harassment area is 0.16. This activity is estimated to take place on 10 construction days. As such, 12 takes by Level A harassment are estimated [(0.06 × 20 construction days × 2 groups × 2 humpback whales) + (0.16 × 10 construction days × 2 groups × 2 humpback whales) = 11.2 takes by Level A harassment].

Any individuals exposed to the higher levels associated with the potential for PTS closer to the source might also be behaviorally disturbed, however, for the purposes of quantifying take we do not count those exposures of one individual as a take by both Level A harassment take and Level B harassment. Therefore, takes by Level B harassment calculated as described above were further modified to deduct the proposed amount of take by Level A harassment. Therefore, NMFS proposes to authorize 12 takes by Level A harassment and 236 takes by Level B harassment for humpback whale, for a total of 248 takes. When allocating take across stocks, take estimates are rounded up to the nearest whole number.

Killer Whale

CBS requested take by Level B harassment of 32 killer whales, based on an estimated 1 killer whale occurring every 2 construction days for 62 construction days. However, because killer whales were unpredictably observed from Whale Park in groups of 4–8 during weekly surveys conducted from September to May between 1995 and 2000, NMFS finds it more appropriate to propose to authorize 1 group of 8 killer whales every 7 construction days (62/7 construction days = 8.9 construction weeks), resulting in 71 takes by Level B harassment (1 group × 8 killer whales × 8.9 construction weeks = 71 takes by Level B harassment). No takes by Level A harassment were requested or are proposed for authorization.

Pacific White-Sided Dolphin

CBS requested take by Level B harassment of 16 Pacific white-sided dolphin, based on an estimated 1 Pacific white-sided dolphin occurring every 4 construction days for 62 construction days. However, Pacific white-sided dolphin were rarely observed from Whale Park in groups of four during weekly surveys conducted from September to May between 1995 and 2000. As such, NMFS finds it more appropriate to propose to authorize 1 group of 4 Pacific white-sided dolphin every 14 construction days (62/14 = 4.4 2-week construction periods), resulting in 18 takes by Level B harassment (1 group × 4 Pacific white-sided dolphin × construction 4.4 periods = 17.6 takes by Level B harassment). No takes by Level A harassment are requested or proposed for authorization.

Harbor Porpoise

CBS requested take by Level B harassment of 16 harbor porpoise, based on an estimated 1 harbor porpoise occurring every 4 construction days for 62 construction days. However, harbor porpoise were rarely observed from Whale Park in groups of five during weekly surveys conducted from September to May between 1995 and 2000. As such, NMFS finds it more appropriate to propose to authorize 1 group of 5 harbor porpoise every 14 construction days (62/14 construction days = 4.4 2-week construction week periods), resulting in 22 takes by Level B harassment (1 group × 5 harbor porpoises × 4.4 construction periods = 22 takes by Level B harassment).

During impact pile driving of 36-in steel piles, estimated across 30 construction days, the expected Level A harassment zone is larger than the planned shutdown zone (see Figure 1 of the Marine Mammal Mitigation and Monitoring Plan). As such, it is possible that harbor porpoise may enter the Level A harassment zone and stay long enough to incur PTS before exiting. For 36-in support piles, the ratio of the Level A harassment area (km^2) that exceeds the shutdown zone to the maximum predicted Level B harassment area (km^2) is 0.38. This activity is estimated to take place on 20 construction days (20 construction days/14 days = 1.43 2-week construction periods). For 36-in batter piles, the ratio of the portion of the Level A harassment area that exceeds the shutdown zone area (km^2) to the maximum predicted Level B harassment area is 0.48. This activity is estimated to take place on 10 construction days (10 construction days/14 days = 0.71 2-week construction periods). As such, five takes by Level A harassment are estimated [(0.38 × 1 group × 5 harbor porpoise × 1.43 2-week construction periods) + (0.48 × 1 group × 5 harbor porpoises × 0.71 2-week construction periods) = 4.4 takes by Level A harassment].

Any individuals exposed to the higher levels associated with the potential for PTS closer to the source might also be behaviorally disturbed; however, for the purposes of quantifying take we do not count those exposures of one individual as a take by both Level A harassment and Level B harassment. Therefore, NMFS proposes to authorize 5 takes by Level A harassment and 17 takes by Level B harassment for harbor porpoise, for a total of 22 takes.

Steller Sea Lion

CBS requested take by Level B harassment of 496 Steller sea lions, based on an estimated 8 Steller sea lions occurring every 1 construction day for 62 construction days. NMFS concurs with this take estimate, acknowledging that four groups of two Steller sea lions occurring each construction day is reasonable based on previous monitoring data (2 groups × 4 Steller sea lion × 62 construction days = 496 takes by Level B harassment of Steller sea lion).

During impact pile driving of 36-in steel piles, estimated across 30 construction days, the expected Level A harassment zone is larger than the proposed shutdown zone. As such, it is possible that Steller sea lion may enter the Level A harassment zone and stay long enough to incur PTS before exiting. For 36-in support piles, the ratio of the Level A harassment area that exceeds the planned shutdown zone (km^2) to the maximum predicted Level B harassment area (km^2) for is 0.001. This activity is estimated to take place on 20 construction days. For 36-in batter piles, the ratio of the Level A harassment area (km^2) to the maximum predicted Level B harassment area is 0.002. This activity is estimated to take place on 10 construction days. As such, one take by Level A harassment was estimated [(0.001 × 20 construction days × 2 groups × 4 Steller sea lion × 20 construction days) + (0.002 × 10 construction days × 2 groups × 4 Steller sea lion × 10 construction days) = 0.32 takes by Level A harassment].

However, the 0.32 takes by Level A harassment estimated using the method described above does not likely reflect the occurrence of Steller sea lion in the project area. Based on monitoring data collected during geotechnical survey conducted to inform this IHA application, Steller sea lions are expected to disproportionally occur within close proximity to the project site. Approximately 37 percent of Steller sea lions documented during that survey were observed between 60 m and 130 m, which corresponds to the Level A zones during impact pile driving of 36-in piles. These scenarios may occur on up to 30 construction days. Therefore 89 additional takes by Level A harassment are proposed for authorization (2 groups of 4 Steller sea lion × 30 construction days × 0.37 = 89 takes by Level A harassment).

Any individuals exposed to the higher levels associated with the potential for PTS closer to the source might also be behaviorally disturbed, however, for the purposes of quantifying take we do not count those exposures of one individual as a take by both Level A and Level B harassment. Therefore takes by Level B harassment calculated as described above are further modified to deduct the proposed amount of take by Level A harassment. Therefore, NMFS proposes to authorize 89 takes by Level A harassment and 407 takes by Level B harassment for Steller sea lion, for a total of 496 takes.

California Sea Lion

CBS requested take by Level B harassment of five California sea lions, based on an estimated one California sea lion occurring every month that construction is planned (October to March = 5 months) to account for the unlikely but small possibility that California sea lion could occur in the project area. However, NMFS finds it more appropriate to estimate take by Level B harassment according to proposed duration of in-water work (62 construction days/30 days in 1 month = 2.06 construction months). As such, NMFS proposes to authorize take by Level B harassment of three California sea lion (1 group × 1 California sea lion × 2.06 construction months = 2.06 takes by Level B harassment of California sea lion). No takes by Level A harassment are requested or proposed for authorization.

Northern Fur Seal

CBS requested take by Level B harassment of five northern fur seals, based on an estimated one northern fur seal occurring every month that construction is planned (October—March = 5 months) to account for the unlikely but small possibility that northern fur seals could occur in the project area. However, NMFS finds it more appropriate to estimate take by Level B harassment according to proposed duration of in-water work (62 construction days/30 days in 1 month = 2.06 months). As such, NMFS proposes to authorize take by Level B harassment of three northern fur seals (1 group × 1 northern fur seal × 2.06 construction months = 2.06 takes by Level B harassment of northern fur seal). No takes by Level A harassment are requested or proposed for authorization.

Harbor Seal

CBS requested take by Level B harassment of 124 harbor seals, based on an estimated 2 harbor seals occurring every 2 construction days for 62 construction days. However, because harbor seals are frequently documented in the project area, NMFS finds it more appropriate to propose to authorize 186 takes by Level B harassment of harbor seal, based on the maximum groups size of 3 documented at the project site in 2017 (1 group × 3 harbor seal × 62 construction days = 186 takes by Level B harassment).

During impact pile driving of 36-in steel piles, estimated across 30 construction days, the expected Level A harassment zone is larger than the planned shutdown zone. As such, it is possible that harbor seal may enter the Level A harassment zone and stay long enough to incur PTS before exiting. For 36-in support piles, the ratio of the Level A harassment area (km^2) that exceeds the planned shutdown zone to the Level B harassment area (km^2) is 0.16. This activity is estimated to take place on 20 construction days. For 36-in batter piles, the ratio of the Level A harassment area that exceeds the shutdown zone area (km^2) to the maximum predicted Level B harassment area is 0.23 (km^2). This activity is estimated to take place on 10 construction days. As such, 34 takes by Level A harassment are estimated [(0.16 × 20 construction days × 1 group × 3 harbor seals × 20 construction days) + (0.23 × 10 construction days × 1 group × 3 harbor seals) = 33.2 takes by Level A harassment].

Any individuals exposed to the higher levels associated with the potential for PTS closer to the source might also be behaviorally disturbed, however, for the purposes of quantifying take we do not count those exposures of one individual as a take by both Level A harassment take and Level B harassment. Therefore takes by Level B harassment calculated as described above are further modified to deduct the proposed amount of take by Level A harassment. Therefore, NMFS proposes to authorize 34 takes by Level A harassment and 152 takes by

Level B harassment for harbor seal, for a total of 186 takes.

The total proposed take authorization for all species is summarized in table 8 below. Take by Level A harassment is proposed for a total of 3 incidents for gray whale, 11 incidents for humpback whale, 5 incidents for harbor porpoise, 6 instances for Steller sea lion, and 34 incidents for harbor seal.

TABLE 8—PROPOSED TAKE BY STOCK AND HARASSMENT TYPE AND AS A PERCENTAGE OF STOCK ABUNDANCE

Species	Stock	Proposed authorized take [1]		Proposed take as a percentage of stock abundance
		Level B harassment	Level A harassment	
Gray Whale	Eastern N Pacific	11	3	<1
	Mexico—North Pacific	5	1	<1
Humpback Whale [2]	Hawaiʻi	231	11	<1
Killer Whale [3]	ENP Alaska Resident	44	0	2.3
	ENP Northern Resident	7	0	14.2
	ENP Gulf of Alaska, Aleutian Islands, and Bering Sea.	14	0	2.4
	West Coast Transient	8	0	2.3
Pacific white-sided dolphin	North Pacific	18	0	<1
Harbor Porpoise	Yakutat/Southeast Alaska Offshore Waters	17	5	([4])
Steller sea lion [5]	Western DPS	5	1	<1
	Eastern DPS	402	88	1.3
California sea lion	United States	3	0	<1
Northern fur seal	Eastern Pacific	3	0	<1
Harbor Seal	Sitka/Chatham Strait	152	34	1.4

[1] When allocating take across stocks, take estimates are rounded up to the nearest whole number.
[2] 2 percent of take by Level A and Level B harassment of humpback whales are allocated to the Mexico DPS according to NMFS, 2021
[3] Take by level B harassment of killer whale is allocated across stocks according to the proportion of the stock compared to total number of animals in all four stocks that could occur in the project area: Alaska Residents, 60.7 percent; Northern Residents, 9.6 percent; Gulf of Alaska, Aleutian Islands, and Bering Sea: 18.6 percent; West Coast Transient, 11.1 percent.
[4] A reliable abundance estimate for this stock is currently unavailable.
[5] 1.2 percent take by Level A and Level B harassment of Steller sea lions are allocated to the Western DPS according to Hastings *et al.* (2020).

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 (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting the activity or other means of effecting the least practicable adverse impact upon the affected species or stocks, and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, NMFS considers two primary factors:

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat, as well as subsistence uses. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned); and,

(2) The practicability of the measures for applicant implementation, which may consider such things as cost, and impact on operations.

Mitigation for Marine Mammals and Their Habitat

Shutdown Zones—For all pile driving activities, CBS proposes to implement shutdowns within designated zones. 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 vary based on the activity type and marine mammal hearing group (table 9). In most cases, the shutdown zones are based on the estimated Level A harassment isopleth distances for each hearing group. However, in cases where it would be challenging to detect marine mammals at the Level A harassment isopleth (*e.g.,* for phocids, high frequency cetaceans, and low frequency cetaceans during impact pile driving) and/or frequent shutdowns would create practicability concerns (*e.g.,* Steller sea lions during impact pile driving), smaller shutdown zones have been proposed (table 9).

Construction supervisors and crews, Protected Species Observers (PSOs), and relevant CBS staff must avoid direct physical interaction with marine mammals during construction activity. If a marine mammal comes within 10 m of such activity, operations must cease and vessels must reduce speed to the minimum level required to maintain steerage and safe working conditions, as necessary to avoid direct physical interaction. If an activity is delayed or halted due to the presence of a marine mammal, the activity may not commence or resume until either the animal has voluntarily exited and been visually confirmed beyond the shutdown zone indicated in table 9, or 15 minutes have passed without re-detection of the animal.

Finally, construction activities must be halted upon observation of a species for which incidental take is not authorized or a species for which incidental take has been authorized but the authorized number of takes has been met entering or within any harassment zone. If a marine mammal species not covered under this IHA enters a harassment zone, all in-water activities will cease until the animal leaves the zone or has not been observed for at least 15 minutes, and NMFS would be notified about species and precautions taken. Pile driving will proceed if the unauthorized species is observed leaving the harassment zone or if 15 minutes have passed since the last observation.

TABLE 9—PROPOSED SHUTDOWN ZONES

Pile size/type	Method	Shutdown zones (m)					
		LF	MF	HF	PW	OW	
						Steller sea lion	Other OW
Haulout Pier Support Pile							
36-in Steel Pipe Pile	Vibratory Installation	30	10	40	20	10	10
	Impact Installation	2,000	90	300	130	60	100
Haulout Pier Batter Pile							
36-in Steel Pipe Pile	Vibratory Installation	40	10	60	30	10	10
	Impact Installation	2,000	120	300	130	60	130
Haulout Pier Fender Pile							
24-in Steel Pipe Pile	Vibratory Installation	20	10	30	10	10	10
Template Pile							
24-in Steel Pipe Pile	Vibratory Installation and removal	20	10	30	20	10	10

Protected Species Observers (PSOs)—The number and placement of PSOs during all construction activities (described in the Proposed Monitoring and Reporting section) would ensure that the entire shutdown zone is visible during impact pile driving. In such cases, PSOs would monitor the Level A harassment zone and corresponding shutdown zone to the greatest extent practicable. CBS would employ at least three PSOs for all pile driving activities.

Monitoring for Level A and Level B Harassment—PSOs would monitor the shutdown zones and beyond to the extent that PSOs can see. Monitoring beyond the shutdown zones enables observers to be aware of and communicate the presence of marine mammals in the project areas outside the shutdown zones and thus prepare for a potential cessation of activity should the animal enter the shutdown zone. If a marine mammal enters either harassment zone, PSOs will document the marine mammal's presence and behavior.

Pre-and Post-Activity Monitoring—Prior to the start of daily in-water construction activity, or whenever a break in pile driving of 30 minutes or longer occurs, PSOs would observe the shutdown zones and as much as the harassment zones as possible for a period of 30 minutes. Pre-start clearance monitoring must be conducted during periods of visibility sufficient for the lead PSO to determine that the shutdown zones are clear of marine mammals. If the shutdown zone is obscured by fog or poor lighting conditions, in-water construction activity will not be initiated until the entire shutdown zone is visible. Pile driving may commence following 30 minutes of observation when the determination is made that the shutdown zones are clear of marine mammals. If a marine mammal is observed entering or within shutdown zones, pile driving activity must be delayed or halted. If pile driving is delayed or halted due to the presence of a marine mammal, the activity may not commence or resume until either the animal has voluntarily exited and been visually confirmed beyond the shutdown zone or 15 minutes have passed without re-detection of the animal. If a marine mammal for which take by Level B harassment is authorized is present in the Level B harassment zone, activities may begin.

Soft-Start—The use of soft-start procedures are believed to provide additional protection to marine mammals by providing warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. For impact pile driving, contractors would be required to provide an initial set of three strikes from the hammer at reduced energy, with each strike followed by a 30-second waiting period. This procedure would be conducted a total of three times before impact pile driving begins. Soft start would be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of 30 minutes or longer. Soft start is not required during vibratory pile driving activities.

Based on our evaluation of the applicant's proposed measures, NMFS has preliminarily determined that the proposed mitigation measures provide the means of effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance. Note that the applicant opted to forgo the use of a bubble curtain as a mitigation measure as its use would decrease production rates due to the need to reposition the curtain around piles and vessel traffic, the need to maintain and operate the compressor, and delays associated with mechanical malfunctions.

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 while conducting the activities. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

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

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

Visual Monitoring—Marine mammal monitoring during pile driving activities must be conducted by NMFS-approved PSOs in a manner consistent with the following:

- PSOs must be independent of the activity contractor (for example, employed by a subcontractor), and have no other assigned tasks during monitoring periods;
- 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 other relevant experience, education (degree in biological science or related field) or training for experience performing the duties of a PSO during construction activities pursuant to a NMFS-issued incidental take authorization;
- Where a team of three or more PSOs is required, a lead observer or monitoring coordinator will be designated. The lead observer will be required to have prior experience working as a marine mammal observer during construction activity pursuant to a NMFS-issued incidental take authorization; and,
- PSOs must be approved by NMFS prior to beginning any activity subject to this IHA.

PSOs should also 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 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 note 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.

Visual monitoring would be conducted by a minimum of three trained PSOs positioned at suitable vantage points, such as the project site, Sawmill Creek Road and Medveje Hatchery (see figure 1 in the Marine Mammal Mitigation and Monitoring Plan). During vibratory pile driving, at least one PSO would have an unobstructed view of all water within the shutdown zone. During impact pile driving, a second PSO would be placed at Sawmill Creek Road to ensure the largest shutdown zone extending into Eastern Channel is observable and a third PSO would be placed at Medvejie Hatchery to ensure as much of the shutdown zone in Silver Bay is observable as possible. All PSOs would be stationed on elevated platforms to aid in monitoring marine mammals.

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

Reporting

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

- Dates and times (begin and end) of all marine mammal monitoring;
- Construction activities occurring during each daily observation period, including: (1) the number and type of piles that were driven and the method (*e.g.,* impact or vibratory); and, (2) total duration of driving time for each pile (vibratory driving) and number of strikes for each pile (impact driving);
- PSO locations during marine mammal monitoring;
- Environmental conditions during monitoring periods (at beginning and end of PSO shift and whenever conditions change significantly), including Beaufort sea state and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon, and estimated observable distance;
- Upon observation of a marine mammal, the following information: (1) name of PSO who sighted the animal(s) and PSO location and activity at time of sighting; (2) time of sighting; (3) identification of the animal(s) (*e.g.,* genus/species, lowest possible taxonomic level, or unidentified), PSO confidence in identification, and the composition of the group if there is a mix of species; (4) distance and location of each observed marine mammal relative to the pile being driven for each sighting; (5) estimated number of animals (min/max/best estimate); (6) estimated number of animals by cohort (adults, juveniles, neonates, group composition, *etc.*); (7) animal's closest point of approach and estimated time spent within the harassment zone; and,

(8) description of any marine mammal behavioral observations (*e.g.,* observed behaviors such as feeding or traveling), including an assessment of behavioral responses thought to have resulted from the activity (*e.g.,* no response or changes in behavioral state such as ceasing feeding, changing direction, flushing, or breaching);

- Number of marine mammals detected within the harassment zones, by species; and,
- Detailed information about implementation of any mitigation (*e.g.,* shutdowns and delays), a description of specific actions that ensued, and resulting changes in behavior of the animal(s), if any.

A final report must be prepared and submitted within 30 calendar days following receipt of any NMFS comments on the draft report. If no comments are received from NMFS within 30 calendar days of receipt of the draft report, the report shall be considered final. All PSO data would be submitted electronically in a format that can be queried such as a spreadsheet or database and would be submitted with the draft marine mammal report.

In the event that personnel involved in the construction activities discover an injured or dead marine mammal, the Holder must report the incident to the OPR, NMFS (*PR.ITP.MonitoringReports@noaa.gov* and *itp.fleming@noaa.gov*) and Alaska Regional Stranding network (877–925–7773) as soon as feasible. If the death or injury was clearly caused by the specified activity, the Holder must immediately cease the activities until NMFS OPR 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 this IHA. The Holder must not resume their activities until notified by NMFS. The report must include the following information:

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

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.,* population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be ''taken'' through harassment, NMFS considers other factors, such as the likely nature of any impacts or responses (*e.g.,* intensity, duration), the context of any impacts or responses (*e.g.,* critical reproductive time or location, foraging impacts affecting energetics), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS' implementing regulations (54 FR 40338, September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the baseline (*e.g.,* as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

To avoid repetition, the discussion of our analysis applies to all the species listed in table 2, given that the anticipated effects of this activity on these different marine mammal stocks are expected to be similar. There is little information about the nature or severity of the impacts, or the size, status, or structure of any of these species or stocks that would lead to a different analysis for this activity.

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

No serious injury or mortality is expected, even in the absence of required mitigation measures, given the nature of the activities. Further, no take by Level A harassment is anticipated for gray whale, killer whale, Pacific white-sided dolphin, California sea lion, and Northern fur seal due to the application of planned mitigation measures, such as shutdown zones that encompass the Level A harassment zones for the species, the rarity of the species near the action area, and the small Level A harassment zones (for mid-frequency cetaceans only) (see Proposed Mitigation section).

Take by Level A harassment is proposed for authorization for four species (humpback whale, harbor porpoise, harbor seal, and Steller sea lion). Any take by Level A harassment is expected to arise from, at most, a small degree of PTS (*i.e.,* minor degradation of hearing capabilities within regions of hearing that align most completely with the energy produced by impact pile driving such as the low-frequency region below 2 kHz), not severe hearing impairment or impairment within the ranges of greatest hearing sensitivity. Animals would need to be exposed to higher levels and/or longer duration than are expected to occur here in order to incur any more than a small degree of PTS.

Further, the amount of take proposed for authorization by Level A harassment is very low for the marine mammal stocks and species. For five species, NMFS anticipates no take by Level A harassment over the duration of CBS's planned activities; NMFS expects no more than 11 takes by Level A harassment for humpback whale; 5 takes by Level A harassment for harbor porpoise; 34 takes by Level A harassment for harbor seal NMFS; and 89 takes by Level A harassment for Steller sea lion. If hearing impairment occurs, it is most likely that the affected animal would lose only a few dB in its hearing sensitivity. Due to the small degree anticipated, any PTS potential incurred would not be expected to affect the reproductive success or survival of any individuals, much less result in adverse impacts on the species or stock.

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

Effects on individuals that are taken by Level B harassment in the form of behavioral disruption, on the basis of reports in the literature as well as monitoring from other similar activities, would likely be limited to reactions such as avoidance, increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (*e.g.,* Thorson and Reyff, 2006). Most likely, individuals would simply move away from the sound source and temporarily avoid the area where pile driving is occurring. If sound produced by project activities is sufficiently disturbing, animals are likely to simply avoid the area while the activities are occurring. We expect that any avoidance of the project areas by marine mammals would be temporary in nature and that any marine mammals that avoid the project areas during construction would not be permanently displaced. Short-term avoidance of the project areas and energetic impacts of interrupted foraging or other important behaviors is unlikely to affect the reproduction or survival of individual marine mammals, and the effects of behavioral disturbance on individuals is not likely to accrue in a manner that would affect the rates of recruitment or survival of any affected stock.

The project is also not expected to have significant adverse effects on affected marine mammals' habitats. The project activities would not modify existing marine mammal habitat for a significant amount of time. The activities may cause a low level of turbidity in the water column and some fish may leave the area of disturbance, thus temporarily impacting marine mammals' foraging opportunities in a limited portion of the foraging range; but, because of the short duration of the activities and the relatively small area of the habitat that may be affected (with no known particular importance to marine mammals), the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

While Steller sea lions are common in the project area, there are no essential primary constituent elements, such as haulouts or rookeries, present. The nearest haulout is well over 25 km away. Therefore, the project is not expected to have significant adverse effects on the critical habitat of Western DPS Steller sea lions. No areas of specific biological importance (*e.g.,* ESA critical habitat, BIAs, or other areas) for any other species are known to co-occur with the project area.

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

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

- No serious injury or mortality is anticipated or authorized;
- Level A harassment would be very small amounts of a low degree;
- Take by Level A harassment of only humpback whale, harbor porpoise, Steller sea lions and harbor seals;
- For all species, Silver Bay and East Channel are a very small and peripheral part of their range;
- Anticipated takes by Level B harassment are relatively low for all stocks. Level B harassment would be primarily in the form of behavioral disturbance, resulting in avoidance of the project areas around where impact or vibratory pile driving is occurring, with some low-level TTS that may limit the detection of acoustic cues for relatively brief amounts of time in relatively confined footprints of activities;
- Effects on species that serve as prey for marine mammals from the activities are expected to be short-term and, therefore, any associated impacts on marine mammal feeding are not expected to result in significant or long-term consequences for individuals, or to accrue to adverse impacts on their populations;
- The ensonified areas are very small relative to the overall habitat ranges of all species and stocks, and would not adversely affect ESA-designated critical habitat for any species or any areas of known biological importance;
- The lack of anticipated significant or long-term negative effects to marine mammal habitat; and,
- CBS would implement mitigation measures including visual monitoring, soft-start, and shutdown zones to minimize the numbers of marine mammals exposed to injurious levels of sound, and to ensure that take by Level A harassment is, at most, a small degree of PTS.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the 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 previously, only take of small numbers of marine mammals may be authorized under sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. When the predicted number of individuals to be taken is fewer than one-third of the species or stock abundance, the take is considered to be of small numbers. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

The amount of take NMFS proposed to authorize is below one third of the estimated stock abundance for all species. This is likely a conservative estimate because we assume all takes are of different individual animals, which likely would not be the case. Some individuals may return multiple times in a day, but PSOs would count them as separate takes if they cannot be individually identified.

The most recent abundance estimate for the Mexico-North Pacific stock of humpback whale is likely unreliable as it is more than 8 years old. The most relevant estimate of this stock's abundance in Southeast Alaska is 918 humpback whales (Wade, 2021), so the 4 proposed takes by Level B harassment and 1 proposed take by Level A harassment is small relative to the estimated abundance (<1 percent), even if each proposed take occurred to a new individual.

There is no abundance information available for the Yakutat/Southeast Alaska stock of harbor porpoise. However, the take numbers are sufficiently small (13 takes by Level B harassment and 9 takes by Level A harassment) that we can safely assume that they are small relative to any reasonable assumption of likely population abundance for these stocks. For reference, current abundance estimates for harbor porpoise stocks in southeast Alaska include 1,619 (Northern Southeast Alaska Inland Waters) and 890 (Southern Southeast Alaska Inland Waters).

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 would be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

In order to issue an IHA, NMFS must find that the specified activity will not have an ''unmitigable adverse impact'' on the subsistence uses of the affected marine mammal species or stocks by Alaskan Natives. NMFS has defined ''unmitigable adverse impact'' in 50 CFR 216.103 as an impact resulting from the specified activity that: (1) 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) cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.

For marine mammals, Alaska Natives have traditionally harvested harbor seals and Steller sea lions in Sitka, Alaska. During the most recent ADF&G subsistence harvest report (2013), about 11 percent of Sitka households used subsistence-caught marine mammals, however, this is the most recent data available and there has not been a survey since 2013 (ADF&G, 2023).

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

- There is no recent recorded subsistence harvest of marine mammals in the area;
- Construction activities are temporary and localized to the Gary Paxton Industrial Park, and industrial area;
- Construction will not take place during the herring spawning season when subsistence species are more active;
- Mitigation measures will be implemented to minimize disturbance of marine mammals in the action area; and,
- The project will not result in significant changes to availability of subsistence resources.

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

Endangered Species Act

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

NMFS is proposing to authorize take of western DPS of Steller sea lions and the Mexico DPS of humpback whales, which are listed under the ESA.

The Permits and Conservation Division has requested initiation of section 7 consultation with the AKRO 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 CBS for conducting Gary Paxton Industrial Park Vessel Haulout project in Sitka, Alaska between October 2024 and March 2025, 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/national/marine-mammal-protection/incidental-take-authorizations-construction-activities.*

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 pile driving and removal activities. We also request 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, 1-year renewal IHA following notice to the public providing an additional 15 days for public comments when (1) up to another year of identical or nearly identical activities as described in the 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 1 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: July 2, 2024.

Kimberly Damon-Randall,

Director, Office of Protected Resources, National Marine Fisheries Service.

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