E 3510-22-P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648-XF566]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Kensington Dock Repair Project in Berners Bay, 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 Coeur Alaska, Inc. (Coeur) for authorization to take marine mammals incidental to the Kensington Dock Repair Project in Berners Bay, Alaska (AK). Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an incidental harassment authorization (IHA) to incidentally take marine mammals during the specified activities. NMFS is also requesting comments on a possible one-time, 1-year renewal that could be issued under certain circumstances and if all requirements are met, as described in **Request for Public Comments** at the end of this notice. NMFS will consider public comments prior to making any final decision on the issuance of the requested MMPA authorization, and agency responses will be summarized in the final notice of our decision.

DATES: Comments and information must be received no later than **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**.

ADDRESSES: Comments should be addressed to the Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service, and should be submitted via email to *ITP.Graham@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/permit/incidental-take-authorizations-under-marine-mammal-protection-act*. 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: Krista Graham, Office of Protected Resources, NMFS, (301) 427-8401.

SUPPLEMENTARY INFORMATION:

Background

The MMPA prohibits the "take" of marine mammals, with certain exceptions. Section 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq*.) directs 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). If such findings are made, NMFS must prescribe the permissible methods of taking; 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 as "mitigation"); and requirements pertaining to the monitoring and reporting of the takings. The definitions of all applicable MMPA statutory terms used above are included in the relevant sections below (see also 16 U.S.C. 1362; 50 CFR 216.3, 216.103).

National Environmental Policy Act

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

This action is consistent with categories of activities identified in Categorical Exclusion B4 (IHAs with no anticipated serious injury or mortality) of the Companion Manual for 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.

Summary of Request

On December 9, 2026, NMFS received a request from Coeur for an IHA to take marine mammals incidental to the replacement of two mooring dolphins at the Kensington Dock in Berners Bay, AK. Following NMFS' review of the application, Coeur submitted a revised application on February 20, 2026. Following additional questions, Coeur submitted a final revised application on March 12, 2026. The application was deemed adequate and complete on March 17, 2026. Coeur's request is for the take of 7 species of marine mammals (13 stocks) by Level B harassment only. Neither Coeur nor NMFS expects serious injury or mortality to result from this activity; therefore, an IHA is appropriate.

Description of Proposed Activity

Overview

Coeur is proposing construction activities that include pile driving (vibratory, impact, and down-the-hole (DTH)) and removal (vibratory). Underwater sound from these activities may result in behavioral harassment of marine mammals.

The purpose of Coeur's project is to replace two damaged mooring dolphins (D–2 and D–4) at the Kensington Dock facility. These docks sustained structural damage from two separate vessel impacts. The project would restore the structural integrity of the mooring system and ensure the dock can continue to safely berth vessels. The Kensington Dock facility provides the only marine access in Berners Bay for importing supplies and fuel and exporting mined ore concentrate from the remote mine site.

Dates and Duration

The proposed IHA would be valid for the statutory maximum of 1 year from the date of effectiveness. It would become effective upon written notification from the applicant to NMFS, but not beginning later than 1 year from the date of issuance or extending beyond 2 years from the date of issuance.

Pile driving is expected to occur sometime after the project is proposed to begin on July 1, 2026. Thirty-three days of in-water pile driving are estimated for this project, spanning 8 to 10 weeks. This includes 30 days of anticipated pile driving and a 10 percent (3-day) contingency. However, project delays may occur due to several factors, including project funding, permitting requirements, equipment and/or material availability, weather-related delays, equipment maintenance and/or repair, and other contingencies. Pile driving would occur only during daylight hours (*i.e.*, approximately 12-16 hours/day).

Specific Geographic Region

The Kensington Dock facility is in Slate Cove along the southern shoreline of Berners Bay, AK. Berners Bay is a large, deep inlet located approximately 40 miles northwest of Juneau, AK, and 35 miles southeast of Haines, AK. Berners Bay is 3.5 miles wide at the entrance, adjacent to Lynn Canal, and surrounded by the Tongass National Forest (see figure 1 of this notice and figure 1–2 of the application).

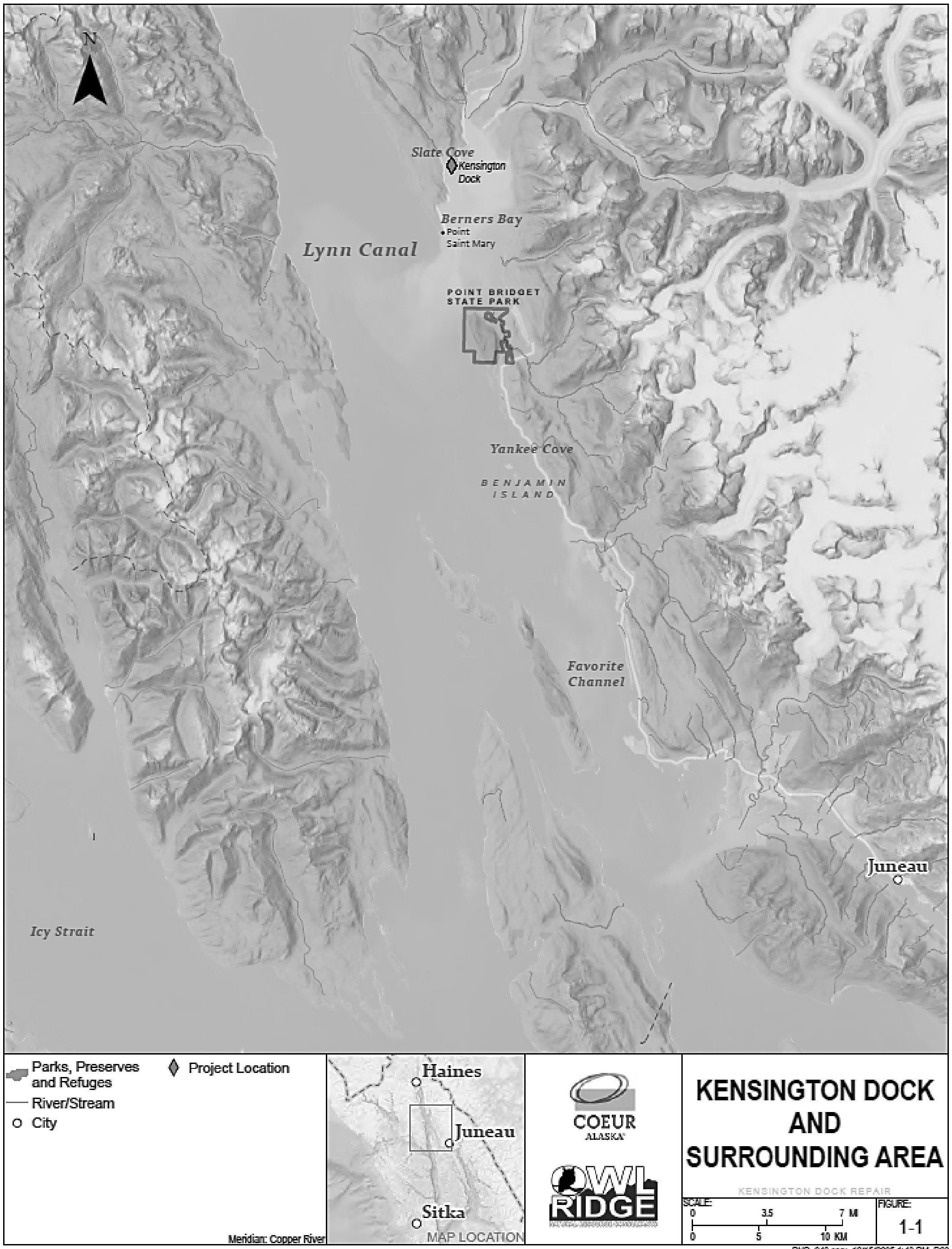

Figure 1 -- Kensington Dock and surrounding area

Detailed Description of the Specified Activity

The Kensington Dock facility configuration consists of four mooring dolphins (D–1, D–2, D–3, and D–4), spaced approximately 50 linear feet (ft) on center, centered on a 140-ft-long floating self-supported steel transfer bridge. Each dolphin consists of a single vertical steel pipe pile with a pre-stressed rock anchor installed at its center. The rock anchor is drilled into the existing bedrock surface below the end of the pipe pile. Two batter piles are used to resist lateral forces. Piles are connected at the top with a welded knife plate. The vertical piles are fitted with used loader tires that provide limited energy absorption during vessel berthing operations.

Mooring dolphins D–2 and D–4, which have both sustained structural damage, would be replaced from an anchored barge, using vibratory and impact hammers to install and remove piles. Temporary template piles (24-inch steel pipe piles or equivalent) would be installed via vibratory hammer to support permanent pile template framing for each dolphin installation. Dolphin D–2 would consist of one 30-inch steel pipe vertical pile and two 24-inch steel pipe batter piles; dolphin D–4 would consist of one 48-inch steel pipe vertical pile and two 24-inch steel pipe batter piles. Dolphin D–4 is larger because it is the first pile the vessel contacts, and it must support the entire vessel until it makes contact with the other three mooring dolphins and lines up with the dock. The vertical and batter piles would be driven to bedrock, first with a vibratory hammer and then with an impact hammer to seat into bedrock and verify pile end bearing. The replacement dolphins would be slightly offset from their original locations to allow continued dock operations throughout the repair project and to avoid conflicts with the existing vertical pile rock anchors. Rock anchors would then be installed in all six dolphin piles: two vertical piles and four batter piles. Rock anchors would be installed using DTH methods. With DTH, a shaft would be drilled beyond the pile tip and into the underlying bedrock. A high-strength steel anchor rod coated for corrosion protection would be placed in the casing and inserted into the bottom of the drilled shaft. The drilled shaft would be filled with concrete to properly anchor the vertical and batter piles to the bedrock under pre-stress.

Once the new dolphins are installed and operational, the existing damaged dolphins would be removed by severing the piles and rock anchors at the mudline. NMFS does not anticipate that removing the existing damaged dolphins will result in take of marine mammals, and this activity is not discussed further. All temporary piles would be removed using a vibratory hammer. No simultaneous pile driving would occur. Pile quantities and construction methods are summarized in table 1.

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

Table 1 -- Pile Types, Construction Method, Quantities, and Days of Effort

Source	Construction Action	Maximum Number of Piles/Day	Total Estimated Number of Days Pile Driving Will Occur[1]	Total # of Piles
Vibratory				
Template piles (24" steel pipe or equivalent)	Installation	5	2	10
Template piles (24" steel pipe or equivalent)	Removal	5	2	10
Batter piles (24" steel pipe or equivalent)	Installation	1	4	4
Batter piles (24" steel pipe or equivalent)	Removal	2	2	4
Vertical piles (30" steel pipe)	Installation	1	1	1
Vertical piles (30" steel pipe)	Removal	1	2	2
Vertical piles (48" steel pipe)	Installation	1	1	1
Impact				
Batter piles (24" steel pipe or equivalent)	Installation	2	2	4
Vertical piles (30" steel pipe)	Installation	1	1	1
Vertical piles (48" steel pipe)	Installation	1	1	1
DTH				
Rock Anchors (6" drill hole)	Installation	1	6	6

[1] The total estimated number of days of pile driving in this table (24) is less than the anticipated 33 days of pile driving in the IHA application (*i.e.*, 30 days of anticipated pile driving plus a 10 percent contingency or buffer) to account for the possibility of construction overages. Total days of effort assume no simultaneous pile-driving installation occurs.

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history of the seven potentially affected marine mammal species or stocks. NMFS fully considered all 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 the species for which take is likely 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), as well as the potential biological removal (PBR), where known. The MMPA defines PBR 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, the PBR and annual mortality and serious injury (M/SI) 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 area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS' U.S. final 2024 SARs. All values presented in table 2 are the most recent available at the time of publication (including from the final 2024 SARs) and are available online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*.

Table 2 -- Species, Stocks, and the Status of Marine Mammals with Estimated Take from the Specified Activities

Common name[a]	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N)[b]	Stock abundance (CV; N_{min}; most recent abundance survey)[c]	PBR	Annual M/SI[d]
Order Artiodactyla—Infraorder Cetacea—Mysticeti (baleen whales)						

Common name[a]	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N)[b]	Stock abundance (CV; N_{min}; most recent abundance survey)[c]	PBR	Annual M/SI[d]
Family Balaenopteridae (rorquals):						
Humpback whale[e]	*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)[f]	UND	0.57
		Western North Pacific (WNP)	E, D, Y	1,084 (0.088, 1,007, 2006)[g]	3.4	5.82
Minke whale	*Balaenoptera acutorostrata*	Alaska	-,-,N	N/A (N/A, N/A, N/A)[h]	UND	0
Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae:						
Killer whale	*Orcinus orca*	Eastern North Pacific Alaska Resident	-,-,N	1,920, (N/A, 1,920, 2019)[i]	19	1.3
		Eastern Northern Pacific Northern Resident	-,-,N	302 (N/A, 302, 2018)[j]	2.2	0.2
		Eastern North Pacific Gulf of Alaska, Aleutian Islands, and Bering Sea Transient	-,-,N	587 (N/A, 587, 2012)[k]	5.9	0.8
		West Coast Transient	-,-,N	349 (N/A, 349, 2018)[l]	3.5	0.4
Family Phocoenidae (porpoises):						
Dall's porpoise	*Phocoenoides dalli*	Alaska	-,-,N	UND (UND, UND, 2015)[m]	UND	37
Harbor porpoise	*Phocoena phocoena*	Northern Southeast Alaska Inland Waters	-,-,N	1,619 (0.26, 1,250, 2019)	13	5.6
Order - Carnivora - Pinnipedia						
Family Otariidae (eared seals and sea lions)						
Steller sea lion	*Eumetopias jubatus*	Western	E, D, Y	49,837 (N/A, 49,837, 2022)[n]	299	267
		Eastern	-,-,N	36,308 (N/A, 36,308, 2022)[o]	2,178	92.3
Family Phocidae (earless seals)						
Harbor seal	*Phoca vitulina*	Lynn Canal/ Stephens Passage	-,-,N	13,388 (N/A, 11,867, 2016)	214	50

[a] 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/*).

[b] Endangered Species Act (ESA) status: Endangered (E), Threatened (T); MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or 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.
[c] NMFS marine mammal stock assessment reports online at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region.* CV is the coefficient of variation; N_{min} is the minimum estimate of stock abundance. In some cases, a CV is not applicable. N/A indicates data are unknown. UND (undetermined) PBR indicates data are available to calculate a PBR level, but a determination has been made that calculating a PBR level using those data is inappropriate (see the SAR for details).
[d] 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, vessel strikes). Annual M/SI is often not precisely determined and is sometimes reported as a minimum value or a range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.
[e] New SAR in 2022 following North Pacific humpback whale stock structure changes.
[f] Abundance estimates are based upon data collected more than 8 years ago and, therefore, current estimates are considered unknown.
[g] PBR in U.S. waters = 0.2, M/SI in U.S. waters = 0.06.
[h] Reliable population estimates are not available for this stock. Please see Friday *et al.* (2013) and Zerbini *et al.* (2006) for additional information on the number of minke whales in Alaska.
[i] N_{est}, or the best estimate of abundance, is based upon counts of individuals identified from photo-ID catalogs.
[j] N_{est} is based upon counts of individuals identified from photo-ID catalogs.
[k] N_{est} is based upon counts of individuals identified from photo-ID catalogs.
[l] N_{est} is based upon counts of individuals identified from photo-ID catalogs in analysis of a subset of data from 1958-2018.
[m] The best available abundance estimate is likely an underestimate for the entire stock because it is based upon a survey that covered only a small portion of the stock's range.
[n] 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 Nmin is 73,211 and overall PBR is 439.
[o] Nest 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, table 2 lists all 7 species (with 13 managed stocks) that temporally and spatially co-occur with the specified activity to the degree that incidental take is likely to occur.

While the general ranges for Pacific white-sided dolphins (*Lagenorhynchus obliquidens*), fin whales (*Balaenoptera physalus)*, and gray whales (*Eschrichtius robustus)* include Southeast Alaska, there are no documented sightings of these three species in the area. This includes the marine mammal monitoring reports from Berners Bay (Blejwas and Mathews, 2005; Coeur Alaska, Inc., 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, and 2025), and Southeast Alaska (Dahlheim *et al.*, 2009). Therefore, the temporal and/or spatial occurrence of these three species is such that take is not expected to occur, Coeur did not request, and NMFS is not proposing to authorize the incidental take of these three species, and they are not discussed further beyond the explanation provided here.

The project area does not overlap the designated critical habitat for the Western DPS of Steller sea lions or the Mexico DPS of humpback whales.

Much of Southeast Alaska's waters are considered Biologically Important Areas (BIAs) for feeding humpback whales, including Berners Bay (Wild *et al.*, 2023). The Berners Bay humpback whale BIA covers a 240-square-kilometer (km^2) (93-square-mile (mi^2)) area. However, this feeding BIA is effective during April and May. Since the project is anticipated to begin after July 1, 2026, and span 8 to 10 weeks, it falls outside the Berners Bay BIA's timeframe.

Harbor seals are commonly sighted in the waters of the inside passages throughout Southeast Alaska. They occur year-round and are regularly sighted in Berners Bay. It is anticipated that their abundance in Berners Bay peaks with the spring spawning runs of eulachon (*Thaleichthys pacificus*) and Pacific herring (*Clupea pallasii*). Although harbor seals regularly haul out at three locations in Berners Bay, these locations are outside of the project area. These locations range in distance to the Kensington Dock from approximately 740 meters (m) (2,428 feet (ft)) at the Slate Cove haul out; to 2,880 m (9,449 ft) at the Berner/Lace rivers (*i.e.*, three to four sandbars at the confluence of the Antler, Berner, and Lace rivers); to 5,000 m (16,404 ft) at Point St. Mary’s. During a July 12th aerial survey, harbor seals were observed out of the water only on the three to four river sandbars (outside of the project area) (Blejwas and Mathews, 2005).

Steller sea lion distribution in the project area is likely seasonal and based on prey availability. Womble and Sigler (2006) reported that they were found in Lynn Canal primarily from November to March and in Berners Bay only during April and May, which is outside of the Project’s 8 to 10-week timeframe beginning July 1, 2026. The nearest major haulouts are in Berners Bay (2.9 km (1.8 mi) away from the construction site and well outside of the project area) and on Benjamin Island (approximately 26 km (16 mi) southeast of the project area), with the lowest abundance between May and Sept (Womble *et al.*, 2009). The nearest Steller sea lion rookery is 115 km (72 mi) west of the project area.

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of sound exposure, it is necessary to understand the frequency ranges that marine mammals can hear. Not all marine mammal species have equal hearing capabilities or hear over the same frequency range (*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 hearing ranges (behavioral or auditory-evoked potential techniques) or on estimated hearing ranges (behavioral response data, anatomical modeling, *etc.*). Generalized hearing ranges were chosen based on the approximately 65 decibel (dB) threshold from composite audiograms, previous analyses in NMFS (2018), and/or data from Southall *et al*. (2007) and Southall *et al.* (2019). We note that the names of two hearing groups and the generalized hearing ranges of all marine mammal hearing groups have been recently updated (NMFS, 2024), as reflected in table 3.

Table 3 -- Marine Mammal Hearing Groups (NMFS, 2024)

Hearing Group	Generalized Hearing Range*
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 36 kHz
High-frequency (HF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz
Very High-frequency (VHF) cetaceans (true porpoises, *Kogia*, river dolphins, Cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*)	200 Hz to 165 kHz
Phocid pinnipeds (PW) (underwater) (true seals)	40 Hz to 90 kHz
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 68 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 may not be as broad. Generalized hearing range chosen

based on approximately 65 dB threshold from composite audiogram, previous analysis in NMFS (2018), and/or data from Southall *et al*. (2007) and Southall *et al*. (2019). Additionally, animals can detect very loud sounds above and below the "generalized" hearing range.

For more details concerning these groups and associated frequency ranges, please see NMFS (2024) for a review of available information.

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

This section discusses how components of the specified activities may affect 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 the specified activities. The **Negligible Impact Analysis and Determination** section considers the content of this section, as well as 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.

Acoustic effects on marine mammals during the specified project activities are likely to result from vibratory pile installation and removal, impact pile driving, and DTH. The effects of underwater noise from Coeur's proposed activities have the potential to result in Level B harassment of marine mammals in the proposed project area.

NMFS has summarized a brief technical description of the physics of sound and relevant measurement metrics (*i.e.*, root-mean-squared (RMS), Peak, and sound exposure level (SEL)) (NMFS, 2024), available online at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance.* We refer readers to this document for definitions of the measurement terms and metrics used herein.

There are a variety of types and degrees of effects on marine mammals, prey species, and habitats that could result from the specified activities. Below, we provide a brief description of the types of sound generated by the specified activities, the general impacts on marine mammals and their habitat from these activities, and a related project-specific analysis that considers the proposed mitigation measures.

Description of Sound Sources for the Specified Activities

Activities associated with the project that have the potential to incidentally take marine mammals through exposure to sound include impact hammers, vibratory hammers, and DTH drilling. Impact hammers typically operate by repeatedly dropping and/or pushing a heavy piston onto a pile to drive the pile into the substrate. Sound generated by impact hammers is impulsive, 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 hammer's weight to drive them into the substrate. Vibratory hammers typically produce less sound (*i.e.*, lower levels) 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; California Department of Transportation (CALTRANS), 2015; 2020). Sounds produced by vibratory hammers are non-impulsive; compared to sounds produced by impact hammers, they have a slower rise time, reducing the probability and severity of injury, and the sound energy is distributed over a greater amount of time (Nedwell and Edwards, 2002; Carlson *et al.*, 2005).

DTH systems use a combination of drilling and percussive mechanisms to advance a hole into the rock, with or without simultaneously advancing a pile/casing into that hole. A DTH system is essentially a drill bit that drills through the bedrock using a rotating function like a normal drill, integrated with a hammering mechanism to increase the speed of progress through the substrate (*i.e.*, it is similar to a “hammer drill” hand tool). The sound produced by the DTH methods simultaneously contains both a continuous non-impulsive component from the drilling action and an impulsive component from the hammering effect. Therefore, for purposes of evaluating Level A harassment and Level B harassment under the MMPA, NMFS treats DTH systems as both impulsive (Level A harassment thresholds) and continuous, non-impulsive (Level B harassment thresholds) sound sources.

The likely or possible impacts of the Coeur's proposed activities on marine mammals could involve both non-acoustic and acoustic stressors. Potential non-acoustic stressors could result from the physical presence of the equipment and personnel; however, given that there are no known pinniped haul-out sites within the project area, visual and other non-acoustic stressors would be limited, and any impacts to marine mammals are expected to primarily be acoustic in nature.

Potential Effects of Underwater Sound on Marine Mammals

The introduction of anthropogenic noise into the aquatic environment from vibratory pile removal and vibratory and impact pile installation is the primary means by which marine mammals may be harassed from Coeur's specified activities. Anthropogenic sounds span a broad range of frequencies and sound levels and can have highly variable impacts on marine life, ranging from none or minor to potentially severe responses, depending on received levels, duration of exposure, behavioral context, and other factors. Broadly, underwater sound from active acoustic sources, such as those in this project, can potentially result in one or more of the following: temporary or permanent hearing impairment, non-auditory physical or physiological effects, behavioral disturbance, stress, and masking (Richardson *et al.*, 1995; Gordon *et al.*, 2003; Nowacek *et al.*, 2007; Southall *et al.*, 2007; Götz *et al.*, 2009).

We describe the more severe effects of certain non-auditory physical or physiological effects only briefly, as we do not expect that the use of vibratory, impact, or

DTH hammers is reasonably likely to result in such effects (see below for further discussion). For non-auditory physical effects, while harbor seals and Steller sea lions are known to haul out, there are no haul-outs or rookeries for either species within the project area (see **Description of Marine Mammals in the Area of Specified Activities** section). Ultimately, we expect that any visual and/or other non-acoustic stressors would be limited and that any impact on marine mammals would be acoustic in nature.

Potential physiological effects from sound sources, particularly impulsive sound, can range from behavioral disturbance or tactile perception to physical discomfort, slight injury to the internal organs and the auditory system, or mortality (Yelverton *et al.*, 1973). Non-auditory physiological effects or injuries that theoretically might occur in marine mammals exposed to high level underwater sound or as a secondary effect of extreme behavioral reactions (*e.g.*, change in dive profile as a result of an avoidance reaction) caused by exposure to sound include neurological effects, bubble formation, resonance effects, and other types of organ or tissue damage (Cox *et al.*, 2006; Southall *et al.*, 2007; Zimmer and Tyack, 2007; Tal *et al.*, 2015). However, the project activities considered here do not involve the use of devices such as explosives or mid-frequency tactical sonar that are associated with these types of effects.

In general, animals exposed to natural or anthropogenic sounds may experience physical and psychological effects, ranging in magnitude from none to severe (Southall *et al.*, 2007, 2019). Exposure to anthropogenic noise can result in auditory threshold shifts and behavioral responses (*e.g.*, avoidance, temporary cessation of foraging and vocalizing, changes in dive behavior). It can also lead to non-observable physiological responses, such as increased stress hormone levels. Additional noise in a marine mammal's habitat can mask acoustic cues used in daily functions, such as communication and predator-prey detection.

The degree of effect of an acoustic exposure on marine mammals is dependent on several factors, including, but not limited to, sound type (*e.g.*, impulsive vs. non-impulsive), signal characteristics, the species, age, and sex class (*e.g.*, adult male vs. mom with calf), duration of exposure, the distance between the noise source and the animal, received levels, behavioral state at time of exposure, and previous history with exposure (Wartzok *et al.*, 2004; Southall *et al.*, 2007). In general, sudden, high-intensity sounds can cause hearing loss, as can longer exposures to lower-intensity sounds. Moreover, any temporary or permanent loss of hearing, if it occurs at all, would occur almost exclusively for noise within an animal's hearing range. Below, we describe the specific manifestations of acoustic effects that may occur based on the activities proposed by Coeur.

Richardson *et al*. (1995) described zones of increasing effect intensity that might be expected to occur with distance from a source, assuming that the signal is within an animal's hearing range. First (at the greatest distance) is the area within which the acoustic signal would be audible (potentially perceived) to the animal but not strong enough to elicit any overt behavioral or physiological response. The next zone (closer to the receiving animal) corresponds to the area where the signal is audible to the animal and sufficiently intense to elicit behavioral or physiological responsiveness. The third is a zone within which, for high-intensity signals, the received level is sufficient to cause discomfort or tissue damage to auditory or other systems. Overlaying these zones to some extent is the area within which masking (*i.e.*, when a sound interferes with or masks an animal's ability to detect a signal of interest above the absolute hearing threshold) may occur; the masking zone may vary widely in size.

Below, we provide additional details regarding the potential impacts on marine mammals and their habitat from noise in general, starting with hearing impairment, as well as from the specific activities that Coeur plans to conduct, to the degree it is available.

Hearing Threshold Shifts

NMFS defines a noise-induced threshold shift (TS) as a change, usually an increase, in the audibility threshold at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS, 2018, 2024). The amount of threshold shift is customarily expressed in dB. A TS can be permanent or temporary. As described in NMFS (2018, 2024), 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), the 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, the time to recovery (seconds to minutes or hours to days), the frequency range of the exposure (*i.e.*, spectral content), the hearing frequency range of the exposed species relative to the signal's frequency spectrum (*i.e.*, how the 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).

Temporary Threshold Shift

A temporary threshold shift (TTS) is 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, 2024). It is not considered an auditory injury (AUD INJ). Based on data from marine mammal TTS measurements (see Southall *et al.*, 2007, 2019), a TTS of 6 dB is considered the minimum threshold shift clearly larger than any day-to-day or session-to-session variation in a subject's normal hearing ability (Finneran *et al.*, 2000, 2002; Schlundt *et al.*, 2000). As described by Finneran (2015), marine mammal studies have shown that the amount of TTS increases with the 24-hour cumulative sound exposure level (SEL_{24}) in an accelerating fashion: at low exposures with lower SEL_{24}, the amount of TTS is typically small, and the growth curves have shallow slopes. At higher SEL_{24} exposures, the growth curves become steeper and approach a linear relationship with the sound exposure level (SEL).

Depending on the degree (elevation of threshold in dB), duration (*i.e.*, recovery time), and frequency range of TTS, and the context in which it is experienced, TTS can have effects on marine mammals ranging from discountable to more impactful (similar to those discussed in auditory masking, below). For example, a marine mammal may readily compensate for a brief, relatively small amount of TTS in a non-critical frequency range that occurs while the animal is traveling through the open ocean, where ambient noise is lower and competing sounds are fewer. Alternatively, a larger amount and a longer duration of sustained TTS during critical communication periods (*e.g.*, for successful mother-calf interactions) could have more severe impacts. We note that reduced hearing sensitivity, as a simple function of aging, has been observed in marine mammals, as well as in humans and other taxa (Southall *et al.*, 2007), suggesting that strategies exist to cope 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, so the sound must be louder to be heard. In terrestrial and marine mammals, TTS can last from minutes to hours (in cases of strong TTS) (Finneran, 2015). 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 (*Delphinapterus leucas*), harbor porpoise, and Yangtze finless porpoise (*Neophocoena asiaeorientalis*) (Southall *et al.*, 2019). For pinnipeds in water, measurements of TTS are limited to harbor seals, northern elephant seals (*Mirounga angustirostris*), bearded seals (*Erignathus barbatus*), and California sea lions (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 in marine mammals before and after exposure to intense or long-duration sound. 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 depend on the exposure frequency. Sounds below the region of best sensitivity for a species or hearing group are less hazardous than those 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 would be lower than that 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, SEL_{24}, 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 warning sound preceded a relatively loud 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 enable conditioned hearing reduction and filtering of low-frequency ambient noise, including increased stiffness and control of middle-ear structures, as well as placement of inner-ear structures (Ketten *et al.*, 2021). Data available on noise-induced hearing loss for mysticetes are currently lacking (NMFS, 2024). Additionally, the existing marine mammal TTS data are limited to a small number of individuals within these species.

Relationships between TTS and AUD INJ thresholds have not been studied in marine mammals, and there are no measured PTS data for cetaceans, but such relationships are assumed to be similar to those in humans and other terrestrial mammals. AUD INJ typically occurs at exposure levels at least several dB above that inducing mild TTS (*e.g.*, a 40-dB threshold shift approximates AUD INJ 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 AUD INJ 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 AUD INJ 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 AUD INJ as compared with TTS, it is considerably less likely that AUD INJ could occur.

Auditory Injury

NMFS (2024) defines AUD INJ as damage to the inner ear that can result in tissue destruction, such as loss of cochlear neuron synapses or auditory neuropathy (Houser, 2021; Finneran, 2024). AUD INJ may or may not result in a permanent threshold shift (PTS). PTS is subsequently defined 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, 2024). PTS generally affects only a limited frequency range, and animals with PTS exhibit some hearing loss at the relevant frequencies; typically, animals with PTS or other AUD INJ are not functionally deaf (Au and Hastings, 2008; Finneran, 2016). Available data from humans and other terrestrial mammals indicate that a 40-dB threshold shift approximates the onset of PTS (see Ward *et al.*, 1958, 1959; Ward, 1960; Kryter *et al.*, 1966; Miller, 1974; Ahroon *et al.*, 1996; Henderson *et al.*, 2008). However, a variety of terrestrial and marine mammal studies (see Ward *et al.*, 1958; Ward *et al.*, 1959; Ward, 1960; Miller *et al.*, 1963; Kryter *et al.*, 1966; Finneran *et al.*, 2007; Kastelein *et al.*, 2013) indicate that threshold shifts of up to 40 to 50 dB (measured a few minutes after exposure) may be induced without resulting in PTS. PTS levels for marine mammals are estimates; with the exception of a single study unintentionally inducing PTS in a harbor seal (Kastak *et al.*, 2008), no empirical data measure PTS in marine mammals largely due to the fact that, for various ethical reasons, experiments involving anthropogenic noise exposure at levels inducing AUD INJ are not typically pursued or authorized (NMFS, 2024). NMFS has set the PTS onset as a threshold shift of 40 dB.

However, after sound exposure ceases or between successive sound exposures, there is potential for recovery from hearing loss. Thus, because a threshold shift is measured a few minutes after noise exposure does not mean that those initial shifts are persistent (*i.e.*, no recovery). When initial threshold shifts fully recover back to baseline hearing levels, these are considered TTS. PTS indicates there is no full recovery back to baseline hearing levels; however, it does not mean there is no recovery. Rather, PTS indicates incomplete hearing recovery. Recovery depends on the initial threshold shift amount, the frequency of the shift, the temporal pattern of exposure (*e.g.*, exposure duration; continuous vs. intermittent), and the physiological mechanisms underlying the shift (*e.g.*, mechanical vs. metabolic). Since recovery is complicated, our current AUD INJ onset criteria do not account for the potential for recovery.

Behavioral Effects

Exposure to noise can also behaviorally disturb marine mammals to a level that rises to the definition of harassment under the MMPA. 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 a behavioral disturbance, and for responses that do, those of higher level or longer duration have the potential to affect foraging, reproduction, or survival. Behavioral disturbance may include subtle changes (*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), and avoiding areas where sound sources are located. In addition, 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, 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 predictable, unvarying sounds. 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 a general moderation in response to human disturbance (Bejder *et al.*, 2009). The opposite process is sensitization, in which an unpleasant experience leads an animal to subsequently respond at lower levels of exposure, often in the form of avoidance.

As noted above, behavioral state may affect the type of response. For example, resting animals may show greater behavioral change in response to disturbing sound levels compared to 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 shown 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 how any given sound in a particular instance might affect marine mammals perceiving it (*e.g.*, Erbe *et al.*, 2019). If a marine mammal briefly reacts to an underwater sound by changing its behavior or moving a small distance, the resulting change is unlikely to be significant to the individual, let alone the stock or population. 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 responses, which we describe in greater detail here, including alterations in dive and foraging behavior, effects on breathing, interference with or alteration of vocalizations, avoidance, and flight.

Avoidance and Displacement

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; Blair *et al*., 2016). 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 in dive behavior resulting from acoustic exposure depends on what the animal is doing at the time of exposure and on 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). Determining whether foraging disruptions incur fitness consequences would require information on, or estimates of, the energetic requirements of affected individuals; the relationships between prey availability, foraging effort, and success; and the animal's life history stage.

Respiration rates vary naturally with different behaviors, and alterations in breathing rate, as a function of acoustic exposure, can be expected to co-occur with other behavioral responses, such as a flight response or changes 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 of 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 rates 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 (SEL_{ss}): 127 dB re 1 μPa^2-s) (Kastelein *et al.*, 2013).

Avoidance is the displacement of an individual from an area or migration path due to 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). 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 the abundance or distribution patterns of the affected species in the affected region if habituation to 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, with directed, rapid movement away from the perceived location of a sound source. The flight response differs from other avoidance responses in its intensity (*e.g.*, directed movement and travel rate). Relatively little information exists on the flight responses of marine mammals to anthropogenic signals, although observations of flight responses to the presence of predators have been made (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 affect marine mammals in more subtle ways. Increased vigilance may incur costs through attentional diversion (*i.e.*, when a response requires heightened vigilance, it may come at the expense of reduced attention to other critical behaviors, such as foraging or resting). These effects have generally not been demonstrated in marine mammals, but studies of 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 reductions in fitness (*e.g.*, declines in body condition) and subsequent reductions 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 result in sleep deprivation or stress.

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, is more likely to be significant if it lasts more than one diel cycle or recurs on subsequent days (Southall *et al.*, 2007). Consequently, a behavioral response lasting less than one 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 multiple days does not necessarily mean that individual animals are exposed to activity-related stressors for multiple days, or, further, that they are exposed in a manner that results in sustained, multi-day, substantive behavioral responses.

Physiological Stress Responses

An animal's perception of a threat may be sufficient to trigger stress responses that include some combination of behavioral, autonomic nervous system, neuroendocrine, and immune responses (*e.g.*, Selye, 1950; Moberg, 2000). In many cases, an animal's first and sometimes most economical response (in terms of energetic costs) 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 pituitary hormone secretion have been implicated in reproductive failure, altered metabolism, reduced immune competence, and behavioral disturbances (*e.g.*, Moberg, 1987; Blecha, 2000). Increases in glucocorticoid levels are also associated 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 its glycogen stores, which 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 would last until the animal replenishes its energy reserves to a sufficient level 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; Ayres *et al.*, 2012; Yang *et al.*, 2022). Stress responses from 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 (*Eubalaena glacialis*). In addition, Lemos *et al*. (2022) observed a correlation between higher levels of fecal glucocorticoid metabolite concentrations (indicative of a stress response) and vessel traffic in gray whales. Yang *et al*. (2022) studied behavioral and physiological responses in captive bottlenose dolphins exposed to playbacks of "pile-driving-like" impulsive sounds, finding significant changes in cortisol and other physiological indicators, but only minor behavioral changes. These and other studies lead to a reasonable expectation that some marine mammals would experience physiological stress responses upon exposure to acoustic stressors, and that some of these responses may be classified as "distress." In addition, any animal experiencing TTS would likely also experience stress responses (NRC, 2005); however, distress is unlikely to result from this Coeur project based on observations of marine mammals during previous, similar construction projects.

Vocalizations and 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 specific frequencies for marine mammals that rely on 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 acoustic sensors or environment are severely masked could also be impaired in 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).

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 (toothed whales) but are more likely to affect the 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 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, including modifications of the signal's acoustic properties or the signaling behavior (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. Few studies have addressed real-world masking sounds likely to be experienced by marine mammals in the wild (*e.g.*, Branstetter *et al.*, 2013).

Masking occurs in the frequency band the animals use and is more likely to occur in the presence of broadband, relatively continuous noise sources, such as vibratory pile removal or installation. The energy distribution of pile-driving sound spans a broad frequency spectrum and is expected to fall within the audible range of marine mammals present in the project area. Since noises generated from the proposed construction activities are mostly concentrated at low frequencies (<2 kHz), these activities likely have less effect on mid-frequency echolocation sounds produced by odontocetes (toothed whales). However, lower-frequency noises are more likely to affect the detection of communication calls and other potentially important natural sounds, such as surf and prey noise. Low-frequency noise may also affect communication signals when they occur near the noise band, thereby reducing the communication space of animals (*e.g.*, Clark *et al.*, 2009) and increasing stress levels (*e.g.*, Holt *et al.*, 2009). Unlike TS, masking, which can occur over large temporal and spatial scales, can potentially affect species at the population, community, or even ecosystem levels, in addition to the individual level. Masking affects both senders and receivers of signals and, at higher levels and for longer durations, could have long-term chronic effects on marine mammal species and populations. However, the noise generated by the Coeur's proposed activities would occur only intermittently, spanning an estimated 33 days during the authorization period, and in a relatively small area focused around the proposed construction site. Thus, while Coeur's proposed activities may mask some acoustic signals 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 affected.

While in some cases marine mammals have exhibited little to no obviously detectable response to certain common or routine industrialized activities (Cornick *et al.*, 2011; Horsley and Larson, 2023), some animals may, at times, be exposed to received levels of sound above the Level B harassment thresholds during the proposed project.

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 across any of these modes and may result from a need to compete with increased 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 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). Fin whales have also been documented to lower the bandwidth, peak frequency, and center frequency of their vocalizations in the presence of increased background noise from large vessels

(Castellote *et al.*, 2012). Other alterations to communication signals have also been observed. For example, gray whales, in response to playback experiments that exposed them to vessel noise, have been observed to increase their vocalization rate and produce louder signals during periods of increased outboard engine noise (Dahlheim and Castellote, 2016). Alternatively, in some cases, animals may cease sound production during the production of aversive signals (Bowles *et al.*, 1994; Wisniewska *et al.*, 2018).

Under certain circumstances, marine mammals that experience significant masking could also be impaired in maximizing their performance fitness for survival and reproduction. Therefore, when the coincident (masking) sound is human-made, it may be considered harassment if it disrupts or alters 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 associated with harassment). Therefore, under certain circumstances, marine mammals whose acoustic sensors or environments are severely masked could also be impaired in maximizing their performance fitness for survival and reproduction.

Airborne Acoustic Effects

Pinnipeds near the project site could be exposed to airborne sounds associated with construction activities, depending on their distance from the activities, which could cause behavioral harassment. Although pinnipeds haul out in Berners Bay, incidents of take resulting solely from airborne sound are unlikely given the distance between the proposed project area and the known haul-out locations, as well as the timing of the project (8 to 10 weeks beginning July 1, 2026). For example, during the July 12 aerial surveys conducted by NMFS and the University of Alaska Fairbanks (UAF), harbor seals were observed out of the water only on the river sandbars, which are approximately 2,880 m from the Kensington Dock (Blejwas and Mathews, 2005). As for Steller sea lions, Womble and Sigler (2006) reported the species was found in Berners Bay only during April and May. Cetaceans are not expected to be exposed to airborne sounds that would result in harassment as defined under the MMPA.

We recognize that pinnipeds in the water may be exposed to airborne sounds that could result in behavioral harassment when they lift their heads above the water or when they haul out. Most likely, airborne sound would cause behavioral responses similar to those discussed above for underwater sound. For instance, anthropogenic sound could cause hauled-out pinnipeds to exhibit changes in their normal behavior, such as a reduction in vocalizations, or to flush from haulouts, temporarily abandon the area, and/or move further from the source. However, these animals would previously have been “taken” because of exposure to underwater sound above 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 additional incidental take resulting from airborne sound for pinnipeds is warranted, and airborne sound is not discussed further here.

Potential Effects on Marine Mammal Habitat

Coeur’s proposed activities for the project could have localized, temporary impacts on marine mammal habitat, including prey, due to increased in-water noise levels. Increased noise levels may affect the acoustic habitat and adversely affect marine mammal prey in the vicinity of the project areas (see discussion below). Elevated levels of underwater noise would ensonify the project areas where both fishes and mammals occur and could affect foraging success. Additionally, marine mammals may avoid the area during the proposed construction activities; however, any displacement due to noise is expected to be temporary and not to result in long-term effects on individuals or populations.

The total area likely impacted by Coeur's proposed activities is relatively small compared to the available habitat in Berners Bay and Lynn Canal. Avoidance by potential prey (*i.e.*, fish) of the immediate areas due to increased noise is possible. The duration of fish and marine mammal avoidance of this area after construction stops is unknown, but a rapid return to normal recruitment, distribution, and behavior is anticipated. Any behavioral avoidance by fish or marine mammals of either disturbed area would still leave significant areas of foraging habitat for fish and marine mammals in the nearby vicinity.

The proposed project would occur within the same footprint as the existing marine infrastructure. The nearshore and intertidal habitats where the proposed project would occur are in a remote area used only for inbound and outbound materials and workforce for the Kensington Mine, so vessel traffic is minimal. Temporary, intermittent, and short-term habitat alteration may result from increased noise levels during the proposed construction activities. Effects on marine mammal habitat would be limited to temporary displacement from pile removal and installation noise, and effects on prey species would be similarly limited in time and space.

Water Quality

A temporary, localized reduction in water quality would occur due to in-water construction activities. Most of this effect would occur during the installation and removal of piles when the bottom sediments are disturbed. The installation and removal of piles would disturb the bottom sediments and may temporarily increase suspended sediment in the project area. During pile extraction, sediment attached to the pile moves vertically through the water column until gravity causes 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).

Impacts on water quality from DTH are expected to be similar to those described for pile driving. Impacts on water quality would be localized and temporary, with negligible impacts on marine mammal habitat. Drilling would have negligible impacts on water quality from sediment resuspension because the system would operate within a casing set into the bedrock. The drill would collect excavated material inside the apparatus, where it would be lifted to the surface and placed onto a barge for subsequent disposal.

Effects on turbidity and sedimentation are expected to be short-term, minor, and localized. Given the strong tidal currents in the area, following completion of sediment-disturbing activities, suspended sediments in the water column should dissipate and return to background levels quickly in all construction scenarios. Turbidity in the water column can reduce dissolved oxygen levels and irritate the gills of prey fish 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 Berners Bay.

Potential Effects on Prey

Sound may affect marine mammals by altering the abundance, behavior, or distribution of prey species (*e.g.*, crustaceans, cephalopods, fishes, zooplankton). Marine mammal prey varies by species, season, and location, and for some, it is not well documented. Studies regarding the effects of noise on known marine mammal prey are described here.

Fishes use 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 and detect the motion of surrounding water (Fay *et al.*, 2008). The potential effects of noise on fishes depend on the overlapping frequency range, distance from the sound source, water depth of exposure, and species-specific hearing sensitivity, anatomy, and physiology. Key impacts on fishes may include behavioral responses, hearing damage, barotrauma (pressure-related injuries), and mortality.

Fish react to 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 their physiological state, 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 fishes (*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.*, Peña *et al.*, 2013; Wardle *et al.*, 2001; Jorgenson and Gyselman, 2009; Cott *et al.*, 2012). More commonly, though, the impacts of noise on fishes are temporary.

SPLs of sufficient strength have been known to cause injury to fishes and fish mortality (summarized in Popper *et al.*, 2014). However, in most fish species, hair cells in the ear continuously regenerate, and auditory function is likely restored when damaged cells are replaced with new ones. Halvorsen *et al.* (2012b) showed that a TTS of 4–6 dB was recoverable within 24 hours in one species. Impacts would be most severe when the individual fish is near the source, and the exposure duration 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.*, 2012a; Casper *et al.*, 2013, 2017).

Fish populations in the proposed project area that serve as prey for marine mammals could be temporarily affected by noise from pile removal and installation. 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 in response to strong and/or intermittent sounds that could harm fish. 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).

Zooplankton is a food source for several marine mammal species, as well as a food source for fish that are then preyed upon by marine mammals. Population effects on zooplankton could indirectly affect marine mammals. Data are limited on the effects of underwater sound on zooplankton species, particularly sound from construction (Erbe *et al.*, 2019). Popper and Hastings (2009) reviewed information on the effects of human-generated sound and concluded that no substantive data are available on whether sound levels from pile driving, seismic activity, or other human-made sources would have physiological effects on invertebrates. Any such effects would be limited to the area very near (1 to 5 m) the sound source and would result in no population effects because of the relatively small area affected at any one time and the reproductive strategy of most zooplankton species (short generation, high fecundity, and very high natural mortality). No adverse impact on zooplankton populations is expected from the specified activities, due in part to their large reproductive capacity and naturally high levels of predation and mortality. Any mortalities or impacts that might occur would be negligible.

The greatest potential impact on marine mammal prey during construction would occur during impact pile driving and DTH. While vibratory pile driving may elicit behavioral responses in fishes, such as temporary avoidance of the area, it is unlikely to cause injuries to fishes or have persistent effects on local fish populations. However, in-water construction activities would only occur during daylight hours, allowing fish to forage and transit the project area in the evening. Moreover, construction would have minimal permanent and temporary impacts on benthic invertebrate species, which are also a marine mammal prey source.

Potential Effects on Foraging Habitat

The proposed project is not expected to result in any habitat-related effects that could cause significant or long-term negative consequences for individual marine mammals or their populations, since installation and removal of in-water piles would be temporary and intermittent. The total seafloor area affected by pile installation and removal is relatively small compared to the available habitat just outside the project area, extending into the remaining Berners Bay and Lynn Canal. In addition, the project area does not overlap any ESA-designated critical habitat, and the Berners Bay humpback whale BIA is only active in April and May, which is outside the anticipated timeframe for project activities. Additionally, any behavioral avoidance by fish of the disturbed area would still leave significantly large areas of fish and marine mammal foraging habitat throughout the rest of Berners Bay and into Lynn Canal. As described in the preceding, the potential for project construction to affect the availability of prey for marine mammals or to meaningfully impact the quality of physical or acoustic habitat is considered to be insignificant. Therefore, the impacts of the projects are not likely to adversely affect marine mammal foraging habitat in the proposed project area.

In summary, given the relatively small areas being affected, as well as the temporary and mostly transitory nature of the proposed construction activities, any adverse effects from Coeur's activities on prey habitat or prey populations are expected to be minor and temporary. The most likely impact on fishes at the project sites would be temporary avoidance of the area. Any behavioral avoidance by fish in the disturbed areas would still leave significantly large areas of fish and marine mammal foraging habitat in the nearby vicinity. Thus, we preliminarily conclude that the impacts of the specified activities are not likely to have more than short-term adverse effects on any prey habitat or populations of prey species. Further, any impacts on 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 be limited to Level B harassment only, in the form of behavioral reactions for individual marine mammals resulting from exposure to acoustic sources (*i.e.*, vibratory, impact, and DTH pile driving). Based on the nature of the activity, Level A harassment is neither anticipated nor proposed to be authorized.

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 criteria above which NMFS believes the best available science indicates that there is some reasonable potential for marine mammals to be behaviorally harassed or incur some degree of AUD INJ; (2) the area or volume of water that would be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) the number of days of activities. 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 Criteria

NMFS recommends the use of acoustic criteria 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 AUD INJ of some degree (equated to Level A harassment). We note that the criteria for AUD INJ, as well as the names of two hearing groups, have been recently updated (NMFS, 2024), as reflected in the Level A harassment section below.

Level B Harassment

Though significantly driven by the received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors. These factors are related to the source or exposure context (*e.g.*, frequency, predictability, duty cycle, exposure duration, signal-to-noise ratio, distance to the source) and the environment (*e.g.*, bathymetry, other noise in the area, predators in the area). Therefore, the receiving animal's hearing, motivation, experience, demography, life stage, and depth can be difficult to predict (*e.g.*, Southall *et al.*, 2007; Southall *et al.*, 2021; Ellison *et al.*, 2012). Based on available science and the practical need to use a threshold based on a predictable, measurable metric for most activities, NMFS typically uses a generalized acoustic threshold based on the 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 sound pressure levels (RMS SPL) of 120 dB (referenced to 1 micropascal (re 1 μPa)) for continuous (*e.g.*, vibratory pile driving, DTH 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. Level B harassment take estimates based on these behavioral harassment thresholds potentially include TTS, as, in most cases, TTS likely occurs at distances from the source less than those at which behavioral harassment may occur. TTS of a sufficient degree can manifest as behavioral harassment and reduced hearing sensitivity, and the potential reduction in opportunities to detect important signals (conspecific communication, predators, prey) may result in behavior patterns that would not otherwise occur.

Coeur's proposed activities include the use of continuous (vibratory and DTH pile driving) and impulsive (impact and DTH pile driving) sources; therefore, the RMS SPL thresholds of 120 and 160 dB re 1 μPa are applicable.

Level A harassment

NMFS' Updated Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 3.0) (NMFS, 2024) identifies dual criteria to assess AUD INJ (Level A harassment) to five different underwater marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). It includes updated thresholds and updated weighting functions for each hearing group, provided in table 4 below. The references, analysis, and methodology used to develop the criteria are described in NMFS' 2024 Updated Technical Guidance, available at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance-other-acoustic-tools*.

Table 4 -- Thresholds Identifying the Onset of Auditory Injury

	AUD INJ Onset Acoustic Thresholds* **(Received Level)**	
Hearing Group	**Impulsive**	**Non-impulsive**
Low-Frequency (LF) Cetaceans	*Cell 1* $L_{pk,flat}$: 222 dB $L_{E,LF,24h}$: 183 dB	*Cell 2* $L_{E,LF,24h}$: 197 dB
High-Frequency (HF) Cetaceans	*Cell 3* $L_{pk,flat}$: 230 dB $L_{E,HF,24h}$: 193 dB	*Cell 4* $L_{E,HF,24h}$: 201 dB
Very High-Frequency (VHF) Cetaceans	*Cell 5* $L_{pk,flat}$: 202 dB $L_{E,VHF,24h}$: 159 dB	*Cell 6* $L_{E,VHF,24h}$: 181 dB
Phocid Pinnipeds (PW) (Underwater)	*Cell 7* $L_{pk,flat}$: 223 dB $L_{E,PW,24h}$: 183 dB	*Cell 8* $L_{E,PW,24h}$: 195 dB
Otariid Pinnipeds (OW) (Underwater)	*Cell 9* $L_{pk,flat}$: 230 dB $L_{E,OW,24h}$: 185 dB	*Cell 10* $L_{E,OW,24h}$: 199 dB

*Dual metric criteria for impulsive sounds: Use whichever criterion results in the larger isopleth for calculating AUD INJ onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level criteria associated with impulsive sounds, the PK SPL criteria are recommended for consideration for non-impulsive sources.

Note: Peak sound pressure level ($L_{p,0\text{-}pk}$) has a reference value of 1 µPa, and weighted cumulative sound exposure level ($L_{E,p}$) has a reference value of 1 µPa^{2}s. In this table, criteria are abbreviated to better reflect International Organization for Standardization (ISO) standards (ISO, 2017). The subscript "flat" is being included to indicate that peak sound pressures are flat weighted or unweighted within the generalized hearing range of marine mammals underwater (*i.e.*, 7 Hz to 165 kHz). The subscript associated with cumulative sound exposure level criteria indicates the designated marine mammal auditory weighting function (LF, HF, and VHF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The weighted cumulative sound exposure level criteria could be exceeded in a multitude of ways (*i.e.*, varying exposure levels and durations, duty cycle). When possible, action proponents should indicate the conditions under which these criteria would be exceeded.

Ensonified Area

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

The sound field in the project area consists of existing background noise and additional construction noise from the proposed project. Marine mammals are expected to be affected via sound generated by the primary components of the project (*i.e.*, vibratory pile removal, vibratory pile driving, impact pile driving, and DTH). The source levels assumed for both removal and installation activities are based on reviews of measurements of piles of the same or similar types and dimensions available in scientific literature and from similar coastal construction projects. The source levels for the piles and activities (*i.e.*, installation or removal) are presented in table 5. All construction methods would use a bubble curtain, thereby reducing the sound source levels. However, the source levels in table 5 are all unattenuated, and do not include the anticipated 5 dB attenuation from the use of a bubble curtain.

Table 5 -- Proxy Sound Source Levels for Pile Sizes and Driving Methods

Source	Construction Method	Unattenuated Source Levels[1]			Source-Level Reference
		SPL_{RMS}	SEL	SPL_{PK}	
Template and Batter piles (24" steel pipe)	Vibratory	163	NA	NA	Naval Base Kitsap Bangor Test Pile (Navy, 2012) and EHW-2 (Navy, 2013), Gustavus (Miner, 2020)
Batter piles (24" steel pipe)	Impact	190	177	203	(Caltrans, 2015); Stockton WWTP, CA; Bradshaw Bridge, CA; Rodeo Dock, CA; Tongue Point Pier, OR; Cleer Creek WWTP, CA; SR 520 Test Pile, WA; Portland Light Rail, OR; Port of Coeyman, NY; Pritchard Lake, CA; Amorco Wharf, CA; 5th Street Bridge, CA; Schuyler Heim Bridge, CA; Tanana River, AK, NBK EHW2, WA; Crescent City, CA; Avon Wharf, CA; Orwood Bridge Replacement, CA; Tesoro Amorco Wharf, CA; USCG Floating Dock, CA; Norfolk, VA; Plains Terminal, CA
Vertical piles (30" steel pipe)	Vibratory	166	NA	NA	Denes *et al*., (2016) (Auke Bay, Ketchikan, Kake), Edmonds Ferry Terminal (Laughlin, 2011, 2017), Colman Dock - Seattle Ferry

Source	Construction Method	Unattenuated Source Levels[1]			Source-Level Reference
		SPL_{RMS}	SEL	SPL_{PK}	
					Terminal (Laughlin, 2012), Kodiak Pier 3 (PND Engineers, 2015)
Vertical piles (30" steel pipe)	Impact	190	177	210	Caltrans 2015; Richmond/San Rafael Bridge, CA; Siuslaw River Bridge, OR; SR520 Test Pile, WA; Avon Wharf, CA; Fender Replacement, Redwood City, CA
Vertical piles (48" steel pipe)	Vibratory	171	NA	NA	Naval Base Kitsap Bangor Test Pile (Navy, 2012) and EHW-2 (Navy, 2013)
Vertical piles (48" steel pipe)	Impact	192	179	213	Caltrans (2020) Project: Alameda Bay, CA; Russian River Geyserville, CA; Terminal Replacement, Antioch, CA; AVON Wharf, CA; Naval Base Kitsap EHW, WA; Philadelphia, PA
Rock Anchors (6” drill hole through 10” casing inside pile)	DTH	156	144	170	Reyff & Heyvaert (2019), Reyff (2020)[2]

[1] Average underwater $SPL_{RMS,}$ SEL, and SPL_{PK} sound pressure levels are reported in dB re: 1 micropascal (µPa) @ 10 meters. These levels are unattenuated and do not include the 5 dB reduction from bubble curtains during vibratory, impact, and DTH operations.
[2] NMFS (2022). NMFS Acoustic Guidance for Assessment of Down-the-Hole (DTH) Systems. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service.

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

$$TL = B * Log_{10} (R_1/R_2),$$

where

TL = transmission loss in dB

B = transmission loss coefficient; for practical spreading, equals 15

R_1 = the distance of the modeled SPL from the driven pile, and

R_2 = the distance from the driven pile of the initial measurement.

This formula neglects loss due to scattering and absorption, which is assumed to be zero here. The degree to which underwater sound propagates away from a sound source depends on various factors, most notably the water bathymetry and the presence or absence of reflective or absorptive conditions, including in-water structures and sediments. Spherical spreading occurs in a perfectly unobstructed (free-field) environment not limited by depth or water surface, resulting in a -6 dB reduction in sound level for each doubling of distance from the source (20*log[range]). Cylindrical spreading occurs in an environment in which sound propagation is bounded by the water surface and sea bottom, resulting in a reduction of 3 dB in sound level for each doubling of distance from the source (10*log[range]). A practical spreading value of 15 is often used in coastal conditions, such as at the Coeur project site. In these environments, sound waves repeatedly reflect off the surface and bottom, reflecting an expected propagation environment between spherical and cylindrical spreading-loss conditions. Therefore, the default coefficient of 15 is used to calculate distances to the Level A harassment and Level B harassment thresholds.

Assuming practicable spreading and other assumptions regarding the source characteristics and operational logistics (*e.g.*, source level, number of strikes per pile, number of piles per day), Coeur calculated distances to the Level A harassment and Level B harassment thresholds and associated ensonified areas. Because an ensonified area associated with Level A harassment is more technically challenging to predict given the accounting for a cumulative energy component that changes over time, to assist applicants in assessing the potential for Level A harassment without the need for complex modeling, NMFS developed an optional User Spreadsheet tool to accompany the 2024 Updated Technical Guidance (see *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance-other-acoustic-tools*). This relatively simple tool can be used to calculate a Level A harassment isopleth distance for use in conjunction with marine mammal density or occurrence data to predict the amount of take that may occur incidental to an activity. We note that, because of assumptions in the methods underlying this spreadsheet tool, we anticipate that the resulting isopleths would typically be overestimates, potentially leading to an overestimate of potential exposures from Level A harassment. However, this optional tool offers a practical alternative for estimating isopleth distances when more sophisticated modeling methods are unavailable or are impractical. For stationary sources such as vibratory pile driving and removal, impact pile driving, or DTH, the optional User Spreadsheet tool predicts the distance at which, if a marine mammal remained at that distance for the duration of the activity within 24 hours, it would be expected to incur AUD INJ. Inputs used in the optional User Spreadsheet tool are included in table 6.

Table 6 -- User Spreadsheet Input Parameters Used for Calculating Level A Harassment Isopleths

	Vibratory Pile Removal			Vibratory Pile Installation				Impact Pile Installation			DTH Installation
Equipment Type	Template piles (24" steel pipe or equivalent)	Batter piles (24" steel pipe or equivalent)	Vertical piles (30" steel pipe)	Template piles (24" steel pipe or equivalent)	Batter piles (24" steel pipe or equivalent)	Vertical piles (30" steel pipe)	Vertical piles (48" steel pipe)	Batter piles (24" steel pipe or equivalent)	Vertical piles (30" steel pipe)	Vertical piles (48" steel pipe)	Rock anchors (6" drill hole)
Spreadsheet tab used	A.1) Vibratory pile driving			A.1) Vibratory pile driving				E.1) Impact pile driving			E.2) DTH
Source level (dB re: 1 µPa)[1]	158 RMS	158 RMS	161 RMS	158 RMS	158 RMS	161 RMS	166 RMS	172 SEL 198 Peak	172 SEL 205 Peak	174 SEL 208 Peak	139 SEL 165 Peak
Weighting factor adjustment (kH)	2.5			2.5				2			2
Duration to drive a single pile (minutes)	30	30	30	30	30	30	30	–	–	–	120
Strike rate (ave. strikes per second)	–	–	–	–	–	–	–	–	–	–	30
Number of strikes per pile	–	–	–	–	–	–	–	600	600	600	–
Number of piles per day	5	2	1	5	1	1	1	2	1	1	1
Propagation (xLogR)	15			15				15			15
Distance of SPL measurement (m)	10			10				10			10

[1] Vibratory removal/installation, impact, and DTH source levels all assume 5 dB attenuation reduction from the use of bubble curtains.

Using practical spreading and the source level assumptions identified in table 6, Coeur calculated, and NMFS has carried forward into this analysis, the distances to the Level A harassment and Level B harassment thresholds for marine mammals for this project (table 7).

Table 7 -- Calculated Distances to Level A Harassment and Level B Harassment Thresholds by Marine Mammal Hearing Group and Activity

Source	Method	Level A Harassment Zone (m)					All Marine Mammals Level B Harassment Zone (m)
		LFC	HFC	VHFC	PW	OW	
Vibratory Pile Driving/Removal							
Template pile (24" steel)	Install	10.7	4.1	8.8	13.8	4.6	3,414.5
Template pile (24" steel)	Removal	10.7	4.1	8.8	13.8	4.6	3,414.5
Batter pile (24" steel)	Install	3.7	1.4	3.0	4.7	1.6	3,414.5
Batter pile (24" steel)	Removal (old)	5.8	2.2	4.8	7.5	2.5	3,414.5
Vertical pile (30" round steel)	Install	5.8	2.2	4.7	7.5	2.5	5,411.7
Vertical pile (30" round steel)	Removal (old)	5.8	2.2	4.7	7.5	2.5	5,411.7
Vertical pile (48" round steel)	Installation	12.5	4.8	10.2	16.1	5.4	11,659.1
Impact Pile Driving							
Batter pile (24" steel)	Install	207.6	26.5	321.3	184.4	68.8	464.2
Vertical pile (30" round steel)	Install	130.8	16.7	202.4	116.2	43.3	464.2
Vertical pile (48" round steel)	Install	177.8	22.7	275.1	157.9	58.9	631.0
DTH Drilling							
Rock anchors (6" drill hole through 10" casing inside pile)	Install	41.8	5.3	64.6	37.1	13.8	1,165.9

Note: All distances are calculated using attenuated sound source levels.
Abbreviations: LFC = Low-Frequency Cetacean; HFC = High-Frequency Cetacean; VHFC = Very High-Frequency Cetacean; PW = Phocid pinniped (in-water); and OW = Otariid pinniped (in-water).

Marine Mammal Occurrence

In this section, we provide information on the anticipated occurrence of marine mammals present in the project area. This occurrence information then informs the take calculations in the following section (see *Take Estimation* and table 9).

For all species, the best available scientific information was considered to estimate occurrence. Since no animal density data is available for Berners Bay, Coeur used marine mammal monitoring reports from both Berners Bay (Blejwas and Mathews, 2005; Coeur Alaska, Inc., 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, and 2025) and Southeast Alaska (Dahlheim *et al.*, 2009) to develop site-specific occurrence estimates for each species. Here, sighting rates (the total number of individuals per day of monitoring effort) for each marine mammal species were calculated for each year, and averaged across years (table 8). Because the 2011–2025 Coeur Alaska, Inc., surveys were conducted during spring (April and May) to align with the eulachon and herring spawning season, species presence was likely higher than in summer months when this project is anticipated to begin (July).

Table 8 -- Estimated Occurrence of Marine Mammal Species

Species	Daily Estimated Sighting Rate[1]
Dall's porpoise	3.04
Harbor porpoise	3.17
Harbor seal	40.98
Humpback whale	11.29
Killer whale	1.71
Minke whale	NA[2]
Steller sea lion	36.33

[1] Daily estimated sighting rates (the total number of individuals per day of monitoring effort) were calculated for each year (2011–2025) and averaged across years.
[2] No minke whales were reported during the 2005 NMFS and UAF surveys (Blejwas and Mathews, 2005) and the 2011–2025 Coeur Surveys. However, minke whales may be present in the project area, based on two sightings reported in Dahlheim *et al.* (2009).

Take Estimation

Here, we describe how the information provided above is synthesized to produce a quantitative estimate of the take that is reasonably likely to occur and is proposed for authorization.

Coeur estimated take by Level B harassment by multiplying the daily estimated sighting rate for each species (table 8) by the anticipated 33 days of pile driving and DTH activity (33 days accounts for a contingency of 10 percent to account for the possibility of construction overages). Calculations were then rounded to the nearest whole number. NMFS concurs with this method.

For Dall's porpoises, the daily estimated sighting rate (3.04) was multiplied by 33 days of pile driving for a total of 100.32, which rounds to 100 estimated takes by Level B harassment. Coeur requests, and NMFS proposes to authorize 100 takes by Level B harassment of Dall's porpoises.

For harbor porpoises, the daily estimated sighting rate (3.17) multiplied by 33 days totals 104.61, which rounds to 105 estimated takes. Therefore, Coeur requests, and NMFS proposes, to authorize 105 takes by Level B harassment of harbor porpoises.

For harbor seals, the daily estimated sighting rate (40.98) multiplied by 33 days totals 1,352.34, which rounds to 1,352 estimated takes. Therefore, Coeur requests, and NMFS proposes to authorize 1,352 takes by Level B harassment of harbor seals.

Multiple humpback whale stocks occur in the project area. Eighty-nine percent of whales present in the Gulf of Alaska are expected to be from the Hawai'i stock, 11 percent from the Mexico-North Pacific stock, and less than 1 percent from the WNP stock (Wade, 2021). Therefore, the total estimated take for each stock was calculated by multiplying the daily estimated sighting rate (11.29) by 33 days of pile driving, then multiplying by the proportion of the stock that makes up the species (*i.e.*, 89, 11, or 0.01 percent for the Hawai'i stock, the Mexico-North Pacific stock, and the WNP stock, respectively). Based on this apportionment, Coeur requests, and NMFS proposes, to authorize 332 takes by Level B harassment for the Hawai'i stock, 41 takes by Level B harassment for the Mexico-North Pacific stock, and 4 takes by Level B harassment for the WNP stock.

For killer whales, the daily estimated sighting rate (1.71) multiplied by 33 days totals 56.43, which rounds to 56 estimated takes. Accordingly, Coeur requests, and NMFS proposes to authorize 56 takes by Level B harassment of killer whales.

Although no minke whales were reported during the 2005 NMFS and UAF surveys (Blejwas and Mathews, 2005) and the 2011–2025 Coeur Alaska, Inc., surveys, the species may be present in the project area, based on two sightings reported in Dahlheim *et al.* (2009). Therefore, Coeur requests, and NMFS proposes to authorize two takes by Level B harassment of minke whales.

For the Steller sea lion species, the daily estimated sighting rate (36.33) multiplied by 33 days totals 1,198.89, which rounds to 1,199 estimated takes by Level B harassment. However, Steller sea lions are divided into two stocks: the Eastern stock, a population east of the 144° W longitude at Cape Suckling, AK, and the Western stock. While most Steller sea lions in the project area would likely be from the Eastern stock, distinguishing between the two stocks without tagging or branding is impossible. Based on genetic data analyzed in Hastings *et al.* (2020), 98.6 percent of animals in the project area are likely from the Eastern stock, and 1.4 percent from the Western stock. Therefore, 1,199 estimated takes multiplied by 0.986 totals 1,182.21, which rounds to 1,182; 1,199 estimated takes multiplied by 0.014 totals 16.79, which rounds to 17. Therefore, Coeur requests, and NMFS proposes to authorize 1,182 takes by Level B harassment of the Eastern stock, and 17 takes by Level B harassment of the Western stock.

Coeur proposes to implement shutdown zones that meet or exceed the Level A harassment zone for all activities, and did not request take by Level A harassment. NMFS anticipates that Coeur will be able to effectively monitor and implement these shutdown zones, and, therefore, NMFS neither anticipates nor proposes to authorize take by Level A harassment.

Table 9 summarizes the proposed authorized takes, by Level B harassment only, and the proposed take as a percentage of stock abundance.

Table 9 -- Proposed Authorized Take by Level B Harassment and as a Percentage of Stock Abundance

Common name	Stock	Proposed Authorized Take		Take as a percent of stock abundance
		Level B	Total proposed take	
Dall's porpoise	Alaska	100	100	N/A
Harbor porpoise	Northern Southeast Alaska Inland Waters	105	105	6.49
Harbor seal	Lynn Canal/Stephens Passage	1,352	1,352	10.10
Humpback whale	Hawai'i	332	332	2.94
	Mexico-North Pacific	41	41	NA
	WNP	4	4	0.37
Killer Whale	Eastern North Pacific Alaska Resident	56	56	2.92
	Eastern Northern Pacific Northern Resident			18.54
	Eastern North Pacific Gulf of Alaska, Aleutian Islands, and Bering Sea Transient			9.54
	West Coast Transient			16.05
Minke whale	Alaska	2	2	NA
Steller sea lion	Western	17	17	0.03
	Eastern	1,182	1,182	3.26

Proposed Mitigation

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 (ITAs) to include information about the availability and feasibility (economic and technological) of equipment, methods, and the 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) How and to what degree the successful implementation of the measure(s) is expected to reduce impacts on marine mammal species or stocks and their habitat. This

considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure would 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.

The mitigation requirements described in the following were proposed by Coeur in its adequate and complete application or are the result of subsequent coordination between NMFS and Coeur. Coeur has agreed that all the mitigation measures are practicable. NMFS has fully reviewed the specified activities and the mitigation measures to determine if the mitigation measures would result in the least practicable adverse impact on marine mammals and their habitat, as required by the MMPA, and has determined that the proposed measures are appropriate. NMFS describes these below as proposed mitigation requirements and has included them in the proposed IHA.

Establishment of Shutdown Zones

Coeur proposed, and NMFS would require, the establishment of shutdown zones with radial distances, as identified in table 10, for all construction activities. The purpose of a shutdown zone is generally to define an area within which shutdown of the activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area) to minimize potential instances of AUD INJ and more severe behavioral disturbances by delaying the start of an activity if marine mammals are near the activity. Additionally, Coeur would be required to shut down if an unauthorized species is present to avoid taking it. Shutdown zones would be cleared before activities begin and would vary by activity type and marine mammal hearing group.

The placement of up to two PSOs during all pile-driving activities (as described in the **Proposed Monitoring and Reporting** section) would ensure that the entire shutdown zone is visible. Should environmental conditions deteriorate to the point that the entire shutdown zone is not visible (*e.g.*, fog, heavy rain), pile driving would be delayed until the PSO is confident that marine mammals within the shutdown zone can be detected. Limiting construction activities to daylight hours only would also increase the detectability of marine mammals in the area.

If pile driving is delayed or halted due to the presence of a marine mammal, the activity may not begin 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.

To avoid direct physical interaction with marine mammals during construction activity, if a marine mammal approaches within 10 m for activities other than pile driving, operations must cease, and vessels must reduce speed to the minimum level necessary to maintain steerage and safe working conditions, as needed to prevent direct physical interaction.

Table 10 -- Shutdown Zones by Marine Mammal Hearing Group and Activity

Source	Method	Distance to Shutdown Zone (m)				
		LFC	**HFC**	**VHFC**	**PW**	**OW**
Vibratory Pile Driving/Removal						
Template pile (24” steel)	Install	20	10	10	20	10
Template pile (24” steel)	Removal	20	10	10	20	10
Batter pile (24” steel)	Install	10	10	10	10	10
Batter pile (24” steel)	Removal (old)	10	10	10	10	10
Vertical pile (30” round steel)	Install	10	10	10	10	10
Vertical pile (30” round steel)	Removal (old)	10	10	10	10	10
Vertical pile (48” round steel)	Installation	20	10	20	20	10
Impact Pile Driving						
Batter pile (24” steel)	Install	210	30	330	190	70

Vertical pile (30" round steel)	Install	140	20	210	120	50
Vertical pile (48" round steel)	Install	180	30	280	160	60
			DTH Drilling			
Rock anchors (6" drill hole through 10" casing inside pile)	Install	50	10	70	40	20

Abbreviations: LFC = Low-Frequency Cetacean; HFC = High-Frequency Cetacean; VHFC = Very High-Frequency Cetacean; PW = Phocid pinniped (in-water); and OW = Otariid pinniped (in-water).

Pre- and Post-Activity Marine Mammal Monitoring

Monitoring would take place from 30 minutes prior to initiation of pile driving or DTH activity (*i.e.*, pre-start clearance monitoring) through 30 minutes post-completion of pile driving or DTH activity. In addition, monitoring for 30 minutes would take place whenever a break in the specified activity (*i.e.*, vibratory pile driving, impact pile driving, or DTH) of 30 minutes or longer occurs. Pre-start clearance monitoring would be conducted during periods of sufficient visibility for the lead PSO to determine that the shutdown zones indicated in table 10 are clear of marine mammals. 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 the 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.

Soft-Start

Coeur would use soft-start techniques when impact pile driving. Soft-start procedures provide additional protection for marine mammals by issuing a warning and/or giving them a chance to leave the area before the hammer operates at full capacity. Soft-start requires contractors to provide an initial set of three strikes at reduced energy, followed by a 30-second waiting period, then two subsequent sets of reduced energy strikes. A 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.

Bubble Curtain

Coeur has proposed using a bubble curtain to reduce the extent of the ensonified areas and the sound levels within them. A bubble curtain would attenuate in-water construction noise during all the proposed pile driving activities presented herein (*i.e.*, vibratory, impact, and DTH).

In summary, based on our evaluation of Coeur's proposed mitigation 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, with particular focus on rookeries, mating grounds, and similar areas of significance.

Proposed Monitoring and Reporting

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104(a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present while conducting the activities. Effective reporting is critical both for compliance and ensuring the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should help improve the 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.

The monitoring and reporting requirements described in the following were proposed by Coeur in its adequate and complete application or are the result of subsequent coordination between NMFS and Coeur. Coeur has agreed to the requirements. NMFS describes these below as requirements and has included them in the proposed IHA.

Visual Monitoring

All PSOs must be NMFS-approved, be independent of the activity contractor, and have no other assigned tasks during monitoring periods. At least one PSO would have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued ITA. Coeur would have one to two PSOs actively monitoring on-site at all times during pile-driving and DTH activities. Where a team of two or more PSOs is required, a lead observer or monitoring coordinator would be designated. The lead observer would be required to have prior experience working as a marine mammal observer during construction. Other PSOs may substitute relevant experience, education (a degree in biological science or a related field), or training for prior experience performing the duties of a PSO. PSOs may also substitute Alaska native traditional knowledge for experience. Additional PSOs may be employed during periods of low or obstructed visibility to ensure the entirety of the shutdown zone is monitored.

PSOs would also have the ability to conduct field observations and collect data according to assigned protocols, including experience or training in the field of identification of marine mammals, including the identification of behaviors; sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations; writing skills sufficient to prepare a report of observations including but not limited to (1) the number and species of marine mammals observed; (2) dates and times when in-water construction activities were conducted; (3) dates, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); (4) marine mammal behavior; and (5) the 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.

Reporting

Coeur would be required to submit a draft report(s) on all construction activities and marine mammal monitoring results to NMFS within 90 days of the completion of monitoring, or 60 days prior to the requested issuance of any subsequent IHAs or similar activity at the same location, whichever comes first. The information required to be collected and reported to NMFS is included in the draft IHA available at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities*. In summary, the report would include, but not be limited to, information regarding activities that occurred, marine mammal sighting data, and whether mitigative actions were taken or could not be taken. Coeur would also be required to submit reports on any observed injured or dead marine mammals. If the death or injury was clearly caused by the project activities, Coeur would immediately cease the specified activities until NMFS reviews the circumstances of the incident and determines what, if any, additional measures are appropriate to ensure compliance with the terms of the IHA. Coeur would not resume its activities until notified by NMFS.

Specific proposed mitigation, monitoring, and reporting requirements can be found in the draft IHA found at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities.*

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 upon 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 9, 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 on the size, status, or structure of any of these species or stocks that would lead to a different analysis for this activity.

Pile-driving activities (via vibratory, impact, and DTH) associated with the project, as outlined previously, may disturb or displace marine mammals. Specifically, the specified activities may result in Level B harassment from underwater sounds generated from pile driving and removal. Potential takes could occur if individual marine mammal species are present in zones ensonified above the thresholds for Level B harassment identified above (see table 7) when these activities are underway.

Given the nature of the proposed activity, NMFS does not anticipate serious injury or mortality to marine mammals from Coeur's proposed project, even in the absence of required mitigation. Further, as stated in the **Proposed Mitigation** section, Coeur would implement shutdown zones that equal or exceed all the Level A harassment isopleths shown in table 7. As such, take by Level A harassment of species occurring at the proposed project site is neither anticipated nor proposed for authorization.

For all species and stocks, take is expected to occur within a limited area (adjacent to the project site) of the stock's range. The intensity and duration of anticipated take by Level B harassment would be minimized through the proposed mitigation measures described herein. Furthermore, the amount of take proposed for authorization is small compared to the relevant stock's abundance, even if every take occurred to separate individuals within a stock.

Behavioral responses of marine mammals to vibratory, impact, and DTH pile driving at the project site, if any, are expected to be mild, short-term, and temporary. Given that pile-driving activities would occur over an estimated 33 days spanning 8 to 10 weeks beginning July 1, 2026, any harassment is expected to be temporary and intermittent. Marine mammals within the Level B harassment zones may not show any visual cues that they are disturbed by activities, or they may become alert, avoid the area, leave the area, or display other mild responses that are not observable, such as changes in vocalization patterns. Additionally, many of the species potentially present in the region would be present only temporarily, due to seasonal patterns or active transit between other habitats. Most likely, during pile-driving activities, individuals would be expected to move away from the sound source and be temporarily displaced from the pile-driving area. However, this reaction has been observed primarily associated with impact pile driving. Vibratory pile driving associated with the proposed project may produce sound at distances of many kilometers from the project site, thus overlapping with some likely less-disturbed habitats. However, the remote project site is located within Slate Cove, Berners Bay, which is used only for importing supplies and fuel and for exporting mined ore concentrate from the Kensington Mine. Animals disturbed by project sounds are expected to avoid the immediate area and use nearby higher-quality habitats in and beyond Berners Bay and Lynn Canal. Pinnipeds in the area would be at their haul-outs outside the project area, and no in-air harassment is anticipated from construction.

The potential for harassment is minimized by implementing the proposed mitigation measures. During all impact driving, the implementation of soft-start procedures and the monitoring of established shutdown zones by trained and qualified PSOs shall be required, thereby significantly reducing any possibility of injury. Given sufficient notice through soft start (for impact driving), marine mammals are expected to move away from an irritating sound source before it becomes potentially injurious.

Any impact on marine mammal prey that would occur during Coeur's proposed activities would have, at most, short-term effects on the foraging of individual marine mammals, and likely have no effect on the populations of marine mammals as a whole. Indirect effects on marine mammal prey during construction are expected to be minor and unlikely, especially since the proposed project is outside of the spring spawning season of eulachon and Pacific herring. Therefore, we do not expect the project to cause substantial individual- or population-level impacts on marine mammals, nor to affect annual recruitment or survival rates.

In addition, the area likely impacted by the proposed project is relatively small compared to the available habitat in the surrounding waters of Lynn Canal, the Tongass Narrows, and in Southeast Alaska in general. Although Berners Bay is part of an identified BIA for feeding humpback whales (NOAA, 2024), the BIA's timing (April and May) does not overlap with the proposed in-water construction schedule (beginning after July 1 and lasting approximately 8 to 10 weeks). Finally, there is no ESA-designated critical habitat in the area for humpback whales or the Western DPS of Steller sea lions.

In summary and as described above, the following factors primarily support our preliminary determination that the potential 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 Level A harassment, serious injury or mortality is anticipated or proposed for authorization incidental to the project;
- The anticipated incidents of Level B harassment would consist of, at worst, temporary modifications in behavior that would not result in fitness impacts on individuals;

- The area affected by the specified activity is very small relative to the overall habitat ranges of all species, and does not include any rookeries, ESA-designated critical habitat, or active BIAs;
- Effects on marine mammal prey species 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 adverse impacts on their populations; and
- The proposed mitigation measures, such as soft-starts and shutdowns, are expected to reduce the potential effects of the specified activity on marine mammals.

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 would 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 section 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers, so, in practice, when estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate abundance estimate for the relevant species or stock in determining 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 (see 86 FR 5322, January 19, 2021). Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

Our analysis shows that less than one-third of each affected stock could be taken by harassment. The number of animals proposed to be taken from these stocks would be considered small relative to the relevant stock's abundance, even if each estimated taking occurred to a new individual—an unlikely scenario.

There is no current abundance estimate of the Mexico-North Pacific stock of the humpback whale (Young *et al.*, 2026). To determine the number of animals belonging to the Mexico-North Pacific stock in Southeast Alaska in the summer, the abundance estimate for each feeding area was multiplied by the probability of movement between that feeding area and the Mexican wintering area, as estimated by Wade (2021), and then added together. This resulted in an estimate of 918 humpback whales in the Mexico-North Pacific stock (Young *et al.*, 2026). Therefore, 41 takes by Level B harassment proposed for authorization represent small numbers of this stock, even if each take occurred to a new individual.

There is no current abundance estimate of the Alaska stock of minke whale, but an abundance of 2,020 individuals was estimated on the eastern Bering shelf based on a 2010 survey (Friday *et al.*, 2013; Young *et al.*, 2024). Therefore, the two takes by Level B harassment proposed for authorization represent small numbers of this stock, even if each take occurred to a new individual.

There is no current abundance estimate of the Alaska stock of Dall's porpoise (Young *et al.*, 2026), but a minimum population estimate for this stock is assumed to be equal to or greater than 13,110 based on a 2015 vessel-based abundance estimate calculated by Rone *et al.* (2017) in the Gulf of Alaska. Therefore, 100 takes by Level B harassment proposed for authorization represent small numbers of this stock, even if each take occurred to a new individual.

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

Alaska Natives have traditionally harvested subsistence resources, including marine mammals (Steller sea lions and harbor seals), for hundreds of years. This includes the harvest of harbor seals near Berners Bay (ADF&G 2009a,b). In recent decades, hunting levels have declined to historically low levels (Wolfe *et al.*, 2013). The last available report of marine mammal harvest in Southeast Alaska was in 2012 and included harbor seals (595) and sea lions (9) (Wolfe *et al.*, 2013); however, this report did not specify subsistence activity in Berners Bay. Moreover, although Steller sea lions and harbor seals regularly haul out in Berners Bay, though well outside the project area, Coeur, which has been operating the Kensington Mine since 2010, reports no knowledge of subsistence activities in Berners Bay during this time (Coeur Alaska, Inc., 2026).

The proposed project is not expected to affect subsistence hunting, as there is none in Berners Bay, which includes the project area. Further, the work would be temporary (33 days) and localized to a specific area, and construction is taking place outside of the spring spawning season of eulachon and Pacific herring when subsistence species are more active (approximately mid-March to mid-May).

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 Coeur's proposed activities.

Endangered Species Act

Section 7(a)(2) of the ESA of 1973 (16 U.S.C. 1531 *et seq*.) requires that each Federal agency ensure 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 in issuing incidental take authorizations, NMFS consults internally whenever we propose to authorize take of ESA-listed species, in this case, with the NMFS Alaska Regional Office.

NMFS is proposing to authorize takes of the humpback whale (Mexico-North Pacific stock (Mexico DPS), ESA-listed as threatened, and the WNP stock (WNP DPS), ESA-listed as endangered) and the Steller sea lion (Western stock (Western DPS, ESA-listed as endangered)).

OPR has requested initiation of an ESA section 7 consultation with the NMFS Alaska Regional Office for the issuance of this IHA. NMFS will conclude the ESA consultation before reaching a determination on the proposed authorization issuance.

Proposed Authorization

As a result of these preliminary determinations, NMFS proposes to issue an IHA to Coeur for conducting the in-water pile driving and removal activities as part of the Kensington Dock Repair Project in Berners Bay, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. A draft of the proposed IHA can be found at: *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act*.

Request for Public Comments

We request comments on our analyses, the proposed authorization, and any other aspect of this notice of proposed IHA for the proposed Kensington Dock Repair Project. We also request comments 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 the 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: April 24, 2026.

Shannon Bettridge,

Chief, Marine Mammal and Sea Turtle Conservation Division,

Office of Protected Resources, National Marine Fisheries Service.

[FR Doc. 2026-08299 Filed: 4/28/2026 8:45 am; Publication Date: 4/29/2026]