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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648-XC798]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Chevron Long Wharf Maintenance and Efficiency Program in San Francisco Bay, California

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 Chevron Products Company for authorization to take marine mammals incidental to the Long Wharf Maintenance and Efficiency Program (LWMEP) in San Francisco Bay, California. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an incidental harassment authorization (IHA) to incidentally take marine mammals during the specified activities. NMFS is also requesting comments on a possible one-time, one-year renewal that could be issued under certain circumstances and if all requirements are met, as described in **Request for Public Comments** at the end of this notice. NMFS will consider public comments prior to making any final decision on the issuance of the requested MMPA 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 Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service and should be submitted via email to *ITP.taylor@noaa.gov*.

Instructions: NMFS is not responsible for comments sent by any other method, to any other address or individual, or received after the end of the comment period. Comments, including all attachments, must not exceed a 25-megabyte file size. All comments received are a part of the public record and will generally be posted online at *www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act* without change. All personal identifying information (*e.g.*, name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

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

SUPPLEMENTARY INFORMATION:

Background

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

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

National Environmental Policy Act

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

This action is consistent with categories of activities identified in Categorical Exclusion B4 (IHAs with no anticipated serious injury or mortality) of the Companion Manual for NOAA Administrative Order 216-6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has preliminarily determined that the issuance of the proposed IHA qualifies to be categorically excluded from further NEPA review. We will review all comments submitted in response to this notice prior to concluding our NEPA process or making a final decision on the IHA request.

Summary of Request

On December 16, 2022, NMFS received a request from Chevron Products Company (Chevron) for an IHA to take marine mammals incidental to pile driving activities associated with the LWMEP in San Francisco Bay (the Bay), California. Following NMFS' review of the application, Chevron submitted a final revised version on February 27, 2023. The application was deemed adequate and complete on March 20, 2023. Chevron's request is for take of 7 species of marine mammals by Level B harassment only. Neither Chevron nor NMFS expect serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

NMFS previously issued IHAs to Chevron for similar work (83 FR 27548, June 13, 2018; 84 FR 28474, June 19, 2019; 85 FR 37064, June 19, 2020; 86 FR 28578, May 27, 2021; 87 FR 35180, June 9, 2022). Chevron complied with all the requirements (*e.g.*, mitigation, monitoring, and reporting) of the previous IHAs and information regarding their monitoring results may be found in the **Estimated Take** section.

This proposed IHA would cover 1 year of a larger project for which Chevron obtained prior IHAs and intends to request take authorization for subsequent facets of the project. The larger 5-year project involves upgrading Long Wharf to satisfy current Marine Oil Terminal Engineering and Maintenance Standards.

Description of Proposed Activity

Overview

Chevron plans to upgrade Berth 1 of the Refinery Long Wharf in the Bay, California in order to meet current safety and efficiency standards. As part of the proposed project, Chevron is proposing to use vibratory extraction to remove concrete piles associated with the existing gangway and catwalk. Impact hammers would be used to install concrete piles to construct a mooring dolphin and hook, breasting dolphin and breasting points with standoff fenders, and to replace the catwalk in a different location.

A temporary construction template composed of steel piles would be installed through the use of a vibratory hammer and removed by vibratory extraction when in-water construction activities are complete. The Long Wharf has six berths for receiving raw materials and shipping products. The project area encompasses the entirety of Berth 1, an area of approximately 470 square meters (m^2). All in-water work would take place within the seasonal work window of June 1, 2023 through November 30, 2023.

Chevron's proposed activity includes impact and vibratory pile driving and vibratory pile removal, which may result in the incidental take of marine mammals, by harassment only. Due to mitigation measures, no Level A harassment is anticipated to occur, and none is proposed for authorization.

Dates and Duration

In-water construction activities would occur over the course of 30 days from June 1, 2023 through November 30, 2023. Chevron states that it would conduct work only in daylight hours. The proposed in-water work schedule is shown in table 1. In-water work would begin with of 1 day of vibratory pile extraction, then 21 days of impact pile installation. The temporary construction trestle would require 4 days of vibratory pile installation and 4 days of vibratory pile removal. Pile installation and removal would occur at a rate 2-3 piles per day, depending upon pile size and type. Only one pile would be driven or extracted at a time. Although the IHA would be active for a period of 1 year, in-water pile installation and removal activities are planned from June through November to protect sensitive life stages of listed fish species in the area.

Table 1. In-Water Construction Schedule

Pile type	Method	Number of piles	Estimated strikes per pile	Estimated duration per pile in minutes (seconds)	Estimated number per day	Total estimated days

24-inch square concrete pile	Impact install	42	440 [1]	20 (1200)	2	21
36-inch steel shell pile [2]	Vibratory install	12	N/A	10 (600)	3	4
18-inch concrete pile	Vibratory extract	2	N/A	6.67 (400)	2	1
36-inch steel shell pile[2]	Vibratory extract	12	N/A	10 (600)	3	4

[1] Using a DelMag D62 22 or similar diesel hammer
[2] Temporary template

Specific Geographic Region

The Long Wharf is located in northern region of the central Bay, south of the eastern terminus of the Richmond-San Rafael Bridge (RSRB) (Figure 1). Water depth in the project area ranges from approximately 6 to 15 meters (m), mean lower low water (MLLW). The substrate is primarily Bay mud, however, sand or gravel may exist deeper into the substrate. The project area around Berth 1 is approximately 470 square kilometers (km^2) in size. Ambient underwater noise in the vicinity of the project area is generated by shipping activity, ferry traffic, and sound generated by the Richmond Bridge piers. Underwater noise measurements in 2006 and from 2020-2022 found the ambient noise in the project area to exceed 120 dB RMS. Ambient underwater noise levels at Long Wharf may vary with noise levels being higher at Berth 1, likely due to its closer proximity to the main shipping channel.

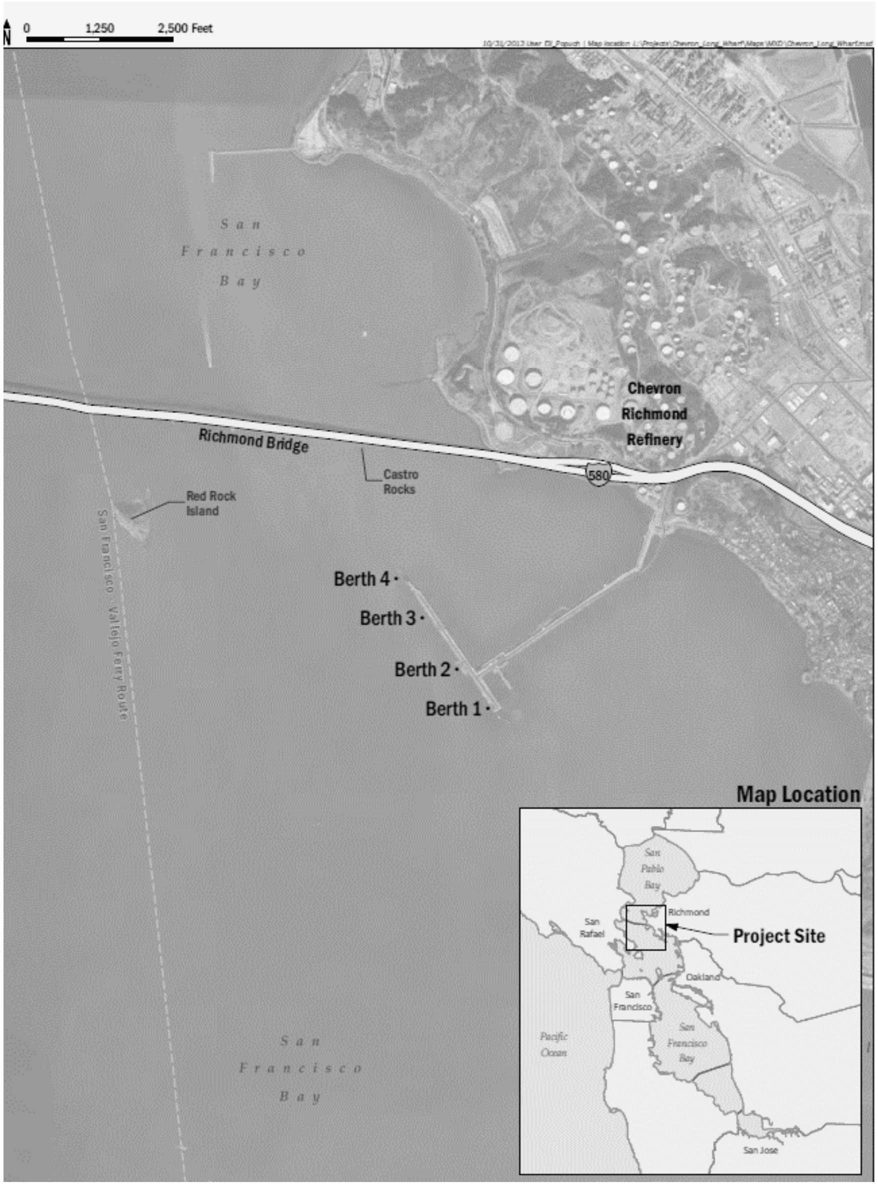

Figure 1 -- Chevron Long Wharf Project Area

Detailed Description of the Specified Activity

The LWMEP upgrades began in 2018 and were planned to be completed within 2-3 years, however, the project experienced several delays. The proposed IHA would cover activities that were not completed under the 2021 IHA (86 FR 28578, May 27, 2021).

Chevron plans to complete modifications to Berth 1 at the Long Wharf by updating the fender system to better accommodate barges and enable balanced utilization across berths. Specifically, these modifications include replacing the gangway, construction of a new mooring dolphin and hook and breasting dolphin with breasting point, removing a catwalk and concrete piles, and installing a temporary construction template. Unless otherwise specified, the term “pile driving” in this section, and all following sections, may refer to either pile installation or removal.

Gangway Replacement— The existing gangway would be replaced in order to accommodate barges. Four 24-inch concrete piles would be installed using an impact hammer at a rate of 2 piles per day (table 1). A new raised fire monitor would be added as well. However, addition of the fire monitor would occur above water, and therefore, we do not anticipate take of marine mammals associated with this activity, and it is not discussed further.

Mooring Dolphin and Hook Construction— A new 24 feet (ft) (7.3 meters (m)) by 25 ft (7.6 m) mooring dolphin and hook would be installed to accommodate barges at Berth 1. An impact hammer would be used to drive 13 24-inch concrete piles at a rate of 2 piles per day (table 1).

Breasting Dolphin and Breasting Point Construction— A new 24 ft (7.3 m) by 25 ft (7.6 m) breasting dolphin would be installed with a 13 ft (4 m) by 26 ft (7.9 m) breasting point with standoff fenders to accommodate barges. The breasting dolphin would be constructed using an impact hammer to install 17 24-inch concrete piles at a rate of 2 piles per day (table 1). The breasting point with standoff fenders would be installed using an impact hammer to drive 8 24-inch concrete piles at a rate of 2 piles per day. Construction of the breasting dolphin and breasting point also require the removal of an existing catwalk and 2 18-inch concrete piles. These piles would be removed through the use of vibratory extraction over 1 day. The existing catwalk would be replaced by a new catwalk in a different location. Removal and replacement of the catwalk would occur above water, and therefore, we do not anticipate take of marine mammals associated with this activity, and it is not discussed further.

In addition to the planned modifications, Chevron would construct a temporary template using 12 36-inch steel piles. These piles would be installed using vibratory installation and removed using vibratory extraction after in-water construction activities are complete.

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

Description of Marine Mammals in the Area of Specified Activities

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

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

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS' stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS' U.S. Pacific SARs. All values presented in table 2 are the most recent available at the time of publication (including from the draft 2022 SARs) and are available online at: *www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*.

Table 2. Marine Mammal Species[4] Likely to be Impacted by the Specified Activities

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N)[1]	Stock abundance (CV, Nmin, most recent abundance survey)[2]	PBR	Annual M/SI[3]
Order Artiodactyla – Infraorder Cetacea – Mysticeti (baleen whales)						

Family Eschrichtiidae						
Gray whale	*Eschrichtius robustus*	Eastern North Pacific	-, -, N	26,960 (0.05, 25,849, 2016)	801	131
Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						
Bottlenose dolphin	*Tursiops truncatus*	California Coastal	-, -, N	453 (0.06, 346, 2011)	2.7	≥2.0
Family Phocoenidae (porpoises)						
Harbor porpoise	*Phocoena phocoena*	San Francisco/Russian River	-, -, N	7,777 (0.62, 4,811, 2017)	73	≥0.4
Order Carnivora – Pinnipedia						
Family Otariidae (eared seals and sea lions)						
California sea lion	*Zalophus californianus*	U.S.	-, -, N	257,606 (N/A, 233,515, 2014)	14,011	>321
Northern fur seal [5]	*Callorhinus ursinus*	California	-, D, N	14,050 (N/A, 7,524, 2013)	451	1.8
Family Phocidae (earless seals)						
Harbor seals	*Phoca vitulina*	California	-, -, N	30,968 (N/A, 27,348, 2012)	1,641	43
Northern elephant seal	*Mirounga angustirostris*	California Breeding	-, -, N	187,386 (N/A, 85,369, 2013)	5,122	13.7

[1] - Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

[2]- NMFS marine mammal stock assessment reports online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments/*. CV is coefficient of variation; Nmin is the minimum estimate of stock abundance. In some cases, CV is not applicable as in the case of the pinnipeds, as population estimates are dependent upon the numbers of individuals hauled out or the number of pups.

[3] - These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (*e.g.,* commercial fisheries, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.
[4]- Information on the classification of marine mammal species can be found on the web page for The Society for Marine Mammalogy's Committee on Taxonomy *(https://marinemammalscience.org/science-and-publications/list-marine-mammal-species-subspecies/*; Committee on Taxonomy (2022)).
[5]- Survey years = Sea Lion Rock-2014; St. Paul and St. George Is - 2014, 2016, 2018; Bogoslof Is. - 2015, 2019.

As indicated above, all 7 species (with 7 number managed stocks) in table 2 temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur. All species that could potentially occur in the proposed survey areas are included in table 4-1 of the IHA application. While humpback whales have been sighted in the coastal waters outside of the Bay, the spatial occurrence of this species is such that take is not expected to occur, and they are not discussed further beyond the explanation provided here. Although there are no published studies available regarding the distribution of humpback whales in the Bay, sightings from whale watching vessels and other mariners report that when humpback whales enter the Bay, they rarely move east into the Bay towards the vicinity of the project area and are unlikely to occur during the proposed activities.

Harbor Seal

Pacific harbor seals are distributed from Baja California north to the Aleutian Islands of Alaska. Harbor seals do not make extensive pelagic migrations, but may travel hundreds of kilometers to find food or suitable breeding areas (Herder, 1986; Harvey and Goley, 2011; Carretta *et al.,* 2022).

The California Department of Transportation (Caltrans) conducted extensive marine mammal surveys in Bay before and during seismic retrofit on the RSRB from 1998-2002 and determined that a minimum of 500 harbor seals occur within the Bay (Green *et al.,* 2002). This estimate aligns with more recent seal counts (Lowry *et al.,* 2008; Codde *et al.,* 2020). The California harbor seal stock may be stabilizing at or near carrying capacity, although conservation concerns such as vessel strikes, disturbance, fishing gear entanglement, and habitat loss are still a concern in the Bay area (Duncan, 2019).

The number of harbor seals in the Bay increases during the winter foraging period as compared to the spring breeding season. In the Bay, harbor seals are known to forage on a variety of fish, crustaceans, and cephalopods found in shallow intertidal waters.

Seals primarily haul out on remote mainland and island beaches, reefs, and estuary areas. At haul-outs, they congregate to rest, socialize, breed, and molt. Haul out sites are consistent for harbor seals across years (Kopec and Harvey, 1995), and females may return to their natal sites for breeding (Green *et al.,* 2006). The nearest major haul out site to the project area is Castro Rocks, located approximately 1,400 meters (0.87 miles) north of the Berth 1 of Long Wharf. Use of Castro Rocks as a haul out site has been increasing over the years (Codde *et al.,* 2020). Seals haul out on Castro Rocks year-round during medium to low tides, and usage of this haul out site is highest during the summer molting period of June-July. During the LWMEP 2020-2021 construction period, protected species observers (PSOs) observed the number of harbor seals on Castro Rocks to vary greatly, from 0 to 90 individuals, depending upon the tide level (AECOM, 2021). Due to the proximity of Long Wharf to the Castro Rocks haul out site and previous monitoring conducted by Chevron, it is likely that harbor seals would be in the project area during construction activities.

California Sea Lion

California sea lions are mainly seen swimming off the San Francisco and Marin shorelines within the Bay, but may occasionally enter the project area to forage. They feed seasonally on schooling fish and cephalopods, including salmon, herring, sardines, anchovy, mackerel, whiting, rockfish, and squid (Lowry *et al.,* 1990, 1991; Weise 2000; Carretta *et al.,* 2022; Lowry *et al.,* 2022). In central California sea lion populations, short term seasonal variations in diet are related to prey movement and life history patterns while long-term annual changes correlate to large-scale ocean climate shifts and foraging competition with commercial fisheries (Weise and Harvey, 2008; McClatchie *et al.,* 2016). Conservation concerns for California sea lions include prey species availability due to climate change, vessel strikes, non-commercial fishery human caused mortality, hookworms, and competition for forage with commercial fisheries (Carretta *et al.,* 2018; Carretta *et al.,* 2022).

Although California sea lions forage and conduct many activities within the water, they also use haul outs on land. In the Bay, sea lions haul out primarily on floating docks at Pier 39 at the Fisherman's Wharf area of the San Francisco Marina, approximately 12.5 kilometers (7.8 miles) southwest of the project area. Haul out numbers at Pier 39 vary seasonally. In addition to the Pier 39 haul out, California sea lions haul out on buoys, wharfs, and similar structures throughout the Bay.

Occurrence of sea lions in the Bay is typically lowest in June during the breeding season and higher during El Niño seasons. In the Bay, California sea lions have been observed foraging near Pier 39, in the shipping channel south of Yerba Buena Island, and along the west and north sides of the Long Wharf (AECOM, 2019). The relatively deep shipping channel west and north of the Point Orient Wharf also provides foraging area for sea lions. PSOs observed up to 13 sea lions within a construction season during prior monitoring efforts for the LWMEP (AECOM, 2021). As sea lions may forage widely throughout the Bay, this species may enter the project area during construction activities.

Harbor Porpoise

Harbor porpoises typically occur in cool temperate to sub-polar waters less than 62.6 degrees Fahrenheit (17 degrees Celsius) (Read 1999) where prey aggregations are concentrated (Watts and Gaskin, 1985). In the eastern Pacific, harbor porpoises occur in coastal and inland waters from Point Conception, California to Alaska (Gaskin 1984). The non-migratory San Francisco-Russian River stock ranges from Pescadero to Point

Arena, California, utilizes relatively shallow nearshore waters (<100 meters), and feeds on small schooling fishes such as northern anchovy and Pacific herring which enter the Bay (Caretta *et al.,* 2022; Stern *et al.,* 2017). Harbor porpoises tend to occur in small groups and are considered to be relatively cryptic animals.

Before 2008, harbor porpoises occurred primarily outside of the Bay although the Bay has historically been considered habitat for harbor porpoises (Broughton, 1999). Recently, observations of harbor porpoises within the Bay have become more common (Duffy 2015; Stern *et al.,* 2017; AECOM, 2021). From 2011-2014, the Golden Gate Cetacean Research (GGCR) program conducted a visual count and identified 2,698 porpoise groups from the Golden Gate Bridge during 96 percent of their on-effort survey days (Stern *et al.,* 2017). During 2021 LWMEP monitoring, PSOs observed harbor porpoises swimming past the Bay side of the Long Wharf on four different occasions (AECOM, 2021). Harbor porpoise movements into the Bay are linked to tidal cycle with the greatest numbers of porpoises sighted during high tide to ebb tide periods. Movements into the Bay are likely influenced by prey availability (Duffy 2015; Stern *et al.,* 2017) and may serve as a foraging area. Although harbor porpoise sightings are generally concentrated in the vicinity of the Golden Gate Bridge and Angel Island, southwest of the project site (Keener, 2011), this species is occurring more frequently in the Bay east of Angel Island and may approach the project area during pile driving activities.

Bottlenose Dolphin

The common bottlenose dolphin is found in all oceans across the globe, and is one of the most commonly observed marine mammal species in coastal waters and estuaries. Two genetically distinct stocks occur off the coast of California, the California coastal stock and the California/Oregon/Washington offshore stock. The range of the California coastal stock has been expanding north since an El Niño event in 1982-1983 (Hansen and

Defran, 1990; Wells *et al.,* 1990) and spans as far north as Sonoma County (Keener *et al.,* 2023). From 2010-2018, a photo-identification monitoring study identified 84 distinctive individual bottlenose dolphins in the Bay, likely belonging to the California coastal stock (Keener *et al.,* 2023). This stock shows little site fidelity and individuals are highly mobile (Weller et al., 2016). Since 2008, coastal bottlenose dolphins have been observed regularly in the Bay, mainly in proximity to the Golden Gate near the mouth of the Bay (Bay Nature, 2020). PSOs did not observe bottlenose dolphins during prior monitoring efforts for the LWMEP. However, due to increased numbers of dolphins occurring in the Bay, it is possible that a limited number of individuals may approach the project area during in-water construction activities.

Gray Whale

Gray whales are one of the most common whales along the California coast. A small number of whales, known as the Pacific Coast Feeding Group (PCFG), are known to feed along the Pacific coast between Kokiak Island, AK and northern California, as well as in nearshore waters just outside of the Bay (Carretta *et al.,* 2022). The southward migration to winter breeding grounds occurs from December through February while the northward migration to the feeding grounds takes place from February through May, peaking in March (NOAA NCOSS, 2007). A few individuals may enter the Bay during the northward migration. Since 2019, it has become more common for gray whales on their northward migration to enter the Bay during the months of February and March to feed (Bartlett, 2022), although many only travel up to 2 miles into the Bay (Self, 2012). Although it is more likely that a gray whale would enter the Bay from February to March, it is possible a gray whale may enter the project area during pile driving activities.

Eastern North Pacific gray whales have been experiencing a UME since 2019 when large numbers of whales began stranding from Mexico to Alaska. As of March 14, 2023, approximately 307 gray whales have stranded in the U.S. and 633 total throughout the U.S., Canada, and Mexico since 2019 (NOAA, 2023). Preliminary necropsy results conducted on a subset of the whales indicated that many whales showed signs of nutritional stress, however, these findings are not consistent across all of the whales examined (NOAA, 2023). This UME is ongoing and similar to that of 1999 and 2000 when large numbers of gray whales stranded along the eastern Pacific coast (Moore *et al.,* 2001; Gulland *et al.,* 2005). Oceanographic factors limiting food availability for whales was identified as a likely cause of the prior UME and may also be influencing the current UME (LeBouef *et al.,* 2000; Moore *et al.,* 2001; Minobe 2002; Gulland *et al.,* 2005).

Northern elephant seal

Northern elephant seals breed and give birth in California and Baja California, mainly on offshore islands during the months of December to March (Stewart and Huber, 1993; Stewart *et al.,* 1994; Carretta *et al.,* 2022). Molting season takes place from March to August. Adults typically reside in offshore pelagic waters when not breeding or molting, however, a healthy juvenile male was observed basking at Aquatic Park in San Francisco in the spring of 2019 (Hernández, 2020). PSOs did not observe northern elephant seals during prior monitoring efforts for the LWMEP. Although rare visitors to the Bay, it is possible that a few individuals may be present during construction activities.

Northern fur seal

Northern fur seals range from southern California north to the Bering Sea, and west to the Okhotsk Sea and Honshu Island, Japan in the west (Carretta *et al.,* 2022). The majority of the population breeds on the Pribilof Islands in the southern Bering Sea, although a small percentage of the population breed at San Miguel Island and the Farallon Islands off the coast of California. Northern fur seals show high site fidelity to breeding and rookery locations, and may swim long distances for prey. Their diet is composed of small schooling fish such as walleye Pollock, herring, hake, anchovy, and squid. Diet and population trends vary with environmental conditions, such as El Niño

(Carretta *et al.,* 2022). The California stock of northern fur seals forage in waters outside of the Bay. Juvenile northern fur seals occasionally strand in the Bay, especially during El Niño events (TMMC 2016). The Marine Mammal Center (TMMC) responds to approximately five northern fur seal strandings per year in the Bay (TMMC, 2016). PSOs did not observe northern fur seals during prior monitoring efforts for the LWMEP. Although rarely observed in the Bay, it is possible individuals may be present during construction activities.

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Not all marine mammal species have equal hearing capabilities (*e.g.*, Richardson *et al.*, 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007, 2019) recommended that marine mammals be divided into hearing groups based on directly measured (behavioral or auditory evoked potential techniques) or estimated hearing ranges (behavioral response data, anatomical modeling, etc.). Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e.*, low-frequency cetaceans). Subsequently, NMFS (2018) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 decibel (dB) threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. Marine mammal hearing groups and their associated hearing ranges are provided in table 3.

Table 3. Marine Mammal Hearing Groups (NMFS, 2018)

Hearing Group	Generalized Hearing Range*
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 35 kHz
Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz
High-frequency (HF) cetaceans (true porpoises, *Kogia*, river dolphins, Cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*)	275 Hz to 160 kHz
Phocid pinnipeds (PW) (underwater) (true seals)	50 Hz to 86 kHz
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 39 kHz
* Represents the generalized hearing range for the entire group as a composite (*i.e.*, all species within the group), where individual species' hearing ranges are typically not as broad. Generalized hearing range chosen based on ~65 dB threshold from normalized composite audiogram, with the exception for lower limits for LF cetaceans (Southall *et al*., 2007) and PW pinniped (approximation).	

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

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

Potential Effects of Specified Activities on Marine Mammals and their Habitat

This section provides a discussion of the ways in which components of the specified activity may impact marine mammals and their habitat. The **Estimated Take** section later in this document includes a quantitative analysis of the number of individuals that are expected to be taken by this activity. The **Negligible Impact Analysis and Determination** section considers the content of this section, the **Estimated Take** section, and the **Proposed Mitigation** section, to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and 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 activities can occur from impact pile driving and vibratory pile driving and removal. The effects of underwater noise from Chevron's proposed activities have the potential to result in Level B harassment of marine mammals in the project area.

Description of Sound Sources

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

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

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

Two types of hammers would be used on this project, impact and vibratory. Impact hammers 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 considered impulsive. Vibratory hammers install piles by vibrating them and allowing the weight of the hammer to push them into the sediment. Vibratory hammers produce non-impulsive, continuous sounds. Vibratory hammering generally produces SPLs 10 to 20 dB lower than impact pile driving of the same-sized pile (Oestman *et al.,* 2009). Rise time is slower, reducing the probability and severity of injury, and sound energy is distributed over a greater amount of time (Nedwell and Edwards, 2002; Carlson *et al.,* 2005).

The likely or possible impacts of Chevron's proposed activities on marine mammals could be generated from both non-acoustic and acoustic stressors. Potential non-acoustic stressors include the physical presence of the equipment, vessels, and personnel; however, we expect that any animals that approach the project site close enough to be harassed due to the presence of equipment or personnel would be within the Level B harassment zones from pile driving and would already be subject to harassment from the in-water activities. Therefore, any impacts to marine mammals are expected to primarily be acoustic in nature. Acoustic stressors are generated by heavy equipment operation during pile driving activities (*i.e.,* impact and vibratory pile driving and removal).

Acoustic Impacts

The introduction of anthropogenic noise into the aquatic environment from pile driving equipment is the primary means by which marine mammals may be harassed from Chevron's specified activities. In general, animals exposed to natural or anthropogenic sound may experience physical and psychological effects, ranging in magnitude from none to severe (Southall *et al.,* 2007). Generally, exposure to pile driving and removal and other construction noise has the potential to result in auditory threshold shifts and behavioral reactions (*e.g.,* avoidance, temporary cessation of foraging and vocalizing, changes in dive behavior). Exposure to anthropogenic noise can also lead to non-observable physiological responses, such as an increase in stress hormones. Additional noise in a marine mammal's habitat can mask acoustic cues used by marine mammals to carry out daily functions, such as communication and predator and prey detection. The effects of pile driving and demolition noise on marine mammals are dependent on several factors, including, but not limited to, sound type (*e.g.,* impulsive vs. non-impulsive), the species, age and sex class (*e.g.,* adult male vs. mother with calf), duration of exposure, the distance between the pile and the animal, received levels, behavior at time of exposure, and previous history with exposure (Wartzok *et al.,* 2004; Southall *et al.,* 2007). Here we discuss physical auditory effects (threshold shifts) followed by behavioral effects and potential impacts on habitat.

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

Permanent Threshold Shift (PTS) — NMFS defines PTS as a permanent, irreversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS, 2018). Available data from humans and other terrestrial mammals indicate that a 40 dB threshold shift approximates PTS onset (see Ward *et al.,* 1958, 1959; Ward, 1960; Kryter *et al.,* 1966; Miller, 1974; Ahroon *et al.,* 1996; Henderson *et al.,* 2008). PTS levels for marine mammals are estimates, because there are limited empirical data measuring PTS in marine mammals (*e.g.,* Kastak *et al.,* 2008), largely due to the fact that, for various ethical reasons, experiments involving anthropogenic noise exposure at levels inducing PTS are not typically pursued or authorized (NMFS, 2018).

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

Depending on the degree (elevation of threshold in dB), duration (*i.e.,* recovery time), and frequency range of TTS, and the context in which it is experienced, TTS can have effects on marine mammals ranging from discountable to serious (similar to those discussed in auditory masking, below). For example, a marine mammal may be able to readily compensate for a brief, relatively small amount of TTS in a non-critical frequency range that takes place during a time when the animal is traveling through the open ocean, where ambient noise is lower and there are not as many competing sounds present. Alternatively, a larger amount and longer duration of TTS sustained during time when communication is critical for successful mother/calf interactions could have more serious impacts. We note that reduced hearing sensitivity as a simple function of aging has been observed in marine mammals, as well as humans and other taxa (Southall *et al.,* 2007), so we can infer that strategies exist for coping with this condition to some degree, though likely not without cost.

Currently, TTS data only exist for four species of cetaceans (bottlenose dolphin, beluga whale (*Delphinapterus leucas*), harbor porpoise, and Yangtze finless porpoise (*Neophocoena asiaeorientalis*), and five species of pinnipeds exposed to a limited number of sound sources (*i.e.,* mostly tones and octave-band noise) in laboratory settings (Finneran, 2015). TTS was not observed in trained spotted (*Phoca largha*) and ringed

(*Pusa hispida*) seals exposed to impulsive noise at levels matching previous predictions of TTS onset (Reichmuth *et al.,* 2016). In general, harbor seals and harbor porpoises have a lower TTS onset than other measured pinniped or cetacean species (Finneran, 2015). 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, 2019b, 2020a, 2020b). In addition, TTS can accumulate across multiple exposures, but the resulting TTS will be less than the TTS from a single, continuous exposure with the same SEL (Finneran *et al.,* 2010; Kastelein *et al.,* 2014b; Kastelein *et al.,* 2015a; Mooney *et al.,* 2009). This means that TTS predictions based on the total, cumulative SEL will overestimate the amount of TTS from intermittent exposures such as sonars and impulsive sources.

The potential for TTS from impact pile driving exists. After exposure to playbacks of impact pile driving sounds (rate 2,760 strikes/hour) in captivity, mean TTS increased from 0 dB after 15 minute exposure to 5 dB after 360 minute exposure; recovery occurred within 60 minutes (Kastelein *et al.,* 2016). Additionally, the existing marine mammal TTS data come from a limited number of individuals within these species. No data are available on noise-induced hearing loss for mysticetes. Nonetheless, what we considered is the best available science. For summaries of data on TTS in marine mammals or for further discussion of TTS onset thresholds, please see Southall *et al.* (2007, 2019), Finneran and Jenkins (2012), Finneran (2015), and table 5 in NMFS (2018).

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

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

Disturbance may result in changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); or avoidance of areas where sound sources are located. Pinnipeds may increase their haul-out time, possibly to avoid in-water disturbance (Thorson and Reyff, 2006). Behavioral responses to sound are highly variable and context-specific and any reactions depend on numerous intrinsic and extrinsic factors (*e.g.,* species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day), as well as the interplay between factors (*e.g.,* Richardson *et al.,* 1995; Wartzok *et al.,* 2004; Southall *et al.,* 2007; Weilgart, 2007; Archer *et al.,* 2010; Southall *et al.,* 2021). Behavioral reactions can vary not only among individuals but also within an individual, depending on previous experience with a sound source, context, and numerous other factors (Ellison *et al.,* 2012), and can vary depending on characteristics associated with the sound source (*e.g.,* whether it is moving or stationary, number of sources, distance from the source). In general, pinnipeds seem more tolerant of, or at least habituate more quickly to, potentially disturbing underwater sound than do cetaceans, and generally seem to be less responsive to exposure to industrial sound than most cetaceans. Please see Appendices B and C of Southall *et al.* (2007) as well as Nowacek *et al.* (2007); Ellison *et al.* (2012), and Gomez *et al.* (2016) for a review of studies involving marine mammal behavioral responses to sound.

Disruption of feeding behavior can be difficult to correlate with anthropogenic sound exposure, so it is usually inferred by observed displacement from known foraging areas, the appearance of secondary indicators (*e.g.,* bubble nets or sediment plumes), or changes in dive behavior. As for other types of behavioral response, the frequency, duration, and temporal pattern of signal presentation, as well as differences in species sensitivity, are likely contributing factors to differences in response in any given circumstance (*e.g.,* Croll *et al.,* 2001; Nowacek *et al.,* 2004; Madsen *et al.,* 2006; Yazvenko *et al.,* 2007; Melcón *et al.,* 2012). In addition, behavioral state of the animal plays a role in the type and severity of a behavioral response, such as disruption to foraging (*e.g.,* Sivle *et al.,* 2016; Wensveen *et al.,* 2017). A determination of whether foraging disruptions incur fitness consequences would require information on or estimates of the energetic requirements of the affected individuals and the relationship between prey availability, foraging effort and success, and the life history stage of the animal (Goldbogen *et al.,* 2013).

Stress responses — An animal's perception of a threat may be sufficient to trigger stress responses consisting of some combination of behavioral responses, autonomic nervous system responses, neuroendocrine responses, or immune responses (*e.g.,* Seyle, 1950; Moberg, 2000). In many cases, an animal's first and sometimes most economical (in terms of energetic costs) response is behavioral avoidance of the potential stressor.

Autonomic nervous system responses to stress typically involve changes in heart rate, blood pressure, and gastrointestinal activity. These responses have a relatively short duration and may or may not have a significant long-term effect on an animal's fitness.

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

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

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

Masking —Sound can disrupt behavior through masking, or interfering with, an animal's ability to detect, recognize, or discriminate between acoustic signals of interest (*e.g.,* those used for intraspecific communication and social interactions, prey detection, predator avoidance, navigation) (Richardson *et al.,* 1995). Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher intensity, and may occur whether the sound is natural (*e.g.,* snapping shrimp, wind, waves, precipitation) or anthropogenic (*e.g.,* pile driving, shipping, sonar, seismic exploration) in origin. The ability of a noise source to mask biologically important sounds depends on the characteristics of both the noise source and the signal of interest (*e.g.,* signal-to-noise ratio, temporal variability, direction), in relation to each other and to an animal's hearing abilities (*e.g.,* sensitivity, frequency range, critical ratios, frequency discrimination, directional discrimination, age or TTS hearing loss), and existing ambient noise and propagation conditions. Masking of natural sounds can result when human activities produce high levels of background sound at frequencies important to marine mammals. Conversely, if the background level of underwater sound is high (*e.g.,* on a day with strong wind and high waves), an anthropogenic sound source would not be detectable as far away as would be possible under quieter conditions and would itself be masked. The masking of communication signals by anthropogenic noise may be considered as a reduction in the communication space of animals (*e.g.,* Clark *et al.,* 2009) and may result in energetic or other costs as animals change their vocalization behavior (*e.g.,* Miller *et al.,* 2000; Foote *et al.,* 2004; Parks *et al.,* 2007; Di Iorio and Clark, 2009; Holt *et al.,* 2009). The Bay is heavily used by commercial, recreational, and military vessels, and background sound levels in the area are already elevated. Due to the transient nature of marine mammals to move and avoid disturbance, masking is not likely to have long-term impacts on marine mammal species within the proposed project area.

Airborne Acoustic Effects —Pinnipeds that occur near the project site could be exposed to airborne sounds associated with pile driving and removal that have the potential to cause behavioral harassment, depending on their distance from pile driving activities. Cetaceans are not expected to be exposed to airborne sounds that would result in harassment as defined under the MMPA.

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

Marine Mammal Habitat Effects

Chevron's proposed construction activities could have localized, temporary impacts on marine mammal habitat, including prey, by increasing in-water sound pressure levels and slightly decreasing water quality. Increased noise levels may affect acoustic habitat (see masking discussion above) and adversely affect marine mammal prey in the vicinity of the project areas (see discussion below). During impact and vibratory pile driving or removal, elevated levels of underwater noise would ensonify the project area where both fishes and mammals occur, and could affect foraging success. Additionally, marine mammals may avoid the area during construction, however, displacement due to noise is expected to be temporary and is not expected to result in long-term effects to the individuals or populations. Construction activities are expected to be of short duration and would likely have temporary impacts on marine mammal habitat through increases in underwater and airborne sound.

A temporary and localized increase in turbidity near the seafloor would occur in the immediate area surrounding the area where piles are installed or removed. In general, turbidity associated with pile driving is localized to about a 25-ft (7.6-m) radius around the pile (Everitt *et al.,* 1980). Cetaceans are not expected to be close enough to the pile driving areas to experience effects of turbidity, and any pinnipeds could avoid localized areas of turbidity. Local currents are anticipated to disburse any additional suspended sediments produced by project activities at moderate to rapid rates depending on tidal stage. Therefore, we expect the impact from increased turbidity levels to be discountable to marine mammals and do not discuss it further.

In-Water Construction Effects on Potential Foraging Habitat — The area likely impacted by the LWMEP is relatively small compared to the total available habitat in the Bay. The proposed project area is highly influenced by anthropogenic activities and provides limited foraging habitat for marine mammals. Furthermore, pile driving and removal at the proposed project site would not obstruct long-term movements or migration of marine mammals.

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

In-water Construction Effects on Potential Prey — Sound may affect marine mammals through impacts on the abundance, behavior, or distribution of prey species (*e.g.,* crustaceans, cephalopods, fish, zooplankton, other marine mammals). Marine mammal prey varies by species, season, and location. Here, we describe studies regarding the effects of noise on known marine mammal prey.

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

Fish react to sounds which are especially strong and/or intermittent low-frequency sounds, and behavioral responses such as flight or avoidance are the most likely effects. Short duration, sharp sounds can cause overt or subtle changes in fish behavior and local distribution. The reaction of fish to noise depends on the physiological state of the fish, past exposures, motivation (*e.g.,* feeding, spawning, migration), and other environmental factors. Hastings and Popper (2005) identified several studies that suggest fish may relocate to avoid certain areas of sound energy. Additional studies have documented effects of pile driving on fish; several are based on studies in support of large, multiyear bridge construction projects (*e.g.,* Scholik and Yan, 2001, 2002; Popper and Hastings, 2009). Many 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). In response to pile driving, Pacific sardines and northern anchovies may exhibit an immediate startle response to individual strikes, but return to “normal” pre-strike behavior following the conclusion of pile driving with no evidence of injury as a result (appendix C in NAVFAC SW, 2014). However, some studies have shown no or slight reaction to impulse sounds (*e.g.,* Pena *et al.,* 2013; Wardle *et al.,* 2001; Jorgenson and Gyselman, 2009; Popper *et al.,* 2005).

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

The most likely impact to fishes from pile driving and removal and construction activities at the project area would be temporary behavioral avoidance of the area. The duration of fish avoidance of this area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution, and behavior is anticipated. In general, impacts to marine mammal prey species are expected to be minor and temporary. Further, it is anticipated that preparation activities for pile driving or removal (*i.e.,* positioning of the hammer, clipper or wire saw) and upon initial startup of devices would cause fish to move away from the affected area outside areas where injuries may occur. Therefore, relatively small portions of the proposed project area would be affected for short periods of time, and the potential for effects on fish to occur would be temporary and limited to the duration of sound-generating activities.

In summary, given the short daily duration of sound associated with individual pile driving events and the relatively small areas being affected, pile driving activities associated with the proposed actions are not likely to have a permanent, adverse effect on any fish habitat, or populations of fish species. Any behavioral avoidance by fish of the disturbed area would still leave significantly large potential areas fish and marine mammal foraging habitat in the nearby vicinity. Thus, we conclude that 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 to marine mammal habitat are not expected to result in significant or long-term consequences for individual marine mammals, or to contribute to adverse impacts on their populations.

Estimated Take of Marine Mammals

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

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 by Level B harassment only, in the form of disruption of behavioral patterns for individual marine mammals resulting from exposure to the acoustic sources. Based on the nature of the activity and the anticipated effectiveness of the mitigation measures (*i.e.,* shutdown zones, PSO monitoring) discussed in detail below in the **Proposed Mitigation** section, 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 thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) the number of days of activities. We note that while these factors can contribute to a basic calculation to provide an initial prediction of potential takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.,* previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the proposed take estimates.

Acoustic Thresholds

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

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

Chevron’s proposed construction activities include the use of continuous (vibratory pile-driving) and impulsive (impact pile-driving) sources, and therefore the RMS SPL thresholds of 120 and 160 dB re 1 μPa are applicable.

Level A harassment – NMFS’ Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). Chevron’s proposed construction activities include the use of impulsive (impact hammer) and non-impulsive (vibratory hammer) sources.

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

Table 4. Thresholds Identifying the Onset of Permanent Threshold Shift

	PTS Onset Thresholds* (Received Level)	
Hearing Group	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	*Cell 1* $L_{p,\text{0-pk,flat}}$: 219 dB $L_{\text{E},p,\text{ LF,24h}}$: 183 dB	*Cell 2* $L_{\text{E},p,\text{ LF,24h}}$: 199 dB
Mid-Frequency (MF) Cetaceans	*Cell 3* $L_{p,\text{0-pk,flat}}$: 230 dB $L_{\text{E},p,\text{ MF,24h}}$: 185 dB	*Cell 4* $L_{\text{E},p,\text{ MF,24h}}$: 198 dB
High-Frequency (HF) Cetaceans	*Cell 5* $L_{p,\text{0-pk,flat}}$: 202 dB $L_{\text{E},p,\text{HF,24h}}$: 155 dB	*Cell 6* $L_{\text{E},p,\text{ HF,24h}}$: 173 dB
Phocid Pinnipeds (PW) (Underwater)	*Cell 7* $L_{p,\text{0-pk.flat}}$: 218 dB $L_{\text{E},p,\text{PW,24h}}$: 185 dB	*Cell 8* $L_{\text{E},p,\text{PW,24h}}$: 201 dB

Otariid Pinnipeds (OW) (Underwater)	*Cell 9* $L_{p,0\text{-pk,flat}}$: 232 dB $L_{E,p,OW,24h}$: 203 dB	*Cell 10* $L_{E,p,OW,24h}$: 219 dB

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

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 1μPa^{2}s. In this table, thresholds are abbreviated to be more reflective of International Organization for Standardization standards (ISO 2017). The subscript "flat" is being included to indicate peak sound pressure are flat weighted or unweighted within the generalized hearing range of marine mammals (*i.e.*, 7 Hz to 160 kHz). The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The weighted cumulative sound exposure level thresholds could be exceeded in a multitude of ways (*i.e.*, varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these thresholds will be exceeded.

Ensonified Area

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

Pile driving activities, using an impact hammer as well as a vibratory hammer, would generate underwater noise that could result in disturbance to marine mammals near the project area. A review of underwater sound measurements for similar projects was conducted to estimate the near-source sound levels for impact and vibratory pile driving and vibratory extraction. Source levels for proposed removal and installation activities derived from this review are shown in table 5.

Table 5. Source Levels for Proposed Pile Removal and Installation Activities

Method	Pile type	Source Levels (dB)/Source Distance (m)			Reference
		Peak Sound Pressure (dB re 1 μPa)	Mean Maximum RMS SPL (dB re 1 μPa)	SEL (dB re 1 μPa2 sec)	
Impact install [1]	24-inch square concrete pile	191/10	173/10	161/10	AECOM (2018, 2019)

Vibratory install/extract	36-inch steel shell pile	196/10	167/15	167	AECOM (2019)
Vibratory extract [2]	18-inch concrete pile	N/A	163/10	150	NAVFAC SW (2022)

[1] Chevron would use a bubble curtain attenuation system for all impact pile driving. NMFS conservatively assumes that the bubble curtain would result in a 5 dB reduction in sound. These source levels incorporate the 5 dB reduction.
[2] 20-inch concrete piles used as a proxy as vibratory data for 18-inch concrete piles was not available.

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

$TL = B * Log10 (R_1/R_2)$, where

TL = transmission loss in dB;

B = transmission loss coefficient;

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

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

The recommended TL coefficient for most nearshore environments is the practical spreading value of 15. This value results in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions, known as practical spreading. As is common practice in coastal waters, here we assume practical spreading (4.5 dB reduction in sound level for each doubling of distance) for vibratory extraction of concrete piles, as hydro-acoustic data for the same pile type was not available for this project site. Chevron conducted hydro-acoustic monitoring for prior projects at Long Wharf for the impact driving of 24-inch concrete piles and vibratory driving of 36-inch steel piles. Based upon hydro-acoustic monitoring conducted at Long Wharf in 2018 and 2019 (AECOM 2018, 2019), Chevron calculated a transmission loss coefficient ranging from 14 to 20 (~4.4 dB to 8 dB per doubling of distance). As this estimate represents a wide range of measured transmission loss, NMFS applied the standard value of 15 for impact driving of concrete piles. For vibratory driving of 36-inch steel piles, Chevron calculated a transmission loss coefficient of 20.8 to 25.0 (~8 dB to 9 dB per doubling of distance) from hydro-acoustic monitoring conducted at Long Wharf in 2019 (AECOM, 2019). Given that all available data suggested a higher transmission loss, NMFS found it appropriate to apply this to its analysis. NMFS applied the lower of these two values, 20.8 TL, to this analysis to be conservative. The Level B harassment zones and ensonified areas for Chevron's proposed activities are shown in table 6.

Table 6. Distance to Level B Harassment Thresholds and Ensonified Areas

Pile Type	Source Levels (dB)/Source distance (m)		Distance to Level B harassment thresholds (m)	Ensonified area (km^2)
	Peak	RMS		
Impact Installation				
24-inch square concrete pile	191/10	173/10	74	0.02
Vibratory Installation				
36-inch steel shell pile	196/10	167/15	2,727	23.36
Vibratory Extraction				
18-inch concrete pile	N/A	163/10	7,356	170
36-inch steel shell pile	196/10	167/15	2,727	17.24

Level A Harassment Thresholds-- The ensonified area associated with Level A harassment is more technically challenging to predict due to the need to account for a duration component. Therefore, NMFS developed an optional User Spreadsheet tool to accompany the Technical Guidance that can be used to relatively simply predict an isopleth distance for use in conjunction with marine mammal density or occurrence to help predict potential takes. We note that because of some of the assumptions included in the methods underlying the optional tool, we anticipate that the resulting isopleth estimates are typically going to be overestimates of some degree, which may result in an overestimate of potential take by Level A harassment. However, this optional tool offers the best way to estimate isopleth distances when more sophisticated modeling methods are not available or practical. For stationary sources, such as pile driving activities, the optional User Spreadsheet tool predicts the closest distance at which a stationary animal would not be expected to incur PTS if the sound source traveled by the stationary animal in a straight line at a constant speed. The isopleths generated by the User Spreadsheet used the same TL coefficients as the Level B harassment zone calculations, as indicated above for each activity type. Inputs used in the User Spreadsheet (*e.g.,* number of piles per day, duration and/or strikes per pile) are presented in table 1. The maximum RMS SPL/SEL SPL as well as peak SPL and resulting isopleths are reported below in table 7. The RMS SPL value was used to calculate Level A harassment isopleths for vibratory pile driving and extraction activities, while the single strike SEL SPL value was used to calculate Level A isopleths for impact pile driving activity.

Table 7. Distance to Level A Harassment Thresholds for each Marine Mammal Hearing Group

Pile Type	Source Levels (dB)/ Source Distance (m)		Distances to Level A harassment threshold (m)				
	Peak	RMS/SEL	Lf cetaceans	Mf cetaceans	Hf cetaceans	Phocid pinnipeds	Otariid pinnipeds
Impact Installation							
24-inch square concrete pile	191/10	161/10 SEL	31.3	1.1	37.3	16.8	1.2
Vibratory Installation							
36-inch steel shell pile	196/10	167/15 RMS	15.9	2.8	21	11.1	1.6
Vibratory Extraction							
18-inch concrete pile	N/A	163/10 RMS	3.4	0.3	5	2.1	0.1
36-inch steel shell pile	196/10	167/15 RMS	15.9	2.8	21	11.1	1.6

Lf = low frequency, Mf = mid-frequency, Hf = high frequency

Marine Mammal Occurrence

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

Harbor Seal-- Limited at-sea densities are available for Pacific harbor seals in the Bay. To estimate the number of harbor seals potentially taken by Level B harassment, take estimates were developed based upon annual surveys of haul outs in the Bay conducted by the National Park Service (NPS) (Codde and Allen 2013, 2015, 2017, 2020; Codde, 2020). Harbor seals spend more time hauled out and enter the water later in the evening during molting season (NPS, 2014). The molting season occurs from June-July and overlaps with the construction period of June-November, therefore, haul out counts may provide the most accurate estimates of harbor seals in the area during that time. Due to the close proximity of Castro Rocks to the project area, Chevron used the highest mean value of harbor seals observed hauled out at Castro Rocks during the molting season in any recent NPS annual survey. The highest mean number of harbor seals was recorded in 2019 as 237 seals. There are no systematic counts available to estimate the number of seals that may be in the water near Long Wharf at any given time and the number of seals hauled out on Castro Rocks may vary based upon time of day, tide, and seal activity. Therefore, the analysis assumes that all 237 seals could swim into the Level B harassment zone each day that pile driving is occurring.

California sea lion— Although there are no haul out sites for California sea lions in close proximity to the project area, sea lions have consistently been sighted in the Bay while monitoring during past construction projects (AECOM 2019, 2020, 2021, 2022; Caltrans, 2017). As limited data is available on the occurrences of California sea lions in the Bay, NMFS used PSO monitoring data from previous stages of the LWMEP (AECOM, 2019, 2020, 2021) and Year 1 of the Point Orient Wharf Removal (POWR) project (AECOM, 2022) to generate a daily occurrence rate. NMFS calculated daily occurrence rate using the following equation:

Daily occurrence rate = Total number of animals sighted / Total monitoring days

From 2018-2022, a total of 73 days of monitoring occurred across all projects during the seasonal window of June through November. During this time, 13 sea lions were sighted. Based upon sightings and monitoring days, we calculated a daily occurrence rate of 0.18 sea lions per day.

San Francisco has received a record amount of rainfall since July 1, 2022 (Bay City News, 2023), indicating that increased freshwater inflow into the Bay could be expected this year. The Bay did not experience similar freshwater inflow during the LWMEP and POWR years of 2018-2022. As the impacts of increased freshwater flow into the project area on California sea lion occurrences are unclear, and this increased freshwater input did not occur during prior monitoring years, we conservatively used a daily occurrence rate of California sea lions, 1 sea lion per day, to estimate take.

Harbor porpoise— The harbor porpoise population has been growing over time in the Bay (Stern *et al.,* 2017). Although commonly sighted in the vicinity of Angel Island and the Golden Gate Bridge, approximately 6 and 12 kilometers (3.7 and 7.5 miles, respectively) southwest of the Wharf, individuals may use other areas of central the Bay (Keener, 2011), as well as the project area. As limited data is available on the occurrences of harbor porpoises in the Bay, NMFS used PSO monitoring data from previous stages of the LWMEP (AECOM, 2019, 2020, 2021) and Year 1 of the Point Orient Wharf Removal (POWR) project (AECOM, 2022) to generate a daily occurrence rate. NMFS calculated the daily occurrence rate according to the same methods for calculating the daily occurrence rate for California sea lions, as described above. From 2018-2022, a total of 16 harbor porpoises were sighted on 73 monitoring days, resulting in a daily occurrence rate of 0.22 harbor porpoises per day. Due to the impacts of increased freshwater inflow into the Bay (Bay City News, 2023) resulting from elevated rainfall being unclear, we conservatively used a higher daily occurrence rate of harbor porpoises, 1 porpoise per day, to estimate take.

Gray whale— Gray whales are often sighted in the Bay during February and March, however, pile driving activities are not planned to occur during this time. Prior monitoring reports for similar projects occurring during the same work windows did not document gray whales in the area (AECOM 2019, 2020, 2021). Limited sightings of gray whales in the Bay include strandings (Bartlett 2022; TMMC, 2019) and whale watch reports (Bartlett, 2022). At-sea densities and regular observational data for gray whales in the Bay during the planned project time are not available. Although unlikely during the time planned for in-water construction activities, Chevron conservatively estimated that up to two gray whales may occur in the project area.

Bottlenose dolphin— The numbers of dolphins in the Bay have been increasing over the years (Perlman, 2017; Szczepaniak *et al.,* 2013), and a recent study determined that bottlenose dolphins have expanded their range to include coastal waters north and south of the Bay (Keener *et al.,* 2023). In the Bay, dolphins have been sighted in the vicinity of the Golden Gate Bridge, around Yerba Buena and Angel Islands, and in the central Bay as far east as Alameda and Point Richard (Keener *et al.,* 2023). Although dolphins may occur in the Bay year-round, occurrence estimates are limited. Chevron estimated that one group of dolphins may enter the Bay once per month. Weller *et al.* (2016) estimated an average group size for coastal bottlenose dolphins to be approximately 8.2 dolphins.

Northern elephant seal— Small numbers of elephant seals may haul out or strand within the central Bay (Hernández, 2020). Previous monitoring, however, has shown northern elephant seal densities to be very low in the area and, based upon seasonality of occurrences, northern elephant seals would be unlikely to occur in the project area during the proposed project activities. Additionally, northern elephant seals were not observed during pile driving monitoring for the LWMEP from 2018-2021 (AECOM, 2018, 2019, 2020, 2021) nor for the Point Orient Wharf Removal in 2022 (AECOM, 2022), which was located just north of the proposed project area. While it is unlikely that northern elephant seals would occur in the project area during the months in which work is proposed, Chevron conservatively estimated that one northern elephant seal could enter the project area once every 3 days during in-water construction activities resulting in a total of 10 northern elephant seals.

Northern fur seal— The presence of northern fur seals in depends upon oceanic conditions, as more fur seals are more likely to range in the Bay in search of food and strand during El Niño events (TMMC, 2016). Equatorial sea surface temperatures of the Pacific Ocean have been below average across most of the Pacific. La Niña conditions are likely to remain into the spring 2023 after which conditions are expected to become more neutral. However, it is unlikely El Niño conditions would develop later in 2023 (NOAA, 2022). Northern fur seals were not observed during prior LWMEP monitoring (AECOM, 2019, 2020, 2021) nor during the POWRP monitoring (AECOM, 2022). While it is unlikely that northern fur seals would occur in the project areas during in-water activities, Chevron conservatively estimated that a maximum of 10 northern fur seals could occur enter the project area.

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 proposed for authorization.

Take estimate calculations vary by species. To calculate take by Level B harassment for harbor seals, California sea lions, and harbor porpoises, NMFS multiplied the daily occurrence estimates described in the *Marine Mammal Occurrence* section by the number of project days (table 8).

For bottlenose dolphins, Chevron estimated, and NMFS concurs, that one group of 8 bottlenose dolphins may be taken by Level B harassment every month of the project. Therefore, Chevron requested, and NMFS proposes to authorize, 32 takes of bottlenose dolphins by Level B harassment.

Chevron based requested take by Level B harassment for gray whales upon total daily occurrence estimates during the project period. Chevron conservatively estimated, and NMFS concurs, that 2 gray whales may enter the project area per year. Therefore, Chevron requested, and NMFS proposes to authorize, 2 takes of gray whales by Level B harassment (table 8).

For northern elephant seals, Chevron conservatively estimated, and NMFS concurs, that one northern elephant seal could enter the project area once every 3 days during in-water construction activities. Therefore, Chevron requested, and NMFS proposes to authorize, 10 takes of northern elephant seals by Level B harassment (table 8).

Based upon prior occurrences in the Bay, Chevron conservatively estimated, and NMFS concurs, that a maximum of 10 northern fur seals could occur in the project area during the in-water construction activity period. Therefore, Chevron requested, and NMFS proposes to authorize 10 takes of northern fur seals by Level B harassment (table 8).

Chevron did not request, nor is NMFS proposing to authorize, take by Level A harassment. For all pile driving activities, Chevron proposed to implement shutdown zones (described further in the **Proposed Mitigation** section) that would be expected to effectively prevent take by Level A harassment.

Table 8. Estimated Take by Level B Harassment Proposed for Authorization and Estimated Take as a Percentage of the Population

Species	Expected occurrence	Estimated take by Level B harassment proposed for authorization			Estimated take as a percentage of population
		Impact install	Vibratory install/extract	Total	
Harbor seal	237 seals per day	4,977	2,133	7,110	23
Sea lion	1 sea lion per day [1]	21	9	30	0.012
Harbor porpoise	1 harbor porpoise per day [1]	21	9	30	0.39
Bottlenose dolphin	Up to 8 dolphins once per month	N/A	N/A	32	1.77
Gray whale	2 whales over project duration	N/A	N/A	2	0.007
Northern elephant seal	1 seal every 3 days	N/A	N/A	10	0.005
Northern fur seal	10 seals over project duration	N/A	N/A	10	0.071

[1] Rounded daily occurrence to one individual per day.

Proposed Mitigation

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stock for taking for certain subsistence uses (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting the activity or other means of effecting the least practicable adverse impact upon the affected species or stocks, and their habitat (50 CFR 216.104(a)(11)).

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

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. 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.

Chevron must follow mitigation measures as specified below.

Chevron must ensure that construction supervisors and crews, the monitoring team, and relevant Chevron staff are trained prior to the start of all pile driving activities, so that responsibilities, communication procedures, monitoring protocols, and operational procedures are clearly understood. New personnel joining during the project must be trained prior to commencing work.

Shutdown Zones

Chevron must establish shutdown zones for all pile driving activities. The purpose of a shutdown zone is generally to define an area within which shutdown of the activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). Shutdown zones would be based upon the Level A harassment zone for each pile size/type and driving method where applicable, as shown in table 7. A minimum shutdown zone of 10 m would be required for all in-water construction activities to avoid physical interaction with marine mammals. For pile driving, the radii of the shutdown zones are rounded to the next largest 10 m interval in comparison to the Level A harassment zone for each activity type. If a marine mammal is observed entering or within a shutdown zone during pile driving activity, the activity must be stopped until there is visual confirmation that the animal has left the zone or the animal is not sighted for a period of 15 minutes. Proposed shutdown zones for each activity type are shown in table 9.

All marine mammals would be monitored in the Level B harassment zones and throughout the area as far as visual monitoring can take place. If a marine mammal enters the Level B harassment zone, in-water activities would continue and PSOs would document the animal's presence within the estimated harassment zone.

Chevron would also establish shutdown zones for all marine mammals for which take has not been authorized or for which incidental take has been authorized but the authorized number of takes has been met. These zones would be equivalent to the Level B harassment zones for each activity. If a marine mammal species for which take is not authorized or a species for which incidental take has been authorized but the authorized number of takes has been met enters the shutdown zone, all in-water activities would cease until the animal leaves the zone or has not been observed for at least 1 hour, and NMFS would be notified about species and precautions taken. Pile removal would proceed if the animal is observed to leave the Level B harassment zone or if 1 hour has passed since the last observation.

If shutdown and/or clearance procedures would result in an imminent safety concern, as determined by Chevron or its designated officials, the in-water activity would be allowed to continue until the safety concern has been addressed, and the animal would be continuously monitored.

Table 9. Proposed Shutdown Zones by Activity Type

Method	Pile Type	Shutdown zones (m)[1]				
		LF	MF	HF	PW	OW
Pile removal activities						
Vibratory extract	36-inch steel pile	20	10	30	20	10

	18-inch concrete pile	10	10	10	10	10
Pile installation activities						
Impact install	24-inch square concrete pile	40	10	40	20	10
Vibratory install	36-inch steel pile	20	10	30	20	10

[1] Observers would monitor as far as the eye can see

Protected Species Observers

The placement of PSOs during all pile driving activities (described in the **Proposed Monitoring and Reporting** section) would ensure that the entire shutdown zone is visible. Should environmental conditions deteriorate such that the entire shutdown zone would not be visible (*e.g.,* fog, heavy rain), pile driving would be delayed until the PSO is confident marine mammals within the shutdown zone could be detected.

PSOs would monitor the full shutdown zones and the Level B harassment zones to the extent practicable. Monitoring zones provide utility for observing by establishing monitoring protocols for areas adjacent to the shutdown zones. Monitoring zones enable observers to be aware of and communicate the presence of marine mammals in the project areas outside the shutdown zones and thus prepare for a potential cessation of activity should the animal enter the shutdown zone.

Pre-and Post-Activity Monitoring

Monitoring must take place from 30 minutes prior to initiation of pile driving activities (*i.e.,* pre-clearance monitoring) through 30 minutes post-completion of pile driving. Prior to the start of daily in-water construction activity, or whenever a break in pile driving of 30 minutes or longer occurs, PSOs would observe the shutdown and monitoring zones for a period of 30 minutes. The shutdown zone would be considered cleared when a marine mammal has not been observed within the zone for a 30-minute period. If a marine mammal is observed within the shutdown zones listed in table 10, pile driving activity would be delayed or halted. If work ceases for more than 30 minutes, the pre-activity monitoring of the shutdown zones would commence. A determination that the shutdown zone is clear must be made during a period of good visibility (*i.e.,* the entire shutdown zone and surrounding waters must be visible to the naked eye).

Soft-start Procedures

Soft-start procedures provide additional protection to marine mammals by providing warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. For impact pile driving, contractors would be required to provide an initial set of three strikes from the hammer at reduced energy, followed by a 30-second waiting period, then two subsequent reduced-energy strike sets. 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

A bubble curtain must be employed during all impact pile installation of the 24-inch square concrete piles to interrupt the acoustic pressure and reduce impact on marine mammals. The bubble curtain must distribute air bubbles around 100 percent of the piling circumference for the full depth of the water column. The lowest bubble ring must be in contact with the mudline for the full circumference of the ring. The weights attached to the bottom ring must ensure 100 percent substrate contact. No parts of the ring or other objects may prevent full substrate contact. Air flow to the bubblers must be balanced around the circumference of the pile.

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

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 would result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present while conducting the activities. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

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

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

- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat); and,
- Mitigation and monitoring effectiveness.

Visual Monitoring

Marine mammal monitoring must be conducted in accordance with the conditions in this section, the Monitoring Plan, and this IHA. Marine mammal monitoring during pile driving activities would be conducted by PSO's meeting NMFS' standards and in a manner consistent with the following:

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

PSOs should have the following additional qualifications:

- Ability to conduct field observations and collect data according to assigned protocols;
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

Chevron would have at least two PSOs stationed at the best possible vantage points in the project area to monitor during all pile driving activities. Monitoring would occur from elevated locations along the shoreline or on barges where the entire shutdown zones and monitoring zones are visible. PSOs would be equipped with high quality binoculars for monitoring and radios or cells phones for maintaining contact with work crews. Monitoring would be conducted 30 minutes before, during, and 30 minutes after all in water construction activities. In addition, PSOs would record all incidents of marine mammal occurrence, regardless of distance from activity, and would document any behavioral reactions in concert with distance from piles being driven or removed. Pile driving activities include the time to install or remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than 30 minutes.

In addition to monitoring on days that construction would occur, as proposed by the applicant, Chevron would conduct biological monitoring within one week ahead of the project's start date to establish baseline observation. These observation periods would encompass different tide levels at different hours of the day.

Data Collection

Chevron would record detailed information about implementation of shutdowns, counts and behaviors (if possible) of all marine mammal species observed, times of observations, construction activities that occurred, any acoustic and visual disturbances, and weather conditions. PSOs would use approved data forms to record the following information:

- Date and time that permitted construction activity begins and ends;
- Type of pile removal activities that take place;
- Weather parameters (*e.g.,* percent cloud cover, percent glare, visibility, air temperature, tide level, Beaufort sea state);
- Species counts, and, if possible, sex and age classes of any observed marine mammal species;
- Marine mammal behavior patterns, including bearing and direction of travel;
- Any observed behavioral reactions just prior to, during, or after construction activities;
- Location of marine mammal, distance from observer to the marine mammal, and distance from pile driving activities to marine mammals;
- Whether an observation required the implementation of mitigation measures, including shutdown procedures and the duration of each shutdown; and
- Any acoustic or visual disturbances that take place.

Reporting

Chevron must submit a draft marine mammal monitoring report to NMFS within 90 days after the completion of pile driving activities, or 60 days prior to the requested issuance of any future IHAs for the project, or other projects at the same location, whichever comes first. A final report must be prepared and submitted within 30 calendar days following receipt of any NMFS comments on the draft report. If no comments are received from NMFS within 30 calendar days of receipt of the draft report, the report shall be considered final. The marine mammal report would include an overall description of work completed, a narrative regarding marine mammal sightings, and associated PSO data sheets and/or raw sighting data. Specifically, the report would include:

- Dates and times (begin and end) of all marine mammal monitoring;
- Construction activities occurring during each daily observation period, including: (a) How many and what type of piles were driven or removed and the method (*i.e.,* impact or vibratory); and (b) the total duration of time for each pile (vibratory driving) number of strikes for each pile (impact driving);
- PSO locations during marine mammal monitoring; and
- Environmental conditions during monitoring periods (at beginning and end of PSO shift and whenever conditions change significantly), including Beaufort sea state and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon, and estimated observable distance. For each observation of a marine mammal, the following would be recorded:
- Name of PSO who sighted the animal(s) and PSO location and activity at time of sighting;
- Time of sighting;

- Identification of the animal(s) (*e.g.,* genus/species, lowest possible taxonomic level, or unidentified), PSO confidence in identification, and the composition of the group if there is a mix of species;
- Distance and location of each observed marine mammal relative to pile being driven or removed for each sighting;
- Estimated number of animals (min/max/best estimate);
- Estimated number of animals by cohort (adults, juveniles, neonates, group composition, *etc.*);
- Description of any marine mammal behavioral observations (*e.g.,* observed behaviors such as feeding or traveling), including an assessment of behavioral responses thought to have resulted from the activity (*e.g.,* no response or changes in behavioral state such as ceasing feeding, changing direction, flushing, or breaching); and
- Animal's closest point of approach and estimated time spent within the harassment zone.

Additionally, Chevron must include the following information in the report:

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

In the event that personnel involved in the construction activities discover an injured or dead marine mammal, Chevron would report the incident to the Office of Protected Resources (OPR) (*PR.ITP.MonitoringReports@noaa.gov*), NMFS and to the West Coast regional stranding network (866-767-6114) as soon as feasible. If the death or injury was clearly caused by the specified activity, Chevron would immediately cease the specified activities until NMFS is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the IHAs. Chevron would not resume their activities until notified by NMFS.

The report would include the following information:

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

Negligible Impact Analysis and Determination

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

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

Level A harassment is extremely unlikely given the small size of the Level A harassment isopleths and the required mitigation measures designed to minimize the possibility of injury to marine mammals. No serious injury or mortality is anticipated given the nature of the activity.

Pile driving activities have the potential to disturb or displace marine mammals. Specifically, the project activities may result in take, in the form of Level B harassment from underwater sounds generated from impact and vibratory pile driving activities. Potential takes could occur if individuals move into the ensonified zones when these activities are underway.

The takes by Level B harassment would be due to potential behavioral disturbance. The potential for harassment is minimized through construction methods and the implementation of planned mitigation strategies (see **Proposed Mitigation** section).

Take would occur within a limited, confined area of each stock's range. Further, the amount of take authorized is extremely small when compared to stock abundance.

No marine mammal stocks for which take is proposed are listed as threatened or endangered under the ESA or determined to be strategic or depleted under the MMPA. The relatively low marine mammal occurrences in the area, small shutdown zones, and planned monitoring make injury takes of marine mammals unlikely. The shutdown zones would be thoroughly monitored before the pile driving activities begin, and activities would be postponed if a marine mammal is sighted within the shutdown zone. There is a high likelihood that marine mammals would be detected by trained observers under environmental conditions described for the project. Limiting construction activities to daylight hours would also increase detectability of marine mammals in the area. Therefore, the mitigation and monitoring measures are expected to eliminate the potential for injury and Level A harassment as well as reduce the amount and intensity of Level B behavioral harassment. Furthermore, the pile driving activities analyzed here are similar to, or less impactful than, numerous construction activities conducted in other similar locations which have occurred with no reported injuries or mortality to marine mammals, and no known long-term adverse consequences from behavioral harassment.

Anticipated and authorized takes are expected to be limited to short-term Level B harassment (behavioral disturbance) as construction activities would occur intermittently over the course of 30 days. Effects on individuals taken by Level B harassment, based upon reports in the literature as well as monitoring from other similar activities, may include increased swimming speeds, increased surfacing time, increased haul out time by pinnipeds, or decreased foraging (*e.g.,* Thorson and Reyff, 2006; NAVFAC SW, 2018b). Individual animals, even if taken multiple times, would likely move away from the sound source and be temporarily displaced from the area due to elevated noise level during pile removal. Marine mammals could also experience TTS if they move into the Level B harassment zone. TTS is a temporary loss of hearing sensitivity when exposed to loud sound, and the hearing threshold is expected to recover completely within minutes to hours. Thus, it is not considered an injury. While TTS could occur, it is not considered a likely outcome of this activity. Repeated exposures of individuals to levels of sounds that could cause Level B harassment are unlikely to considerably significantly disrupt foraging behavior or result in significant decrease in fitness, reproduction, or survival for the affected individuals. In all, there would be no adverse impacts to the stock as a whole.

As previously described, a UME has been declared for Eastern Pacific gray whales. However, we do not expect proposed takes for authorization in this action to exacerbate the ongoing UME. As mentioned previously, no injury or mortality is proposed for authorization, and take by Level B harassment is limited (2 takes over the duration of the project). Therefore, we do not expect the proposed take authorization to compound the ongoing UME.

The project is not expected to have significant adverse effects on marine mammal habitat. There are no known Biologically Important Areas (BIAs) or ESA-designated critical habitat within the project area, and the activities would not permanently modify existing marine mammal habitat. Although harbor seal haul out sites are located in the Bay, hauled out seals are not likely to be impacted. PSOs during the seismic retrofit of the Richmond Bridge did not note any decline in use by harbor seals at Castro Rocks, a haul out site which is approximately 20 to 100 m from the bridge (Greene *et al.,* 2006) and 560 m from the project area. In addition, any pupping that may occur at Castro Rocks would take place outside of the work window for the proposed pile driving activities. The activities may cause fish to leave the area temporarily. This could impact marine mammals' foraging opportunities in a limited portion of the foraging range, however, due to the short duration of activities and the relatively small area of affected habitat, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

In combination, these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activities would have only minor, short-term effects on individuals. The specified activities are not expected to impact reproduction or survival of any individual marine mammals, much less have impacts on annual rates of recruitment or survival.

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

- No serious injury, mortality, or Level A harassment is anticipated or proposed for authorization;
- The specified activities and associated ensonified areas are very small relative to the overall habitat ranges of all species;
- The project area does not overlap known BIAs or ESA-designated critical habitat;
- The lack of anticipated significant or long-term effects to marine mammal habitat;
- The presumed efficacy of the mitigation measures in reducing the effects of the specified activity; and
- Monitoring reports from similar work in the Bay have documented little to no effect on individuals of the same species impacted by the specified activities.

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

The amount of take NMFS has authorized is below one-third of the estimated stock abundances for all seven stocks (refer back to table 8). For most stocks, the proposed take of individuals is less than 2 percent of the abundance of the affected stock (with exception for harbor seals at 23 percent). This is likely a conservative estimate because it assumes all takes are of different individual animals, which is likely not the case for harbor seals, given the nearby haulout. Some individuals may return multiple times in a day, but PSOs would count them as separate takes if they cannot be individually identified.

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

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act

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

No incidental take of ESA-listed species is proposed for authorization or expected to result from this activity. Therefore, NMFS has determined that formal consultation under section 7 of the ESA is not required for this action.

Proposed Authorization

As a result of these preliminary determinations, NMFS proposes to issue an IHA to Chevron's for conducting pile driving activities in San Francisco Bay from June 1, 2023 through November 30, 2023, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. A draft of the proposed IHA can be found at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities*.

Request for Public Comments

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

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

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

- The request for renewal must include the following:

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

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

Upon review of the request for renewal, the status of the affected species or stocks, and any other pertinent information, NMFS determines that there are no more than minor changes in the activities, the mitigation and monitoring measures will remain the same and appropriate, and the findings in the initial IHA remain valid.

Dated: March 28, 2023.

Catherine Marzin,

Deputy Director, Office of Protected Resources,

National Marine Fisheries Service.

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