observer coverage, this would equate to roughly 30–35 EFP trips.

Vessels participating in this EFP would use EM in lieu of human ASMs, and in addition to Northeast Fishery Observer Program (NEFOP) observers, on groundfish trips selected for observer coverage. Vessels would adhere to a vessel-specific Vessel Monitoring Plan (VMP) detailing at-sea catch handling protocols. An EM service provider would review 100 percent of the video footage. The provider would also produce an EM summary report identifying, counting, and generating weight estimates for all groundfish discards, which it would submit to the NMFS Greater Atlantic Fisheries Regional Office. These data would be used for catch accounting purposes on trips selected for ASM coverage. EM data would not be used for catch accounting in place of observer data on NEFOP trips, but the information generated would facilitate comparisons between cameras and human observers. The Northeast Fisheries Science Center would conduct a secondary review of the EM summary reports for a subset of EFP trips.

Under this EFP, vessels would be exempt from their sector's monitoring program requirement only, and all other standard sector reporting and monitoring requirements would still apply, such as using dealer-reported landings and vessel trip reports. Vessels would be assigned observer coverage at the standard ASM coverage level of 15 percent, which is a combination of NEFOP and ASM coverage. All catch of allocated groundfish stocks would be deducted from the appropriate sector's allocation. Legal-sized regulated groundfish would be retained and landed, as required by the Northeast Multispecies Fishery Management Plan. Undersized groundfish would be handled according to the VMP guidelines in view of cameras and returned to the sea as quickly as possible. All other species would be handled per normal commercial fishing operations. No legal-size regulated groundfish would be discarded, unless otherwise permitted through regulatory exemptions granted to the participating vessel's sector.

If approved, the applicant may request minor modifications and extensions to the EFP throughout the year. EFP modifications and extensions may be granted without further notice if they are deemed essential to facilitate completion of the proposed research and have minimal impacts that do not change the scope or impact of the initially approved EFP request. Any fishing activity conducted outside the scope of the exempted fishing activity would be prohibited.

Authority: 16 U.S.C. 1801 *et seq.*

Dated: April 9, 2018.

Jennifer M. Wallace,

Acting Director, Office of Sustainable Fisheries, National Marine Fisheries Service.

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XG059

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Demolition and Reuse of the Original East Span of the San Francisco-Oakland Bay Bridge

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

ACTION: Notice; proposed incidental harassment authorization; request for comments.

SUMMARY: NMFS has received a request from the California Department of Transportation (Caltrans) for authorization to take marine mammals during the dismantling and reuse of the original East Span of the San Francisco-Oakland Bay Bridge (SFOBB) in the San Francisco Bay (SFB). 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 will consider public comments prior to making any final decision on the issuance of the requested MMPA authorizations and agency responses will be summarized in the final notice of our decision.

DATES: Comments and information must be received no later than May 14, 2018.

ADDRESSES: Comments should be addressed to Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service. Physical comments should be sent to 1315 East-West Highway, Silver Spring, MD 20910 and electronic comments should be sent to *ITP.Young@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 received electronically, including all attachments, must not exceed a 25-megabyte file size. Attachments to electronic comments will be accepted in Microsoft Word or Excel or Adobe PDF file formats only. All comments received are a part of the public record and will generally be posted online at *https://www.fisheries.noaa.gov/node/23111* 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: Sara Young, 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

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

An authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth.

NMFS has defined ''negligible impact'' in 50 CFR 216.103 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.

The MMPA states that the term ''take'' means to harass, hunt, capture, kill or attempt to harass, hunt, capture, or kill any marine mammal.

Except with respect to certain activities not pertinent here, 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).

National Environmental Policy Act

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

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

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

Summary of Request

On January 9, 2018, NMFS received a request from Caltrans for an IHA to take marine mammals incidental to the demolition and reuse of the original East Span of the SFOBB in San Francisco Bay. Caltrans' request is for take of seven species of marine mammals, by Level B harassment. Neither Caltrans nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

NMFS previously issued several IHAs to Caltrans for similar work, with the most recent IHA issued in 2017 (82 FR 35510). Caltrans 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 Effects of the Specified Activity on Marine Mammals and their Habitat and Estimated Take section. This proposed IHA would cover one year of a larger project for which Caltrans obtained previous IHAs. The larger project involves dismantling of many piers of many remaining structures from the original east span of the bridge.

Description of Proposed Activity

Overview

Caltrans proposes to demolish and reuse portions of the original East Span of the SFOBB by mechanical dismantling and by use of controlled charges to implode two piers (Piers E19 and E20) into their open cellular chambers below the mudline. Activities associated with dismantling of the piers may potentially result in incidental take of marine mammals due to the use of highly controlled charges to dismantle the marine foundations of the piers. A public access point will incorporate existing piers (E21, E22, and E23) but requires use of pile driving to finalize the access structure. Pier E2 will also be retained for public access improvements, but does not require any in-water work.

Several previous one-year IHAs have been issued to Caltrans for pile driving/removal and construction of the new SFOBB East Span beginning in 2003. NMFS has issued 11 IHAs to Caltrans for the SFOBB Project. The first five IHAs (2003, 2005, 2007, 2009, and 2011) addressed potential impacts associated with pile driving for the construction of the new East Span of the SFOBB. IHAs issued in 2013, 2014 and July 2015 addressed activities associated with both constructing the new East Span and dismantling the original East Span, specifically addressing vibratory pile driving, vibratory pile extraction/removal, attenuated impact pile driving, pile proof testing, and mechanical dismantling of temporary and permanent marine foundations. On September 9, 2015, NMFS issued an IHA to Caltrans for incidental take associated with the demolition of Pier E3 of the original SFOBB by highly controlled explosives (80 FR 57584; September 24, 2015). On September 30, 2016, NMFS issued an IHA authorizing the incidental take of marine mammals associated with both pile driving/removal and controlled implosion of Piers E4 and E5 (81 FR 67313). On July 13, 2017, NMFS issued an IHA to Caltrans authorizing take of marine mammals for additional dismantling the original East Span of the SFOBB using mechanical means as well as 5to 6 implosion events to dismantle 13 piers (Piers E6–E18). This year of work will include removal of Piers E19 and E20.

Dates and Duration

Vibratory pile driving for construction of the Oakland Touchdown pedestrian bridge (OTD) and OTD access trestle may begin in June 2018. Impact pile-driving activities will be restricted from June 1 to November 30, to avoid peak salmonid migration periods. Pier implosion requiring IHA coverage is scheduled to begin in September 2018. Pier implosion will be restricted from September 1 to November 30, to minimize potential impacts on biological resources in the Bay.

Specific Geographic Region

The SFOBB project area is located in the central SFB or Bay, between Yerba Buena Island (YBI) and the city of Oakland. The western limit of the project area is the east portal of the YBI tunnel, located in the city of San Francisco. The eastern limit of the project area is located approximately 1,312 feet (400 meters) west of the Bay Bridge toll plaza, where the new and former spans of the bridge connect with land at the OTD in the city of Oakland. The approximate width of the in-water work area is 350 meters (1,148 feet). This includes all in-water areas under the original bridge and new bridge. All activities proposed under this IHA application will be confined to this area. However, other previous in-water project activities have taken place in discrete areas near both YBI and Treasure Island outside these limits.

Detailed Description of Specific Activity

Construction activities associated with both dismantling and reuse of marine foundations of the original east span bridge may result in the incidental take of marine mammals. These activities include the use of highly controlled charges to dismantle Piers E19 and E20, as well as pile-driving activities associated with construction of a public access facility that will incorporate reuse Piers E21, E22 and E23. Pier E2 will also be retained and incorporated into a public access facility. However, public access improvements at Pier E2 will not require any in-water work and would not result in incidental take of marine mammals; therefore, are not discussed further.

Removal of Piers 19 and 20

The removal of Piers E19 and E20 will be performed in three phases. The first phase will use mechanical dismantling to remove the above-water portions of

the piers, which is not expected to result in take. The second phase will use controlled blasting methods for removal of the in-water portions of the piers. The third phase will include dredging of imploded rubble to specified removal limits, which is also not expected to result in take. Limits of removal will be determined at each location and will result in removal to between 0.46 and 0.91 meter (1.5 and 3 feet) below the mudline.

Piers E19 and E20 are large cellular structures through the water column, which are supported on concrete slabs and hundreds of driven timber piles encased in a concrete seal. The timber piles and concrete seal courses that are below approved removal limits will remain in place. Rubble that mounds above the determined debris removal elevation limits from the dismantling of these piers will be removed off-site for disposal; as was done during the removal of Piers E6 to E18.

A Blast Attenuation System (BAS) similar to that used for previous blast events will be used during all future controlled blasting events, to minimize potential impacts on biological resources in the Bay. The effectiveness of this minimization measure is supported by the findings from the successful removal of Piers E3 to E18.

Each pier will be removed in the following three phases:

- Pre-blasting activities, including removing the pier cap and concrete pedestals, installing and testing the BAS;
- installing charges, activating the BAS, and imploding the pier; and
- dredging of imploded rubble to specified removal limits.

Further detail on the above steps to remove the marine foundations are provided. Phase 1: Dismantling the concrete pedestals and concrete pier cap by mechanical means (including the use of torches and excavators mounted with hoe rams, drills, and cutting tools), and drilling vertical boreholes where the charges will be loaded for controlled blasting. Phase 2: The charges then will be loaded into the drilled boreholes. Controlled blasting removal will be accomplished using hundreds of small charges, with delays between individual charges. The controlled blast sequence for each pier will last approximately 1 to 5 seconds. The controlled blast removals have been designed to remove each pier to between 0.46 and 0.91 meter (1.5 and 3 feet) below the mudline. Phase 3: Dredging of imploded rubble to specified removal limits.

Blast Attenuation System Testing, Installation, and Deployment

The BAS will be deployed around each pier being imploded and will be the same system as that successfully used for the removal of Piers E3 to E18. The BAS is a modular system of pipe manifold frames, placed around each pier and fed by air compressors to create a curtain of air bubbles. Each BAS frame is approximately 15.4 meters long by 1.8 meters wide (50.5 feet long by 6 feet wide). The BAS to be used will be the same design that was used at Piers E3 to E18 and will meet the same specifications. The BAS will be activated before and during implosion. As shown during the Pier E3 Demonstration Project and eight subsequent pier blast events by the SFOBB Project, the BAS will attenuate noise and pressure waves generated during each controlled blast, to minimize potentially adverse effects on biological resources that may be nearby.

Before installing the BAS, Caltrans will move any existing debris on the Bay floor that may interrupt or conflict with proper installation of the BAS. Each BAS frame will be lowered to the bottom of the Bay by a barge-mounted crane and will be positioned into place. Divers will assist frame placement and will the connect air hoses to the frames. Based on location around the pier, the BAS frame elements will be situated from approximately 8 to 12 meters (25 to 40 feet) from the outside edge of each pier. The frames will be situated to contiguously surround each pier. Frame ends will overlap to ensure no break in the BAS when operational. Each frame will be weighted to negative buoyancy for activation. Compressors will provide enough pressure to achieve a minimal air volume fraction of 3 to 4 percent, consistent with the successful use of BAS systems in past controlled blasting activities.

The complete BAS will be installed and tested during the weeks leading up to the controlled blast. The BAS test parameters will include checking operating levels, flow rate, and a visual check to determine that the system is operating correctly. System performance is anticipated to provide approximately 80 percent noise and pressure attenuation, based on the results from the previous SFOBB Project blast events using a similar system.

Test blasts may be conducted to ensure that the hydroacoustic monitoring equipment will be functional and triggered properly before the pier implosion event. The test blasts would be conducted within the completely installed and operating BAS. A key requirement of pier implosion will involve accurately capturing hydroacoustic information from the controlled blast. To accomplish this, a smaller test charge will be used to trigger recording instrumentation. Multiple test blasts on the same day may be required to verify proper instrument operation and calibrate the equipment for the implosion events. These same instruments and others of the same type will use high-speed recording devices to capture hydroacoustic data at both near-field and far-field monitoring locations during the implosion.

Test blasts will be scheduled to occur within two weeks of the scheduled implosion. Tests will use a charge weight of approximately 18 grains (0.0025 pound) or less and will be placed along one of the longer faces of the pier. The results from test blasts that occurred before the implosions of Pier E3 and E5 indicate that these test blasts will have minimal impacts on fish and no impacts on marine mammals (see Appendix A in application).

Piers E19 and E20 will be imploded during a single event. Before pier removal via controlled blasting, Caltrans will load the bore holes of the piers with controlled charges. Individual cartridge charges using electronic blasting caps have been selected to provide greater control and accuracy in determining the individual and total charge weights. Use of individual cartridges will allow a refined blast plan that efficiently breaks concrete while minimizing the amount of charges needed.

Boreholes will vary in diameter and depth, and have been designed to provide optimal efficiency in transferring the energy created by the controlled charges to dismantle the piers. Individual charge weights will vary from 7 to 11 kilograms (15 to 25 pounds), and the total charge weight for the Pier E19 and E20 blast event will be approximately 1,800 kilograms (4,000 pounds). The total number of individual charges to be used per pier will be approximately 100. Charges will be arranged in different levels (decks) and will be separated in the boreholes by stemming. Stemming is the insertion of inert materials (*e.g.,* sand or gravel) to insulate and retain charges in an enclosed space. Stemming allows more efficient transfer of energy into the structural concrete for fracture, and further reduces the release of potential energy into the surrounding water column. The entire detonation sequence, consisting of approximately 200 detonations, will last approximately 1 to 5 seconds for each pier; with a minimum delay time of 9 milliseconds

(msec) between detonations. There will be approximately half a second delay between pier blasts to avoid overlap of pressure waves.

Piers E19 and E20 will be blasted in a single pier implosion event. These piers will be removed by blasting down through the concrete cellular structure but not through the concrete slab, seal, and timber piles below. Remaining concrete seals and timber piles below the mudline will not be removed.

Reuse of Piers E21 to E23

Piers E19 and E20 will be imploded during a single event. Before pier removal via controlled blasting, Caltrans will load the bore holes of the pier with controlled charges. Individual cartridge charges using electronic blasting caps have been selected to provide greater control and accuracy in determining the individual and total charge weights. Use of individual cartridges will allow a refined blast plan that efficiently breaks concrete while minimizing the amount of charges needed.

Boreholes will vary in diameter and depth, and have been designed to provide optimal efficiency in transferring the energy created by the controlled charges to dismantle the piers. Individual charge weights will vary from 7 to 11 kilograms (15 to 25 pounds), and the total charge weight for the Pier E19 and E20 blast event will be approximately 1,800 kilograms (4,000 pounds). The total number of individual charges to be used per pier will be approximately 100. Charges will be arranged in different levels (decks) and will be separated in the boreholes by stemming. Stemming is the insertion of inert materials (*e.g.,* sand or gravel) to insulate and retain charges in an enclosed space. Stemming allows more efficient transfer of energy into the structural concrete for fracture, and further reduces the release of potential energy into the surrounding water column. The entire detonation sequence, consisting of approximately 200 detonations, will last approximately 1 to 5 seconds for each pier; with a minimum delay time of 9 msec between detonations. There will be approximately half a second delay between pier blasts to avoid overlap of pressure waves.

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

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history, of the potentially affected species. Additional information regarding population trends and threats may be found in NMFS's Stock Assessment Reports (SAR; *www.nmfs.noaa.gov/pr/sars/*) and more general information about these species (*e.g.,* physical and behavioral descriptions) may be found on NMFS's website (*www.nmfs.noaa.gov/pr/species/mammals/*).

Table 1 lists all species with expected potential for occurrence in San Francisco Bay and summarizes information related to the population or stock, including regulatory status under the MMPA and ESA and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2016). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS's SARs). While no mortality is anticipated or authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS's stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS's U.S. 2016 SARs (Carretta *et al.,* 2017). All values presented in Table 1 are the most recent available at the time of publication and are available in the 2016 SARs (Carretta *et al.,* 2017) (available online at: *www.nmfs.noaa.gov/pr/sars/draft.htm*).

TABLE 1—MARINE MAMMAL SPECIES THAT MAY OCCUR IN THE ACTION AREA

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N) [1]	Stock abundance (CV, N_{min}, most recent abundance survey) [2]	PBR	Annual M/SI [3]
Order Cetartiodactyla—Cetacea—Superfamily Mysticeti (baleen whales)						
Family Eschrichtiidae:						
Gray whale	*Eschrichtius robustus*	Eastern North Pacific	-; N	20,990 (0.05, 20,125, 2011)	624	132
Family Balaenopteridae (rorquals):						
Fin Whale	*Balaenoptera physalus*	California/Oregon/Washington	E; Y	9,029 (0.12, 8,127, 2014)	81	2
Humpback Whale	*Megaptera novaeangliae*	California/Oregon/Washington	E; Y	1,918 (.03, 1,876, 2014)	11	6.5
Minke Whale	*Balaenoptera acutorostrata*	California/Oregon/Washington	-; N	636 (0.72, 369, 2014)	3.5	1.3
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Physeteridae:						
Sperm whale	*Physeter macrocephalus*	California/Oregon/Washington	E; Y	2,106 (0.58, 1,332, 2008)	2.7	1.7
Family Delphinidae:						
Common Bottlenose Dolphin.	*Tursiops truncatus*	California Coastal	-; N	453 (0.06, 346, 2011)	2.7	2
Short-Beaked Common Dolphin.	*Delphinus delphis*	California/Oregon	-; N	969,861 (0.17, 839,325, 2014)	8,393	40
Family Phocoenidae (porpoises):						
Harbor Porpoise	*Phocoena phocoena*	San Francisco-Russian River	-; N	9,886 (0.51, 6,625, 2011)	66	0

TABLE 1—MARINE MAMMAL SPECIES THAT MAY OCCUR IN THE ACTION AREA—Continued

Common name	Scientific name	Stock	ESA/ MMPA status; Strategic (Y/N) [1]	Stock abundance (CV, N_{min}, most recent abundance survey) [2]	PBR	Annual M/SI [3]
Order Carnivora—Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions):						
California Sea Lion	*Zalophus californianus*	United States	-; N	296,750 (N/A, 153,337, 2011)	9,200	389
Northern Fur Seal	*Callorhinus ursinus*	California, Eastern North Pacific.	-; N	14,050 (N/A, 7,524, 2013)	451	1.8
Steller sea lion	*Eumetopias jubatus*	Eastern	T; D	41,638 (N/A, 41,638, 2015)	2,498	108
Family Phocidae (earless seals):						
Harbor seal	*Phoca vitulina*	California	-; N	30,968 (N/A, 27,348, 2012)	1,641	43
Northern Elephant Seal	*Mirounga angustirostris*	California Breeding	-; N	179,000 (N/A, 81,368, 2010)	542	3.2

[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: *www.nmfs.noaa.gov/pr/sars/*. CV is coefficient of variation; Nmin is the minimum estimate of stock abundance. In some cases, CV is not applicable [explain if this is the case].

[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.

Note: *Italicized species are not expected to be taken or proposed for authorization.*

All species that could potentially occur in the proposed survey areas are included in Table 1. However, the temporal or spatial occurrence of the species italicized in Table 1 is such that take is not expected to occur, and they are not discussed further beyond the explanation provided here. San Francisco Bay would be considered extralimital and have not been sighted during marine mammal monitoring conducted by Caltrans under past IHAs.

Harbor Seal

Harbor seals are found from Baja California to the eastern Aleutian Islands of Alaska. The species primarily hauls out on remote mainland and island beaches and reefs, and estuary areas. Harbor seal tends to forage locally within 53 miles (85 kilometers) of haul out sites (Harvey and Goley 2011). Harbor seal is the most common marine mammal species observed in the Bay and also commonly is seen near the SFOBB east span (Department 2013b, 2013c). Tagging studies have shown that most seals tagged in the Bay remain in the Bay (Harvey and Goley 2011; Manugian 2013). Foraging often occurs in the Bay, as noted by observations of seals exhibiting foraging behavior (short dives less than 5 minutes, moving back and forth in an area, and sometimes tearing up prey at the surface).

The molt occurs from May through June. During both pupping and molt seasons, the number of seals and the length of time hauled out per day increases, with about 60.5 percent of the population hauled out during this time versus less than 20 percent in fall (Yochem *et al.,* 1987; Huber *et al.,* 2001; Harvey and Goley 2011). Mother-pup pairs spend more time on shore; therefore, the percentage of seals on shore at haul out sites increases during the pupping season (Stewart and Yochem 1994). Peak numbers of harbor seals hauling out in central California occurs during late May to early June, which coincides with the peak of their molt. Seals haul out more often and spend more time on shore to molt. Yochem *et al.* (1987) found that harbor seals at San Miguel Island only hauled out 11 to 19 percent of the time in fall, from late October through early December.

Harbor seal tends to forage at night and haul out during the day. Harbor seal predominately hauls out from 10 a.m. to 7 p.m., with a peak in the afternoon between 1 and 4 p.m. (Yochem *et al.,* 1987; Stewart and Yochem 1994; Grigg *et al.,* 2002; London *et al.,* 2012). Harbor seals in the Bay typically haul out in groups ranging from a few individuals to several hundred seals. One known haul out site is on the southern side of YBI, approximately 1,600 meters (5,250 feet) from Pier E6 and approximately 2,800 meters (9,190 feet) from Pier E18. The YBI haul out site had a daily range of zero to 109 harbor seals hauled out during September, October, and November, with the highest numbers hauled out during afternoon low tides (Department 2004b). Pile driving for the SFOBB was not audible to the monitors just above the haul out site, and no response to pile driving was observed.

Tide level also can affect haul out behavior, by exposing and submerging preferred haul out sites. Tides likely affect the maximum number of seals hauled out, but time of day and the season have the greatest influence on haul out behavior (Stewart and Yochem 1994; Patterson and Acevedo-Gutiérrez 2008).

Harbor seals in the Bay are an isolated population, although about 40 percent may move a short distance out of the Bay to forage (Manugian *et al.* 2017). The Bay harbor seals likely are accustomed to a noisy environment because of construction, vessel traffic, the Bay Area Rapid Transit (BART) Transbay Tube, and mechanical noise (*i.e.,* machinery, generators).

During 251 days of SFOBB monitoring from 2000 through 2016, 958 harbor seals were observed in the vicinity of the SFOBB east span. Harbor seals made up 90 percent of the marine mammals observed during monitoring for the SFOBB Project. In 2015 and 2016, the number of harbor seals sighted in the project area increased (8 days of monitoring and 95 sightings). Foraging near the project area was common, particularly in the coves adjacent to the YBI United States Coast Guard Station and in Clipper Cove between YBI and Treasure Island. Foraging also occurred in a shallow trench area southeast of YBI (Department 2013a, 2013b). These sites are more than 900 to 1,525 meters (3,000 to 5,000 feet) west of Pier E6. In 2015, juvenile harbor seals began foraging around Piers E2W and E2E of the new SFOBB east span, and in 2016, they extended east around Piers E3 to E5 of the new SFOBB east span. Foraging can occur throughout the Bay, and prey abundance and distribution affect where harbor seals will forage. Most of the harbor seal sightings were

animals transiting the area, likely moving from haul out sites or from foraging areas.

California Sea Lion

California sea lion breeds on the offshore islands of California from May through July (Heath and Perrin 2008). During the non-breeding season, adult and sub-adult males and juveniles migrate northward along the coast, to central and northern California, Oregon, Washington, and Vancouver Island (Jefferson *et al.,* 1993). They return south the following spring (Lowry and Forney 2005; Heath and Perrin 2008). Females and some juveniles tend to remain closer to rookeries (Antonelis *et al.,* 1990; Melin *et al.,* 2008).

California sea lions have been observed occupying docks near Pier 39 in San Francisco, about 3.2 miles (5.2 kilometers) from the project area, since 1987. The highest number of sea lions recorded at Pier 39 was 1,701 individuals in November 2009 (De Rango, pers. comm., 2013). Occurrence of sea lions here typically is lowest in June (breeding season) and highest in August. Approximately 85 percent of the animals that haul out at this site are males, and no pupping has been observed here or at any other site in the Bay (Lander, pers. comm., 1999). Pier 39 is the only regularly used haul out site in the project vicinity, but sea lions occasionally haul out on human-made structures, such as bridge piers, jetties, or navigation buoys (Riedman 1990).

During monitoring for the SFOBB Project, 80 California sea lions were observed from 2000 through 2016. The number of sea lions that were sighted in the project area decreased in 2015 and 2016. Sea lions appear mainly to be transiting through the project area rather than feeding, although two exceptions have occurred. In 2004, several sea lions were observed following a school of Pacific herring that moved through the project area, and one sea lion was observed eating a large fish in 2015.

Breeding and pupping occur from mid to late May until late July. After the mating season, adult males migrate northward to feeding areas as far away as the Gulf of Alaska (Lowry *et al.,* 1992), and they remain away until spring (March–May), when they migrate back to the breeding colonies. Adult females remain near the rookeries throughout the year and alternate between foraging and nursing their pups on shore until the next pupping/breeding season.

Northern Elephant Seal

Northern elephant seal is common on California coastal mainland and island sites, where the species pups, breeds, rests, and molts. The largest rookeries are on San Nicolas and San Miguel islands in the northern Channel Islands. Near the Bay, elephant seals breed, molt, and haul out at Año Nuevo Island, the Farallon Islands, and Point Reyes National Seashore.

Northern elephant seals haul out to give birth and breed from December through March. Pups remain onshore or in adjacent shallow water through May. Both sexes make two foraging migrations each year: One after breeding and the second after molting (Stewart 1989; Stewart and DeLong 1995). Adult females migrate to the central North Pacific to forage, and males migrate to the Gulf of Alaska to forage (Robinson *et al.* 2012). Pup mortality is high when they make the first trip to sea in May, and this period correlates with the time of most strandings. Pups of the year return in the late summer and fall, to haul out at breeding rookery and small haul out sites, but occasionally they may make brief stops in the Bay.

Generally, only juvenile elephant seals enter the Bay and do not remain long. The most recent sighting near the project area was in 2012, on the beach at Clipper Cove on Treasure Island, when a healthy yearling elephant seal hauled out for approximately 1 day. Approximately 100 juvenile northern elephant seals strand in or near the Bay each year, including individual strandings at YBI and Treasure Island (less than 10 strandings per year).

Northern Fur Seal

Northern fur seal breeds on the offshore islands of California and in the Bering Sea from May through July. Two stocks of Northern fur seals may occur near the Bay, the California and Eastern Pacific stocks. The California stock breeds, pups, and forages off the California coast. The Eastern Pacific stock breeds and pups on islands in the Bering Sea, but females and juveniles move south to California waters to forage in the fall and winter months.

Both the California and Eastern Pacific stocks forage in the offshore waters of California, but only sick, emaciated, or injured fur seals enter the Bay. The Marine Mammal Center (TMMC) occasionally picks up stranded fur seals around YBI and Treasure Island. The rare occurrence of northern fur seal near the SFOBB east span makes it unlikely that the species will be exposed to implosion activities.

Bottlenose Dolphin

This species is found within 0.6 mile (1 kilometer) of shore and occurs from northern Baja California, Mexico to Bodega Bay, with the range extending north over the last several decades related to El Niño events and increased ocean temperatures. As the range of bottlenose dolphins extended north, dolphins began entering the Bay in 2010 (Szczepaniak 2013). Until 2016, most bottlenose dolphins in the Bay were observed in the western Bay, from the Golden Gate Bridge to Oyster Point and Redwood City, although one individual was observed frequently near the former Alameda Air Station (Perlman 2017). In 2017, two individuals have been observed regularly near Alameda (Keener, pers. comm., 2017) and likely passed by the project area.

Harbor Porpoise

This species seldom is found in waters warmer than 62.6 degrees Fahrenheit (17 degrees Celsius) (Read 1990) or south of Point Conception, and occurs as far north as the Bering Sea (Barlow and Hanan 1995; Carretta *et al.,* 2009; Carretta *et al.,* 2012; Allen and Angliss 2013). The San Francisco–Russian River stock is found from Pescadero, 18 miles (30 kilometers) south of the Bay, to 99 miles (160 kilometers) north of the Bay at Point Arena (Carretta *et al.,* 2012). In most areas, harbor porpoise occurs in small groups, consisting of just a few individuals.

Harbor porpoises are seen frequently outside the Bay, and they began to re-enter the Bay in 2008. Keener *et al.* (2012) reports sightings of harbor porpoises from just inside the Bay, northeast to Tiburon and south to the SFOBB west span. In 17 years of monitoring in the project area, 24 harbor porpoises have been observed, and all occurred between 2006 and 2015; including two in 2014, five in 2015 and 15 in 2017. In 2017, the number of harbor porpoises in the project area increased significantly. However, the majority of harbor porpoise observations made during monitoring for the SFOBB Project have been at distances ranging from 2,438 to 3,048 meters (8,000 to 10,000 feet) from the work area.

Gray Whale

The eastern North Pacific population of gray whales ranges from the southern tip of Baja California, Mexico to the Chukchi and Beaufort Seas (Jefferson *et al.,* 1993). The gray whale makes a well-defined, seasonal north-south migration. Most of the population summers in the shallow waters of the northern Bering Sea, the Chukchi Sea, and the western Beaufort Sea (Rice and Wolman 1971). However, some individuals also summer along the Pacific coast, from Vancouver Island to central California

(Rice and Wolman 1971; Darling 1984; Nerini 1984). In October and November, gray whales begin to migrate south and follow the shoreline to breeding grounds along the western coast of Baja California and the southeastern Gulf of California (Braham 1984). Gray whales begin heading north in late winter and early spring (Rice and Wolman 1971). The average gray whale migrates 4,660 to 6,213 miles (7,500 to 10,000 kilometers), at a rate of 91 miles/day (147 kilometers/day) (Jones and Swartz 2002). Gray whales generally calve and breed during the winter, in lagoons in Baja California (Jones and Swartz 2002), although some calves are born along the California coast during the migration south.

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (*e.g.,* Richardson *et al.,* 1995; Wartzok and Ketten, 1999; Au and Hastings 2008). To reflect this, Southall *et al.* (2007) recommended that marine mammals be divided into functional hearing groups based on directly measured or estimated hearing ranges on the basis of available behavioral response data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e.,* low-frequency cetaceans). Subsequently, NMFS (2016) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 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. The functional groups and the associated frequencies are indicated below (note that these frequency ranges correspond to the range for the composite group, with the entire range not necessarily reflecting the capabilities of every species within that group):

- Low-frequency cetaceans (mysticetes): Generalized hearing is estimated to occur between approximately 7 hertz (Hz) and 35 kilohertz (kHz);
- Mid-frequency cetaceans (larger toothed whales, beaked whales, and most delphinids): Generalized hearing is estimated to occur between approximately 150 Hz and 160 kHz;
- High-frequency cetaceans (porpoises, river dolphins, and members of the genera Kogia and Cephalorhynchus; including two members of the genus Lagenorhynchus, on the basis of recent echolocation data and genetic data): Generalized hearing is estimated to occur between approximately 275 Hz and 160 kHz.
- Pinnipeds in water; Phocidae (true seals): Generalized hearing is estimated to occur between approximately 50 Hz to 86 kHz;
- Pinnipeds in water; Otariidae (eared seals): Generalized hearing is estimated to occur between 60 Hz and 39 kHz.

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 (2016) for a review of available information. seven marine mammal species (three cetacean and four pinniped (three otariid and one phocid) species) have the reasonable potential to co-occur with the proposed survey activities. Please refer to Table 1. Of the cetacean species that may be present, one is classified as low-frequency cetaceans (gray whale), one is classified as mid-frequency cetaceans (bottlenose dolphin), and one is classified as high-frequency cetaceans (harbor porpoise).

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

This section includes a summary and discussion of the ways that components of the specified activity may impact marine mammals and their habitat. The ''Estimated Take by Incidental Harassment'' 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 by Incidental Harassment'' section, and the ''Proposed Mitigation'' section, to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and how those impacts on individuals are likely to impact marine mammal species or stocks.

General Information on Potential Effects

Explosives are impulsive sounds, which are characterized by short duration, abrupt onset, and rapid decay. The proposed Caltrans SFOBB work using controlled charges (*i.e.,* implosion events) could adversely affect marine mammal species and stocks by exposing them to elevated noise levels in the vicinity of the activity area. Based on the nature of the other activities associated with the dismantling of Piers E6 through E18 of the original SFOBB East Span (mechanical dismantling) and measured sound levels from those activities during past monitoring associated with previous IHAs, NMFS does not expect activities other than implosion events to contribute to underwater noise levels such that take of marine mammals would potentially occur.

Exposure to high intensity sound for a sufficient duration may result in behavioral reactions and auditory effects such as a noise-induced threshold shift—an increase in the auditory threshold after exposure to noise (Finneran *et al.,* 2005). Factors that influence the amount of threshold shift include the amplitude, duration, frequency content, temporal pattern, and energy distribution of noise exposure. The magnitude of hearing threshold shift normally decreases over time following cessation of the noise exposure. The amount of threshold shift just after exposure is the initial threshold shift. If the threshold shift eventually returns to zero (*i.e.,* the threshold returns to the pre-exposure value), it is a temporary threshold shift (Southall *et al.,* 2007).

When animals exhibit reduced hearing sensitivity (*i.e.,* sounds must be louder for an animal to detect them) following exposure to an intense sound or sound for long duration, it is referred to as a noise-induced threshold shift (TS). An animal can experience temporary threshold shift (TTS) or permanent threshold shift (PTS). TTS can last from minutes or hours to days (*i.e.,* there is complete recovery), can occur in specific frequency ranges (*i.e.,* an animal might only have a temporary loss of hearing sensitivity between the frequencies of 1 and 10 kHz), and can be of varying amounts (for example, an animal's hearing sensitivity might be reduced initially by only 6 decibel (dB) or reduced by 30 dB). PTS is a permanent loss within a specific frequency range.

For cetaceans, published TTS data are limited to the captive bottlenose dolphin, beluga, harbor porpoise, and Yangtze finless porpoise (Finneran *et al.,* 2000, 2002, 2003, 2005, 2007, 2010a, 2010b; Finneran and Schlundt, 2010; Lucke *et al.,* 2009; Mooney *et al.,* 2009a, 2009b; Popov *et al.,* 2011a, 2011b; Kastelein *et al.,* 2012a; Schlundt *et al.,* 2000; Nachtigall *et al.,* 2003, 2004). For pinnipeds in water, data are limited to measurements of TTS in harbor seals, an elephant seal, and California sea lions (Kastak *et al.,* 1999, 2005; Kastelein *et al.,* 2012b).

Marine mammal hearing plays a critical role in communication with conspecifics, and interpretation of environmental cues for purposes such as predator avoidance and prey capture. 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 occurs during a time 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. Also, depending on the degree and frequency range, the effects of PTS on an animal could range in severity, although it is considered generally more serious because it is a permanent condition. Of note, 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 one can infer that strategies exist for coping with this condition to some degree, though likely not without cost.

In addition, chronic exposure to excessive, though not high-intensity, noise could cause masking at particular frequencies for marine mammals that utilize sound for vital biological functions (Clark *et al.,* 2009). Acoustic masking occurs when other noises, such as those from human sources, interfere with animal detection of acoustic signals such as communication calls, echolocation sounds, and environmental sounds important to marine mammals. Therefore, under certain circumstances, marine mammals whose acoustical sensors or environment are being severely masked could also be impaired from maximizing their performance fitness in survival and reproduction.

Masking occurs at the frequency band, which the animals utilize. However, lower frequency man-made noises are more likely to affect detection of communication calls and other potentially important natural sounds such as surf and prey noise. It may also affect communication signals when they occur near the noise band and thus reduce the communication space of animals (*e.g.,* Clark *et al.,* 2009) and cause increased stress levels (*e.g.,* Foote *et al.,* 2004; Holt *et al.,* 2009).

Unlike TS, masking, which can occur over large temporal and spatial scales, can potentially affect the species at population, community, or even ecosystem levels, as well as individual levels. Masking affects both senders and receivers of the signals and could have long-term chronic effects on marine mammal species and populations. Recent science suggests that low frequency ambient sound levels have increased by as much as 20 dB (more than 3 times in terms of sound pressure level) in the world's ocean from pre-industrial periods, and most of these increases are from distant shipping (Hildebrand 2009). For Caltrans' proposed SFOBB construction activities, noises from controlled blasting is not likely to contribute to the elevated ambient noise levels in the project area in such a way as to increasing potential for or severity of masking. Baseline ambient noise levels in the Bay are very high due to ongoing shipping, construction and other activities in the Bay, and the sound associated with the controlled blasting activities would be very brief.

Finally, exposure of marine mammals to certain sounds could lead to behavioral disturbance (Richardson *et al.,* 1995), such as: Changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); avoidance of areas where noise sources are located; and/or flight responses (*e.g.,* pinnipeds flushing into water from haul outs or rookeries).

The onset of behavioral disturbance from anthropogenic noise depends on both external factors (characteristics of noise sources and their paths) and the receiving animals (hearing, motivation, experience, demography) and is also difficult to predict (Southall *et al.,* 2007). For impulse noises (such as the proposed controlled implosions associated with the dismantling of the original SFOBB spans), NMFS uses received levels of 165 dB SEL to predict the onset of behavioral harassment for mid-frequency cetaceans and phocid pinnipeds (bottlenose dolphins and harbor seals and northern elephant seals, respectively); 135 dB SEL for high-frequency cetaceans (harbor porpoises); and 183 dB SEL for otariid pinnipeds (California sea lions and northern fur seals).

The biological significance of many of these behavioral disturbances is difficult to predict, especially if the detected disturbances appear minor. However, the consequences of behavioral modification could be biologically significant if the change affects growth, survival, and/or reproduction, which depends on the severity, duration, and context of the effects.

Potential Effects From Controlled Pier Implosion

It is expected that an intense impulse from the proposed controlled blasting of Piers E19 and E20 would have the potential to impact marine mammals in the vicinity of the activity. The majority of impacts would be startle behavioral responses and temporary behavioral modification of marine mammals. However, a few individual animals could be exposed to sound levels that would cause TTS.

The underwater explosion would send a shock wave and blast noise through the water, release gaseous by-products, create an oscillating bubble, and cause a plume of water to shoot up from the water surface. The shock wave and blast noise are of most concern to marine animals. The effects of an underwater explosion on a marine mammal depends on many factors, including the size, type, and depth of both the animal and the explosive charge; the depth of the water column; and the standoff distance between the charge and the animal, as well as the sound propagation properties of the environment. Potential impacts can range from brief effects (such as behavioral disturbance), tactile perception, physical discomfort, slight injury of the internal organs and the auditory system, to death of the animal (Yelverton *et al.,* 1973; DoN, 2001). Non-lethal injury includes slight injury to internal organs and the auditory system; however, delayed lethality can be a result of individual or cumulative sublethal injuries (DoN, 2001). Immediate lethal injury would be a result of massive combined trauma to internal organs as a direct result of proximity to the point of detonation (DoN 2001). Generally, the higher the

level of impulse and pressure level exposure, the more severe the impact to an individual.

Injuries resulting from a shock wave take place at boundaries between tissues of different density. Different velocities are imparted to tissues of different densities, and this can lead to their physical disruption. Blast effects are greatest at the gas-liquid interface (Landsberg 2000). Gas-containing organs, particularly the lungs and gastrointestinal (GI) tract, are especially susceptible (Goertner 1982; Hill 1978; Yelverton *et al.,* 1973). In addition, gas-containing organs including the nasal sacs, larynx, pharynx, trachea, and lungs may be damaged by compression/expansion caused by the oscillations of the blast gas bubble. Intestinal walls can bruise or rupture, with subsequent hemorrhage and escape of gut contents into the body cavity. Less severe GI tract injuries include contusions, petechiae (small red or purple spots caused by bleeding in the skin), and slight hemorrhaging (Yelverton *et al.,* 1973).

Because the ears are the most sensitive to pressure, they are the organs most sensitive to injury (Ketten 2000). Sound-related damage associated with blast noise can be theoretically distinct from injury from the shock wave, particularly farther from the explosion. If an animal is able to hear a noise, at some level it can damage its hearing by causing decreased sensitivity (Ketten 1995). Sound-related trauma can be lethal or sublethal. Lethal impacts are those that result in immediate death or serious debilitation in or near an intense source and are not, technically, pure acoustic trauma (Ketten 1995). Sublethal impacts include hearing loss, which is caused by exposures to perceptible sounds. Severe damage (from the shock wave) to the ears includes tympanic membrane rupture, fracture of the ossicles, damage to the cochlea, hemorrhage, and cerebrospinal fluid leakage into the middle ear. Moderate injury implies partial hearing loss due to tympanic membrane rupture and blood in the middle ear. Permanent hearing loss also can occur when the hair cells are damaged by one very loud event, as well as by prolonged exposure to a loud noise or chronic exposure to noise. The level of impact from blasts depends on both an animal's location and, at outer zones, on its sensitivity to the residual noise (Ketten 1995).

The above discussion concerning underwater explosions only pertains to open water detonations in a free field. Caltrans' demolition of Piers E19 and E20 using controlled implosion uses a confined detonation method, meaning that the charges would be placed within the structure. Therefore, most energy from the explosive shock wave would be absorbed through the destruction of the structure itself, and would not propagate through the open water. Measurements and modeling from confined underwater detonation for structure removal showed that energy from shock waves and noise impulses were greatly reduced in the water column compared to expected levels from open water detonations (Hempen *et al.,* 2007; Department 2016). Therefore, with monitoring and mitigation measures discussed below, Caltrans' controlled implosions of Piers E19 and E20 are not likely to have injury or mortality effects on marine mammals in the project vicinity. Instead, NMFS considers that Caltrans' proposed controlled implosions in the San Francisco Bay are most likely to cause behavioral harassment and may cause TTS in a few individual of marine mammals, as discussed below.

Changes in marine mammal behavior are expected to result from acute stress, or startle, responses. This expectation is based on the idea that some sort of physiological trigger must exist to change any behavior that is already being performed, and this may occur due to being startled by the implosion events. The exception to this expectation is the case of behavioral changes due to auditory masking (increasing call rates or volumes to counteract increased ambient noise). Masking is not likely since the Caltrans' controlled implosion would only consist of five to six short, sequential detonations that last for approximately 3–4 seconds each.

The removal of the SFOBB East Span is not likely to negatively affect the habitat of marine mammal populations because no permanent loss of habitat will occur, and only a minor, temporary modification of habitat will occur due to the addition of sound and activity associated with the dismantling activities.

Project activities will not affect any pinniped haul out sites or pupping sites. The YBI harbor seal haul out site is on the opposite site of the island from the SFOBB Project area. Because of the distance and the island blocking the sound, underwater noise and pressure levels from the SFOBB Project will not reach the haul out site. Other haul out sites for sea lions and harbor seals are at a sufficient distance from the SFOBB Project area that they will not be affected. The closest recognized harbor seal pupping site is at Castro Rocks, approximately 8.7 miles (14 kilometers) from the SFOBB Project area. No sea lion rookeries are found in the Bay.

The addition of underwater sound from SFOBB Project activities to background noise levels can constitute a potential cumulative impact on marine mammals. However, these potential cumulative noise impacts will be short in duration and would not occur in biologically important areas, would not significantly affect biologically important activities, and are not expected to have significant environmental effects, as noted in the original FHWA 2001 FEIS for the SFOBB project, incorporated by reference into NMFS' 2003 EA and subsequent Supplemental EAs (2009 and 2015) for the issuance of IHAs for the SFOBB project.

Marine mammal forage on fish within SFB and pier implosions have the potential to injure or kill fish in the immediate area. During previous pier implosion and pile driving activities, Caltrans reported mortality to prey species of marine mammals, including northern anchovies and Pacific herring (Department 2016), averaging approximately 200 fish per implosion event (none of which were ESA-listed species and none of which are managed under a Fishery Management Plan). These few isolated fish mortality events are not anticipated to have a substantial effect on prey species populations or their availability as a food resource for marine mammals.

Studies on explosives also suggest that larger fish are generally less susceptible to death or injury than small fish, and results of most studies are dependent upon specific biological, environmental, explosive, and data recording factors. For example, elongated forms that are round in cross section are less at risk than deep-bodied forms; orientation of fish relative to the shock wave may also affect the extent of injury; and finally, open water pelagic fish, such as those expected to be in the project area, seem to be less affected than reef fishes.

The huge variation in fish populations, including numbers, species, sizes, and orientation and range from the detonation point, makes it very difficult to accurately predict mortalities at any specific site of detonation. Most fish species experience a large number of natural mortalities, especially during early life-stages, and any small level of mortality caused by the Caltrans' controlled implosion events will likely be insignificant to the population as a whole. This negligible effect on population levels of forage fish should ensure continued prey availability for marine mammal species in the area.

Estimated Take

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

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

Authorized takes would be by Level B harassment only, in the form of disruption of behavioral patterns and TTS, for individual marine mammals resulting from exposure to pile driving and controlled blasting. Based on the nature of the activity and the anticipated effectiveness of the mitigation measures such as the use of a blast attenuation system and shutdown zones, Level A harassment is neither anticipated nor proposed to be authorized.

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

Described in the most basic way, we estimate take by considering: (1) Acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) and the number of days of activities. Below, we describe these components in more detail and present the proposed take estimate.

Acoustic Thresholds

Using the best available science, NMFS has developed acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment). Thresholds have also been developed to identify the pressure levels above which animals may incur different types of tissue damage from exposure to pressure waves from explosive detonation.

Level B Harassment for non-explosive sources—Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.,* frequency, predictability, duty cycle), the environment (*e.g.,* bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et al.,* 2007, Ellison *et al.,* 2011). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 dB re 1 µPa (rms) for continuous (*e.g.* vibratory pile-driving, drilling) and above 160 dB re 1 µPa (rms) for non-explosive impulsive (*e.g.,* seismic airguns) or intermittent (*e.g.,* scientific sonar) sources.

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

Level A harassment for non-explosive sources—NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Technical Guidance, 2016) 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). Caltrans' proposed activity includes the use of impulsive (impact driving) AND non-impulsive (vibratory driving) sources.

These thresholds are provided in the table below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2016 Technical Guidance, which may be accessed at: *http://www.nmfs.noaa.gov/pr/acoustics/guidelines.htm.*

Explosive sources—Based on the best available science, NMFS uses the acoustic and pressure thresholds indicated in Table 2 to predict the onset of behavioral harassment, PTS, tissue damage, and mortality.

Based on the best available scientific data, NMFS' 2016 Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing includes acoustic thresholds related to PTS and TTS for impulsive sounds that are expressed as weighted, cumulative sound exposure levels (SELcum) and unweighted peak sound pressure levels (SPLPK), as presented in Table 3.

TABLE 2—NMFS TAKE THRESHOLDS FOR MARINE MAMMALS FROM UNDERWATER IMPLOSIONS

Group	Species	Level B harassment		Level A harassment	Serious injury		Mortality
		Behavioral	TTS	PTS	Gastro-intestinal tract	Lung	
Mid-freq cetacean	Bottlenose dolphin	165 dB SEL	170 dB SEL or 224 dB SPL_{pk}.	185 dB SEL or 230 dB SPL_{pk}.	237 dB SPL	$39.1M^{1/3}$ (1 + [D/10.081]) $^{1/2}$ Pa-sec. where: M = mass of the animals in kg. D = depth of animal in m.	$91.4M^{1/3}$ (1 + [D/10.081]) $^{1/2}$ Pa-sec where: M = mass of the animals in kg D = depth of animal in m.
High-freq cetacean ...	Harbor porpoise	135 dB SEL	140 dB SEL or 196 dB SPL_{pk}.	155 dB SEL or 202 dB SPL_{pk}.			
Phocidae	Harbor seal & northern elephant seal.	165 dB SEL	170 dB SEL or 212 dB SPL_{pk}.	185 dB SEL or 218 dB SPL_{pk}.			
Otariidae	California sea lion & northern fur seal.	183 dB SEL	188 dB SEL or 226 dB_{pk}.	203 dB SEL or 232 dB SPL_{pk}.			

* **Note:** All dB values are referenced to 1 µPa. SPL_{pk} = Peak sound pressure level; psi = pounds per square inch.

Table 3. Thresholds identifying the onset of Permanent Threshold Shift

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

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

Note: Peak sound pressure (L_{pk}) has a reference value of 1 µPa, and cumulative sound exposure level (L_E) has a reference value of 1µPa^{2}s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript "flat" is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (i.e., varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

Table 4. Explosive acoustic and pressure thresholds for marine mammals

Hearing Group	PTS Impulsive Thresholds	TTS Impulsive Thresholds	Behavioral Threshold (multiple detonations)
Low-Frequency (LF) Cetaceans	*Cell 1* $L_{pk,flat}$: 219 dB $L_{E,LF,24h}$: 183 dB	*Cell 2* $L_{pk,flat}$: 213 dB $L_{E,LF,24h}$: 168 dB	*Cell 3* $L_{E,LF,24h}$: 163 dB
Mid-Frequency (MF) Cetaceans	*Cell 4* $L_{pk,flat}$: 230 dB $L_{E,MF,24h}$: 185 dB	*Cell 5* $L_{pk,flat}$: 224 dB $L_{E,MF,24h}$: 170 dB	*Cell 6* $L_{E,MF,24h}$: 165 dB
High-Frequency (HF) Cetaceans	*Cell 7* $L_{pk,flat}$: 202 dB $L_{E,HF,24h}$: 155 dB	*Cell 8* $L_{pk,flat}$: 196 dB $L_{E,HF,24h}$: 140 dB	*Cell 9* $L_{E,HF,24h}$: 135 dB
Phocid Pinnipeds (PW) (Underwater)	*Cell 10* $L_{pk,flat}$: 218 dB $L_{E,PW,24h}$: 185 dB	*Cell 11* $L_{pk,flat}$: 212 dB $L_{E,PW,24h}$: 170 dB	*Cell 12* $L_{E,PW,24h}$: 165 dB
Otariid Pinnipeds (OW) (Underwater)	*Cell 13* $L_{pk,flat}$: 232 dB $L_{E,OW,24h}$: 203 dB	*Cell 14* $L_{pk,flat}$: 226 dB $L_{E,OW,24h}$: 188 dB	*Cell 15* $L_{E,OW,24h}$: 183 dB

* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS/TTS onset.

Note: Peak sound pressure (L_{pk}) has a reference value of 1 µPa, and cumulative sound exposure level (L_E) has a reference value of 1µPa²s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript "flat" is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (i.e., varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

Ensonified Area

Here, we describe operational and environmental parameters of the activity that will feed into identifying the area ensonified above the acoustic thresholds.

For pile removal activities, hydroacoustic monitoring was performed during the implosions of Piers E3 through E18. Results for this monitoring were used to determine distances to marine mammal threshold criteria for underwater blasting. The criterion for lung injury and mortality to marine mammals is dependent on the mass of the animal and the depth of the animal in the water column; animals smaller in mass are more susceptible to injury from impulse pressures. The criterion is an impulse metric, expressed in pascal-second or psi-msec (Table 5). The estimated mass of a juvenile fur seal (15 kilograms (33 pounds)), was used in the lung injury and mortality calculations, because this will be the smallest animal potentially to be exposed to the implosions. The depth at which the animal is exposed also affects the criterion threshold calculation. The water depth around Piers E19 and E20 is very shallow, at 3 to 4 meters (10 to 12 feet). Although implosions will take place in shallow areas, marine mammals are more likely to be present in slightly deeper waters. Therefore, an average depth for the project area of 6 meters (20 feet) was used in the threshold calculation.

Caltrans proposes to use hydroacoustic monitoring results from the implosions of Piers E3 through E18 to estimate distances to marine mammal thresholds for the implosion of Piers E19 and E20 (Department 2015a, 2016). Measured distances from the implosion of Piers E17 to E18 (two-pier implosion event) were used to estimate distances to threshold criteria for the implosion of Piers E19 and E20. The measured distances to threshold criteria from the previous Pier E17 and E18 implosion event are shown in Tables 5 and 6. Depictions of the isopleths for all functional hearing groups is found in Figures 9–13 in the application.

TABLE 5—MEASURED DISTANCES TO UNDERWATER BLASTING THRESHOLD CRITERIA FOR LEVEL B BEHAVIORAL AND TTS AND LEVEL A PTS FROM THE PREVIOUS IMPLOSION OF PIERS E17 AND E18 IN A SINGLE EVENT AND ESTIMATED DISTANCES TO THESE THRESHOLD CRITERIA FOR THE PROPOSED IMPLOSION OF PIERS E19 AND E20 IN A SINGLE EVENT

Species hearing group		Behavioral	TTS [1]		PTS [1]	
	Threshold	165 dB SELcum	224 dB Peak	170 dB SELcum	230 dB Peak	185 dB SELcum
Mid-Frequency Cetaceans (Dolphins).	**Piers E17–E18 Measured**	511 feet	40.84 meters	**109.42 meters**	27.13 meters	**37.8 meters.**
	Piers E19–E20 Estimate ..	200 meters	50 meters	**120 meters**	30 meters	**40 meters.**
	Threshold	135 dB SELcum	196 dB Peak	140 dB SELcum	202 dB Peak	155 dB SELcum
High-Frequency Cetaceans (Porpoises).	**Piers E17–E18 Measured**	1142.1 meters	279.2 meters	**802.54 meters**	185.01 meters.	**278.28 meters.**
	Piers E19–E20 Estimate ..	1,220 meters ..	290 meters ...	**830 meters**	200 meters ...	**290 meters.**
	Threshold	165 dB SELcum	212 dB Peak	170 dB SELcum	218 dB Peak	185 dB SELcum
Phocid Pinnipeds (Seals)	**Piers E17–E18 Measured**	278.59 meters	92.96 meters	**195.38 meters**	61.57 meters	**67.36 meters.**
	Piers E19–E20 Estimate ..	290 meters	100 meters ...	**200 meters**	70 meters	**70 meters.**
	Threshold	183 dB SELcum	226 dB Peak	188 dB SELcum	232 dB Peak	203 dB SELcum.
Otariid Pinnipeds (Sea Lions).	**Piers E17–E18 Measured**	75.9 meters	35.66 meters	**53.04 meters**	**23.47 meters**	18.29 meters.
	Piers E19–E20 Estimate ..	80 meters	40 meters	**60 meters**	**30 meters**	20 meters.

Notes:
[1] For the TTS and PTS criteria thresholds with dual criteria, the largest criteria distances (*i.e.,* more conservative) are shown in bold.
Threshold Source: NMFS 2016.
Isopleth Distance Sources: Estimated distances to threshold criteria for the implosion of two small piers were determined based on measured distance to threshold criteria from the implosion of Piers E17 and E18.

TABLE 6—ESTIMATED DISTANCES TO UNDERWATER BLASTING THRESHOLD CRITERIA FOR LEVEL A GI TRACT AND LUNG INJURY AND MORTALITY FOR IMPLOSION OF PIER E3, TWO SMALL PIERS AND FOUR SMALL PIERS

Species		GI tract		Lung [1]	Mortality [1]
	Threshold	237 dB Peak	104 psi	39.1 (15 kg)$^{1/3}$ (1 + [6/10.081])$^{1/2}$ = 122 Pa-sec	91.4 (15 kg)$^{1/3}$ (1 + [6/10.081])$^{1/2}$ = 285 Pa-sec
All Species	Piers E17–E18 Measured.	55 feet	55 feet	<40 feet	<40 feet.
	Pier Implosion Estimate.	27 meters (89 feet)	27 meters (89 feet)	<12 meters (<40 feet)	<12 meters (<40 feet).

Notes:
Lung injury and mortality threshold calculations are for a 15-kilogram (33-pound) juvenile fur seal, the smallest marine mammal with the potential to be present in the project area.
Threshold Source: Finneran and Jenkins 2012.
Isopleth Distance Sources: Estimated distances to threshold criteria for the implosion of piers were determined based on measured distance to threshold criteria from the implosions of Pier E4, Piers E17 to E18, Piers E11 to E13 and Piers E14 to E16.

For pile driving, the distance to the marine mammal threshold criteria for vibratory and impact driving were calculated based on hydroacoustic measurements collected during previous pile-driving activities for the SFOBB Project and other projects, involving similar activities under similar conditions. Measured sound pressure levels from other projects came from Caltrans' Compendium of Pile Driving Sound Data (Department 2007), which provides information on sound pressures resulting from pile driving measured throughout Northern California. Distances to marine mammal threshold criteria were calculated for all pile types and installation methods listed above. These distances were calculated using the NMFS-provided companion User Spreadsheet.

TABLE 7—NMFS USER SPREADSHEET INPUT VALUES FOR PILE DRIVING

Vibratory driving of steel piles	H-Pile (vibratory)	24 inch steel (vibratory)	36 inch steel (vibratory)
Spreadsheet Tab Used	(A) Non-Impulsive, Cont	(A) Non-Impulsive, Cont	(A) Non-Impulsive, Cont.
Source Level (RMS SPL)	150	165	170.

TABLE 7—NMFS USER SPREADSHEET INPUT VALUES FOR PILE DRIVING—Continued

Vibratory driving of steel piles	H-Pile (vibratory)	24 inch steel (vibratory)	36 inch steel (vibratory)
Weighting Factor Adjustment (kHz)	2.5	2.5	2.5.
a) Activity Duration (h) within 24-h period	0.5	1	1.333333.
Propagation (xLogR)	15	15	15.
Distance of source level (meters) *	10	10	10.
Other factors.			
Impact driving of steel piles	**H-Pile (impact)**	**24 inch steel (impact)**	**36 inch steel (impact)**
Spreadsheet Tab Used	(E.1) Impact pile driving	(E.1) Impact pile driving	(E.1) Impact pile driving.
Source Level (Single Strike/shot SEL)	160	167 *	170. *
Weighting Factor Adjustment (kHz)	2	2	2.
a) Number of strikes in 1 h	200	450	600.
a) Activity Duration (h) within 24-h period	6	4	4.
Propagation (xLogR)	15	15	15.
Distance of source level (meters) *	10	10	10.
Other factors		Using Bubble Curtain *	Using Bubble Curtain.*
Pile proofing (impact)	**H-Pile (impact)**	**24 inch steel (impact)**	**36 inch steel (impact)**
Spreadsheet Tab Used	(E.1) Impact pile driving	(E.1) Impact pile driving	(E.1) Impact pile driving.
Source Level (Single Strike/shot SEL)	160	177	180.
Weighting Factor Adjustment (kHz)	2	2	2.
a) Number of strikes in 1 h	20	20	20.
a) Activity Duration (h) within 24-h period	2	2	2.
Propagation (xLogR)	15	15	15.
Distance of source level (meters) *	10	10	10.
Other factors.			
Impact driving of concrete piles	**24 inch concrete (impact)**		**36 inch concrete (impact)**
Spreadsheet Tab Used	(E.1) Impact pile driving		(E.1) Impact pile driving.
Source Level (Single Strike/shot SEL)	160		160.*
Weighting Factor Adjustment (kHz)	2		2.
a) Number of strikes in 1 h	1200		1400.
a) Activity Duration (h) within 24-h period	5		5.
Propagation (xLogR)	15		15.
Distance of source level (meters) *	10		10.
Other factors			Using Bubble Curtain.*

* Attenuated value—Bubble curtain is assumed to provide 10dB of attenuation.

For calculation of SELcum threshold distances, the following assumptions were made:

- Only one type/size of pile will be installed on the same day;
- Only one pile installation method, impact or vibratory, will be performed on the same day;
- A maximum of four steel pipe piles will be installed (impact driving or vibratory) on the same day;
- A maximum of six H-piles will be installed (impact or vibratory) on the same day; and
- A maximum of two pile will be proof-tested with an impact hammer on the same day; administering a maximum of 20 strikes per pile.

The distances to the marine mammal threshold criteria for these pile driving and pile removal activities are shown in Table 8.

TABLE 8—DISTANCES TO LEVELS A AND B HARASSMENT THRESHOLD CRITERIA FOR IMPACT AND VIBRATORY PILE DRIVING AND PILE REMOVAL

Parameters				Level B ZOI radii (meters)		Level A ZOI radii (meters)				
Pile size and type	Drive method	Piles per day	Attenuation system	160 dB RMS	120 dB RMS	Low-frequency cetaceans	Mid-frequency cetaceans	High-frequency cetaceans	Phocid pinnipeds	Otariid pinnipeds
H-Pile	Vibratory	6	None	NA	1,000	1	1	2	1	1
24 inch steel	Vibratory	4	None	NA	Calculated Practical 2,000	13	1	19	8	1
36 inch steel	Vibratory	4	None	NA	Calculated Practical 2,000	33	3	49	20	1
H-Pile	Impact	6	None	100	NA	33	1	39	18	1
24 inch steel	Impact	4	Bubble Curtain	215	NA	127	5	151	68	5
36 inch steel	Impact	4	Bubble Curtain	541	NA	243	9	290	130	9
24 inch concrete	Impact	5	None	46	NA	97	3	115	52	4
36 inch concrete	Impact	5	Bubble Curtain	117	NA	107	4	127	57	4
H-Pile	Proof Testing	2	None	100	NA	3	0	4	2	0
24 inch steel	Proof Testing	2	None	1,000	NA	46	2	55	25	2

TABLE 8—DISTANCES TO LEVELS A AND B HARASSMENT THRESHOLD CRITERIA FOR IMPACT AND VIBRATORY PILE DRIVING AND PILE REMOVAL—Continued

Parameters				Level B ZOI radii (meters)		Level A ZOI radii (meters)				
Pile size and type	Drive method	Piles per day	Attenuation system	160 dB RMS	120 dB RMS	Low-frequency cetaceans	Mid-frequency cetaceans	High-frequency cetaceans	Phocid pinnipeds	Otariid pinnipeds
36 inch steel	Proof Testing	2	None	2,512	NA	74	3	88	39	3

Sources: Sound levels from the Department's Compendium of Pile Driving Sound Data (Department 2007). Distances were calculated using the NMFS-provided companion User Spreadsheet, available at *http://www.nmfs.noaa.gov/pr/acoustics/guidelines.htm*.

The distance to the 120 dB rms Level B Zone of Influence (ZOI) threshold for vibratory pile driving was calculated to be 10,000 meters for 24-inch (0.61-meter) diameter steel pipe piles and 21,544 meters for 36-inch (0.91-meter) diameter steel pipe piles. Previous monitoring for the SFOBB Project has shown background sound levels in the active portions of the Bay, near the project area, to range from 110 to 140 dB rms, with typical background levels in the range of 110 to 120 dB rms (Department 2015). During previous hydroacoustic monitoring for the SFOBB Project, it has not been possible to detect or distinguish sound from vibratory pile driving beyond 1,000 to 2,000 meters (3,280 to 6,562 feet) from the source (Rodkin 2009). Under all previous IHAs for the SFOBB Project, which included vibratory pile driving, the ZOI for this activity has been set at 2,000 meters (6,562 feet) or less (NOAA 2016). Furthermore, it unlikely that marine mammals in the Bay will detect or show response to this sound at distances greater than 2,000 meters (6,562 feet), because of the background sound levels in the Central Bay. Therefore, the practical, applied ZOI for the vibratory driving of 24-inch (0.61-meter) and 36-inch (0.91-meter) diameter steel pipe piles has been set at 2,000 meters (6,562 feet), as shown in Table 7.

When NMFS Technical Guidance (2016) was published, in recognition of the fact that ensonified area/volume could be more technically challenging to predict because of the duration component in the new thresholds, we developed a User Spreadsheet that includes tools to help predict a simple isopleth that can be used in conjunction with marine mammal density or occurrence to help predict takes. We note that because of some of the assumptions included in the methods used for these tools, we anticipate that isopleths produced are typically going to be overestimates of some degree, which will result in some degree of overestimate of Level A take. However, these tools offer the best way to predict appropriate isopleths when more sophisticated 3D modeling methods are not available, and NMFS continues to develop ways to quantitatively refine these tools, and will qualitatively address the output where appropriate. For stationary sources pile driving, NMFS User Spreadsheet predicts the closest distance at which, if a marine mammal remained at that distance the whole duration of the activity, it would not incur PTS. Inputs used in the User Spreadsheet, and the resulting isopleths are reported below in Table 8.

Marine Mammal Occurrence

In this section we provide the information about the presence, density, or group dynamics of marine mammals that will inform the take calculations.

No systematic line transect surveys of marine mammals have been performed in the Bay. Therefore, the in-water densities of harbor seals, California sea lions, and harbor porpoises were calculated based on 17 years of observations during monitoring for the SFOBB construction and demolition. Care was taken to eliminate multiple observations of the same animal, although this can be difficult and is likely that the same individual may have been counted multiple times on the same day. The amount of monitoring performed per year varied, depending on the frequency and duration of construction activities with the potential to affect marine mammals. During the 257 days of monitoring from 2000 through 2017 (including 15 days of baseline monitoring in 2003), 1,029 harbor seals, 83 California sea lions, and 24 harbor porpoises were observed in waters in the project vicinity in total. In 2015, 2016, and 2017, the number of harbor seals in the project area increased significantly. In 2017, the number of harbor porpoise in the project area also increased significantly. Therefore, a harbor seal density estimate was calculated for 2015–2017, and a harbor porpoise density estimate was calculated for 2017, which may better reflect the current use of the project area by these animals. These observations included data from baseline, pre-, during, and post-pile driving, mechanical dismantling, on-shore blasting, and off-shore implosion activities.

Insufficient sighting data exist to estimate the density of bottlenose dolphins. However, a single bottlenose dolphin has been observed regularly, south of the SFOBB east span since fall 2016. During monitoring performed in 2017 for the SFOBB, two bottlenose dolphins were observed south of the SFOBB.

Insufficient sighting data exist to estimate elephant seal densities in the Bay. Generally, only juvenile elephant seals enter the Bay and do not remain long. The most recent sighting near the project area was in 2012, on the beach at Clipper Cove on Treasure Island, when a healthy yearling elephant seal hauled out for approximately 1 day. Approximately 100 juvenile northern elephant seals strand in or near the Bay each year, including individual strandings at YBI and Treasure Island (less than 10 strandings per year).

Insufficient sighting data exist to estimate northern fur seal densities in the Bay. Only two to four northern fur seals strand in the Bay each year, and they are unlikely to occur in the project area.

The size of the areas monitored for marine mammals has increased over the 17 years of observations. The majority of pinniped monitoring has been focused within a 610-meter (2,000-foot) radius of the work area. Although some pinniped observations have been recorded at greater distances, in part because of recent monitoring of larger areas for harbor porpoise zones during pier implosion, a 2-square-kilometer area, corresponding with a 610-meter (2,000-foot) radial distance, was used for density calculations. Harbor porpoise sightings in the Bay have increased in recent years; however, the majority of harbor porpoise observations made during monitoring for the SFOBB Project have been at distances ranging from 2,438 to 3,048 meters (8,000 to 10,000 feet) from the work area. Therefore, harbor porpoise densities were calculated based on a 15-square-kilometer area, corresponding with a 2,438-meter (8,000-foot) radial distance, with land areas subtracted from the

area. Numbers used for density calculations are shown in Table 9. In the cases where densities were refined to capture a narrower range of years to be conservative, bold densities were used for take calculations.

TABLE 9—ESTIMATED IN-WATER DENSITY OF MARINE MAMMAL SPECIES IN SFOBB AREA

Species observed	Area of monitoring zone (square kilometer)	Days of monitoring	Number of animals observed	Density animals/square kilometer
Harbor seals, 2000–2017	2	257	1029	2.002.
Harbor Seals, 2015–2017	2	47	372	**3.957.**
California Sea Lions, 2000–2017	2	257	83	**0.161.**
Bottlenose Dolphins 2017	2	6	2	Insufficient sighting data exists to estimate density.
Harbor Porpoise, 2000–2017	3	257	24	0.031.
Harbor Porpoise, 2017	15	6	15	**0.167.**
Elephant Seal, 2000–2017	2	257	0	Insufficient sighting data exists to estimate density.
Northern Fur Seal, 2000–2017	2	257	0	Insufficient sighting data exists to estimate density.
Gray Whale, 2000–2017	2	257	0	Insufficient sighting data exists to estimate density.

Notes:
Densities for Pacific harbor seals, California sea lions, and harbor porpoises are based on monitoring for the east span of the SFOBB from 2000 to 2017.
A second set of Pacific harbor seal densities were calculated from the increase in sightings recorded from 2015 to 2017.
A second set of harbor porpoise densities were calculated for the increase in sightings that were recorded in 2017.
Bold densities were used for take calculations.
Sources: Department 2001, 2004b, 2013b, 2013c, 2014, 2015b, 2016, 2017; Perlman 2017.

For species without enough sightings to construct a density estimate, Caltrans uses information based on group size and frequency of sightings from previous years of work to inform the number of animals estimated to be taken, which is detailed in the Take Estimation section below.

Take Calculation and Estimation

Here we describe how the information provided above is brought together to produce a quantitative take estimate.

Take From Pier Implosion

The numbers of harbor seals, sea lions and harbor porpoise that may be taken by implosion of Piers E19 and E20 were calculated based on distances to the marine mammal threshold criteria, duration of the activity, and the estimated density of these species in the ZOI.

The numbers of elephant seals, northern fur seals and bottlenose dolphin that may be taken by implosion of Piers E19 and E20 were determined based on distances to the marine mammal threshold criteria, duration of the activity, and sightings and occurrence of these species in the Bay, specifically near the project area. Distances to marine mammal threshold criteria were calculated based on the highest sound pressure levels generated during the previous pier implosion of Piers E17 and E18 (two-pier implosion event) . Gray whales were not considered for pier implosion activities as those activities will occur in late fall and early winter, when gray whales are not found in the Bay area.

The number of exposures of each species was calculated over the entire area of each Level A, Level B, and mortality threshold criteria zone for the proposed pier implosion event (Tables 10 through 12).

TABLE 10—LEVEL A PTS TAKE CALCULATIONS FOR IMPLOSION OF PIERS E19 AND E20

Species	Species density (animals/ square kilometer)	Species density (animals/ square meters)	Level A ZOI radii (meters)	Level A PTS ZOI area (square meters)	Level A PTS take	Number of implosion events	Level B take calculated
Harbor Seal	3.957	3.96E–06	70	29462.347	0.1166	1	0.1166
Sea Lion	0.161	1.61E–07	30	9118.458	0.0015	1	0.0015
Harbor Porpoise	0.167	1.67E–07	290	315798.484	0.0527	1	0.0527
Bottlenose Dolphin	NA	NA	40	5026.548	NA	1	NA
Elephant Seal	NA	NA	70	15393.804	NA	1	NA
Fur Seal	NA	NA	30	2827.43	NA	1	NA

TABLE 11—LEVEL B TTS TAKE CALCULATIONS FOR IMPLOSION OF PIERS E19 AND E20

Species	Species density (animals/ square kilometer)	Species density (animals/ square meters)	Level B ZOI radii (meters)	Level B TTS ZOI area (square meters)	Level B TTS take	Number of pier implosion events	Level B take calculated
Harbor Seal	3.957	3.96E–06	200	164964.771	0.6528	1	0.6528
Sea Lion	0.161	1.61E–07	60	23434.268	0.0038	1	0.0038
Harbor Porpoise	0.167	1.67E–07	830	2085701.996	0.3483	1	0.3483
Bottlenose Dolphin	NA	NA	120	45238.934	NA	1	NA
Elephant Seal	NA	NA	200	125663.706	NA	1	NA
Fur Seal	NA	NA	60	11309.73	NA	1	NA

TABLE 12—LEVEL B BEHAVIORAL TAKE CALCULATIONS FOR IMPLOSION OF PIERS E19 AND E20

Species	Species density (animals/ square kilometer)	Species density (animals/ square meters)	Level B ZOI radii (meters)	Level B behavioral ZOI area (square meters)	Level B behavioral take	Number of pier implosion events	Level B take calculated
Harbor Seal	3.957	3.96E–06	290	315798.486	1.2496	1	1.2496
Sea Lion	0.161	1.61E–07	80	36118.343	0.0058	1	0.0058
Harbor Porpoise	0.167	1.67E–07	1,220	4256937.444	0.7109	1	0.7109
Bottlenose Dolphin	NA	NA	200	125663.706	NA	1	NA
Elephant Seal	NA	NA	290	264207.942	NA	1	NA
Fur Seal	NA	NA	80	20106.19	NA	1	NA

TABLE 13—COMBINED ESTIMATED EXPOSURES OF MARINE MAMMALS TO THE PIER IMPLOSIONS FOR LEVELS A AND B, AND MORTALITY THRESHOLD CRITERIA

Species	Level B exposures for all implosions		Level A exposures [1]			Mortality [1]
	Behavioral response	Temporary threshold shift	Permanent threshold shift	Gastro-intestinal tract injury	Slight lung injury	
Pacific Harbor Seal	1	1	0	0	0	0
California Sea Lion	0	0	0	0	0	0
Northern Elephant Seal	0	0	0	0	0	0
Northern Fur Seal	0	0	0	0	0	0
Bottlenose Dolphin	0	0	0	0	0	0
Harbor Porpoise	1	0	0	0	0	0
Total	2	1	0	0	0	0

Note:
[1] No implosion will occur if any marine mammal is within the Level A or mortality threshold criteria zones.

Based on the distances to the marine mammal threshold criteria and estimated species density, it is not expected that GI tract, lung injury, or mortality could occur from the pier implosion event. Approximately two harbor seals (one by behavioral response and one by TTS) and one harbor porpoise (by behavioral response) may be taken by Level B harassment during the implosion Piers E19 and E20 (Table 12). No take of any other species is anticipated.

The estimated number of marine mammals to be exposed to implosion SPLs for each threshold criteria (Table 13) are based on current density estimates or occurrence of marine mammals in the project area (Table 9 through 12). However, the number of marine mammals in the area at any given time is highly variable. Animal movement depends on time of day, tide levels, weather, and availability and distribution of prey species. Therefore, Caltrans requests the following number of allowable harassment takes for each Level B harassment criteria threshold (Table 14).

TABLE 14—AMOUNT OF LEVEL B HARASSMENT TAKE REQUESTED FOR THE IMPLOSIONS OF PIERS E19 AND E20

Species	Level B harassment take [1]	
	Behavioral response	Temporary threshold shift
Pacific Harbor Seal	20	10
California Sea Lion	4	3
Northern Elephant Seal	2	1
Northern Fur Seal	2	1
Harbor Porpoise	5	5

TABLE 14—AMOUNT OF LEVEL B HARASSMENT TAKE REQUESTED FOR THE IMPLOSIONS OF PIERS E19 AND E20—Continued

Species	Level B harassment take [1]	
	Behavioral response	Temporary threshold shift
Bottlenose Dolphin	4	2
Total	42	25

Note:
[1] Pier implosion will be delayed if any marine mammals are detected within any of the Level A or mortality threshold criteria exclusion zones.

Pacific Harbor Seal: As discussed above, harbor seal is the most numerous marine mammal in the Bay. However, take calculated based on species density and the distances to the marine mammal threshold criteria indicated that only two harbor seals would be exposed to sound pressure levels that can result in Level B harassment (Table 13). One of those exposures would be within the Level B monitoring zone, and one would be within the TTS zone (Table 13). Based on previous monitoring the number of harbor seals in the water can vary greatly, depending on weather conditions or the availability of prey. For example, during Pacific herring runs further north in the Bay (near Richardson Bay) in February 2014, very few harbor seals were observed foraging near YBI or transiting through the project area for approximately 2 weeks. Sightings went from a high of 27 harbor seal individuals foraging or in transit in one day to no seals per day in transit or foraging through the project area (Department 2014). In 2015 and 2016, the number of harbor seal sighting in a single day in the project area increased up to 41 seals (Department 2015b, 2016). Because of this high degree of variability, and the observation of up to 41 seals in the project area in a single day Caltrans are requesting authorization for the take of 30 harbor seals by Level B harassment (20 by Level B behavioral response and 10 by Level B TTS) (Table 14).

California Sea Lion: As discussed above, California sea lion is the second most numerous marine mammal species in the Bay, after the harbor seal. However, take calculated based on species density and the distances to the marine mammal threshold criteria indicated that no sea lions would be exposed to sound pressure levels that can result in Level B harassment (Table 13). Based on previous monitoring the number of sea lions transiting through or foraging in the project area can vary greatly. Because of the high degree of variability, regular observation of sea lions in the project area, and because this species may travel in groups Caltrans are requesting authorization for the take of seven sea lions (four by Level B behavioral response and three by Level B TTS) (Table 14).

Harbor Porpoises: Based on the calculated density estimates and the distances to the marine mammal threshold criteria, one harbor porpoise (by behavioral response) may be taken by Level B harassment during the implosion of Piers E19 and E20 (Table 13). However the number of harbor porpoise in the Bay and their foraging range appears to be steadily increasing. This high-frequency cetacean has a large ZOI, because of its sensitivity to anthropogenic sound. Further, this species generally travels in either calf cow pairs or small pods of four to five porpoises. For these reasons Caltrans are requesting authorization for the take of 10 harbor porpoise (five by Level B behavioral response and five by Level B TTS) (Table 14).

Northern Elephant Seal: As discussed above, because of the infrequent observation of this species in the Bay, Caltrans estimates that no elephant seals will be exposed to SPLs that can result in Level B harassment (Table 13). However, the number of elephant seals that may enter and or strand in the Bay in a given year is highly variable; dependent on changes in oceanographic conditions, effecting water temperature and prey availability. Caltrans wants to ensure that the project has coverage for the incidental take of any species with the potential to be present in the project area. Therefore, Caltrans are requesting authorization for the take of three elephant seals (two by Level B behavioral response and one by Level B TTS) (Table 14).

Northern Fur Seal: As discussed above, northern fur seals are found infrequently in the Bay and are unlikely to be in the vicinity of the pier implosion. However, the number of fur seals that may enter and or strand in the Bay in a given year is highly variable; dependent on changes in oceanographic conditions, effecting water temperature and prey availability. Caltrans wants to ensure that the project has coverage for the incidental take of any species with the potential to be present in the project area. Therefore, they are requesting authorization for the take of three northern fur seals (two by Level B behavioral response and one by Level B TTS) (Table 14).

Bottlenose Dolphin: As discussed above, only small numbers of bottlenose dolphin occur in the project vicinity. Based on the low number of individuals in the Bay and the distances to the marine mammal threshold criteria Caltrans anticipates that no bottlenose dolphins would be exposed to SPLs that can result in Level B harassment. However, as discussed in Chapter 4, until 2016, most bottlenose dolphins in the Bay were observed in the western Bay, from the Golden Gate Bridge to Oyster Point and Redwood City, although one individual was observed frequently near the former Alameda Air Station (Perlman 2017). As of 2017, the same two individuals have been observed regularly near Alameda (Keener, pers. comm., 2017) and likely pass by the project area. If additional individuals begin using this eastern area of the Bay, the number of bottlenose sightings near the project area will likely increase. Caltrans wants to ensure that the project has coverage for the incidental take of any species with the potential to be present in the project area. Therefore, they are requesting authorization for the take of six bottlenose dolphins (four by Level B behavioral response and two by Level B TTS) (Table 14).

Take From Pile Driving

The numbers of marine mammals by species that may be taken by pile driving were calculated based on distance to the marine mammal threshold criteria, days of driving, and the estimated density of each species in the ZOI, for the species that density could be determined. The distances to the relevant Level A and B zones are listed above in Table 8. Because the sizes of piles, types of piles, or installation methods to be used are unknown at this time, the take estimate

has been prepared based on a worst case scenario. The Level B take estimate is based on 60 days of pile driving to install 200 piles, 36 inches (0.91 meters) in diameter, with a vibratory hammer, as this results in the largest Level B zone for a precautionary approach. The Level A take estimate is based on 60 days of pile driving to install 200 piles, 36 inches (0.91 meters) in diameter, with an impact hammer, which has a larger Level A zone than vibratory driving, using of an air bubble curtain sound attenuation system. The take of each species was calculated based on species density (Table 9), for the species that density could be determined, over the entire area of each threshold criteria zone as shown in Figures 14 and 15 in the application. The numbers used for take calculation are shown in Table 15.

TABLE 15—ESTIMATED TAKE OF MARINE MAMMALS FROM PILE DRIVING AND PILE REMOVAL ACTIVITIES

Species	Species density (animals/ square kilometer)	Species density (animals/ square meters)	Level B ZOI radii (meters)	Level B ZOI area (square meters)	Per day take Level B	Days of pile driving	Level B take calculated	Level B take requested
Harbor Seal	3.96	3.96E–06	2,000	9101027.61	36.01	60	2160.77	2161
Sea Lion	0.16	1.61E–07	2,000	9101027.61	1.47	60	87.92	88
Harbor Porpoise	0.17	1.67E–07	2,000	9101027.61	1.52	60	91.19	91
Bottlenose Dolphin	NA	NA	2,000	9101027.61	NA	60	NA	30
Elephant Seal	NA	NA	2,000	9101027.61	NA	60	NA	23
Gray Whale	NA	NA	2,000	9101027.61	NA	60	NA	4
Fur Seal	NA	NA	2,000	9101027.61	NA	60	NA	12
Total Level B Take								2,392

Species	Species density (animals/ square kilometer)	Species density (animals/ square meters)	Level A ZOI radii (meters)	Level A ZOI area (square meters)	Per day take Level A	Days of pile driving	Level A take calculated	Level A take requested [1]
Harbor Seal	3.96	3.96E–06	130	77907.73574	0.21	60	18.50	0
Sea Lion	0.16	1.61E–07	9	4302.570961	0.00	60	0.04	0
Harbor Porpoise	0.17	1.67E–07	290	293195.3612	0.04	60	2.94	0
Bottlenose Dolphin	NA	NA	9	4302.570961	NA	60	NA	0
Elephant Seal	NA	NA	130	77907.73574	NA	60	NA	0
Gray Whale	NA	NA	243	215669.2122	NA	60	NA	0
Fur Seal	NA	NA	9	4302.570961	NA	60	NA	0
Total Level A Take [1]								0

Caltrans estimates a maximum of 2,392 instances of take by Level B harassment may occur to seven stocks of marine mammal during pile-driving activities (Table 15). These individuals will be exposed temporarily to continuous (vibratory pile driving and removal) sounds greater than 120 dB rms and impulse (impact driving) sounds greater than 160 dB rms. The majority of the animals taken by Level B harassment will be harbor seals (Table 15), the most numerous marine mammals in the project area. Although Level A take of marine mammals was calculated based on distances to the threshold, density of the species, and duration of the activity; Caltrans does not anticipate any individuals will be taken by Level A harassment. With proposed monitoring and establishment of shutdown zones, discussed in the Proposed Mitigation section below, Caltrans proposes to avoid Level A harassment of marine mammals.

The number of takes requested by Caltrans are based on a calculation of marine mammal density multiplied by the daily isopleth multiplied by the number of days of pile driving. However, due to variability in sightings of northern elephant seal, northern fur seal, bottlenose dolphin, and gray whale, take estimates were adjusted using species specific monitoring data detailed below.

Northern Elephant Seal: Based on low number of elephant seal sightings in the project area, Caltrans anticipates that very few if any elephant seals would be exposed to continuous sounds greater than 120 dB rms and impulse sounds greater than 160 dB rms during pile driving. No elephant seals have been observed in the immediate project vicinity. However, the number of elephant seals that may enter and or stand in the Bay in a given year is highly variable; dependent of changes in oceanographic conditions, effecting water temperature and prey availability. Further, the size of the Level B harassment zone is large, extending 2,000 meters (6,562 feet) from the pile driving site. Pile driving may take place for up to 60 days and many of the driving days would be consecutive. Should an elephant seal or multiple elephant seals be in the vicinity of the project area for multiple days they could be taken several times. To ensure Caltrans has coverage for the incidental take of any species with the potential to be present in the project area, we are proposing to authorize take of 12 elephant seals by Level B harassment during pile driving activities (Table 15). This equates to the take of one elephant seal during 20 percent of the driving days.

Northern fur seal: No fur seals have been observed in the immediate project vicinity. Should a fur seal or multiple fur seals be in the vicinity of the project area for multiple days they could be taken several times. To ensure Caltrans has necessary coverage for occasion fur seals in the area, we propose to authorize take of up to six northern fur seals by Level B harassment during pile driving activities (Table 15). This equates to the take of one elephant seal during 10 percent of the driving days.

Bottlenose dolphin: Only small numbers of bottlenose dolphin occur in the project vicinity. Until 2016, most bottlenose dolphins in the Bay were observed in the western Bay, from the Golden Gate Bridge to Oyster Point and Redwood City, although one individual

was observed frequently near the former Alameda Air Station (Perlman 2017). As of 2017, the same two individuals have been observed regularly near Alameda (Keener, pers. comm., 2017) are likely pass by the project area. If additional individuals begin using this eastern area of the Bay, the number of bottlenose dolphin sightings near the project area will likely increase. It is possible that the same two resident bottlenose dolphins and or additional individuals could be taken multiple times during the up to 60 days of pile driving. Therefore, Caltrans is requesting authorization for the take of 90 bottlenose dolphins by Level B harassment during pile driving activities. This equates to the take of 1.5 bottlenose dolphins during each day of pile driving.

Gray whale: No gray whales have been observed within 2,000 meters (6,562 feet) of the project area, but they have been observed just north of Treasure Island and southwest of Oakland Middle Harbor. According to TMMC, two to six gray whales enter the Bay each year in late winter through spring (February through April), presumably to feed. Caltrans wants to ensure that the project has coverage for the incidental take of any species with the potential to be present in the project area. Therefore, Caltrans is requesting authorization for the take of 4 grey whales by Level B harassment during pile driving activities.

TABLE 16—COMBINED TOTAL TAKE REQUESTED FOR PIER IMPLOSION AND PILE-DRIVING ACTIVITIES

Species	Pier implosion Level B harassment take [1]		Pile driving Level B harassment take [1]	Total Level B harassment take [1]	Requested take as percent of stock abundance
	Behavioral response	Temporary threshold shift			
Pacific Harbor Seal	20	10	2,161	2,191	7
California Sea Lion	4	3	88	95	.03
Northern Elephant Seal	2	1	12	15	.01
Northern Fur Seal	2	1	6	9	.06
Harbor Porpoise	10	8	91	109	1.1
Bottlenose Dolphin	4	2	30	36	8
Gray Whale	0	0	4	4	.02

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 such activity, and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such 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 such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)).

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

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

(2) the practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

Mitigation for Marine Mammals and Their Habitat

Pier Implosions—The decision to combine two smaller piers into single, sequential blast events will further reduce potential impacts on marine mammals. This will allow faster completion of the project and will reduce the total number of pier implosion events (days where pier implosions occur).

BAS—As described previously in this document, a BAS will be used around both piers during the implosion. Based on the results of acoustic monitoring for the previous pier implosions, BAS performance is anticipated to provide approximately 70 to 80 percent attenuation of implosion-related pressure waves.

Implosion shutdown zone—During the implosion of Piers E19 and E20, a project-specific monitoring plan will be implemented to avoid the potential for individual exposure to Level A harassment, and to document the number and species potentially exposed to Level B harassment. This plan will be similar to the Marine Foundation Removal Project Final Biological Monitoring Program, previously approved by NMFS, that was implemented during the implosions of Piers E6 to E18. In particular, monitors will observe the shutdown zone and will delay the implosion if any individuals are within this zone. The same procedure was implemented successfully for the implosions of Piers E3 through E18, and no marine mammals were exposed to SPLs above the Level A or mortality threshold criteria. This project-specific monitoring plan will be transmitted to NMFS before the implosions, for review and concurrence.

Pile driving—All steel pipe piles initially will be installed with a vibratory hammer. The vibratory hammer will be used to drive the majority of the total pile lengths. In the event that a pipe pile is installed entirely with a vibratory hammer, it still will be subject to final proof testing with an impact hammer. A maximum of 10 percent of the piles installed completely with a vibratory hammer may be proof-tested with an impact hammer, without

the use of a marine pile-driving energy attenuator. Proofing of piles will be limited to a maximum of two piles per day, for less than 1 minute per pile, administering a maximum of 20 blows per pile. Although both vibratory and impact pile driving have the potential to affect marine mammals, impact driving is expected to generate higher SPLs. Requiring the use of the vibratory hammer will reduce the duration of impact driving and potential exposure to higher SPLs.

Pile driving energy attenuator—Use of a marine pile-driving energy attenuator (*i.e.,* air bubble curtain system), or other equally effective sound attenuation method (*e.g.,* dewatered cofferdam), will be required by Caltrans during impact driving of all steel pipe piles (with the exception of pile proof-testing) and during impact driving of 0.91-meter (36-inch) diameter concrete piles. Requiring the use of sound attenuation will reduce SPLs and the size of the ZOIs for Level A and Level B harassment.

Pile Driving Shutdown Zone—Before the start of impact pile-driving activities, the shutdown zones will be established. The shutdown zones are intended to include all areas where the underwater SPLs are anticipated to equal or exceed thresholds for injury—PTS Level A harassment thresholds for the specific species hearing groups, shown in Table 3. NMFS-approved observers will survey the shutdown zones for 30 minutes before pile-driving activities start. If marine mammals are found within the shutdown zones, pile driving will be delayed until the animal has moved out of the shutdown zone, either verified through sighting by an observer or by waiting until enough time has elapsed without a sighting, 15 minutes for pinnipeds and small cetaceans (harbor porpoise and bottlenose dolphin), and 30 minutes for gray whale, to be able to assume that the animal has moved beyond the zone. With implementation of this avoidance and minimization measure, exposure of marine mammals to SPLs that can result in PTS Level A harassment will be avoided.

A 10 meter shutdown zone for all marine mammals will also be implemented for in-water heavy machinery work that is not pile driving or pier implosion. Similarly, if a marine mammal for which take is not authorized is seen within the monitoring zone, operations will cease until the animal is seen leaving the zone or until 15 minutes have passed.

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

Proposed Monitoring and Reporting

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

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

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

Visual Marine Mammal Observations

Caltrans will collect sighting data and behavioral responses to construction for marine mammal species observed in the region of activity during the period of activity. All protected species observers (PSOs) will be trained in marine mammal identification and behaviors and are required to have no other construction-related tasks while conducting monitoring. A minimum of two PSOs will be required for all pile driving activities. Caltrans will establish shutdown zones, similar to those detailed in Table 8, as well as a monitoring zone of 2,000 meters for all marine mammals. Caltrans will monitor the shutdown zone and monitoring zone 30 minutes before, during, and 30 minutes after pile driving, with observers located at the best practicable vantage points. Based on our requirements, Caltrans would implement the following procedures for pile driving:

- PSOs would be located at the best vantage point(s) in order to properly see the entire shutdown zone and as much of the disturbance zone as possible;
- During all observation periods, observers will use binoculars and the naked eye to search continuously for marine mammals;
- If the shutdown zones are obscured by fog or poor lighting conditions, pile driving at that location will not be initiated until that zone is visible. Should such conditions arise while impact driving is underway, the activity would be halted; and
- The shutdown zone and observable portion of the monitoring zone around the pile will be monitored for the presence of marine mammals 30 min before, during, and 30 min after any pile driving activity.

Data Collection

We require that observers use approved data forms. Among other pieces of information, Caltrans will record detailed information about any implementation of shutdowns, including the distance of animals to the pile and description of specific actions that ensued and resulting behavior of the animal, if any. In addition, Caltrans will attempt to distinguish between the number of individual animals taken and the number of incidences of take. We require that, at a minimum, the following information be collected on the sighting forms:

- Date and time that monitored activity begins or ends;
- Construction activities occurring during each observation period;
- Weather parameters (*e.g.,* percent cover, visibility);

- Water conditions (*e.g.,* sea state, tide state);
- Species, numbers, and, if possible, sex and age class of marine mammals;
- Description of any observable marine mammal behavior patterns, including bearing and direction of travel, and if possible, the correlation to SPLs;
- Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
- Description of implementation of mitigation measures (*e.g.,* shutdown or delay);
- Locations of all marine mammal observations; and
- Other human activity in the area.

Reporting

A draft report would be submitted to NMFS within 90 days of the completion of marine mammal monitoring, or 60 days prior to the requested date of issuance of any future IHA for projects at the same location, whichever comes first. The report will include marine mammal observations pre-activity, during-activity, and post-activity during pile driving days, and will also provide descriptions of any behavioral responses to construction activities by marine mammals and a complete description of all mitigation shutdowns and the results of those actions and an extrapolated total take estimate based on the number of marine mammals observed during the course of construction. A final report must be submitted within 30 days following resolution of comments on the draft report.

Negligible Impact Analysis and Determination

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

Pile driving and pier implosion activities associated from the Caltrans project, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level B harassment (TTS and behavioral disturbance), from underwater sounds generated from pier implosions and pile driving. Potential takes could occur if individuals of these species are present in the ensonified zone when pile driving or implosion occurs. A few marine mammals could experience TTS if they occur within the Level B TTS zone. However, 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. Therefore, it is not considered an injury. In addition, even if an animal receives a TTS, the TTS would be a one-time event from a brief impulse noise (about 5 seconds), making it unlikely that the TTS would lead to PTS. If an animal undergoes a TTS from pier implosion, it is likely to recover quickly as there is only one implosion event proposed. Finally, there is no critical habitat or other biologically important areas in the vicinity of Caltrans' proposed controlled implosion areas (Calambokidis *et al.,* 2015).

No serious injury or mortality is anticipated given the nature of the activities and measures designed to minimize the possibility of injury to marine mammals. The potential for these outcomes is minimized through the construction method and the implementation of the planned mitigation measures. Specifically, Caltrans proposes to use a blast attenuation system for the pier implosion, which it has previously used successfully. For pile driving activities, vibratory and impact hammers will be the primary methods of pier installation. Impact pile driving produces short, sharp pulses with higher peak levels and much sharper rise time to reach those peaks. If impact driving is necessary, implementation of soft start and shutdown zones significantly reduces any possibility of injury. Given sufficient ''notice'' through use of soft start (for impact driving), marine mammals are expected to move away from a sound source that is annoying prior to it becoming potentially injurious. Caltrans will use a minimum of two PSOs stationed strategically to increase detectability of marine mammals, enabling a high rate of success in implementation of shutdowns to avoid injury.

Caltrans' proposed activities are localized and of relatively short duration (June to November). This duration does not overlap with breeding, pupping, or other biologically significant events for marine mammal species in the area. The project area is also very limited in scope spatially, as all work is concentrated on the edges of a single bridge expanse. These localized and short-term noise exposures may cause short-term behavioral modifications in seven marine mammal species. Moreover, the proposed mitigation and monitoring measures are expected to further reduce the likelihood of injury, as it is unlikely an animal would remain in close proximity to the sound source with small Level A isopleths. While the project area is known to be frequented by harbor seals and California sea lions, it is not an established breeding ground for local populations.

The project also is not expected to have significant adverse effects on affected marine mammals' habitat. The project activities would not modify existing marine mammal habitat for a significant amount of time. The activities may cause some fish to leave the area of disturbance, thus temporarily impacting marine mammals' foraging opportunities in a limited portion of the foraging range. However, because of the short duration of the activities and the relatively small area of the habitat that may be affected, and the decreased potential of prey species to be in the Project area during the construction work window, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to temporary reactions such as increased swimming speeds, increased surfacing time, flushing, or decreased foraging (if such activity were occurring) (*e.g.,* Thorson and Reyff 2006; Lerma 2014). Most likely, individuals will simply move

away from the sound source and be temporarily displaced from the areas of pile driving and implosions. Thus, even repeated Level B harassment of some small subset of the overall stock is unlikely to result in any significant realized decrease in fitness for the affected individuals, and thus would not result in any adverse impact to the stock as a whole. For some stocks, such as harbor seal, more animal presence has increased in recent years, despite Caltrans' work in the area.

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

- No mortality is anticipated or authorized;
- No more than 10 individuals per species are expected to incur TTS during pier implosion. No TTS is expected to occur during pile driving. The size of the zones in which TTS is expected to occur are small and will be heavily monitored per the measures outlined above in the Proposed Monitoring section;
- Level B harassment may consist of temporary modifications in behavior (*e.g.* temporary avoidance of habitat or changes in behavior);
- The lack of important feeding, pupping, or other biologically significant areas in the action area during the construction window;
- The small impact area relative to species range size;
- Mitigation is expected to minimize the likelihood and severity of the level of harassment; and
- The small percentage of the stock that may be affected by project activities (< eight percent for all stocks).

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

Small Numbers

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

Table 16 above details the number of individuals that could be exposed to received noise levels that could cause TTS or Level B harassment for the proposed work at the project site relative to the total stock abundance. The numbers of animals authorized to be taken for all species would be considered small relative to the relevant stocks or populations even if each estimated instance of take occurred to a new individual. The total percent of the population (if each instance was a separate individual) for which take is requested is less than eight percent for all stocks (Table 16). Based on the analysis contained herein of the proposed activity (including the proposed mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS preliminarily finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has preliminarily 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 (ESA)

Section 7(a)(2) of the Endangered Species Act of 1973 (ESA: 16 U.S.C. 1531 *et seq.*) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the issuance of IHAs, NMFS consults internally, in this case with the West Coast Region Protected Resources Division Office, 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 Caltrans for conducting pier implosion and pile driving activity at the San Francisco-Oakland Bay Bridge from May 2018–April 2019, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. This section contains a draft of the IHA itself. This section contains a draft of the IHA itself. The wording contained in this section is proposed for inclusion in the IHA (if issued).

1. This Incidental Harassment Authorization (IHA) is valid for 1 year from May 15, 2018 through April 14, 2019.

2. This IHA is valid only for pier implosion and pile driving activities associated with the San Francisco—Oakland Bay Bridge.

3. General Conditions

(a) A copy of any issued LOA or IHA must be in the possession of the applicant, its designees, and work crew personnel operating under the authority of the issued LOA.

(b) The species authorized for taking are summarized in Table 17.

(c) The taking, by Level B harassment only, is limited to the species listed in condition 3(b). See Table 17 for numbers of take authorized.

TABLE 17—AUTHORIZED TAKE NUMBERS

Species	Total Level B harassment take
Pacific Harbor Seal	2,161
California Sea Lion	88
Northern Elephant Seal	12
Northern Fur Seal	6
Harbor Porpoise	91
Bottlenose Dolphin	30
Gray Whale	4

(d) The taking by injury (Level A harassment), serious injury, or death of the species listed in condition 3(c) of the Authorization or any taking of any other species of marine mammal is prohibited and may result in the modification, suspension, or revocation of this IHA, unless authorization of take by Level A harassment is listed in condition 3(b) of this Authorization.

4. Mitigation Measures

The holder of this Authorization is required to implement the following mitigation measures.

(a) In-water pile driving and pile removal activities and the controlled

implosion of Piers E19 and E20 shall only be conducted during daylight hours and with enough time for pre and post activity monitoring, and with good visibility when the largest exclusion zone can be visually monitored.

(b) For controlled implosion of Piers E19 and E20, Caltrans shall install and use a Blast Attenuation System (BAS) prior to demolition to reduce the shockwave from the implosion.

(c) Establishment of shutdown zones

(i) For in-water heavy machinery work (such as debris removal or setting up the BAS), a minimum 10 m shutdown zone shall be implemented. If a marine mammal comes within 10 m of such operations, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions. This type of work could include (but is not limited to) the following activities: (1) Vibratory pile driving; (2) movement of the barge to the pile location; (3) positioning of the pile on the substrate via a crane (*i.e.,* stabbing the pile); (4) removal of the pile from the water column/substrate via a crane (*i.e.,* deadpull); or (5) the placement of sound attenuation devices around the piles.

(ii) For controlled implosion and associated test blasting, as well as pile driving, Caltrans shall establish monitoring zones that are appropriate to specific marine mammal functional hearing groups for each implosion scenario (See Tables 18 & 19 below).

TABLE 18—SHUTDOWN AND MONITORING ZONES FOR PIER IMPLOSIONS

Species/group	Level B behavioral response monitoring zone	Level B TTS monitoring zone	Level A injury and mortality exclusion zone
Pinniped and Dolphin	290 meters (951 feet)	200 meters (656 feet)	70 meters (230 feet).
Harbor Porpoise	1,220 meters (4,003 feet)	830 meters (2,723 feet)	290 meters (951 feet).

TABLE 19—SHUTDOWN AND MONITORING ZONES FOR PILE DRIVING

Pile type	Installation method	Attenuation system	Level A pinniped and dolphin exclusion zone	Level A porpoise and whale exclusion zone	Level B monitoring zone—all species
H-Pile	Vibratory	None	2 meters (7 feet)	1 meter (3 feet)	1,000 meters (3,280 feet).
24-inch Steel Pipe Pile	Vibratory	None	8 meters (26 feet)	19 meters (62 feet)	2,000 meters (6,562 feet).
36-inch Steel Pipe Pile	Vibratory	None	20 meters (98 feet)	49 meters (161 feet)	2,000 meters (6,562 feet).
H-Pile	Impact	None	18 meters (59 feet)	39 meters (128 feet)	100 meters (328 feet).
24-inch Steel Pipe Pile	Impact	Bubble Curtain	68 meters (223 feet)	151 meters (495 feet)	215 meters (705 feet).
36-inch Steel Pipe Pile	Impact	Bubble Curtain	130 meters (427 feet)	290 meters (951 feet)	541 meters (1,775 feet).
24-inch Concrete Pile	Impact	None	52 meters (171 feet)	115 meters (377 feet)	46 meters (151 feet).
36-inch Concrete Pile	Impact	Bubble Curtain	57 meters (187 feet)	127 meters (417 feet)	117 meters (384 feet).

(d) Shutdown Zone Monitoring for Mitigation Measures

(i) Pre-activity monitoring shall take place from 30 minutes prior to initiation of activity and post-activity monitoring shall continue through 30 minutes post-completion for construction activity and 60 minutes post-completion for implosion activity. Pile driving may commence at the end of the 30-minute pre-activity monitoring period, provided observers have determined that the shutdown zone is clear of marine mammals, which includes delaying start of pile driving activities if a marine mammal is sighted in the zone, as described in Table 19 above.

(ii) 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).

(iii) If a marine mammal approaches or enters the shutdown zone during activities or pre-activity monitoring, all pile driving or implosion activities at that location shall be halted or delayed, respectively. If activity is halted or delayed due to the presence of a marine mammal, the activity may not resume or commence until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone and 30 minutes have passed without re-detection of the animal. 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 thirty minutes.

(iv) Caltrans shall use soft start techniques when impact pile driving. Soft start requires contractors to provide an initial set of strikes at reduced energy, followed by a thirty-second waiting period, then two subsequent reduced energy strike sets. Soft start shall be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of thirty minutes or longer.

(v) If the number of authorized takes are reached, Caltrans will shut down if a marine mammal is sighted within or approaching the monitoring zone.

(vi) If a species for which take is not authorized is sighted within or approaching the monitoring zone, Caltrans will shut down.

5. Monitoring

(i) The holder of this Authorization is required to conduct marine mammal monitoring during pier implosion and pile driving and removal activities. Marine mammal monitoring and reporting shall be conducted in accordance with the monitoring measures in the application.

(a) For all pile driving activities, a minimum of two protected species observer (PSOs) shall be required, with at least one PSO stationed at the active pile driving rig or at the best vantage point(s) practicable to monitor the shutdown zone for marine mammals and implement shutdown or delay procedures when applicable through communication with the equipment operator. Other PSOs should be stationed at the best vantage point(s) practicable to observe the monitoring zone.

(b) For all pier implosion activities, a minimum of eight PSOs will be required. One PSO will be designated as the Lead PSO, who will receive updates from other PSOs on the presence or absence of marine mammals within the PSO. This Lead PSO will notify the Environmental Compliance Manager of a cleared shutdown zone before the start of the implosion(s). PSOs shall be positioned near the edge of each of the threshold criteria zones and shall utilize

boats, barges, and bridge piers and roadway.

(ii) Caltrans shall conduct briefings for construction supervisors and crews, the monitoring team, and Caltrans staff prior to the start of all pile driving activity, and when new personnel join the work, in order to explain responsibilities, communication procedures, the marine mammal monitoring protocol, and operational procedures.

(iii) Monitoring of pile driving shall be conducted by qualified PSOs (see below), who shall have no other assigned tasks during monitoring periods. Caltrans shall adhere to the following conditions when selecting observers:

- Independent PSOs shall be used (*i.e.,* not construction personnel);
- At least one PSO must have prior experience working as a marine mammal observer during construction activities;
- Other PSOs may substitute education (degree in biological science or related field) or training for experience;
- Where a team of three or more PSOs are required, a lead observer or monitoring; coordinator shall be designated. The lead observer must have prior experience working as a marine mammal observer during construction; and
- Caltrans shall submit PSO CVs for approval by NMFS;

Caltrans shall ensure that observers 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.

(iv) If a species for which authorization has not been granted, or a species for which authorization has been granted but the authorized takes are met, is observed approaching or within the monitoring zone (2,000 m), activities must shut down immediately using delay and shut-down procedures. Activities must not resume until the animal has been confirmed to have left the area or the observation time period has elapsed.

6. Reporting

(i) Caltrans shall submit a draft report to NMFS [not later than 90 days following the end of construction activities OR 60 days prior to the issuance of any subsequent IHA for the project]. Caltrans shall provide a final report within 30 days following resolution of NMFS' comments on the draft report. Reports shall contain, at minimum, the following:

- Date and time that monitored activity begins and ends for each day conducted (monitoring period);
- Construction activities occurring during each daily observation period, including how many and what type of piles driven;
- Deviation from initial proposal in pile numbers, pile types, average driving times, etc.;
- Weather parameters in each monitoring period (*e.g.,* wind speed, percent cloud cover, visibility);
- Water conditions in each monitoring period (*e.g.,* sea state, tide state);
- For each marine mammal sighting:
  - Species, numbers, and, if possible, sex and age class of marine mammals;
  - Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;
  - Location and distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point; and
  - Estimated amount of time that the animals remained in the Level B zone;
- Description of implementation of mitigation measures within each monitoring period (*e.g.,* shutdown or delay);
- Other human activity in the area within each monitoring period
- A summary of the following:
  - Total number of individuals of each species detected within the Level B Zone, and estimated as taken if correction factor appropriate;
  - Total number of individuals of each species detected within the Level A Zone and the average amount of time that they remained in that zone; and
  - Daily average number of individuals of each species (differentiated by month as appropriate) detected within the the Level B Zone, and estimated as taken, if appropriate.

(ii) In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by this IHA, such as a serious injury or mortality, Caltrans shall immediately cease the specified activities and report the incident to the Office of Protected Resources, NMFS, and the West Coast Regional Stranding Coordinator. The report must include the following information:

a. Time and date of the incident;

b. Description of the incident;

c. Environmental conditions (*e.g.,* wind speed and direction, Beaufort sea state, cloud cover, and visibility);

d. Description of all marine mammal observations in the 24 hours preceding the incident;

e. Species identification or description of the animal(s) involved;

f. Fate of the animal(s); and

g. Photographs or video footage of the animal(s).

(iii) Activities shall not resume until NMFS is able to review the circumstances of the prohibited take. NMFS will work with Caltrans to determine what measures are necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. Caltrans may not resume their activities until notified by NMFS.

(iv) In the event that the Caltrans discovers an injured or dead marine mammal, and the lead observer determines that the cause of the injury or death is unknown and the death is relatively recent (*e.g.,* in less than a moderate state of decomposition), Caltrans shall immediately report the incident to the Office of Protected Resources, NMFS, and the West Coast Regional Stranding Coordinator.

The report must include the same information identified above. Activities may continue while NMFS reviews the circumstances of the incident. NMFS will work with Caltrans to determine whether additional mitigation measures or modifications to the activities are appropriate.

(v) In the event that Caltrans discovers an injured or dead marine mammal, and the lead observer determines that the injury or death is not associated with or related to the activities authorized in the IHA (*e.g.,* previously wounded animal, carcass with moderate to advanced decomposition, scavenger damage), Caltrans shall report the incident to the Office of Protected Resources, NMFS, and the West Coast Regional Stranding Coordinator, NMFS, within 24 hours of the discovery. Caltrans shall provide photographs or video footage or other documentation of the stranded animal sighting to NMFS.

7. This Authorization may be modified, suspended or withdrawn if the holder fails to abide by the conditions prescribed herein, or if NMFS determines the authorized taking is having more than a negligible impact on the species or stock of affected marine mammals.

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 pier implosion and pile driving. We also request comment on the potential for 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 our final decision on the request for MMPA authorization.

On a case-by-case basis, NMFS may issue a second one-year IHA without additional notice when (1) another year of identical or nearly identical activities as described in the Specified Activities section is planned or (2) the activities would not be completed by the time the IHA expires and a second IHA would allow for completion of the activities beyond that described in the Dates and Duration section, provided all of the following conditions are met:

- A request for renewal is received no later than 60 days prior to expiration of the current IHA;
- The request for renewal must include the following:

(1) An explanation that the activities to be conducted beyond the initial dates either are identical to the previously analyzed activities or include changes so minor (*e.g.,* reduction in pile size) that the changes do not affect the previous analyses, take estimates, or mitigation and monitoring requirements; and

(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; and

- 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 remain the same and appropriate, and the original findings remain valid.

Dated: April 9, 2018.

Donna S. Wieting,

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

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XG149

Magnuson-Stevens Act Provisions; General Provisions for Domestic Fisheries; Application for Exempted Fishing Permits

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

ACTION: Notice; request for comments.

SUMMARY: The Assistant Regional Administrator for Sustainable Fisheries, Greater Atlantic Region, NMFS, has made a preliminary determination that an Exempted Fishing Permit application contains all of the required information and warrant further consideration. The Exempted Fishing Permit would allow commercial fishing vessels to land Atlantic halibut under the minimum size limit and in excess of the possession limit. This EFP is required to support an Atlantic halibut study by the University of Massachusetts, Dartmouth, School for Marine Science and Technology, and The Nature Conservancy to improve future halibut stock assessments.

Regulations under the Magnuson-Stevens Fishery Conservation and Management Act require publication of this notification to provide interested parties the opportunity to comment on applications for proposed Exempted Fishing Permits.

DATES: Comments must be received on or before April 27, 2018.

ADDRESSES: You may submit written comments by any of the following methods:

- *Email: NMFS.GAR.EFP@noaa.gov.* Include in the subject line ''Comments on TNC Atlantic halibut EFP.''
- *Mail:* Michael Pentony, Regional Administrator, NMFS, Northeast Regional Office, 55 Great Republic Drive, Gloucester, MA 01930. Mark the outside of the envelope ''TNC Atlantic Halibut EFP.''

FOR FURTHER INFORMATION CONTACT: Spencer Talmage, Fishery Management Specialist, 978–281–9232, *Spencer.Talmage@noaa.gov.*

SUPPLEMENTARY INFORMATION: The Nature Conservancy (TNC) submitted a complete application for an Exempted Fishing Permit (EFP) on March 6, 2018, which requests a renewal of an EFP issued last year to collect biological samples of halibut. The project is funded through the Saltonstall-Kennedy Grant Program, and seeks to address identified information gaps in order to improve future Atlantic halibut stock assessments. Research focuses on characteristics such as stock structure, seasonal movements, behavior, and life history. The renewal application requests the same exemptions from the regulations that were approved for the 2017 fishing year. The exemptions include the Atlantic halibut possession limit, as described in § 648.86(c), and the Atlantic halibut minimum size limit, as described in § 648.83(a)(1).

The EFP would authorize 21 commercial fishing vessels to collect biological samples of halibut during regular fishing operations. A maximum of five halibut may be sampled per trip. Participating vessels may land halibut under the minimum size limit and/or above the possession limit provided these fish are transferred to participating researchers for additional data collection. The EFP issued for the 2017 fishing year allowed for a total sampling size of 250 halibut sampled across the entirety of the project. To date, TNC has sampled 132 halibut. The renewed EFP would increase the total sample size to 275. TNC requested this increase in order to fully utilize Saltonstall-Kennedy Grant Program funding. Sampling would include recording of fish length and weight, as well as removal of gonads, otoliths, and genetic material.

The exemption from the minimum size limit would allow researchers to collect data from all sizes of halibut, which is necessary to ensure that results of the project are accurate and reflective of the halibut population. The exemption from the possession limit is necessary to ensure that the researchers are able to obtain sufficient biological samples to conduct their research. No halibut above the possession limit or below the minimum size limit could be landed for sale.

Fishing under the EFP would occur during the 2018 fishing year, from May 1, 2018 through April 30, 2019. Participating vessels would use multiple gear types, including handline/jig, longline, sink gillnet, and otter trawl. Fishing would occur throughout both the Gulf of Maine and the Georges Bank Regulated Mesh Areas, primarily in statistical areas 514, 521, 522, 525, and 526.