10:45 a.m.–12:15 p.m	Review/Edit Assessment Summary Report (Scallop).	
12:15–1:15 p.m	Lunch.	
1:15 p.m. -2:45 p.m	Review/Edit Assessment Summary Report (Scallop).	
2:45 p.m.–3 p.m	Break.	
3 p.m.–6 p.m	Review/Edit Assessment Summary Report (Herring).	

Friday, June 29, 2018

9 a.m.–5 p.m	SARC Report Writing.	

The meeting is open to the public; however, during the 'SARC Report Writing' session on Friday June 29th the public should not engage in discussion with the SARC.

Special Accommodations

This meeting is physically accessible to people with disabilities. Special requests should be directed to James Weinberg at the NEFSC, 508–495–2352, at least 5 days prior to the meeting date.

Dated: May 31, 2018.

Jennifer M. Wallace,

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

[FR Doc. 2018–12058 Filed 6–4–18; 8:45 am]

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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; Issuance of an incidental harassment authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that NMFS has issued an incidental harassment authorization (IHA) to the California Department of Transportation (Caltrans) to incidentally harass, by Level B harassment only, 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).

DATES: This Authorization is applicable from May 24, 2018 to May 23, 2019.

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 reviewed 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 determined that the issuance of the IHA qualifies to be categorically excluded from further NEPA review.

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 IHA will 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 proposed 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 (82 FR 35510, July 31, 2017) to Caltrans authorizing take of marine mammals for additional dismantling the original East Span of the SFOBB using mechanical means as well as 5 to 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 will 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 will 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

A pedestrian bridge and observation platforms, will be constructed near the Oakland shoreline, using the existing marine foundations as anchors for this public access facility. Construction of this facility at Piers E21 to E23 (Oakland side) will require mechanical removal of some or perhaps all of the pedestals and pier slabs to elevations required by the design. Both temporary and permanent piles will be needed for construction of this pedestrian bridge and observation platforms.

The OTD pedestrian bridge will extend from Pier E23 on the Oakland shoreline to Pier E21. It will be supported by Piers E23, E22, and E21. Observation areas also may be constructed at Piers E22 and E21. Reinforced concrete slabs may be constructed on top of Piers E22 and E21, to serve as an observation platforms. The existing pier foundations are spaced 88 meters (290 feet) apart. New intermediate piers will be constructed between the existing pier foundations to support the pedestrian bridge. These permanent intermediate piers will be pile-supported.

A temporary access trestle also may also be needed to facilitate construction of the pedestrian bridge. This temporary access trestle will be pile-supported.

Both the pedestrian bridge and temporary access trestle will be designed by the construction contractor. Because these structures will be contractor-designed, their exact nature (*e.g.,* size, type, number of piles) will not be known until construction begins. However, the Caltrans has developed a conservative estimate as to the approximate type, size, and number of piles needed for these proposed structures. Up to 200 in-water piles may be required for construction of the OTD pedestrian bridge and temporary access trestle. Caltrans originally proposed concrete piles as a possibility but has determined concrete piles will not be used for this work and reference to concrete piles has been removed from the remainder of the document. Piles may be steel pipe piles or H-piles. The steel pipe piles will be 24 to 36 inches in diameter, or less. In-water pile driving for construction of the pedestrian bridge and temporary access trestle may result in the incidental harassment of marine mammals.

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

Comments and Responses

A notice of NMFS's proposal to issue an IHA to Caltrans was published in the **Federal Register** on April 12, 2018 (83 FR 15795). That notice described, in detail, Caltrans' activity, the marine mammal species that may be affected by the activity, and the anticipated effects on marine mammals. During the 30-day public comment period, NMFS received comments from the Marine Mammal Commission. The Marine Mammal Commission submitted the following comments to NMFS.

Comment 1: The Commission noted various errors in the proposed authorization, including errors in the description of the action and the effects analyses. The Commission recommends that NMFS review its notices more thoroughly before submitting for publication.

Response 1: NMFS thanks the Commission for pointing out the errors in the **Federal Register** Notice for the proposed authorization. To address errors in the description and effects analyses, NMFS is reprinting these sections in the **Federal Register** notice for the issuance of the authorization, with the errors corrected. NMFS makes every effort to read the notices thoroughly prior to publication and will continue this effort to publish the best possible product for public comment.

Comment 2: The Commission recommends that NMFS refrain from using a source level reduction factor for sound attenuation device implementation during impact pile driving for all relevant incidental take authorizations due to the different noise level reduction at different received ranges.

Response 2: While it is true that noise level reduction measured at different received ranges does vary, given that both Level A and Level B estimation using geometric modeling is based on noise levels measured at near-source distances (~10 m), NMFS believes it reasonable to use a source level reduction factor for sound attenuation device implementation during impact pile driving. In the case of the SFOBB impact driving isopleth estimates using an air bubble curtain for source level reduction, NMFS reviewed Caltrans' bubble curtain ''on and off'' studies conducted in San Francisco Bay in 2003 and 2004. The equipment used for bubble curtains has likely improved since 2004 but due to concerns for fish species, Caltrans has not able to conduct ''on and off'' tests recently. Based on 74 measurements (37 with the bubble curtain on and 37 with the bubble curtain off) at both near (<100 m) and far (>100 m) distances, the linear averaged received level reduction is 6 dB. If limiting the data points (a total of 28 measurements, with 14 during bubble curtain on and 14 during bubble curtain off) to only near distance measurements, the linear averaged noise level reduction is 7 dB. Based on this analysis, we conclude that there is not a significant difference of source level reduction between near and far-distance measurements. As a conservative approach, NMFS used the reduction of 7 dB of the source level for impact zone estimates.

NMFS will evaluate the appropriateness of using a certain source level reduction factor for sound attenuation device implementation during impact pile driving for all relevant incidental take authorizations when more data become available. Nevertheless at this point, we think it appropriate that a conservative 6 dB reduction is reasonable to be used as a source level reduction factor for impact pile driving using an air bubble curtain system.

Comment 3: The Commission recommends that NMFS promptly revise its draft rounding criteria and share it with the Commission.

Response 3: NMFS appreciates the Commission's ongoing concern in this matter. Calculating predicted takes is not an exact science and there are arguments for taking different mathematical approaches in different situations, and for making qualitative adjustments in other situations. We believe, however, that the methodology used for take calculation in this IHA remains appropriate and is not at odds with the 24-hour reset policy the Commission references. We look forward to continued discussion with the Commission on this matter and will share the rounding guidance as soon as it is ready for public review.

Comment 4: The Commission recommends that NMFS refrain from implementing its proposed renewal process and use abbreviated **Federal Register** notices and reference existing documents to aid in streamlining. It also recommends that NMFS provide the Commission and the public with a legal analysis supporting use of the renewal process.

Response 4: The process of issuing a renewal IHA does not bypass the public notice and comment requirements of the MMPA. The notice of the proposed IHA expressly notifies the public that under certain, limited conditions an applicant could seek a renewal IHA for an additional year. The notice describes the conditions under which such a renewal request could be considered and expressly seeks public comment in the event such a renewal is sought. Importantly, such renewals would be limited to circumstances where: The activities are identical or nearly identical to those analyzed in the proposed IHA; monitoring does not indicate impacts that were not previously analyzed and authorized; and, the mitigation and monitoring requirements remain the same, all of which allow the public to comment on the appropriateness and effects of a renewal at the same time the public provides comments on the initial IHA. NMFS has, however, modified the language for future proposed IHAs to clarify that all IHAs, including renewal IHAs, are valid for no more than one year and that the agency would consider only one renewal for a project at this time. In addition, notice of issuance or denial of a renewal IHA would be published in the **Federal Register**, as they are for all IHAs. Last, NMFS will publish on our website a description of the renewal process before any renewal is issued utilizing the new process.

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
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; N_{min} 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 activity 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 these species 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 Bearing 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 construction 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 ''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 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 will 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' 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 will 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 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 controlled blasting of Piers E19 and E20 have the potential to impact marine mammals in the vicinity of the activity. The majority of impacts will be startle behavioral responses and temporary behavioral modification of marine mammals. However, a few individual animals could be exposed to sound levels that may cause TTS.

The underwater explosion will 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 will be placed within the structure. Therefore, most energy from the explosive shock wave will be absorbed through the destruction of the structure itself, and will 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' 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 will 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 will not occur in biologically important areas, will 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.

Potential Effects of Pile Driving Activities

In-water construction activities associated with the project will include impact pile driving, vibratory pile driving, and removal. The sounds produced by these activities fall into one of two general sound types: Pulsed and non-pulsed (defined in the following). The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (*e.g.,* Ward 1997 in Southall et al., 2007). Please see Southall et al. (2007) for an in-depth discussion of these concepts.

Pulsed sound sources (*e.g.,* explosions, gunshots, sonic booms, impact pile driving) produce signals that are brief (typically considered to be less than one second), broadband, atonal transients (ANSI 1986; Harris 1998; NIOSH 1998; ISO 2003; ANSI 2005) and occur either as isolated events or repeated in some succession. Pulsed sounds are all characterized by a relatively rapid rise from ambient pressure to a maximal pressure value followed by a rapid decay period that may include a period of diminishing, oscillating maximal and minimal pressures, and generally have an increased capacity to induce physical injury as compared with sounds that lack these features.

Non-pulsed sounds can be tonal, narrowband, or broadband, brief or prolonged, and may be either continuous or non-continuous (ANSI 1995; NIOSH 1998). Some of these non-pulsed sounds can be transient signals of short duration but without the essential properties of pulses (*e.g.,* rapid rise time). Examples of non-pulsed sounds include those produced by vessels, aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems. The duration of such sounds, as received at a distance, can be greatly extended in a highly reverberant environment.

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

The effects of sounds from pile driving might include one or more of the following: Temporary or permanent hearing impairment, non-auditory physical or physiological effects, behavioral disturbance, and masking (Richardson et al., 1995; Gordon et al., 2003; Nowacek et al., 2007; Southall et al., 2007). The effects of pile driving or drilling on marine mammals are dependent on several factors, including the type and depth of the animal; the pile size and type, and the intensity and duration of the pile driving or drilling sound; the substrate; the standoff distance between the pile and the animal; and the sound propagation properties of the environment. Impacts to marine mammals from pile driving are expected to result primarily from acoustic pathways. As such, the degree of effect is intrinsically related to the frequency, received level, and duration of the sound exposure, which are in turn influenced by the distance between the animal and the source. The further away from the source, the less intense the exposure should be. The substrate and depth of the habitat affect the sound propagation properties of the environment. In addition, substrates that are soft (*e.g.,* sand) will absorb or attenuate the sound more readily than hard substrates (*e.g.,* rock), which may reflect the acoustic wave. Soft porous substrates will also likely require less time to drive the pile, and possibly less forceful equipment, which will ultimately decrease the intensity of the acoustic source.

In the absence of mitigation, impacts to marine species could be expected to include physiological and behavioral responses to the acoustic signature (Viada et al., 2008). Potential effects from impulsive sound sources like pile driving can range in severity from effects such as behavioral disturbance to temporary or permanent hearing impairment (Yelverton et al., 1973). Due to the nature of the pile driving sounds in the project, behavioral disturbance is the most likely effect from the activity. Marine mammals exposed to high intensity sound repeatedly or for prolonged periods can experience hearing threshold shifts. PTS constitutes injury, but TTS does not (Southall et al., 2007). Based on the best scientific information available, the SPLs for the construction activities in this project are below the thresholds that could cause TTS or the onset of PTS.

Responses to continuous sound, such as vibratory pile installation, have not been documented as well as responses to pulsed sounds. With both types of pile driving, it is likely that the onset of pile driving could result in temporary, short-term changes in an animal's typical behavior and/or avoidance of the affected area. These behavioral changes may include (Richardson et al., 1995): Changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); avoidance of areas where sound sources are located; and/or flight responses (*e.g.,* pinnipeds flushing into water from haulouts or rookeries). Pinnipeds may increase their haul-out time, possibly to avoid in-water disturbance (Thorson and Reyff 2006). If a marine mammal responds to a stimulus by changing its behavior (*e.g.,* through relatively minor changes in locomotion direction/speed or vocalization behavior), the response may or may not constitute taking at the individual level, and is unlikely to affect the stock or the species as a whole. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on animals, and if so potentially on the stock or species, could potentially be significant (*e.g.,* Lusseau and Bejder 2007; Weilgart 2007).

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, or reproduction. Significant behavioral modifications that could potentially lead to effects on growth, survival, or reproduction include:

• Drastic changes in diving/surfacing patterns (such as those thought to cause beaked whale stranding due to exposure to military mid-frequency tactical sonar);

• Longer-term habitat abandonment due to loss of desirable acoustic environment; and

• Longer-term cessation of feeding or social interaction.

The onset of behavioral disturbance from anthropogenic sound depends on both external factors (characteristics of sound sources and their paths) and the specific characteristics of the receiving animals (hearing, motivation, experience, demography) and is difficult to predict (Southall et al., 2007).

Non-Auditory Physiological Effects—Non-auditory physiological effects or injuries that theoretically might occur in marine mammals exposed to strong underwater sound include stress, neurological effects, bubble formation, resonance effects, and other types of organ or tissue damage (Cox et al., 2006; Southall et al., 2007). Studies examining such effects are limited. In general, little is known about the potential for pile driving or removal to cause auditory impairment or other physical effects in marine mammals. Available data suggest that such effects, if they occur at all, will presumably be limited to short distances from the sound source and to activities that extend over a prolonged period. The available data do not allow identification of a specific exposure level above which non-auditory effects can be expected (Southall et al., 2007) or any meaningful quantitative predictions of the numbers (if any) of marine mammals that might be affected in those ways. Marine mammals that show behavioral avoidance of pile driving, including some odontocetes and some pinnipeds, are especially unlikely to incur auditory impairment or non-auditory physical effects.

Auditory Masking—Natural and artificial sounds can disrupt behavior by masking. The frequency range of the potentially masking sound is important in determining any potential behavioral impacts. Because sound generated from in-water pile driving and removal is mostly concentrated at low-frequency ranges, it may have less effect on high frequency echolocation sounds made by porpoises. Given that the energy distribution of pile driving covers a broad frequency spectrum, sound from these sources will likely be within the audible range of marine mammals present in the project area. Impact pile driving activity is relatively short-term, with rapid pulses occurring for approximately fifteen minutes per pile. The probability for impact pile driving resulting from this action masking acoustic signals important to the behavior and survival of marine mammal species is low. Vibratory pile driving is also relatively short-term, with rapid oscillations occurring for approximately one and a half hours per pile. It is possible that vibratory pile driving resulting from this action may mask acoustic signals important to the behavior and survival of marine mammal species, but the short-term duration and limited affected area will result in insignificant impacts from masking. Any masking event that could possibly rise to Level B harassment under the MMPA will occur concurrently within the zones of behavioral harassment already estimated for vibratory and impact pile driving, and which have already been taken into account in the exposure analysis.

Estimated Take

This section provides an estimate of the number of incidental takes 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 will 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 authorized for blasting. Although Caltrans has not requested Level A harassment for their construction activities in the past, in consultation with the Marine Mammal Commission, Caltrans has requested Level A take of 120 harbor seals and 2 elephant seals during pile driving activities.

As described previously, no mortality is anticipated or 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 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 will 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 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' 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 FOR PILE DRIVING

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

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

Note: Peak sound pressure (L_{pk}) has a reference value of 1μPa, and cumulative sound exposure level (L_E) has a reference value of 1 μPa²s. 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 weighted 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 pier 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 4). 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 will 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 4—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 IMPLOSION OF PIERS E19 AND E20 IN A SINGLE EVENT

Species hearing group		Behavioral (meters)	TTS [1] (meters)		PTS [1] (meters)	
Mid-Frequency Cetaceans (Dolphins).	Threshold	165 dB SELcum	224 dB Peak	170 dB SELcum	230 dB Peak	185 dB SELcum
	Piers E17–E18 Measured. Piers E19–E20 Estimate.	155.75 200	40.84 50	**109.42** **120**	27.13 30	**37.8** **40**
High-Frequency Cetaceans (Porpoises).	Threshold	135 dB SELcum	196 dB Peak	140 dB SELcum	202 dB Peak	155 dB SELcum
	Piers E17–E18 Measured. Piers E19–E20 Estimate.	1142.1 1,220	279.2 290	**802.54** **830**	185.01 200	**278.28** **290**
Phocid Pinnipeds (Seals).	Threshold	165 dB SELcum	212 dB Peak	170 dB SELcum	218 dB Peak	185 dB SELcum
	Piers E17–E18 Measured. Piers E19–E20 Estimate.	278.59 290	92.96 100	**195.38** **200**	61.57 70	**67.36** **70**

TABLE 4—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 IMPLOSION OF PIERS E19 AND E20 IN A SINGLE EVENT—Continued

Species hearing group		Behavioral (meters)	TTS [1] (meters)		PTS [1] (meters)	
Otariid Pinnipeds (Sea Lions).	Threshold	183 dB SELcum	226 dB Peak	188 dB SELcum	232 dB Peak	203 dB SELcum
	Piers E17–E18 Measured.	75.9	....	**53.04**	**23.47**	18.29
	Piers E19–E20 Estimate.	80	35.66	**60**	**30**	20
			40			

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 5—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 (meters)		Lung [1] (meters)	Mortality [1] (meters)
All Species	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
	Piers E17–E18 Measured ...	17	17	<12	<12
	Pier Implosion Estimate	27	27	<12	<12

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. Sound exposure levels for 36 inch concrete piles were derived from the Mukilteo Ferry Test Pile Project. 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 6—NMFS USER SPREADSHEET INPUT VALUES FOR PILE DRIVING

	H-Pile (vibratory)	24 inch steel (vibratory)	36 inch steel (vibratory)
Vibratory Driving of Steel Piles:			
Spreadsheet Tab Used	(A) Non-Impulsive, Cont.	(A) Non-Impulsive, Cont.	(A) Non-Impulsive, Cont.
Source Level (RMS SPL)	150	165	170.
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.			
	H-Pile (impact)	**24 inch steel (impact)**	**36 inch steel (impact)**
Impact Driving of Steel Piles:			
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	170 *	173 *.
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 *.

TABLE 6—NMFS USER SPREADSHEET INPUT VALUES FOR PILE DRIVING—Continued

Pile Proofing (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.			

* Attenuated value—Bubble curtain is assumed to provide 7dB reduction.

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

- Only one type/size of pile will be installed on the same day;
- One type of hammer to be used at a given time;
- 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 7.

TABLE 7—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 10,000 Practical 2,000	13	1	19	8	1
36 inch steel	Vibratory	4	None	NA	Calculated 21,544 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	201	7	239	107	8
36 inch steel	Impact	4	Bubble Curtain	541	NA	386	14	459	206	15
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
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 6.

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 will not incur PTS. Inputs used in the User Spreadsheet, and the resulting isopleths are reported below in Table 7.

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 8. 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 8—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 pier implosion event (Tables 9 through 12).

TABLE 9—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	29,462.347	0.1166	1	0.1166
Sea Lion	0.161	1.61E–07	30	9,118.458	0.0015	1	0.0015
Harbor Porpoise	0.167	1.67E–07	290	315,798.484	0.0527	1	0.0527
Bottlenose Dolphin	NA	NA	40	5,026.548	NA	1	NA
Elephant Seal	NA	NA	70	15,393.804	NA	1	NA
Fur Seal	NA	NA	30	2,827.43	NA	1	NA

TABLE 10—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 kilometers)	Level B TTS Take	Number of pier implosion events	Level B take calculated
Harbor Seal	3.957	3.96E–06	200	0.17	0.6528	1	0.6528
Sea Lion	0.161	1.61E–07	60	0.023	0.0038	1	0.0038
Harbor Porpoise	0.167	1.67E–07	830	2.09	0.3483	1	0.3483
Bottlenose Dolphin	NA	NA	120	0.045	NA	1	NA
Elephant Seal	NA	NA	200	0.13	NA	1	NA
Fur Seal	NA	NA	60	0.011	NA	1	NA

TABLE 11—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 kilometers)	Level B behavioral take	Number of pier implosion events	Level B take calculated
Harbor Seal	3.957	3.96E–06	290	0.32	1.2496	1	1.2496
Sea Lion	0.161	1.61E–07	80	0.036	0.0058	1	0.0058
Harbor Porpoise	0.167	1.67E–07	1,220	4.26	0.7109	1	0.7109
Bottlenose Dolphin	NA	NA	200	0.13	NA	1	NA
Elephant Seal	NA	NA	290	0.26	NA	1	NA
Fur Seal	NA	NA	80	0.02	NA	1	NA

TABLE 12—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 track 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

TABLE 12—COMBINED ESTIMATED EXPOSURES OF MARINE MAMMALS TO THE PIER IMPLOSIONS FOR LEVELS A AND B, AND MORTALITY THRESHOLD CRITERIA—Continued

Species	Level B exposures for all implosions		Level A exposures [1]			Mortality [1]
	Behavioral response	Temporary threshold shift	Permanent threshold shift	Gastro-intestinal track injury	Slight lung injury	
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 11). 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 12) are based on current density estimates or occurrence of marine mammals in the project area (Table 8 through 11). 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 13).

TABLE 13—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
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 will be exposed to sound pressure levels that can result in Level B harassment (Table 12). One of those exposures may be within the Level B monitoring zone, and one may be within the TTS zone (Table 12). 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 13).

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 will be exposed to sound pressure levels that can result in Level B harassment (Table 12). 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 11).

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 12). 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 13).

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 12). 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 13).

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 13).

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 will 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 13).

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 7. 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 8), 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 14.

TABLE 14—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 kilometers)	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	9.10	36.01	60	2,160.77	2161
Sea Lion	0.16	1.61E–07	2,000	9.10	1.47	60	87.92	88
Harbor Porpoise	0.17	1.67E–07	2,000	9.10	1.52	60	91.19	91
Bottlenose Dolphin	NA	NA	2,000	9.10	NA	60	NA	30
Elephant Seal	NA	NA	2,000	9.10	NA	60	NA	12
Gray Whale	NA	NA	2,000	9.10	NA	60	NA	4
Fur Seal	NA	NA	2,000	9.10	NA	60	NA	6
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 kilometers)**	**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	206	0.163	0.65	60	38.69	120
Sea Lion	0.16	1.61E–07	15	0.007	0.001	60	0.065	0
Harbor Porpoise	0.17	1.67E–07	459	0.70	0.119	60	6.71	0
Bottlenose Dolphin	NA	NA	15	0.007	NA	60	NA	0
Elephant Seal	NA	NA	206	0.163	NA	60	NA	2
Gray Whale	NA	NA	386	0.488	NA	60	NA	0
Fur Seal	NA	NA	15	0.007	NA	60	NA	0
Total Level A Take [1]								122

[1] Impact pile driving will not begin if a marine mammal other than phocid pinnipds are within PTS, Level A, shutdown zone. Therefore, only phocids will be taken by Level A harassment.

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 14). 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 14), 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 did not anticipate any individuals will be taken by Level A harassment. However, based on correspondence from the Marine Mammal Commission, NMFS is authorizing Level A take of 120 harbor seals and two elephant seals. This increase in potential Level A take is based upon an assumed take of two harbor seals per day with 60 days of pile driving. To make sure mitigation and monitoring zones are clear and practicable, Caltrans will use one monitoring zone for both phocid species, and therefore also requested Level A take of two elephant seals. With monitoring and establishment of shutdown zones, discussed in the Mitigation section below, Caltrans plans to avoid, and NMFS did not authorize, Level A harassment of other marine mammal species.

The number of takes requested, and authorized, 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 will 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 will be consecutive. This 60 day window also includes removal of temporary piles through vibratory removal or cutting off piles below the mudline. 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 14). 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 14). 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 15—COMBINED TOTAL TAKE REQUESTED FOR PIER IMPLOSION AND PILE-DRIVING ACTIVITIES

Species	Pier implosion Level B harassment take		Pile driving Level B harassment take	Total Level B harassment Take	Total Level A take	Requested take as percent of stock abundance
	Behavioral response	Temporary threshold shift				
Pacific Harbor Seal	20	10	2,161	2,191	120	7.5
California Sea Lion	4	3	88	95	0	.03
Northern Elephant Seal	2	1	12	15	2	.01
Northern Fur Seal	2	1	6	9	0	.06
Harbor Porpoise	10	8	91	109	0	1.1
Bottlenose Dolphin	4	2	30	36	0	8
Gray Whale	0	0	4	4	0	.02

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). 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 for species other than harbor seals—PTS Level A harassment thresholds for the specific species hearing groups, shown in Table 3. The shutdown zone for phocid pinnipeds, for which Level A take is requested, is 25 meters. 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 for all species except harbor seals and elephant seals. Due to the resident nature of harbor seals, and their ability to appear undetected in close range to construction activities, Caltrans is requesting Level A take of 120 harbor seals and two elephant seals.

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 determined that the 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.

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 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 7, 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. For implosion activities, Caltrans will monitor the area for 60 minutes after implosions. Caltrans also plans to conduct post-implosion surveys on shore and by vessel immediately after implosion events and for the following two days to search for any dead or injured marine mammals. Based on our requirements, Caltrans will implement the following procedures:

- PSOs will 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 will 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 will 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 will be a one-time event from a brief impulse noise (about 5 seconds), making it unlikely that the TTS will 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 planned. Finally, there is no critical habitat or other biologically important areas in the vicinity of Caltrans' 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 will 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 for all species except harbor seal.

Caltrans' 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 mitigation and monitoring measures are expected to further reduce the likelihood of injury, as it is unlikely an animal will 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 will 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 will 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 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 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 monitoring and mitigation measures, NMFS finds that the total marine mammal take from the 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 15 above details the number of individuals that could be exposed to received noise levels that could cause TTS or Level B harassment for the work at the project site relative to the total stock abundance. The numbers of animals authorized to be taken for all species will 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 15). Based on the analysis contained herein of the activity (including the mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS 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 determined that the total taking of affected species or stocks will 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 authorized or expected to result from this activity. Therefore, NMFS has determined that consultation under Section 7 of the ESA is not required for this action.

Authorization

NMFS has issued an IHA to Caltrans for the harassment of small numbers of marine mammals incidental to the dismantling and reuse of the original East Span of the San Francisco–Oakland Bay Bridge in the San Francisco Bay provided the previously mentioned mitigation, monitoring, and reporting requirements.

Dated: May 31, 2018.

Donna S. Wieting,

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

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DEPARTMENT OF COMMERCE

National Telecommunications and Information Administration

[Docket No. 180124068–8068–01]

RIN 0660–XC041

International internet Policy Priorities

AGENCY: National Telecommunications and Information Administration, U.S. Department of Commerce.

ACTION: Notice of inquiry.

SUMMARY: Recognizing the vital importance of the internet and digital communications to U.S. innovation, prosperity, education, and civic and cultural life, the National Telecommunications and Information Administration (NTIA) of the U.S. Department of Commerce has made it a top priority to encourage growth and innovation for the internet and internet-enabled economy. Towards that end, NTIA is seeking comments and recommendations from all interested stakeholders on its international internet policy priorities for 2018 and beyond. These comments will help inform NTIA to identify priority issues and help NTIA effectively leverage its resources and expertise to address those issues.

DATES: Comments are due on or before 5 p.m. Eastern Time on July 2, 2018.

ADDRESSES: Written comments may be submitted by email to *iipp2018@ntia.doc.gov*. Comments submitted by email should be machine-readable and should not be copy-protected. Written comments also may be submitted by mail to the National Telecommunications and Information Administration, U.S. Department of Commerce, 1401 Constitution Avenue NW, Room 4725, Attn: Fiona Alexander, Washington, DC 20230.

FOR FURTHER INFORMATION CONTACT: Fiona Alexander, National Telecommunications and Information Administration, U.S. Department of Commerce, 1401 Constitution Avenue NW, Room 4706, Washington, DC 20230; telephone (202) 482–1866; email *falexander@ntia.doc.gov*. Please direct media inquiries to NTIA's Office of Public Affairs, (202) 482–7002, or at *press@ntia.doc.gov*.

SUPPLEMENTARY INFORMATION:

Background: Within the U.S. Department of Commerce, the National Telecommunications and Information Administration (NTIA) is the Executive Branch agency responsible for advising the President on telecommunications and information policy.[1] NTIA was established in 1978 in response to the growing national consensus that ''telecommunications and information are vital to the public welfare, national security, and competitiveness of the United States,'' and that, ''rapid technological advances being made in the telecommunications and information fields make it imperative that the United States maintain effective national and international policies and programs capable of taking advantage of continued advancements.'' [2]

In the 40 years since its inception, NTIA has made growth and innovation in communications technologies—most recently internet communications—a cornerstone of its mission. The Administration's 2017 National Security Strategy reaffirmed that ''[t]he flow of data and an open, interoperable internet are inseparable from the success of the U.S. economy,'' and stated unequivocally that, ''the United States will advocate for open, interoperable communications, with minimal barriers to the global exchange of information and services.'' [3]

NTIA's Office of International Affairs: The Office of International Affairs (OIA) leads NTIA's overseas work. It plays a central role in the formulation of the U.S. Government's international information and communications technology policies, particularly with respect to the internet and the internet-enabled economy. OIA's diverse policymaking efforts include protecting and promoting an open and interoperable internet, advocating for the free flow of information, and strengthening the global marketplace for American digital products and services.

OIA advances these and related priorities at such global venues as the International Telecommunication Union (ITU), the internet Governance Forum (IGF), the Asia-Pacific Economic Cooperation (APEC) forum, the Organization of American States (OAS) the Organization for Economic Cooperation and Development (OECD),

[1] 47 U.S.C. 902(b)(2)(D).

[2] 47 U.S.C. 901(b)(1–6).

[3] Executive Office of the President, *The National Security Strategy of the United States of America* (Dec. 2017), *https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf.*