BILLING CODE 3510-22-P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XD829

Taking of Marine Mammals Incidental to Specified Activities; Construction of the 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 we have issued an incidental harassment authorization (IHA) to California Department of Transportation (CALTRANS) to incidentally harass, by Level B harassment only, four species of marine mammals during activities related to the construction of Pier 3 of the East Span of the San Francisco-Oakland Bay Bridge (SF-OBB) in California

DATES: This authorization is effective from July 15, 2015 through July 14, 2016.

FOR FURTHER INFORMATION CONTACT: Robert Pauline, Office of Protected Resources, NMFS, (301) 427-8401.

SUPPLEMENTARY INFORMATION:

Availability

An electronic copy of CALTRANS' application and supporting documents, as well as a list of the references cited in this document, may be obtained by visiting the Internet at:

www.nmfs.noaa.gov/pr/permits/incidental/construction.htm. In case of problems accessing these documents, please call the contact listed above (see FOR FURTHER INFORMATION CONTACT).

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 et seq.) direct the Secretary of Commerce 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.

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."

Section 101(a)(5)(D) of the MMPA established an expedited process by which citizens of the U.S. can apply for an authorization to incidentally take small numbers of marine mammals by harassment. Section 101(a)(5)(D) establishes a 45-day time limit for NMFS' review of an application followed by a 30-day public notice and comment period on any proposed authorizations for the incidental harassment of marine mammals. Within 45 days of the close of

the comment period, NMFS must either issue or deny the authorization. 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]."

Summary of Request

On December 15, 2014, CALTRANS submitted its most recent request to NOAA requesting an IHA for the possible harassment of small numbers of California sea lions (*Zalophus californianus*), Pacific harbor seals (*Phoca vitulina richardsii*), harbor porpoises (*Phocoena phocoena*), and gray whales (*Eschrichtius robustus*) incidental to construction associated with a replacement bridge for the East Span of the SF-OBB, in San Francisco Bay (SFB, or Bay), California.

An IHA was previously issued to CALTRANS for this activity on January 8, 2014 (79 FR 2421; January 14, 2014), based on activities described on CALTRANS' IHA application dated April 13, 2013. That IHA expired on January 7, 2015. Since the construction activity would continue for another two years, CALTRANS requests to renew its IHA. In its IHA renewal request, CALTRANS also states that there has been no change in the scope of work for the SF-OBB Project from what was outlined in its April 13, 2013, IHA application project description, the *Federal Register* notice for the proposed IHA (78 FR 60852; October 2, 2013), and the *Federal Register* notice for the issuance of that IHA (79 FR 2421; January 14, 2014). On November 10, 2003, NMFS issued the first project-related IHA authorizing the take of small numbers of marine mammals incidental to the construction of the SFOBB Project. CALTRANS

has been issued a total of seven subsequent IHAs for the SF-OBB Project to date, excluding the application currently under review.

Description of the Specified Activity

Overview

Construction activities for the replacement of the SF-OBB East Span commenced in 2002 and are expected to be completed in 2016 with the completion of the bike/pedestrian path and eastbound on ramp from Yerba Buena Island. The new east span is now open to traffic.

This stage of the project covered under the IHA will include the mechanical dismantling of marine foundations of the East Span of the bridge as well as the installation of approximately 200 steel piles.

Dates and Duration

In-water activities are expected to begin in July 2015. Up to 128 days of pile driving may occur under the IHA. However, the schedule for this project is highly variable. As such, activities covered under this IHA may occur anytime between July 15, 2015 and July14, 2016 which are the effective dates of the IHA.

Specific Geographic Region

The project site is located in San Francisco Bay around the east span of the SFOBB.

Detailed Description of Activities

We provided a description of the proposed action in our **Federal Register** notice announcing the proposed authorization (80 FR 23774; April 29, 2015). Please refer to that document; we provide only summary information here.

The proposed action would involve the mechanical dismantling of marine foundations and superstructure components of the East Span of the bridge as well as the installation of approximately 200 steel piles. These piles include 0.45-meter, 0.61-meter, 0.91-meter (18-inch, 24-inch, and 36-inch) diameter pipe piles, and 0.34 meter (14-inch) H-piles on up to 128 days. These piles will be installed in the water to construct temporary supports between Piers E4-E8, which will help with the dismantling process by providing support to the original bridge superstructure as it is taken down. Both vibratory and impact hammers could be used to install pipe piles depending on the substrate. In addition, CALTRANS would remove various bridge superstructures including trusses, road decks, and steel and concrete support towers. The concrete foundation of the bridge would be removed using various mechanical means including saw cutting, flame cutting, mechanical splitting, drilling, pulverizing, and/or hydrocutting. Some of the installed piles may be removed under this IHA, but the contractor has until 2018 to remove all 200 piles.

Comments and Responses

A notice of NMFS' proposal to issue an IHA was published in the **Federal Register** on April 29, 2015 (80 FR 23774). During the 30-day public comment period, the Marine Mammal Commission submitted a letter. The letter is available on the Internet *www.nmfs.noaa.gov/pr/permits/incidental/construction.htm*. All comments specific to CALTRANS' application that address the statutory and regulatory requirements or findings NMFS must make to issue an IHA are addressed in this section of the **Federal Register** notice.

Comment 1: The Commission noted that during the last authorization marine mammal monitoring did not occur 100 percent of time spent on activities authorized under the IHA. The

Commission believes that this results in underestimates the number of takes of marine mammals known to occur in the project area. Monitoring during all in-water sound-producing activities is the only way for CALTRANS and NMFS to be confident that the numbers of marine mammals taken are within the limits authorized and the least practicable impact occurs. For these reasons, the Commission recommended that NMFS require CALTRANS to implement full-time monitoring of Level A and B harassment zones during all in- water sound-producing activities (i.e., pile driving and dismantling activities).

Response 1: NMFS does not agree with the Commission's recommendation. NMFS had discussed with CALTRANS specific protocols concerning marine mammal monitoring during its proposed in-water construction activities. As described in detail in the Federal Register notice for the previous proposed IHA (79 FR 2421; January 14, 2014) and in CALTRANS' IHA application, CALTRANS' planned construction includes installation of up to 635 temporary falsework piles, 1,925 steel sheet piles, and various mechanical dismantling activities over several years. The extent of the work made it infeasible and costly to implement marine mammal monitoring for Level A and B harassment zones at all times, particularly since some of the Level B harassment zones for vibratory pile driving extend to a radius of 2 km. CALTRANS will monitor the 180 and 190 dB exclusion zones and 160 dB behavioral harassment zone for all unattenuated impact pile driving of H-piles, and the 180 and 190 dB exclusion zones for attenuated impact pile driving and mechanical dismantling, thereby minimizing the possibility of injury. Further, for the purposes of better understand behavioral efforts, CALTRANS will also monitor the 160 dB behavioral harassment zone for 20% of the attenuated impact pile driving, and 120 dB behavioral harassment zone for 20% of vibratory pile driving and mechanic

dismantling. Results have been extrapolated in past monitoring reports and will continue to be extrapolated in the future reports. Results of past monitoring reports are discussed later in this notice in the section in Monitoring and reporting. CALTRANS, however, will not monitor the unattenuated impact pile proofing, which only lasts for less than one minute. Proposed proofing of piles will be limited to a maximum of two piles per day, and for less than 1 minute per pile, administering a maximum of twenty blows per pile. CALTRANS states, and NMFS agrees, that the logistics of scheduling and mobilizing a monitoring team for activities that will last less than one minute is not practical.

Comment 2: The Commission noted that each authorization under section 101(a)(5)(D) is a separate undertaking and should contain sufficient information to allow for meaningful public review and comment. The Commission recommended in 2013 that NMFS include in each proposed incidental harassment authorization it publishes in the *Federal Register* a detailed description of the proposed activities rather than referring to previous documents. NMFS agreed and stated that it would provide such detailed descriptions in the *Federal Register* notices moving forward (see 79 FR 2422). However, NMFS' current notice did not include such a description. The Commission again recommends that NMFS include in each proposed incidental harassment authorization published in the *Federal Register* a detailed description of the proposed activities rather than referring to previous documents.

Response 2: The CALTRANS bridge project is a multi-year, multi-stage construction initiative. The schedule and scope of this project have undergone multiple revisions. NMFS felt that it captured the essential elements of what is proposed to occur under the proposed authorization under review. NMFS has added additional information to the Detailed Description

of Activity section of this Federal Register Notice. NMFS will include a comprehensive description of proposed activities in future proposed notices.

Description of Marine Mammals in the Area of the Specified Activity

There are four marine mammal species known to occur in the vicinity of the SF-OBB in California which may be subjected to Level B harassment. These are the Pacific harbor seal, California sea lion, gray whale, and harbor porpoise.

We have reviewed CALTRANS' detailed species descriptions, including life history information, for accuracy and completeness and refer the reader to Section 3 of CALTRANS' application as well as the proposed incidental harassment authorization published in the **Federal Register** (80 FR 23774) instead of reprinting the information here. Please also refer to NMFS' website (*www.nmfs.noaa.gov/pr/species/mammals*) for generalized species accounts which provide information regarding the biology and behavior of the marine resources that occur in SE Alaska. We provided additional information for the potentially affected stocks, including details of stock-wide status, trends, and threats, in our **Federal Register** notice of proposed authorization (80 FR 23774).

Table 1 lists marine mammal stocks that could occur in the vicinity of the SFOBB project that may be subject to Level B harassment and summarizes key information regarding stock status and abundance. Taxonomically, we follow Committee on Taxonomy (2014). Please see NMFS' Stock Assessment Reports (SAR), available at *www.nmfs.noaa.gov/pr/sars*, for more detailed accounts of these stocks' status and abundance.

Table 1. List of Marine Mammal Species under NMFS Jurisdiction that Occur in the Vicinity of SF-OBB Project Area*

Common Name	Stock	Scientific Name	ESA Status	Stock Abundance	Population Trend
Harbor Seal	California	*Phoca vitulina*	Not listed	30,196	Decreasing
California sea lion	United States	*Zalophus californianus*	Not listed	296,750	Increasing
Gray whale	Eastern North Pacific Stock	*Eschrichtius robustus*	Not listed	19,126	Increasing
Harbor porpoise	San Francisco-Russian River	*Phocoena phocoena*	Not listed	9,886	Stable

*Estimated abundance numbers come primarily from NMFS 2014 Pacific Marine Mammal Stock Assessment Report (Carretta et al. 2014).

Potential Effects of the Specified Activity on Marine Mammals

The **Federal Register** notice of proposed authorization (80 FR 23744), incorporated here by reference, provides a general background on sound relevant to the specified activity as well as a detailed description of marine mammal hearing and of the potential effects of these construction activities on marine mammals.

Anticipated Effects on Habitat

We described potential impacts to marine mammal habitat in detail in our **Federal Register** notice of proposed authorization. In summary, the project activities would not modify existing marine mammal habitat. 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; but, because of the short duration of the activities and the relatively small area of the habitat that may be affected, the impacts to marine mammal habitat

are not expected to cause significant or long-term negative consequences for individual marine mammals or their populations

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.

Measurements from similar pile driving events were coupled with practical spreading loss to estimate zones of influence (ZOI; see "Estimated Take by Incidental Harassment"). ZOIs are often used to establish a mitigation zone around each pile (when deemed practicable) to prevent Level A harassment to marine mammals, and also provide estimates of the areas within which Level B harassment might occur. ZOIs may vary between different diameter piles and types of installation methods. CALTRANS will employ the following mitigation measures:

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

(b) For in-water heavy machinery work other than pile driving (using, e.g., standard barges, tug boats, barge-mounted excavators, or clamshell equipment used to place or remove material), if a marine mammal comes within 10 m, operations shall cease and vessels shall

reduce speed to the minimum level required to maintain steerage and safe working conditions. This type of work could include the following activities: (1) movement of the barge to the pile location or (2) positioning of the pile on the substrate via a crane (i.e., stabbing the pile).

Monitoring and Shutdown for Pile Driving

The following measures apply to CALTRANS' mitigation through shutdown and disturbance zones:

Shutdown Zone – For all pile driving activities, CALTRANS will establish shutdown zones in which SPLs equal or exceed the 180/190 dB rms acoustic injury criteria to define the areas where shutdown of activity will occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area), thus preventing injury of marine mammals. For impact driving this is 235 meters. For vibratory driving, CALTRANS's activities are not expected to produce sound at or above the 180 dB rms injury criterion. Before the sizes of actual zones are determined based on hydroacoustic measurements, CALTRANS shall establish this zone based on prior measurements conducted during SF-OBB constructions, as described in Table 1 of this document. CALTRANS will also implement a minimum shutdown zone of 10 m radius for all marine mammals around all vibratory pile driving and removal activity and 100 m radius around any dismantling activity. These precautionary measures are intended to further reduce the unlikely possibility of injury from direct physical interaction with construction operations.

Disturbance Zone – Disturbance zones are the areas in which SPLs equal or exceed 120 dB rms (for continuous sound) for pile driving installation and removal. This is 2,000 meters for vibratory driving and 1,000 meters for impact driving. Disturbance zones provide utility for

monitoring conducted for mitigation purposes (i.e., shutdown zone monitoring) by establishing monitoring protocols for areas adjacent to the shutdown zones. Monitoring of disturbance zones enables observers to be aware of and communicate the presence of marine mammals in the project area but outside the shutdown zone and thus prepare for potential shutdowns of activity. However, the primary purpose of disturbance zone monitoring is for documenting incidents of Level B harassment; disturbance zone monitoring is discussed in greater detail later (see "Monitoring and Reporting"). Nominal radial distances for disturbance zones are shown in Table 1.

Table 1. Temporary exclusion and Level B harassment zones for various pile driving and dismantling activities

Pile Driving / Dismantling Activities	Pile Size (m)	Distance to 120 dB re 1 µPa (rms) (m)	Distance to 160 dB re 1 µPa (rms) (m)	Distance to 180 dB re 1 µPa (rms) (m)	Distance to 190 dB re 1 µPa (rms) (m)
Vibratory Driving	24	2,000	NA	NA	NA
	36	2,000	NA	NA	NA
	Sheet pile	2,000	NA	NA	NA
Attenuated Impact Driving	24	NA	1,000	235	95
	36	NA	1,000	235	95
Unattenuated Proofing	24	NA	1,000	235	95
	36	NA	1,000	235	95
Unattenuated Impact Driving	H-pile	NA	1,000	235	95
Dismantling		2,000	NA	100	100

Once hydroacoustic measurements of pile driving and mechanical dismantling activities have been conducted, CALTRANS shall revise the sizes of the zones based on actual measurements.

Use of Noise Attenuation Devices - To reduce impact on marine mammals, CALTRANS shall use a marine pile driving energy attenuator (i.e., air bubble curtain system), or other equally

effective sound attenuation method (e.g., dewatered cofferdam) for all impact pile driving, with the exception of pile proofing or impact driving of H-piles.

In order to document observed incidents of harassment, observers record all marine mammal observations, regardless of location. The observer's location, as well as the location of the pile being driven, is known from a GPS. The location of the animal is estimated as a distance from the observer, which is then compared to the location from the pile and the estimated ZOIs for relevant activities (i.e., pile installation and removal). This information may then be used to extrapolate observed takes to reach an approximate understanding of actual total takes.

Time Restrictions - Work will occur only during daylight hours, when visual monitoring of marine mammals can be conducted. In addition, all in-water construction will be limited to the period between July 15, 2015 and July 14, 2016.

Soft Start - The use of a soft start procedure is believed to provide additional protection to marine mammals by warning or providing a chance to leave the area prior to the hammer operating at full capacity, and typically involves a requirement to initiate sound from the hammer at reduced energy followed by a waiting period. This procedure is repeated two additional times. It is difficult to specify the reduction in energy for any given hammer because of variation across drivers and, for impact hammers, the actual number of strikes at reduced energy will vary because operating the hammer at less than full power results in "bouncing" of the hammer as it strikes the pile, resulting in multiple "strikes." The project will utilize soft start techniques for both impact and vibratory pile driving. We require CALTRANS to initiate sound from vibratory hammers for fifteen seconds at reduced energy followed by a thirty-second waiting period, with the procedure repeated two additional times. For impact driving, we require an initial set of three strikes from the impact hammer at reduced energy, followed by a thirty-second waiting period,

then two subsequent three strike sets. Soft start will be required at the beginning of each day's pile driving work and at any time following a cessation of pile driving of 20 minutes or longer (specific to either vibratory or impact driving).

Power Down and Shut-down - Although power down and shut-down measures will not be required for impact pile driving and removal activities due to the nature of sediments in the Bay, these measures will be required for mechanical dismantling activities. The contractor performing mechanical dismantling work will stop in-water noise generation.

Monitoring

Monitoring Protocols – Monitoring would be conducted before, during, and after pile driving, pile and mechanical dismantling. In addition, observers shall record all incidents of marine mammal occurrence, regardless of distance from activity, and shall document any behavioral reactions in concert with distance from piles being driven. Observations made outside the shutdown zone will not result in shutdown and that pile segment would be completed without cessation, unless the animal approaches or enters the shutdown zone, at which point all pile driving activities would be halted, except in the case of impact driving when driving will be allowed to continue. Monitoring will take place from thirty minutes prior to initiation through thirty minutes post-completion of pile driving activities. Pile driving activities include the time to remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than thirty minutes.

The following additional measures apply to visual monitoring:

(1) Monitoring will be conducted by qualified observers, who will be placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown/delay

procedures when applicable by calling for the shutdown to the hammer operator. Qualified observers are trained biologists, with the following minimum qualifications:

(a) Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance; use of binoculars may be necessary to correctly identify the target;

(b) Advanced education in biological science or related field (undergraduate degree or higher required);

(c) Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience);

(d) Experience or training in the field identification of marine mammals, including the identification of behaviors;

(e) Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;

(f) Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates and times when in-water construction activities were suspended to avoid potential incidental injury from construction sound of marine mammals observed within a defined shutdown zone; and marine mammal behavior; and

(g) Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

(2) Prior to the start of pile driving activity, the shutdown zone will be monitored for 30 minutes to ensure that it is clear of marine mammals. Pile driving will only commence once observers have declared the shutdown zone clear of marine mammals; animals will be allowed to

remain in the shutdown zone (i.e., must leave of their own volition) and their behavior will be monitored and documented. The shutdown zone may only be declared clear, and pile driving started, when the entire shutdown zone is visible (i.e., when not obscured by dark, rain, fog, etc.).

If a marine mammal approaches or enters the shutdown zone during the course of vibratory pile driving operations, activity will be halted and delayed until he animal has voluntarily left and been visually confirmed beyond the shutdown zone. If a marine mammal is seen above water and then dives below, the contractor would wait 15 minutes for pinnipeds and harbor porpoise and 30 minutes for gray whale. If no marine mammals are seen by the observer in that time it will be assumed that the animal has moved beyond the exclusion zone.

Monitoring will be conducted throughout the time required to drive a pile. In impact driving situations, once the pile driving of a segment begins it will not be stopped until that segment has reached its predetermined depth due to the nature of the sediments underlying the Bay. If impact pile driving were to stop and then resumes, it would potentially have to occur for a longer time and at increased energy levels. If marine mammals enter the safety zone after pile driving of a segment has begun, pile driving will continue and marine mammal observers will monitor and record marine mammal numbers and behavior.

(3) The area within the Level B harassment zone shall be conducted by a minimum of three qualified NMFS-approved marine mammal observers (MMOs) placed in strategic locations that will afford visual coverage of these zones. Observers may be stationed on boats, Yerba Buena Island and/or Treasure Island, the new bridge or construction barges. Marine mammal presence within the Level B harassment zone will be monitored, but vibratory and impact pile driving as well as dismantling activity will not be stopped if marine mammals are found to be present. Any marine mammal documented within the Level B harassment zone during vibratory

and impact driving or mechanical dismantling activities would constitute a Level B take (harassment), and will be recorded and reported as such.

Mitigation Conclusions

We have carefully evaluated CALTRANS' proposed mitigation measures and considered their effectiveness in past implementation to determine whether they are likely to effect the least practicable impact on the affected marine mammal species and stocks and their habitat. Our evaluation of potential measures included consideration of the following factors in relation to one another: (1) the manner in which, and the degree to which, the successful implementation of the measure is expected to minimize adverse impacts to marine mammals, (2) the proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and (3) the practicability of the measure for applicant implementation.

Any mitigation measure(s) we prescribe should be able to accomplish, have a reasonable likelihood of accomplishing (based on current science), or contribute to the accomplishment of one or more of the general goals listed below:

(1) Avoidance or minimization of injury or death of marine mammals wherever possible (goals 2, 3, and 4 may contribute to this goal).

(2) A reduction in the number (total number or number at biologically important time or location) of individual marine mammals exposed to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing takes by behavioral harassment only).

(3) A reduction in the number (total number or number at biologically important time or location) of times any individual marine mammal would be exposed to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing takes by behavioral harassment only).

(4) A reduction in the intensity of exposure to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing the severity of behavioral harassment only).

(5) Avoidance or minimization of adverse effects to marine mammal habitat, paying particular attention to the prey base, blockage or limitation of passage to or from biologically important areas, permanent destruction of habitat, or temporary disturbance of habitat during a biologically important time.

(6) For monitoring directly related to mitigation, an increase in the probability of detecting marine mammals, thus allowing for more effective implementation of the mitigation.

Based on our evaluation of CALTRANS' proposed measures, including information from monitoring of implementation of mitigation measures very similar to those described here under previous IHAs from other marine construction projects, we have determined that the proposed mitigation measures provide the means of effecting the least practicable impact on marine mammal 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 incidental take authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of

taking or impacts on populations of marine mammals that are expected to be present in the proposed action area.

Any monitoring requirement we prescribe should improve our understanding of one or more of the following:

(1) An increase in the probability of detecting marine mammals, both within the mitigation zone (thus allowing for more effective implementation of the mitigation) and in general to generate more data to contribute to the analyses mentioned below;

(2) An increase in our understanding of how many marine mammals are likely to be exposed to levels of pile driving that we associate with specific adverse effects, such as behavioral harassment, TTS, or PTS;

(3) An increase in our understanding of how marine mammals respond to stimuli expected to result in take and how anticipated adverse effects on individuals (in different ways and to varying degrees) may impact the population, species, or stock (specifically through effects on annual rates of recruitment or survival) through any of the following methods:

- Behavioral observations in the presence of stimuli compared to observations in the absence of stimuli (need to be able to accurately predict received level, distance from source, and other pertinent information);
- Physiological measurements in the presence of stimuli compared to observations in the absence of stimuli (need to be able to accurately predict received level, distance from source, and other pertinent information);

- Distribution and/or abundance comparisons in times or areas with concentrated stimuli versus times or areas without stimuli;

(4) An increased knowledge of the affected species; and

(5) An increase in our understanding of the effectiveness of certain mitigation and monitoring measures.

CALTRANS has submitted monitoring reports for each of the IHAs that have been issued to them for this project. NMFS received the most recent report on April 28, 2015 covering the IHA issued for the period between January 8, 2014 and January 7, 2015. CALTRANS observed all required monitoring and mitigation protocols during this period. Recorded takes were below permitted levels for all species except for harbor seals. After extrapolating observed numbers during 30 percent of driving activities, CALTRANS determined that 130 harbor seals were taken. This exceeded the allowable take limit of 50 stated in the IHA. CALTRANS reported that most of these seals were within the ZOI in Coast Guard Cove and Clipper Cove north of Yurba Buena Island (YBI) as well as an area 200-400 m off the southeast shore of YBI. Most seals appeared to be foraging and none showed any response to pile driving noise and continued to forage in those areas for up to several hours during pile driving. Based on the high number of harbor seal takes recorded, CALTRANS has requested an increase in takes under the IHA discussed in this Federal Register Notice. NMFS has approved an increase in harbor seal takes, which is discussed in a following section.

CALTRANS consulted with NMFS to create a marine mammal monitoring plan as part of the IHA application for this project.

Visual Marine Mammal Observations

- CALTRANS will implement onsite marine mammal monitoring for 100% of all unattenuated impact pile driving of H-piles for 180- and 190-dB re 1 µPa exclusion zones (235 meter radius) and 160-dB re 1 µPa Level B harassment zone, attenuated impact pile driving (except pile proofing) and mechanical dismantling for 180- and 190-dB re 1 µPa exclusion zones. CALTRANS will also monitor 20% of the attenuated impact pile driving for the 160-dB re 1 µPa Level B harassment zone (1,000 meter radius), and 20% of vibratory pile driving and mechanic dismantling for the 120-dB re 1 µPa Level B harassment zone (2,000 meter radius).
- Three individuals meeting the minimum qualification previously identified will monitor the Level A and B harassment zones during impact pile driving and the Level B harassment zone during vibratory pile driving and dismantling. Monitors may be stationed on boats, Yerba Buena Island and/or Treasure Island, the new bridge or construction barges.
- During impact pile driving, the area within 235 meters of pile driving activity will be monitored and maintained as marine mammal buffer area in which pile installation will not commence if any marine mammals are observed within or approaching the area of potential disturbance. If a marine mammal approaches or appears within the zone, pile driving of a segment will continue until that segment has reached its predetermined depth due to the nature of the sediments underlying the Bay.
- The area within the Level B harassment threshold for impact driving will be monitored by three field monitors stationed in a positon permitting visual access to the 1,000 meter limit of the Level B harassment zone. Marine mammal presence within this Level B harassment zone, if any, will be monitored, but impact pile driving activity will not be

stopped if marine mammals are found to be present. Any marine mammal documented within the Level B harassment zone during impact driving would constitute a Level B take (harassment), and will be recorded and reported as such.

- During vibratory pile driving, the area within 10 meters of pile driving activity will be monitored and maintained as a marine mammal buffer area in which pile installation will not commence or will be suspended temporarily if any marine mammals are observed within or approaching the area of potential disturbance. The Level B harassment area with a 2,000 meter radius will be monitored by three qualified observers stationed at strategic locations that provide adequate visual coverage of the disturbance zone. The monitoring staff will record any presence of marine mammals by species, will document any behavioral responses noted, and record Level B takes when sightings overlap with pile installation activities.
- During mechanical dismantling activities a 100 meters radius will be monitored and maintained as a marine mammal buffer area in which pile installation will not commence or will be suspended temporarily if any marine mammals are observed within or approaching the area.
- The individuals will scan the waters within each monitoring zone activity using binoculars (Vector 10X42 or equivalent), spotting scopes (Swarovski 20-60 zoom or equivalent), and visual observation.
- The area within which the Level B harassment thresholds could be exceeded during impact pile driving and vibratory pile driving will be monitored for the presence of marine mammals during all impact and vibratory pile driving. Marine mammal presence within these zones, if any, will be monitored but pile driving activity will not be stopped

if marine mammals were found to be present. Any marine mammal documented within the Level B harassment zone will constitute a Level B take, and will be recorded and used to document the number of take incidents.

- If waters exceed a sea-state which restricts the observers' ability to make observations within the marine mammal buffer zone (the 235 meter radius) (e.g. excessive wind or fog), impact pile installation will cease until conditions allow the resumption of monitoring.
- The waters will be scanned for 30 minutes before, during, and 30 minutes after any and all pile driving and removal activities.
- If marine mammals enter or are observed within the designated marine mammal buffer zone (the 235m radius) during or 30 minutes prior to pile driving, the monitors will notify the on-site construction manager to not begin until the animal has moved outside the designated radius.
- If a marine mammal approaches the Level A harassment zone prior to initiation of pile driving, CALTRANS cannot commence activities until the marine mammal (a) is observed to have left the Level A harassment zone or (b) has not been seen or otherwise detected within the Level A harassment zone for 30 minutes.
- The waters will continue to be scanned for at least 30 minutes after pile driving has completed each day, and after each stoppage of 30 minutes or greater.

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 incidents 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 distance from pile driving activity;
- Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
- Locations of all marine mammal observations; and
- Other human activity in the area.

Reporting

CALTRANS will notify NMFS prior to the initiation of the pile driving and dismantling activities for the removal of the existing east span. NMFS will be informed of the initial sound pressure level measurements for both pile driving and foundation dismantling activities,

including the final exclusion zone and Level B harassment zone radii established for impact and vibratory pile driving and marine foundation dismantling activities.

Monitoring reports will be posted on the SF-OBB Project's biological mitigation website (*www.biomitigation.org*) on a weekly basis if in-water construction activities are conducted. Marine mammal monitoring reports will include species and numbers of marine mammals observed, time and location of observation and behavior of the animal. In addition, the reports will include an estimate of the number and species of marine mammals that may have been harassed as a result of activities.

CALTRANS will provide NMFS with a draft monitoring report within 90 days of the conclusion of the proposed construction work. This report will detail the monitoring protocol, summarize the data recorded during monitoring, and estimate the number of marine mammals that may have been harassed. If no comments are received from NMFS within 30 days, the draft final report will constitute the final report. If comments are received, a final report must be submitted within 30 days after receipt of comments.

Estimated Take by Incidental Harassment

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]."

All anticipated takes would be by Level B harassment resulting from impact and vibratory pile driving/removal and involving temporary changes in behavior. Injurious or lethal takes are not expected due to the expected source levels and sound source characteristics associated with the activity, and the planned mitigation and monitoring measures are expected to further minimize the possibility of such take.

Given the many uncertainties in predicting the quantity and types of impacts of sound in every given situation on marine mammals, it is common practice to estimate how many animals are likely to be present within a particular distance of a given activity, or exposed to a particular level of sound, based on the available science.

This practice potentially overestimates the numbers of marine mammals taken for stationary activities, as it is likely that some smaller number of individuals may accrue a number of incidences of harassment per individual than for each incidence to accrue to a new individual, especially if those individuals display some degree of residency or site fidelity and the impetus to use the site (e.g., because of foraging opportunities) is stronger than the deterrence presented by the harassing activity.

CALTRANS has requested authorization for the incidental taking of small numbers of California sea lions (*Zalophus californianus*), Pacific harbor seals (*Phoca vitulina richardsii*), harbor porpoises (*Phocoena phocoena*), and gray whales (*Eschrichtius robustus*) incidental to construction associated with a replacement bridge for the East Span of the SF-OBB, in San Francisco Bay (SFB, or Bay), California.

In order to estimate the potential incidents of take that may occur incidental to the specified activity, we must first estimate the extent of the sound field that may be produced by the activity and then consider in combination with information about marine mammal density or

abundance in the project area. We provided detailed information on applicable sound thresholds for determining effects to marine mammals as well as describing the information used in estimating the sound fields, the available marine mammal density or abundance information, and the method of estimating potential incidences of take, in our **Federal Register** notice of proposed authorization (80 FR 23744; March 20, 2015).

Table 1 illustrated the 190 dB rms Level A harassment (injury) threshold for underwater noise for pinniped species could be exceeded at a distance of up to approximately 95 meters during impact pile driving activities, and the 180 dB rms Level A harassment (injury) threshold for cetacean species could be exceeded at a distance of up to approximately 235 meters during impact pile driving activities. Additionally, the 160 dB rms Level B harassment (behavioral disruption) threshold for impulsive source underwater noise for pinniped and cetacean species could be exceeded at a distance of up to approximately 1,000 meters during impact pile driving and the 120 dB Level B harassment threshold could be exceeded at 2,000 meters. Note that the actual area insonified by pile driving activities is significantly constrained by local topography relative to the identified threshold radii.

Marine mammal density estimates were based on marine mammal monitoring reports and marine mammal observations made during pile driving activities associated with the SF-OBB construction work authorized under prior IHAs. Pacific harbor seal densities were calculated and described in the **Federal Register** notice of proposed authorization (80 FR 23744; March 20, 2015). During monitoring for the East Span of the SF-OBB, there were 657 observations of harbor seals made during over 210 days from 2000 to 2014. Two densities were calculated because of the higher density of seals observed foraging near YBI and Treasure Island. Foraging seals tended to remain in the area for several hours while transiting seals passing under the

SFOBB were only observed 1-2 times. Therefore, densities east of Pier E3-E8 are much lower than the density than west of Pier E3.

The area of 2,000-meter threshold for the Level B behavioral harassment zone is 12.57 km^2 (12,570,000 m^2). Half of that area to the west of Piers E3-E8 (6.29 km^2) would have a higher density of harbor seals which are frequently observed in the three foraging areas. The range of seals observed within the foraging areas is 0-8 seals and the mean is 3.6 seals per day (combined for all three areas). The other half of the Level B harassment zone would have a lower density due to the infrequent observations of seals moving through the area. In addition the density of seals will vary with season therefore a density for the spring-summer season when seals spend more time onshore as they are pupping and molting and the fall/winter season.

This estimate of 460 harbor seal takes is above the number of seals that have been permitted for take in previous IHAs that have been issued related to this project. However, the estimate presented here represents a more complete picture of the marine mammal density in the project area and the potential for exposure to project activities.

California sea lions are based on CALTRANS observations over 15 years of monitoring on the Bay Bridge, 2000 to 2014, including baseline monitoring in 2003 before bridge construction began. It should be noted that monitoring was not year round and there was little monitoring required during the period of mid-2010 to mid-2013 due to no pile driving. During 2013 and 2014, there was a large increase in pile driving to construct temporary falsework and for mechanical dismantling so the current estimates of animals do include recent monitoring. California sea lion numbers fluctuate from year to year. For example, in 2014 no sea lions were observed in the harassment zone while in 2004, 36 sea lions were recorded near the Bay Bridge construction areas during pile driving. The larger number of sea lions in 2004 was probably

related to a run of herring that was near the Bay Bridge and sea lions were observed feeding on dense aggregations of herring in the area. Therefore, an allowed take 50 sea lions is considered a conservative estimate.

Harbor porpoises were observed near the tower of the new Bay Bridge in 2013 and 2014. Each of those was a single animal and far out of their normal range for the Bay. If 1 or 2 pods of porpoises were to enter the construction area, then there might be up to 6 takes (pod size of 2-3 porpoises). Based on this NMFS believes that an allowed take of up to 10 harbor porpoises is conservative, but reasonable.

Gray whale take estimates were based on sighting reports collected by the Marine Mammal Center in Sausalito (the NMFS stranding facility for northern California). The Center collects whale sightings information from the general public, researchers, and the US Coast Guard. For the gray whale, 5 permitted takes is likely to be a conservative, but reasonable, estimate as they have never been observed within any of the behavioral zones during monitoring. Additionally, there has only been one report of a gray whale swimming under the original East Span of the Bay Bridge a number of years ago.

Based on these results, and accounting for a certain level of uncertainty regarding the next phase of construction, NMFS concludes that at maximum 460 harbor seals, 50 California sea lions, 10 harbor porpoises, and 5 gray whales could be exposed to noise levels that could cause Level B harassment as a result of the CALTRAN' SF-OBB construction activities. These numbers represent 1.5%, <0.01%, <0.01% and 0.10% of the California stock harbor seal, the U.S. stock California sea lion, the Eastern North Pacific stock gray whale, and the San Francisco-Russian River stock harbor porpoise, respectively (Table 2).

Table 2. Estimates of the possible maximum numbers of marine mammals taken by Level B harassment as a result of the proposed CALTRANS' SF-OBB construction activities

Species	Stocks	Level B takes	Percent population
Pinnipeds			
Harbor seal	California	460	1.5%
California sea lion	U.S.	50	<0.01%
Cetaceans			
Gray whale	Eastern North Pacific	5	<0.01%
Harbor porpoise	San Francisco-Russian River	10	0.10%

Analyses and Determinations

Negligible Impact Analysis

Negligible impact is "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 Level B harassment 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 behavioral harassment, NMFS must consider other factors, such as the likely nature of any responses (their intensity, duration, etc.), the context of any responses (critical reproductive time or location, migration, etc.), as well as the number and nature of estimated Level A harassment takes, the number of estimated mortalities, effects on habitat, and the status of the species.

To avoid repetition, the discussion of our analyses applies to all the species listed in Table 2, given that the anticipated effects of this pile driving project on marine mammals are expected to be relatively similar in nature. There is no information about the size, status, or structure of any species or stock that would lead to a different analysis for this activity.

Pile driving, pile removal and mechanical dismantling activities associated with the construction of a replacement bridge for the East Span of the SF-OBB, 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 (behavioral disturbance) only, from underwater sounds generated from pile driving. Potential takes could occur if individuals of these species are present in the ensonified zone when pile driving and removal are happening.

No injury, serious injury, or mortality is anticipated given the nature of the activity and measures designed to minimize the possibility of injury to marine mammals. The known potential for serious injury or mortality is minimized through the construction method and the implementation of the planned mitigation measures. Both vibratory hammers and impact hammers will be utilized based on local substrate conditions. Vibratory driving will be used wherever conditions are favorable for this technique. Vibratory driving does not have significant potential to cause injury to marine mammals due to the relatively low source levels produced and the lack of potentially injurious source characteristics. Impact pile driving produces short, sharp pulses with higher peak levels and much sharper rise time to reach those peaks. When impact driving is necessary, required measures (implementation of shutdown zones) significantly reduce 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 its becoming potentially injurious. The likelihood that marine mammal detection ability by trained observers is high under the environmental conditions described for this area of San Francisco Bay further enables the implementation of shutdowns to avoid injury, serious injury, or mortality.

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 reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (e.g., Thorson and Reyff, 2006; HDR, 2012; Lerma, 2014). Most likely, individuals will simply move away from the sound source and be temporarily displaced from the areas of pile driving, although even this reaction has been observed primarily only in association with impact pile driving. In response to vibratory driving, pinnipeds (which may become somewhat habituated to human activity in industrial or urban waterways) have been observed to orient towards and sometimes move towards the sound. The pile driving activities analyzed here are similar to, or less impactful than, numerous construction activities conducted in other similar locations, which have taken place with no reported injuries or mortality to marine mammals, and no known long-term adverse consequences from behavioral harassment. Repeated exposures of individuals to levels of sound that may cause Level B harassment are unlikely to result in hearing impairment or to significantly disrupt foraging behavior. Thus, even repeated Level B harassment of some small subset of the overall stock is unlikely to result in any significant realized decrease in fitness for the affected individuals, and thus would not result in any adverse impact to the stock as a whole. Level B harassment will be reduced to the level of least practicable impact through use of mitigation measures described herein and, if sound produced by project activities is sufficiently disturbing, animals are likely to simply avoid the project area while the activity is occurring.

CALTRANS' proposed activities are localized and of short duration. The entire project area is limited to the East Span of the bridge and its immediate surroundings. The project will require the installation of a total of approximately 200 piles. Impact driving of pipe piles will be

limited to a maximum of 20 piles per day and proofing of the pipe piles will not exceed a maximum of 2 piles per day—each pile would be driven with no more than 20 blows during a one-minute period. Total hammer time is scheduled to occur over 128 days between July 15, 2015 and July 14, 2016. These localized and short-term noise exposures may cause brief startle reactions or short-term behavioral modification by the animals. These reactions and behavioral changes are expected to subside quickly when the exposures cease. Moreover, the proposed mitigation and monitoring measures are expected to reduce potential exposures and behavioral modifications even further. Additionally, no important feeding and/or reproductive areas for marine mammals are known to be near the proposed action area. Therefore, the take resulting from this CALTRANS project is not reasonably expected to and is not reasonably likely to adversely affect the marine mammal species or stocks through effects on annual rates of recruitment or survival and, therefore, will have a negligible impact on the affected species or stocks.

The project also is not expected to have significant adverse effects on affected marine mammals' habitat, as analyzed in detail in the "Anticipated Effects on Marine Mammal Habitat" section. The project activities would not modify existing marine mammal habitat. 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; but, because of the short duration of the activities and the relatively small area of the habitat that may be affected, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

In summary, this negligible impact analysis is founded on the following factors: (1) the possibility of injury, serious injury, or mortality may reasonably be considered discountable; (2)

the anticipated incidents of Level B harassment consist of, at worst, temporary modifications in behavior with no significant adverse impacts on habitat and; (3) the presumed efficacy of the proposed mitigation measures in reducing the effects of the specified activity to the level of least practicable impact. In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activity will have only short-term effects on individuals. The specified activity is not expected to impact rates of recruitment or survival and will therefore not result in population-level impacts.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the proposed monitoring and mitigation measures, NMFS finds that the total marine mammal take from CALTRANS' construction of a replacement bridge for the East Span of the SF-OBB will have a negligible impact on the affected marine mammal species or stocks.

Small Numbers Analysis

Table 2 demonstrates the number of animals that could be exposed to received noise levels that could cause Level B behavioral harassment for the proposed work associated with the replacement bridge construction. These numbers represent 1.5%, <0.01%, <0.01% and 0.10% of the California stock harbor seal, the U.S. stock California sea lion, the Eastern North Pacific stock gray whale, and the San Francisco-Russian River stock harbor porpoise, respectively (Table 3).

The numbers of animals authorized to be taken for all species are small relative to the relevant stocks or populations even if each estimated taking occurred to a new individual – an extremely unlikely scenario. For pinnipeds occurring in the vicinity of the SF-OBB project, there will almost certainly be some overlap in individuals present day-to-day, and these takes are

likely to occur only within some small portion of the overall regional stock, such as the number of harbor seals that regularly use nearby haul-out rocks.

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 mitigation and monitoring measures, which are expected to reduce the number of marine mammals potentially affected by the proposed action, NMFS finds that small numbers of marine mammals will be taken relative to the populations of the affected species or stocks.

Impact on Availability of Affected Species for Taking for Subsistence Uses

There are no subsistence uses of marine mammals in the proposed project area; and, thus, no subsistence uses impacted by this action.

Endangered Species Act (ESA)

No marine mammal species listed under the ESA are expected to be affected by these activities. Therefore, we have determined that a section 7 consultation under the ESA is not required.

National Environmental Policy Act (NEPA)

NMFS' prepared an Environmental Assessment (EA) for the take of marine mammals incidental to construction of the East Span of the SF-OBB and made a Finding of No Significant Impact (FONSI) on November 4, 2003. Due to the modification of part of the construction project and the mitigation measures, NMFS reviewed additional information from CALTRANS regarding empirical measurements of pile driving noises for the smaller temporary piles without an air bubble curtain system and the use of vibratory pile driving. NMFS prepared a Supplemental Environmental Assessment (SEA) and analyzed the potential impacts to marine

mammals that would result from the modification of the action. A Finding of No Significant Impact (FONSI) was signed on August 5, 2009. A copy of the SEA and FONSI is available upon request

Authorization

As a result of these determinations, we have issued an IHA to CALTRANS for conducting the described activities related to the construction of the East Span of the San Francisco-Oakland Bay Bridge, from July 15, 2015 through July 14, 2016 provided the previously described mitigation, monitoring, and reporting requirements are incorporated.

Dated: July 16, 2015.

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Perry Gayaldo,

Deputy Director,

Office of Protected Resources,

National Marine Fisheries Service.

[FR Doc. 2015-18021 Filed: 7/22/2015 08:45 am; Publication Date: 7/23/2015]