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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XC622

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to a Pier Replacement Project

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 the U.S. Navy (Navy) to incidentally harass, by Level B harassment only, four species of marine mammals during construction activities associated with a pier replacement project in San Diego Bay, California.

DATES: This authorization is effective from September 1, 2013, through August 31, 2014.

ADDRESSES: A copy of the IHA and related documents may be obtained by visiting the internet at: http://www.nmfs.noaa.gov/pr/permits/incidental.htm or by writing to Michael Payne, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East West Highway, Silver Spring, MD 20910. A memorandum describing our adoption of the Navy's Environmental Assessment (2013) and our associated Finding of No Significant Impact, prepared pursuant to the National Environmental Policy Act, are also available at the same site. Documents cited in this notice may also be viewed, by appointment, during regular business hours, at the aforementioned address.

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

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 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

We received an application on September 24, 2012, from the Navy for the taking of marine mammals incidental to pile driving and removal in association with a pier replacement project in San Diego Bay at Naval Base Point Loma in San Diego, CA (NBPL). The Navy submitted a revised version of the application on November 15, 2013, which we deemed adequate and complete, and submitted additional revisions on December 20, 2012, and April 22, 2013. The pier replacement project is a multi-year project; this IHA would cover only the first year of the project, from September 1, 2013, through August 31, 2014. Four species of marine mammals are expected to occur in the vicinity of the project during all or a portion of the project duration: California sea lion (Zalophus californianus californianus), harbor seal (Phoca vitulina richardii), bottlenose dolphin (Tursiops truncatus truncatus), and gray whale (Eschrichtius robustus). California sea lions are present year-round and are common in the project area, while bottlenose dolphins may be present year-round but sightings are highly variable in Navy marine mammal surveys of northern San Diego Bay. Harbor seals have limited occurrence in the project area. Gray whales may be observed in San Diego Bay sporadically during migration periods.

NBPL provides berthing and support services for Navy submarines and other fleet assets. The existing fuel pier serves as a fuel depot for loading and unloading tankers and Navy

underway replenishment vessels that refuel ships at sea ("oilers"), as well as transferring fuel to local replenishment vessels and other small craft operating in San Diego Bay, and is the only active Navy fueling facility in southern California. Portions of the pier are over one hundred years old, while the newer segment was constructed in 1942. The pier as a whole is significantly past its design service life and does not meet current construction standards.

Demolition and construction will occur in two phases to maintain the fueling capabilities of the existing fuel pier while the new pier is being constructed. The total duration of demolition/construction is estimated to be approximately four years (2013-17). During the first year of construction (the specified activity considered under this IHA), approximately 120 piles (including 18-in concrete and 36 to 48-in steel) will be installed and 109 piles will be removed (via multiple methods). All steel piles will be driven with a vibratory hammer for their initial embedment depths and finished with an impact hammer for proofing, as necessary.

For pile driving activities, the Navy used NMFS-promulgated thresholds for assessing project impacts, outlined later in this document. The Navy used a site-specific model for transmission loss and empirically-measured source levels from other 36-72 in diameter pile driving events to estimate potential marine mammal exposures. Predicted exposures are outlined later in this document.

Description of the Specified Activity

NBPL is located on the peninsula of Point Loma near the mouth and along the northern edge of San Diego Bay (see Figures 1-1 and 1-2 in the Navy's application). The specified activities with the potential to cause harassment of marine mammals within the waterways adjacent to NBPL, under the MMPA, are vibratory and impact pile driving and removal of piles via vibratory driver or pneumatic chipper associated with the pier replacement project and

associated projects. The entire project is scheduled to occur from 2013-17; the specified activities for which incidental take is authorized by this IHA will occur for one year from September 1, 2013. Under the terms of a memorandum of understanding between the Navy and the U.S. Fish and Wildlife Service, all noise- and turbidity-producing in-water activities in designated least tern foraging habitat are to be avoided during the period when least terns are present and engaged in nesting and foraging. Therefore, all in-water construction activities will occur during a window from approximately September 15 through April 1. Additional details regarding the specified geographic area and construction plans for the project were described in our Federal Register notice of proposed authorization (78 FR 30873; May 23, 2013; hereafter, the FR notice); please see that document or the Navy's application for more information.

The fuel pier replacement will consist of concurrent demolition of the old pier and construction of the new pier, such that fueling capabilities are maintained, as well as (1) temporary relocation of the Navy Marine Mammal Program (MMP); (2) temporary relocation of the Everingham Brothers San Diego Bay Bait Barge facility; and (3) dredging and sediment disposal. The bait barge facility is being moved during the project because it is a primary attractant of California sea lions to the project area and the relocation may be expected to reduce the number of sea lions exposed to noise levels constituting harassment under the MMPA. Dredging and sediment disposal are not considered to have significant impacts under the MMPA and are not considered as part of the specified activities described herein and in the FR notice. Pier demolition and construction and relocation of the MMP will require impact and vibratory pile driving. See Table 1-1 in the Navy's application for a complete construction phase summary.

For the entire project, approximately 1,500 piles and caissons of various materials will be removed. There are multiple methods for pile removal, including dry pulling, cutting at the

mudline, jetting, and vibratory removal. The majority of these methods do not produce significant levels of underwater sound; however, a vibratory hammer or pneumatic chipper may be required for certain piles. For the replacement pier structure, approximately 554 total piles will be installed, including steel and concrete piles of various sizes. For steel piles, vibratory driving is the preferred method of installation and will be used to drive the pile to refusal. The impact hammer may then be used for proofing or until the pile meets structural requirements. The concrete piles will first be jetted, a process wherein pressurized air or water jets are applied at the tip of the pile to loosen the substrate and allow the pile to sink vertically, before being driven the last few feet with the impact hammer. The fiberglass piles do not need to be embedded very deeply into the subsurface so will be impact-driven for the entire length. In all cases, impact driving will be minimized.

Initial pile driving will be conducted as part of an Indicator Pile Program (IPP), designed to validate the length of pile required and the method of installation (vibratory and impact). Approximately twelve steel pipe piles (36- and 48-in diameter, exact mix to be determined later) will be driven in the new pier alignment to verify the driving conditions and establish the final driving lengths prior to fabrication of the final production piles that will be used to construct the new pier. In addition, the IPP will validate the acoustics modeling used by the Navy to estimate incidental take levels. Table 1-4 in the Navy's application summarizes the total piles that would be installed over the life of the project.

The specified activity for the one-year period of this IHA includes pile driving associated with relocation of the MMP, pile driving associated with the IPP and construction of a temporary mooring dolphin, and beginning of construction of the new pier structure. In addition, pile removal associated with demolition of the old structure will begin. These activities are detailed

in Table 1. The majority of pile removal will likely not require the use of vibratory extraction and/or pneumatic chipping, and these methods are included here as contingency in the event other methods of extraction are not successful.

Activity	Timing (days)	Pile type	Number piles
MMP relocation (at NMAWC)	Sep-Oct 2013 (16)	18-in square concrete	50
Indicator Pile Program	Mar 2014 (17)	36- and 48-in steel pipe	12
Temporary mooring dolphin	Mar 2014 (5)	36-in steel pipe	16
Abutment pile driving	Mar-Apr 2014 (13)	48-in steel pipe	24
Structural pile driving	Mar-Apr 2014 (15)	36- and 48-in steel pipe	26
Total installed			**128**
Pile removal[1]	Mar-Sep 2014	16- and 24-in square concrete	18
Pile removal[1]	Mar-Sep 2014	12-in timber	91

Table 1. Specified activity summary (2013-14)

[1]Pile removal schedule is notional and is dependent on contractor workload and timing of in-water work shutdown in spring 2014. Removals using no-impact methods (e.g., dry pull) may continue outside the in-water work window or would resume under the period of subsequent IHAs (i.e., September 2014).

The analysis contained herein is based upon the specified work schedule. During the first year of work, approximately 66 non-overlapping days of pile driving are expected to occur in the episodes described in Table 1. Approximately 84 days of demolition work are expected, beginning in March 2014. The majority of these 84 days will involve above-water work or other no-impact methods and will not impact marine mammals; the Navy assumes that approximately one quarter of the days (21 days) might involve methods that could cause disturbance to marine mammals.

Description of Sound Sources and Distances to Thresholds

An in-depth description of sound sources in general was provided in the FR notice (78 FR 30873; May 23, 2013). Significant sound-producing in-water construction activities associated with the project include impact and vibratory pile driving and vibratory pile removal.

NMFS uses generic sound exposure thresholds to determine when an activity that produces sound might result in impacts to a marine mammal such that a take by harassment

might occur. To date, no studies have been conducted that examine impacts to marine mammals from pile driving sounds from which empirical sound thresholds have been established. Current NMFS practice (in relation to the MMPA) regarding exposure of marine mammals to sound is that cetaceans and pinnipeds exposed to sound levels of 180 and 190 dB root mean square (rms; note that all underwater sound levels in this document are referenced to a pressure of 1 μPa) or above, respectively, are considered to have been taken by Level A (i.e., injurious) harassment, while behavioral harassment (Level B) is considered to have occurred when marine mammals are exposed to sounds at or above 120 dB rms for continuous sound (such as will be produced by vibratory pile driving) and 160 dB rms for pulsed sound (produced by impact pile driving), but below injurious thresholds. For airborne sound, pinniped disturbance from haul-outs has been documented at 100 dB (unweighted) for pinnipeds in general, and at 90 dB (unweighted) for harbor seals (note that all airborne sound levels in this document are referenced to a pressure of 20 μPa). NMFS uses these levels as guidelines to estimate when harassment may occur. NMFS is currently revising these acoustic guidelines. For more information on that process, please visit http://www.nmfs.noaa.gov/pr/acoustics/guidelines.htm.

Distance to Sound Thresholds

Pile driving generates underwater noise that can potentially result in disturbance to marine mammals in the project area. Please see the FR notice (78 FR 30873; May 23, 2013) for a detailed description of the calculations and information used to estimate distances to relevant threshold levels. In general, the sound pressure level (SPL) at some distance away from the source (e.g., driven pile) is governed by a measured source level, minus the transmission loss of the energy as it dissipates with distance. Transmission loss – the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source – was modeled specifically for the

project site on the basis of historical temperature-salinity data and location-dependent bathymetry. In the model, TL is the same for different sound source levels and is applied to each of the different activities to determine the point at which the applicable thresholds are reached as a function of distance from the source. The model's predictions result in a slightly lower average rate of TL than practical spreading, and hence are conservative. Because the model is specific to the project area around the fuel pier site, practical spreading loss was assumed in modeling sound propagation for pile driving at the relocation site for the Navy Marine Mammal Program facility. The practical spreading model follows a geometric propagation loss based on the distance from the pile, resulting in a 4.5 dB reduction in level for each doubling of distance from the source.

The intensity of pile driving sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity takes place. Literature regarding SPLs recorded from pile driving projects is available for consideration. In order to determine reasonable SPLs and their associated effects on marine mammals that are likely to result from pile driving at NBPL, studies with similar properties to the proposed action were evaluated. Piles to be installed include 36- and 48-in steel pipe piles, 24- and 18-in concrete piles, and 16-in fiberglass-concrete piles. In addition, a vibratory pile driver could be used in the extraction of 16-in steel, 14-, 16- and 24-in concrete, 13-in plastic, and 12-in timber piles. Sound levels associated with vibratory pile removal are assumed to be the same as those during vibratory installation (Reyff, 2007) – which is likely a conservative assumption – and have been taken into consideration in the modeling analysis. Overall, studies which met the following parameters were considered: (1) Pile size and materials: Steel pipe piles (30-72 in diameter); (2) Hammer machinery: Vibratory and impact hammer; and (3) Physical environment: shallow depth (less than 100 ft [30 m]).

Representative data for pile driving SPLs recorded from similar construction activities in recent years, as well as additional assumptions made in determining appropriate proxy values, were presented in the FR notice (78 FR 30873; May 23, 2013). Underwater sound levels from pile driving for this project are therefore assumed to be as follows:

- For 36- and 48-in steel pipes, 195 dB re 1 µPa (rms) at 10 m when driven by impact hammer, 180 dB re 1 µPa (rms) at 10 m when driven by vibratory hammer;
- For 24-in concrete piles driven by impact hammer, 176 dB re 1 µPa (rms) at 10 m; and
- For 16- and 18-in concrete piles driven by impact hammer, 173 dB re 1 µPa (rms) at 10 m.
- For vibratory removal of steel piles, 172 dB re 1 µPa (rms) at 10 m; for vibratory removal/pneumatic chipping of non-steel piles, 160 dB re 1 µPa (rms) at 10 m.

Based on these values and the results of site-specific transmission loss modeling, distances to relevant thresholds and associated areas of ensonification are presented in Table 2. Predicted distances to thresholds for different sources are shown in Figures 6-1 through 6-7 of the Navy's application. The areas of ensonification reflect the conventional assumption that topographical features such as shorelines act as a barrier to underwater sound. Although it is known that there can be leakage or diffraction around such barriers, it is generally accepted practice to model underwater sound propagation from pile driving as continuing in a straight line past a shoreline projection such as Ballast Point. In contrast, although Zuniga Jetty would likely prevent sound propagation east of the jetty, this effect was not considered. Hence the projection of sound through the mouth of the bay into the open ocean would be truncated along the jetty and

narrower in reality than shown. The limits of ensonification due to the project are assumed to be essentially the same for different pile sizes subject to vibratory installation or removal.

Description	Source level (dB at 10 m)	Distance to threshold (m) and associated area of ensonification (km^2)			
		190 dB	180 dB	160 dB	120 dB
Steel piles, impact	195	36 / 0.0034	452 / 0.1477	5,484 / 8.5069	n/a
Steel piles, vibratory	180	n/a	14 / 0.0004	n/a	6,470 / 11.4895
24-in concrete piles	176	n/a	n/a	505 / 0.1914	n/a
16-in concrete-fiberglass piles	173	n/a	n/a	259 / 0.0834	n/a
18-in concrete piles[1] (NMAWC)	173	n/a	n/a	84 / 0.0620	n/a
Vibratory extraction, steel	172	n/a	n/a	n/a	6,467 / 11.4895
Vibratory extraction/pneumatic chipping, non-steel	160	n/a	n/a	n/a	6,467 / 11.4890

Table 2. Distances to relevant sound thresholds and areas of ensonification

[1]Practical spreading loss was assumed for pile driving at marine mammal relocation site because site-specific TL model used for sources at fuel pier is not applicable.

Pile driving can generate airborne sound that could potentially result in disturbance to marine mammals (specifically, pinnipeds) which are hauled out or at the water's surface. As a result, the Navy analyzed the potential for pinnipeds hauled out or swimming at the surface near NBPL to be exposed to airborne SPLs that could result in Level B behavioral harassment. A spherical spreading loss model (i.e., 6 dB reduction in sound level for each doubling of distance from the source), in which there is a perfectly unobstructed (free-field) environment not limited by depth or water surface, is appropriate for use with airborne sound and was used to estimate the distance to the airborne thresholds.

As was discussed for underwater sound from pile driving, the intensity of pile driving sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity takes place. In order to determine reasonable airborne SPLs and their associated effects on marine mammals that are likely to result from pile driving at NBPL, studies with similar properties to the Navy's project, as described previously, were evaluated.

Based on in-situ recordings from similar construction activities, the Navy previously considered the maximum airborne sound levels that would result from impact and vibratory pile driving as 118 dB and 96 dB (at 15 m), respectively (Blackwell et al., 2004; Laughlin, 2010). The Navy has calculated the radial distances to the 90 and 100 dB airborne thresholds as 358 m and 113 m, respectively, for impact pile driving and 28 m and 9 m, respectively, for vibratory pile driving. The nearest known haul-out location for harbor seals is approximately 250 m distant from the notional pile driving location and hence would be subject to sound levels that may result in behavioral disturbance, if animals are present. For sea lions, all airborne distances are less than those calculated for underwater sound thresholds, therefore, protective measures would be in place out to the distances calculated for the underwater thresholds, and the distances for the airborne thresholds would be covered fully by mitigation and monitoring measures in place for underwater sound thresholds. No sea lion haul-outs or rookeries are located within the airborne harassment radii. However, we assume that any harbor seals present at the haul-out would likely flush into the water if harassed, and would therefore be subject to underwater sound. Similarly, pinnipeds in water that are within the area of ensonification for airborne sound could be incidentally taken by either underwater or airborne sound or both. Therefore, we consider any

incidences of harassment from airborne sound to be accounted for in the take estimates for underwater sound.

Comments and Responses

We published a notice of receipt of the Navy's application and proposed IHA in the Federal Register on May 23, 2013 (78 FR 30873). NMFS received comments from the Marine Mammal Commission (Commission), as well as a letter from the National Park Service. The Commission's comments and our responses are provided here, and the comments have been posted on the internet at: http://www.nmfs.noaa.gov/pr/permits/incidental.htm. We have determined that the mitigation measures described here will effect the least practicable impact on the species or stocks and their habitats.

Comment 1: The Commission recommends that we require the Navy to use densities of 5.75 sea lions/km^2 for summer and fall and 2.51 sea lions/km^2 for winter and spring to re-estimate the number of sea lions that could be taken during the proposed activities.

Response: The density values cited by the Commission are found in the Navy Marine Species Density Database (Hanser et al., 2012) and are derived from Navy surveys of San Diego Bay conducted from 2007-11 (n = 11). The methodology for take estimation proposed by the Navy and employed here uses those same data, with an additional year of survey results (2007-12; n = 16). The primary difference, however, is that we attempt to produce the most realistic take estimate possible by approximating conditions expected to be in effect during the project. Specifically, only those survey results during the in-water work window (n = 13) and from the specific action area are used, and we attempt to quantify the effect of relocating the primary attractant for the population of California sea lions resident in the action area – the Everingham Brothers bait barges.

During Navy surveys of the action area, an average abundance of approximately 63 California sea lions was observed (5.50 sea lions/km^2), but an average of approximately 50 of these individuals was observed to be on or near the bait barges. Therefore, we believe it appropriate to account for the relocation of this attractant outside of the action area and assume that approximately 13 individuals would be present in the action area (1.18 sea lions/km^2). The bait barges, which are essentially floating pens filled with fish, provide a large haul-out area for sea lions but, importantly, they also provide a foraging opportunity. Therefore, while we recognize that the Commission has a valid point – that although the bait barges will be relocated outside the action area, some of the sea lions could still transit through the action area – we believe that the unique nature of the bait barges as both haul-out and de facto foraging hotspot for animals resident to San Diego Bay means that the majority of those individuals will remain in the vicinity of the bait barges. It would produce a grossly exaggerated estimate of take to ignore the relocation. Required marine mammal monitoring will determine whether this assumption is accurate or not and, if not, the approach to take estimation will be revised in future years of this project.

Finally, the Commission points out that this approach produces a density estimate that is reduced by as much as a factor of five, depending on seasonality. For California sea lions, an increase in the currently authorized level of take (994 incidences) by a factor of five would not affect either our small numbers finding or our negligible impact determination. However, we believe the approach to take estimation described here to be appropriate to produce the most accurate estimate.

Comment 2: The Commission recommends that we require the Navy to implement soft start procedures after 15 minutes if pile driving or removal is delayed or shut down because of the presence of a marine mammal within or approaching the shutdown zone.

Response: We do not believe the recommendation would be effective in reducing the number or intensity of incidents of harassment – in fact, we believe that implementation of this recommendation may actually increase the number of incidents of harassment by extending the overall project duration – while imposing a high cost in terms of operational practicability. We note here that, while the Commission recommends use of the measure to avoid serious injury (i.e., injury that will result in death of the animal), such an outcome is extremely unlikely even in the absence of any mitigation measures (as described in the FR notice). Rather than disregard the recommendation as not germane, we address our response to the potential usefulness of the measure in avoidance of non-serious injury (i.e., Level A harassment).

Soft start is required for the first impact pile driving of each day and, subsequently, after any impact pile driving stoppage of 30 minutes or greater. The purpose of a soft start is to provide a "warning" to animals by initiating the production of underwater sound at lower levels than are produced at full operating power. This warning is presumed to allow animals the opportunity to move away from an unpleasant stimulus and to potentially reduce the intensity of behavioral reactions to noise or prevent injury of animals that may remain undetected in the zone ensonified to potentially injurious levels. However, soft start requires additional time, resulting in a larger temporal footprint for the project. That is, soft start requires a longer cumulative period of pile driving (i.e., hours) but, more importantly, leads to a longer overall duration (i.e., more days on which pile driving occurs). In order to maximize the effectiveness of soft start while minimizing the implementation costs, we require soft start after a period of extended and

unobserved relative silence (i.e., at the beginning of the day, after the end of the required 30-minute post-activity monitoring period, or after 30 minutes with no impact driving). It is after these periods that marine mammals are more likely to closely approach the site (because it is relatively quiet) and less likely to be observed prior to initiation of the activity (because continuous monitoring has been interrupted).

The Commission justifies this recommendation on the basis of the potential for undetected animals to remain in the shutdown zone, and describes various biases (i.e., availability, detection, and perception) on an observer's ability to detect an animal. We do not believe that time is a factor in determining the influence of these biases on the probability of observing an animal in the shutdown zone. That is, an observer is not more likely to detect the presence of an animal at the 15-minute mark of continuous monitoring than after 30 minutes (it is established that soft start is required after any unmonitored period). Therefore, requiring soft start after 15 minutes (i.e., more soft starts) is not likely to result in increased avoidance of injury. Finally, we do not believe that the use of soft start may be expected to appreciably reduce the potential for injury where the probability of detection is high (e.g., small, shallow zones with good environmental conditions). Rather, the primary purpose of soft start under such conditions is to reduce the intensity of potential behavioral reactions to underwater sound in the disturbance zone.

As noted by the Commission, there are multiple reasons why marine mammals may remain in a shutdown zone and yet be undetected by observers. Animals are missed because they are underwater (availability bias) or because they are available to be seen, but are missed by observers (perception and detection biases) (e.g., Marsh and Sinclair, 1989). Negative bias on perception or detection of an available animal may result from environmental conditions,

limitations inherent to the observation platform, or observer ability. While missed detections are possible in theory, this would require that an animal would either (a) remain submerged (i.e., be unavailable) for periods of time approaching or exceeding 15 minutes and/or (b) remain undetected while at the surface. We provide further site-specific detail below.

First, environmental conditions in San Diego Bay are typically excellent and, unlike the moving aerial or vessel-based observation platforms for which detectability bias is often a concern, the observers here will be positioned in the most suitable locations to ensure high detectability (randomness of observations is not a concern, as it is for abundance sampling). We believe that the probability of detecting an animal within the 190 dB zone is 100 percent and, even in the larger 180 dB zone, we believe that under similar circumstances the appropriate monitoring strategy will allow detection of marine mammals. Biologists conducting Navy marine mammal surveys in the action area from 2007-12 believe that the detectability of animals within the study area at the time the surveys were conducted approached 100 percent. Regarding availability, the most abundant species, and therefore the species most likely to be present in the mitigation zones, are the California sea lion and bottlenose dolphin.

It is extremely unlikely that a pinniped would remain within approximately 40 m (the radial distance to the shutdown zone for pinnipeds is 36 m) of a construction zone and area of high vessel traffic, in the absence of any known foraging opportunities or other attractant of any significance, for an extended period of time. However, in the event that such an unlikely situation occurred, the possibility that individuals would remain submerged for a period of time exceeding 15 minutes is discountable. Sea lions employ a shallow epipelagic foraging strategy, and numerous studies have reported mean dive times of approximately 2 minutes for California sea lions (e.g., Feldkamp et al., 1989 [mean dive time less than 3 min]; Weise et al., 2006 [mean

dive time 1.9 ± 1.6 min]). Kuhn et al. (2003) cite published values for sea lion aerobic dive limits ranging from 2.3-5.8 minutes and, while it is possible that sea lions may dive beyond these limits when foraging on the benthos, significantly longer dive durations would not be expected in shallow waters. In addition, while short surface intervals are also possible, longer values are typical of data found in the literature for animals engaged in foraging (e.g., Costa et al. (2007) report a mean surface interval of 1.6 minutes). Sea lions will typically spend a much greater proportion of time at the surface when not foraging. Under the typically excellent observation conditions found in San Diego Bay, we believe that these surfaced animals would be observed.

For bottlenose dolphins, a much greater proportion of time is typically spent submerged. However, dive intervals are also typically much shorter, meaning that surfacing occurs frequently. Mate et al. (1995) report a typical dive duration from another shallow bay (Tampa Bay) of only 25 seconds. Short dive duration coupled with a large average group size – approximately six during Navy surveys – means high availability and increased detectability. Based on the foregoing factors, we have high confidence in the ability of observers to detect marine mammals in the shutdown zones estimated for this project in San Diego Bay.

Comment 3: The Commission recommends that we require the Navy to monitor the extent of the disturbance zone using additional shore- or vessel-based observers beyond the waterfront restricted area to (1) determine the numbers of marine mammals taken during pile driving and removal activities and (2) characterize the effects on them.

Response: The Commission correctly notes that the proposed monitoring requirements for the proposed IHA did not specify the number or locations of observers. We have worked with the Navy to develop an appropriate monitoring strategy, as detailed in the Navy's Acoustic and Marine Mammal Monitoring Plan and now available at

http://www.nmfs.noaa.gov/pr/permits/incidental.htm. In summary, at least one observer will be placed in the immediate vicinity of the active pile driving rig to observe the shutdown zones, while three additional observers will be placed on vessels at various locations throughout the action area to provide additional observation capability for the cetacean shutdown zone for impact driving and to monitor and record presence of marine mammals in the larger Level B harassment zone for vibratory pile driving. Only one observer will be required for monitoring at the MMP relocation site, as the shutdown zones are the minimum 10 m and the 160 dB Level B harassment zone has a radial distance of only 84 m. We agree with the Commission's recommendation and believe that the Monitoring Plan is sufficient to accomplish these objectives.

Description of Marine Mammals in the Area of the Specified Activity

There are four marine mammal species which are either resident or have known seasonal occurrence in San Diego Bay, including the California sea lion, harbor seal, bottlenose dolphin, and gray whale. In addition, Pacific white-sided and common dolphins (Lagenorhynchus obliquidens and Delphinus sp., respectively) have been observed in nearshore coastal waters in the vicinity, but have no known occurrence in San Diego Bay or near the project area. None of these species are listed under the Endangered Species Act (ESA). The FR notice (78 FR 30873; May 23, 2013) summarizes the population status and abundance of these species, and the Navy's application provides detailed life history information.

Potential Effects of the Specified Activity on Marine Mammals

We have determined that pile driving, as outlined in the project description, has the potential to result in behavioral harassment of marine mammals that may be present in the project vicinity while construction activity is being conducted. Pile driving could potentially

harass those pinnipeds that are in the water close to the project site, whether exposed to airborne or underwater sound. The FR notice (78 FR 30873; May 23, 2013) provides a detailed description of marine mammal hearing and of the potential effects of these construction activities on marine mammals.

Anticipated Effects on Habitat

The specified activities at NBPL will not result in permanent impacts to habitats used directly by marine mammals, such as haul-out sites, but may have potential short-term impacts to food sources such as forage fish. There are no rookeries or major haul-out sites nearby (the bait barges will be relocated from the project area), foraging hotspots, or other ocean bottom structure of significant biological importance to marine mammals that may be present in the marine waters in the vicinity of the project area. Therefore, the main impact issue associated with the specified activity will be temporarily elevated sound levels and the associated direct effects on marine mammals. The most likely impact to marine mammal habitat occurs from pile driving effects on likely marine mammal prey (i.e., fish) near NBPL and minor impacts to the immediate substrate during installation and removal of piles during the pier replacement project. The FR notice (78 FR 30873; May 23, 2013) describes these potential impacts in greater detail.

Mitigation

In order to issue an incidental take authorization (ITA) under section 101(a)(5)(D) of the MMPA, we 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 (where relevant).

Proxy source measurements and site-specific modeling of spreading loss (with the exception of the MMP relocation site, where practical spreading loss was assumed) were used to estimate zones of influence (ZOIs; see "Estimated Take by Incidental Harassment"); these values were used to develop mitigation measures for pile driving activities at NBPL. The ZOIs effectively represent the mitigation zones that will be established around each pile to prevent Level A harassment to marine mammals, while providing estimates of the areas within which Level B harassment might occur. In addition to the measures described later in this section, the Navy will employ the following standard mitigation measures:

(a) Conduct briefings between construction supervisors and crews, marine mammal monitoring team, acoustical monitoring team, and Navy 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) Comply with applicable equipment sound standards and ensure that all construction equipment has sound control devices no less effective than those provided on the original equipment.

(c) For in-water heavy machinery work with the potential to affect marine mammals (other than pile driving), 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 and (2) removal of the pile from the water column/substrate via a crane (i.e., deadpull). For these activities, monitoring will take place from 15 minutes prior to initiation until the action is complete.

Monitoring and Shutdown for Pile Driving

The following measures will apply to the Navy's mitigation through shutdown and disturbance zones:

Shutdown Zone – For all pile driving and removal activities, the Navy will establish a shutdown zone intended to contain the area in which SPLs equal or exceed the 180/190 dB rms acoustic injury criteria. The purpose of a shutdown zone is to define an area within which shutdown of activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area), thus preventing injury, serious injury, or death of marine mammals. Radial distances for shutdown zones are shown in Table 2. For certain pile types or techniques, the shutdown zone would not exist because source levels are lower than the threshold (see Table 2). However, a minimum shutdown zone of 10 m will be established during all pile driving and removal activities, regardless of the estimated zone. These precautionary measures are intended to prevent the already unlikely possibility of physical interaction with construction equipment and to further reduce any possibility of acoustic injury.

Disturbance Zone – Disturbance zones are typically defined as the area in which SPLs equal or exceed 160 or 120 dB rms (for pulsed or non-pulsed sound, respectively). 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 2. As with any such large action area, it is impossible to guarantee that

all animals will be observed or to make comprehensive observations of fine-scale behavioral reactions to sound.

In order to document observed incidences of harassment, monitors 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. If acoustic monitoring is being conducted for that pile, a received SPL may be estimated, or the received level may be estimated on the basis of past or subsequent acoustic monitoring. It may then be determined whether the animal was exposed to sound levels constituting incidental harassment in post-processing of observational and acoustic data, and a precise accounting of observed incidences of harassment created. Therefore, although the predicted distances to behavioral harassment thresholds are useful for estimating incidental harassment for purposes of authorizing levels of incidental take, actual take may be determined in part through the use of empirical data. That information may then be used to extrapolate observed takes to reach an approximate understanding of actual total takes.

Monitoring Protocols – Monitoring will be conducted before, during, and after pile driving activities. In addition, observers shall record all incidences 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; 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. Please see the Acoustic and Marine Mammal Monitoring Plan (available at http://www.nmfs.noaa.gov/pr/permits/incidental.htm), developed by the Navy in agreement with

NMFS, for full details of the monitoring protocols. Monitoring will take place from 15 minutes prior to initiation through 30 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 30 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 (as defined in the Navy's Monitoring Plan) 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:

- 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;
- Advanced education in biological science, wildlife management, mammalogy, or related fields (bachelor's degree or higher is required);
- Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience);
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;

- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates 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
- 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 15 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.). In addition, if such conditions should arise during impact pile driving that is already underway, the activity will be halted.

(3) If a marine mammal approaches or enters the shutdown zone during the course of pile driving operations, activity will be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or 15 minutes have passed without re-detection of the animal. Monitoring will be conducted throughout the time required to drive a pile.

Timing Restrictions

The Navy has set timing restrictions for pile driving activities to avoid in-water work when least tern populations are most likely to be foraging and nesting. The in-water work

window for avoiding negative impacts to terns is September 16-March 31. All pile driving will be conducted only during daylight hours.

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 vibratory hammers for fifteen seconds at reduced energy followed by a 30-second waiting period. This procedure is repeated two additional times. However, implementation of soft start for vibratory pile driving during previous pile driving work conducted by the Navy at another location has led to equipment failure and serious human safety concerns. Therefore, although vibratory soft start was proposed for implementation in the FR notice (78 FR 30873; May 23, 2013), it is not required as a mitigation measure for this project, as we have determined it not to be practicable. We have further determined this measure unnecessary to providing the means of effecting the least practicable impact on marine mammals and their habitat. For impact driving, soft start will be required, and contractors will provide an initial set of three strikes from the impact hammer at 40 percent energy, followed by a 30-second waiting period, then two subsequent three strike sets.

We have carefully evaluated the applicant's mitigation measures and considered a range of other measures in the context of ensuring that we prescribe the means of effecting 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, including consideration of personnel safety, and practicality of implementation.

Based on our evaluation of the applicant's planned measures, as well as any other potential measures that may be relevant to the specified activity, we have determined that these 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 ITA for an activity, section 101(a)(5)(D) of the MMPA states that we 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 ITAs 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. Please see the Navy's Acoustic and Marine Mammal Monitoring Plan for full details of the requirements for monitoring and reporting. We have determined that this monitoring plan, which is summarized here, is sufficient to meet the MMPA's monitoring and reporting requirements.

Acoustic Measurements

The primary purpose of acoustic monitoring is to empirically verify modeled injury and behavioral disturbance zones for marine mammals. The Navy will determine actual distances to the 160-, 180-, and 190-dB zones for underwater sound (where applicable) and to the 90- and 100-dB zones for airborne sound. For non-pulsed sound, distances will be determined for attenuation to the greater of either the 120-dB threshold or to the point at which sound becomes

indistinguishable from background levels. Acoustic monitoring will be conducted with the following objectives:

(a) Indicator Pile Program (IPP) – Implement a robust in-situ monitoring effort to measure sound pressure levels from different project activities, including impact and vibratory driving of 36- and 48-in piles, and to validate the Navy's site-specific transmission loss modeling effort.

(b) Conduct acoustic monitoring for vibratory pile extraction and for pneumatic chipping, if used.

(c) Continue the Navy's collection of ambient underwater sound measurements in the absence of project activities to develop a rigorous baseline for the San Diego Bay region.

It is assumed that the measured contours will be significantly reduced compared to the conservatively modeled ZOIs. As statistically robust results from acoustic monitoring become available, marine mammal mitigation zones will be revised as necessary to encompass actual ZOIs in subsequent years of the fuel pier replacement project. However, should substantial discrepancies become evident through limited data processing, the Navy will contact NMFS to propose and discuss appropriate changes in monitoring protocols. Acoustic monitoring will be conducted in accordance with the approved Acoustic and Marine Mammal Monitoring Plan developed by the Navy. Notional monitoring locations are shown in Figures 3-1 and 3-2 of the Navy's Plan. Please see that plan, available at http://www.nmfs.noaa.gov/pr/permits/incidental.htm, for full details of the required acoustic monitoring.

Some details of the methodology include:

- Hydroacoustic monitoring will be conducted for each different type of pile and each different method of installation and removal. Monitoring will occur across a representative range of locations with special attention given to the 120-, 160-, 180-, and 190-dB ZOI contours. The resulting data set will be analyzed to provide a statistically robust characterization of the sound source levels and transmission loss associated with different types of pile driving and removal activities.

- For underwater recordings, hydrophone systems with the ability to measure real time SPLs will be used in accordance with NMFS' most recent guidance for the collection of source levels.

- For airborne recordings, to the extent that logistics and security allow, reference recordings will be collected at approximately 50 ft (15.2 m) from the source via a sound meter with integrated microphone placed on a tripod 5 ft above the ground. Other distances may also be utilized to obtain better data if the signal cannot be isolated clearly due to other sound sources (i.e., barges or generators). If from a distance other than 50 ft, the source data would be converted to the 50-ft distance based on simple spherical spreading.

- Hydrophones will be placed 10 m from the source and within the ZOIs to their predicted eastern and southern limits. An integrated DGPS will record the location of individual acoustic records. A depth sounder or weighted tape measure will be used to determine the depth of the water. The hydrophone will be attached to a weighted line to maintain a constant depth.

- Each hydrophone (underwater) and microphone (airborne) will be calibrated at the beginning of each day of monitoring activity. Pressure and intensity levels will be reported relative to 1 μPa and 1 μPa^2, respectively.

- For each monitored location, a hydrophone will be deployed at mid-depth in order to evaluate site specific attenuation and propagation characteristics.
- In order to determine the area encompassed by the relevant isopleths for marine mammals, hydrophones will collect data at various distances from the source to measure attenuation throughout the ZOIs.
- Ambient conditions, both airborne and underwater, will be measured at the same monitoring locations but in the absence of project sound to determine background sound levels. Ambient levels are intended to be recorded over the frequency range from 7 Hz to 20 kHz. Ambient conditions will be recorded for at least one minute every hour of the work day, for at least one week of each month of the period of the IHA.
- Sound levels associated with soft-start techniques will also be measured but will be differentiated from source level measurements.
- Airborne levels will be recorded as unweighted as well as in dBA, and the distance to marine mammal injury and behavioral disturbance thresholds, also referred to as shutdown and buffer zones, would be measured.
- Environmental data will be collected including but not limited to: wind speed and direction, air temperature, humidity, surface water temperature, water depth, wave height, weather conditions and other factors that could contribute to influencing the airborne and underwater sound levels (e.g., aircraft, boats, etc.).

Visual Marine Mammal Observations

The Navy 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 observers

will be trained in marine mammal identification and behaviors and are required to have no other construction-related tasks while conducting monitoring. The Navy will monitor the shutdown zone and disturbance zone before, during, and after pile driving as described under "Mitigation" and in the Acoustic and Marine Mammal Monitoring Plan. Notional monitoring locations are shown in Figures 3-1 and 3-2 of the Navy's Plan. Please see that plan, available at http://www.nmfs.noaa.gov/pr/permits/incidental.htm, for full details of the required marine mammal monitoring. Based on our requirements, the Plan includes the following procedures for pile driving:

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

Individuals implementing the monitoring protocol will assess its effectiveness using an adaptive approach. Monitoring biologists will use their best professional judgment throughout implementation and seek improvements to these methods when deemed appropriate. Any modifications to protocol will be coordinated between NMFS and the Navy.

Data Collection

We require that observers use approved data forms. Among other pieces of information, the Navy 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, the Navy 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;
- Locations of all marine mammal observations; and
- Other human activity in the area.

In addition, photographs will be taken of any gray whales observed. These photographs will be submitted to NMFS' Southwest Regional Office for comparison with photo-identification catalogs to determine whether the whale is a member of the western North Pacific population.

Reporting

A draft report must be submitted to NMFS within 45 calendar days of the completion of acoustic measurements and marine mammal monitoring. 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 adverse responses to construction activities by marine mammals and a complete description of all mitigation shutdowns and the results of those actions and a refined 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. Required contents of the monitoring reports are described in more detail in the Navy's Acoustic and Marine Mammal Monitoring Plan.

Estimated Take by Incidental Harassment

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 will be by Level B harassment, involving temporary changes in behavior. The planned mitigation and monitoring measures are expected to minimize the possibility of injurious or lethal takes such that take by Level A harassment, serious injury or mortality is considered discountable. However, it is unlikely that injurious or lethal takes would occur even in the absence of the planned mitigation and monitoring measures.

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 or on the stock or species could potentially be significant (Lusseau and Bejder, 2007; Weilgart, 2007). Given the many uncertainties in predicting the quantity and types of impacts of sound 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. This practice potentially overestimates the numbers of marine mammals taken.

The project area is not believed to be particularly important habitat for marine mammals, nor is it considered an area frequented by marine mammals (with the exception of California sea lions). The occurrence of California sea lions in the project area, and, therefore, the likely incidence of exposure of sea lions to sound levels above relevant thresholds, will be much reduced due to the relocation of the bait barges (i.e., significant California sea lion haul-outs). Therefore, behavioral disturbances that could result from anthropogenic sound associated with these activities are expected to affect only a relatively small number of individual marine mammals, although those effects could be recurring over the life of the project if the same individuals remain in the project vicinity.

The Navy has requested authorization for the potential taking of small numbers of California sea lions, harbor seals, bottlenose dolphins, and gray whales in San Diego Bay that may result from pile driving during construction activities associated with the fuel pier replacement project described previously in this document.

Marine Mammal Densities

For all species, the best scientific information available was used to construct density estimates or estimate local abundance. Although information exists for regional offshore surveys

for marine mammals, it is unlikely that these data would be representative of the fauna that may be encountered in San Diego Bay. As a result, the data resulting from dedicated line-transect surveys conducted by the Navy from 2007-12, or from opportunistic observations for more rarely observed species, was deemed most appropriate for use in estimating the number of incidental harassments that may occur as a result of the specified activities (see Figures 3-1 and 3-2 of the Navy's application). Boat survey transects established within northern San Diego Bay in 2007 have been resurveyed on 16 occasions, 13 of which were during the seasonal window for in-water construction and demolition (September-April).

Description of Take Calculation

The take calculations presented here rely on the best data currently available for marine mammal populations in San Diego Bay. The methodology for estimating take was described in detail in the FR notice (78 FR 30873; May 23, 2013). The ZOI impact area is the estimated range of impact to the sound criteria. The distances (actual) specified in Table 2 were used to calculate ZOI around each pile. The ZOI impact area took into consideration the possible affected area of San Diego Bay with attenuation due to land shadowing from bends in the shoreline. Because of the close proximity of some of the piles to the shore, the ZOIs for each threshold are not necessarily spherical and may be truncated.

While pile driving can occur any day throughout the in-water work window, and the analysis is conducted on a per day basis, only a fraction of that time is actually spent pile driving. The exposure assessment methodology is an estimate of the numbers of individuals exposed to the effects of pile driving activities exceeding NMFS-established thresholds. Of note in these exposure estimates, mitigation methods (i.e., visual monitoring and the use of shutdown zones) were not quantified within the assessment and successful implementation of mitigation is not

reflected in exposure estimates. For the reasons noted above, results from this acoustic exposure assessment likely overestimate take estimates to some degree.

Airborne Sound – No incidents of incidental take resulting solely from airborne sound are expected. Distances to the harassment thresholds are generally not expected reach areas where pinnipeds may haul out (but see below regarding harbor seals). We recognize that pinnipeds in the water could be exposed to airborne sound that may result in behavioral harassment when looking with heads above water. However, these animals would previously have been incidentally taken as a result of exposure to underwater sound above the behavioral harassment thresholds, which are in all cases larger than those associated with airborne sound. Thus, the behavioral harassment of these animals is already accounted for in these estimates of potential take. Multiple incidents of exposure to sound above NMFS' thresholds for behavioral harassment are not believed to result in increased behavioral disturbance, in either nature or intensity of disturbance reaction. Therefore, we do not believe that authorization of incidental take resulting from airborne sound for pinnipeds is warranted.

In the proposal for this IHA, because the nearest known haul-out location for harbor seals is approximately 250 m from the fuel pier and within the largest airborne ZOI, we did assume that individuals present could be incidentally taken by both underwater and airborne sound on each day. However, we have determined that this is not likely and is inconsistent with our past practice with regard to the potential for incidental taking by airborne sound. Because few harbor seals are likely to be present, and harbor seals readily flush from haul-outs in the presence of harassing stimuli, we believe that any harbor seals present at the haul-out would likely be exposed to potentially harassing levels of underwater sound in addition to the airborne sound.

Therefore, our take proposal for harbor seals was an overestimate and double-counted potential incidences of harbor seal take.

The derivation of density or abundance estimates for each species, as well as further description of the rationale for each take estimate, was described in detail in the FR notice (78 FR 30873; May 23, 2013). A summary of the information and assumptions that went into take estimates for each species is provided here. Total take estimates are presented in Table 3.

- California sea lion – For California sea lions, the most common species in northern San Diego Bay and the only species with regular occurrence in the project area, it was determined that the density value derived from site-specific surveys would be most appropriate for use in estimating potential incidences of take. Corrected survey data indicate an average abundance in the project area of 63 individuals; however, an average of 47 animals was observed on or swimming next to the bait barges. Assuming the same proportion of the population continues to congregate at the bait barges when they are relocated, there would be an average of approximately 13 individuals within the ZOI without the bait barges' influence as a sea lion aggregator.

- Bottlenose dolphin – Given the sporadic nature of bottlenose dolphin sightings and their high variability in terms of numbers and locations, the regional density estimate of 0.36/km^{2}developed for the NMSDD (Hanser et al., 2012) was considered a more reliable indicator than the results of site-specific surveys of the number of bottlenose dolphins that may be present and is used here to estimate the potential number of incidences of take.

- Harbor seal – Harbor seal presence in the project area is assessed on the basis of the only observational data available, the opportunistic observation of several individuals occurring in the vicinity of Pier 122 repeatedly for a period of about a month. We therefore

assume that as many as three harbor seals could be incidentally harassed on a daily basis for as much as one month.

- Gray whale – On the basis of limited information, we assume here that 15 exposures of gray whales to sound that could result in harassment might occur. This could result from as many as 15 individuals transiting near the mouth of the Bay, or from one individual entering the Bay and lingering in the project area for 15 days. We limit the time period to 15 days because, although both of these scenarios are unlikely, they would only possibly occur in March. Most sightings of gray whales near or within the Bay have been outside of the in-water work window.

Steel pile installation involves a combination of vibratory and impact hammering. Both are assumed to occur on the same day and, therefore, the estimated number of animals taken is given by the maximum of either type of exposure. Given that the vibratory (120 dB rms) ZOI is larger, all animals considered behaviorally harassed by impact pile driving are also considered to potentially be harassed by vibratory pile driving, whereas animals outside of the ZOI for impact hammering but within the ZOI for vibratory hammering would only be harassed by the latter. For example, for California sea lions the estimate for vibratory pile driving is 700 and the estimate for impact pile driving is 500. Because both events occur on the same day and the vibratory harassment zone subsumes the impact harassment zone, the estimate for vibratory pile driving necessarily includes the 500 incidents of harassment estimated for impact pile driving alone. To provide a more conservative estimate of total harassments, demolition use of vibratory extraction is assumed not to overlap the driving of steel piles for the new pier. Thus, the 294 incidences of harassment for California sea lions resulting from pile removal would add to the 700 estimated

for pile installation (500 resulting from either vibratory or impact installation and 200 resulting from vibratory installation alone) for a total estimate of 994 incidences of harassment.

Species	Density (#/km^2)	Underwater				Airborne	Total Authorized Takes
		Impact injury threshold (180/190 dB)	Disturbance threshold, combined impact/vibratory (160 dB)[1]	Vibratory injury threshold (180/190 dB)	Vibratory disturbance threshold (120 dB)	Impact disturbance Threshold (90/100 dB)	
California sea lion	1.18	0	500	0	494	0	**994**
Harbor seal[2]	n/a	0	90	0	0	90[3]	**90**
Gray whale[2]	n/a	0	15	0	0	N/A	**15**
Bottlenose dolphin	0.36	0	144	0	163	N/A	**307**

Table 3. Number of Potential Incidental Takes of Marine Mammals within Various Acoustic Threshold Zones

[1] The 160-dB acoustic harassment zone associated with impact pile driving will always be subsumed by the 120-dB harassment zone produced by vibratory driving. Therefore, total takes estimated for impact driving alone could occur as a result of either impact or vibratory driving.

[2] Because there is no density estimate available for harbor seals or gray whales, we cannot estimate takes separately for vibratory and impact pile driving. We simply assume here that these animals could be present within the project area for 30 (3 harbor seals) or 15 days (1 gray whale), respectively, and that they could be taken by impact or vibratory driving or vibratory removal. We also assume that mitigation measures would be effective in preventing Level A harassment for these species and believe a zero value for Level A harassments to be reasonable.

[3] Although the assumed harbor seal haul-out location is within the airborne ZOI, we believe that these individuals would likely flush or enter the water on their own during the course of a 24-hr period and be exposed to underwater sound. Therefore, only one incidence of taking per animal per day is considered under total authorized takes.

Negligible Impact and Small Numbers Analysis and Determinations

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." In making a negligible impact determination, NMFS considers a variety of factors, including but not limited to: (1) the number of anticipated mortalities; (2) the number and nature of anticipated injuries; (3) the number, nature, intensity, and duration of Level B harassment; and (4) the context in which the take occurs.

Small Numbers Analysis

The numbers of animals authorized to be taken for California sea lions, harbor seals, and gray whales would be considered small relative to the relevant stocks or populations (each less than one percent) even if each estimated taking occurred to a new individual – an extremely unlikely scenario. However, for animals occurring in northern San Diego Bay, there will almost certainly be some overlap in individuals present day-to-day and, for harbor seals and gray whales, the estimates are explicitly assumed to represent repeated incidental taking of the same individuals (three harbor seals and one gray whale).

The number of authorized takes for bottlenose dolphins is higher relative to the total stock abundance estimate. However, these numbers represent the estimated incidences of take, not the number of individuals taken. That is, it is likely that a relatively small subset of California coastal bottlenose dolphins would be harassed by project activities. California coastal bottlenose dolphins range from San Francisco Bay to San Diego (and south into Mexico) and the specified activity will be stationary within an enclosed bay that is not recognized as an area of any special significance for coastal bottlenose dolphins (and is therefore not an area of dolphin aggregation, as evident in Navy observational records). We therefore believe that the estimated numbers of takes, were they to occur, likely represent repeated exposures of a much smaller number of bottlenose dolphins and that, based on the limited region of exposure in comparison with the known distribution of the coastal bottlenose dolphin, these estimated incidences of take represent small numbers of bottlenose dolphins.

Negligible Impact Analysis

Pile driving activities associated with the pier replacement 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 (behavioral disturbance) only, from airborne or underwater sounds generated from pile driving. Potential takes could occur if individuals of these species are present in the ensonified zone when pile driving is happening.

No injury, serious injury, or mortality is anticipated given the methods of installation 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, vibratory hammers will be the primary method of installation, and this activity does not have significant potential to cause injury to marine mammals due to the relatively low source levels produced (less than 190 dB) 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 (use of a sound attenuation system, which reduces overall source levels as well as dampening the sharp, potentially injurious peaks, and implementation of shutdown zones) significantly reduce any possibility of injury. Likewise, Level B harassment will be reduced to the level of least practicable adverse impact through the use of mitigation measures described herein. that, given sufficient "notice" through mitigation measures including 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, and the likelihood that marine mammal detection ability by trained observers is high under the environmental conditions described for San Diego Bay, enabling 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). 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. The pile driving activities analyzed here are similar to numerous other construction activities conducted in San Francisco Bay and in the Puget Sound region, 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 viability for California coastal bottlenose dolphins, and thus would not result in any adverse impact to the stock as a whole. For pinnipeds, no rookeries are present in the project area, there are no haul-outs other than those provided opportunistically by man-made objects (the primary such haul-out, the bait barges, will be relocated away from the project area), and the project area is not known to provide foraging habitat of any special importance.

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 incidences of Level B harassment consist of, at worst, temporary modifications in behavior; (3) the absence of any major rookeries and only a few isolated and opportunistic haul-out areas near or adjacent to the project site; (4) the absence of any other known areas or features of special significance for foraging or reproduction within the project area; (5) the presumed efficacy of the planned mitigation measures in reducing the effects of the specified activity to the

level of least practicable impact. In addition, none of these stocks are listed under the ESA or considered of special status (e.g., depleted or strategic) under the MMPA. California sea lions and harbor seals (in California) are thought to have reached or to be approaching carrying capacity, while gray whales are thought to be increasing. The California coastal stock of bottlenose dolphins remained stable during the most recent period of trend analysis. 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.

Determinations

The number of marine mammals actually incidentally harassed by the project will depend on the distribution and abundance of marine mammals in the vicinity of the survey activity. However, we find that the number of potential takings authorized (by level B harassment only), which we consider to be a conservative, maximum estimate, is small relative to the relevant regional stock or population numbers, and that the effect of the activity will be mitigated to the level of least practicable impact through implementation of the mitigation and monitoring measures described previously. Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, we find that the total taking from the activity will have a negligible impact on the affected species or stocks.

Impact on Availability of Affected Species or Stock for Taking for Subsistence Uses

There are no relevant subsistence uses of marine mammals implicated by this action.

Endangered Species Act (ESA)

The Navy initiated informal consultation under section 7 of the ESA with NMFS' Southwest Regional Office on March 5, 2013. NMFS concluded on May 16, 2013, that the proposed action may affect, but is not likely to adversely affect, western North Pacific gray whales. The Navy has not requested authorization of the incidental take of WNP gray whales and no such authorization is issued. There are no other ESA-listed marine mammals found in the action area. Therefore, no consultation under the ESA is required.

National Environmental Policy Act (NEPA)

In compliance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), as implemented by the regulations published by the Council on Environmental Quality (40 CFR parts 1500-1508), the Navy prepared an Environmental Assessment (EA) to consider the direct, indirect and cumulative effects to the human environment resulting from the pier replacement project. NMFS made the Navy's EA available to the public for review and comment, in relation to its suitability for adoption by NMFS in order to assess the impacts to the human environment of issuance of an IHA to the Navy. Also in compliance with NEPA and the CEQ regulations, as well as NOAA Administrative Order 216-6, NMFS has reviewed the Navy's EA, determined it to be sufficient, and adopted that EA and signed a Finding of No Significant Impact (FONSI) on July 8, 2013. The Navy's EA and NMFS' FONSI for this action may be found at http://www.nmfs.noaa.gov/pr/permits/incidental.htm.

Authorization

As a result of these determinations, we have issued an IHA to the Navy to conduct the specified activities in San Diego Bay for one year, from September 1, 2013, through August 31, 2014, provided the previously described mitigation, monitoring, and reporting requirements are incorporated.

Dated: July 19, 2012.

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