ACOUSTIC AND MARINE PROTECTED SPECIES MONITORING PLAN FOR THE NAVY'S FUEL PIER INBOARD PILE REMOVAL AND DREDGING PROJECT AT NAVAL BASE POINT LOMA, CALIFORNIA

Submitted to:

Office of Protected Resources,
National Marine Fisheries Service,
National Oceanic and Atmospheric Administration

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For:

Naval Base Point Loma

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ACRONYMS AND ABBREVIATIONS

µPa	microPascal
AT	Acoustic Technician
dB	decibel(s)
ESA	Endangered Species Act
ft	foot/feet
GPS	Global Positioning System
IHA	Incidental Harassment Authorization
kHz	kilohertz
km	kilometer
km^2	square kilometer
LF	Low-Frequency cetaceans
m	meter(s)
MF	Mid-Frequency cetaceans
MLLW	mean lower low water
MMPA	Marine Mammal Protection Act
Navy	U.S. Department of the Navy
NBPL	Naval Base Point Loma
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	National Marine Fisheries Service
OW	Otariid pinnipeds
PAM	Passive Acoustic Monitoring
Plan	Marine Mammal and Acoustic Monitoring Plan
Project	Fuel Pier Pile Removal and Dredging Project
PSO	Protected Species Observer
PW	Phocid pinnipeds
re 1 µPa	referenced to one microPascal
RMS	root mean square
SEL	sound exposure level
SPL	sound pressure level
ZOI	zone of influence

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1.0 INTRODUCTION

1.1 Purpose of the Monitoring Plan

The purpose of this Acoustic and Marine Protected Species Monitoring Plan (Plan) is to provide protocols for marine mammal and acoustic monitoring during pile removal activities in accordance with the Incidental Harassment Authorization (IHA) issued on **Date TBD**, by the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NOAA Fisheries) for the incidental take of six species:

- California sea lion (*Zalophus californianus*)
- Harbor seal (*Phoca vitulina*)
- Northern elephant seal (*Mirounga angustirostris*)
- Bottlenose dolphin (*Tursiops truncatus*)
- Common dolphins including long- and short-beaked (*Delphinus capensis* and *D. delphis*)
- Pacific white-sided dolphin (*Lagenorhynchus obliquidens*)

Incidental Level B take is expected as a result of the U.S. Department of the Navy's (Navy's) Fuel Pier Pile Removal Project (hereafter referred to as "Project") associated with the Naval Base Point Loma (NBPL), California. No other marine mammal species are expected to occur in the Project area.

NBPL is located on the peninsula of Point Loma near the mouth and along the northern edge of San Diego Bay. NBPL provides berthing and support services to Navy submarines and other fleet assets. The Proposed Action (Figure 1-1) involves removal of approximately 409 partial piles, mostly concrete, and performance of associated dredging of the Fuel Pier Inboard area to approximately -6.7 meters (m; -22 feet [ft]) mean lower low water (MLLW), and the beneficial reuse of dredged sediments.

Pile removal activities will include multiple methods and equipment including, pile clipping, use of underwater chainsaw, diamond wire saw, or a vibratory hammer. The actual equipment used to remove piles would be determined by the construction contractor. Pile removal activities that have the potential to result in Marine Mammal Protection Act (MMPA) take by acoustic harassment will be monitored. See the IHA for a definition of MMPA take relative to this Project.

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1 inch = 300 feet
0 150 300 Feet

Notes:
MLWW = Mean Lower Low Water
OD = Over Dredge

Berthing and Transit Area

Dredge to -22 MLLW Plus OD Allowance

Bathymetric Contour

FIGURE 1-1

Project Location
Navy Base Point Loma Fuel Pier
Inboard Pile Removal and Dredging
San Diego Bay, CA

Based on likely equipment to be used above the water surface, airborne noise is not expected to exceed airborne noise thresholds at locations where marine mammals are likely to haul out. Therefore, airborne noise will not be monitored for Level B incidental take and these activities are not discussed further in this Plan. The purpose of monitoring described herein is twofold:

1) To minimize the potential for Level A (injury) harassment of marine mammals by implementing a shutdown of activities when a marine mammal is observed within a designated buffered shutdown zone of influence (ZOI). With this mitigation measure in place, the proposed activities are not anticipated to result in any Level A harassment; therefore, no Level A take is being requested for this project.
2) To enumerate the numbers and species of marine mammals that occur within established Level A (injury) and Level B (behavioral disturbance) ZOIs, and to document any differences in species, numbers, or behavioral effects associated with Project-related in-water activities.

The Plan is a requirement of the IHA issued under the MMPA. Once approved by NOAA Fisheries, the Plan cannot be modified without NOAA Fisheries approval. The IHA and this corresponding Plan is valid for take incidental to the specified waterfront demolition activities at NBPL during the IHA time period.

While no Level A harassment is anticipated, and only Level B harassment is authorized under the IHA, the mitigation measures and monitoring protocols described herein will serve to protect marine mammals in the Project area, provide for practical implementation of this Plan, reduce the risk of unauthorized take, and allow maintenance of demolition and dredging schedules.

1.2 Summary of Activities to be Monitored

All relevant in-water pile removal activities that have the potential to result in Level A or Level B harassment of marine mammals will be monitored are pile removal by clipping, cutting with an underwater chainsaw or diamond wire saw, or use of a vibratory hammer to loosen and pull piles.

In-water construction and demolition activities under the IHA must comply with the following General Conditions of the IHA:

1) The IHA permit must be in the possession of the Navy, its designees, and work crew personnel operating under the authority of the IHA;
2) Only incidental take of marine mammals by Level B harassment, as specified in the IHA is authorized; and
3) Taking of species that exceeds the numbers and/or intensity indicated in the IHA, or any taking of other species of marine mammal is prohibited and may result in modification, suspension, or revocation of the IHA.

Marine mammal monitoring will be conducted before, during, and after all pile removal activities within the acoustic ZOIs of those activities relative to the Level A and B acoustic thresholds. The proposed monitoring will document the number of marine mammal species exposed to underwater sound levels that would constitute "take" under the MMPA.

The proposed demolition activities at the Fuel Pier are summarized in Table 1-1.

Table 1-1 Pile Type and Pile Removal Method and Duration

Pile Type	Removal Method	Number of Piles[1]	Piles Removed / Day[2]	Estimated Days[3]
Fender				
13-inch polycarbonate	Pile clipper	12	5	3
14-inch concrete	Pile clipper Two pile clippers Underwater chainsaw Diamond wire saw Vibratory hammer	56	5	12
Structural				
16-inch concrete	Pile clipper Two pile clippers Underwater chainsaw Diamond wire saw Vibratory hammer	341	5	69
Total		409		84

Notes:

[1] Pile counts are extrapolated from previous Fuel Pier plans

[2] Rate of pile removal extrapolated from average values reported in previous Fuel Pier Replacement monitoring reports (IHA-5) for the previous Fuel Pier replacement project

[3] Total Estimated Days is conservative and rounded up to next whole number

It is anticipated that pile removal activities would occur over the 84-day project period (Table 1-1). It is anticipated that differing removal equipment and methods would be employed to removal pilings based on the individual pile type and size. A 24-inch pile clipper would be employed to clip both polycarbonate and concrete piles. Additionally, up to two 24-inch pile clippers may be used simultaneously to independently clip two separate piles at a time within the activity area. An underwater chainsaw may also be used to cut concrete piles where the pile clipper cannot be employed. A diamond wire saw would be employed for removal activities in the event that the above methods are unsuccessful. Finally, a vibratory hammer may be used to loosen relatively intact piles to free piles from surrounding sediment and then piles would be removed by vertical pulling.

Detailed analysis of ZOIs and estimated numbers of species takes are contained in the Navy's IHA application (Navy 2021). There would be no Level A takes. The number of requested Level B takes are summarized in Table 1-2.

Table 1-2 Number of Level B Marine Mammal Takes Requested for the Fuel Pier Pile Removal Project.

Species	Total Authorized Take
California sea lion (*Zalophus californianus*)	1,260
Harbor Seal (*Phoca vitulina*)	84
Northern elephant seal (*Mirounga angustirostris*)	7
Bottlenose dolphin (*Tursiops truncatus*)	84
Common dolphin (*Delphinus capensis* and *D. delphis*)	756
Pacific white-sided dolphin (*Lagenorhynchus obliquidens*)	84
Total	**2,275**

Notes:
If the number of takes may be exceeded in any year, NOAA Fisheries must be notified as early as possible of a potential need to modify the authorized takes.

1.3 Monitoring Zones

The Level A and Level B monitoring and the buffered shutdown zone as well as representative protected species observer (PSO) monitoring locations are described for the Fuel Pier Pile Removal Project in the subsections below.

Following NOAA Fisheries Technical Guidance, acoustic thresholds and weighting factor adjustments applicable to the relevant marine mammals groups expected to occur in San Diego Bay were used (Table 1-3). Distances to marine mammal Level A acoustic thresholds were calculated using NOAA Fisheries Technical Guidance (NOAA Fisheries 2018), NOAA Fisheries User Spreadsheet (NOAA Fisheries 2020), and the practical spreading loss model.

Table 1-3 Summary of Species Likely to Occur in Project Area and Assigned Marine Mammal Hearing Groups

Marine Mammal Hearing Group	Species
Otariid pinnipeds (OW)	California sea lion (*Zalophus californianus*)
Phocid pinnipeds (PW)	Harbor Seal (*Phoca vitulina*)
	Northern elephant seal (*Mirounga angustirostris*)
Mid-frequency cetaceans (MF)	Bottlenose dolphin (*Tursiops truncatus*)
	Common dolphin (*Delphinus capensis* and *D. delphis*)
	Pacific white-sided dolphin (*Lagenorhynchus obliquidens*)

Abbreviations:
MF = mid-frequency cetaceans, PW = phocid pinnipeds, OW = otariid pinnipeds

Weighting Factor Adjustment (2.5 kilohertz [kHz] for non-impulsive sound) and representative frequency ranges were used for calculations using the NOAA Fisheries User Spreadsheets. For all in-water pile removal, the distances to PTS onset (Level A) are modeled to be less than 10 m (33 ft) from the source pile.

Calculated distances to in-water marine mammal disturbance (Level B) for continuous noise sources and corresponding areas within the ZOIs are based on the average ambient underwater noise level (129.6 decibels [dB]) within the project area (NAVFAC SW 2020). ZOIs for pile removal are based on the practical spreading loss model and acoustic data recorded during the previous NBPL Fuel Pier Replacement Project.

1.3.1 Level A and Level B Harassment Monitoring and Buffered Shutdown Zone

Maximum potential distances to Level A and Level B acoustic harassment associated with the proposed pile removal activities at the Fuel Pier are provided in Tables 1-4 and 1-5 and Level B distances, 20 meter buffered shutdown zone, and PSO locations are shown in Figures 1-2 through 1-7 depict the extent of the ZOIs associated with noise propagation specific to each of the pile removal methods in Table 1-5. When Level A ZOIs are small, a 10 m (33 ft) "Physical Interaction Shutdown Zone" is generally used to reduce the risk of physical interaction between marine mammals and in-water equipment. However, because there are large numbers of pinnipeds in the Project area, an additional 10 m (33 ft) buffer has been added to the "Physical Interaction Shutdown Zone." This would provide a 20 m (66 ft) buffered shutdown zone for all marine species observed in the Project area. This would further reduce the likelihood of Level A harassment (minor injury due to the onset of a permanent threshold shift [PTS]), which could only occur if an animal were to remain well inside of 10 m (33 ft) for a prolonged period.

Table 1-4 Projected Distances to Underwater Level A Thresholds by Marine Mammal Hearing Group

Pile Removal Activity	***Projected Distances to Level A Thresholds (m [ft])***		
	MF	***PW***	***OW***
13-inch polycarbonate piles with pile clipper 154 dB RMS for 0.42 hour per day	0.0	0.1 (0.33)	0.0
14- and 16-inch concrete piles with pile clipper 147 dB RMS for 0.42 hour per day	0.0	0.0	0.0
14- and 16-inch concrete piles with two pile clippers 150 dB RMS for 0.42 hour per day	0.0	0.0	0.0
14- and 16-inch concrete piles with underwater chainsaw 150 dB RMS for 0.83 hour per day	0.0	0.1 (0.33)	0.1 (0.33)
14- and 16-inch concrete piles with diamond wire saw 156 dB RMS for 1.7 hours per day	0.0	0.3 (1.0)	0.0
14- and 16-inch concrete piles with vibratory hammer 152 dB RMS for 0.83 hour per day	0.1 (0.33)	0.9 (3.0)	0.1 (0.33)

Abbreviations:
RMS = root mean square, dB re 1 µPa = decibels referenced to a pressure of 1 microPascal
m = meters, ft = feet
MF = mid-frequency cetaceans, PW = phocid pinnipeds, OW = otariid pinnipeds

Table 1-5 Distances to Level B Underwater Thresholds and ZOI Areas within the Thresholds from Pile Removal

Pile Removal Activity/ Source Sound Levels at 10-m (33-ft)	***Level B Monitoring Areas[1]***	
	Maximum Radial Distance (m [ft])	***Total ZOI Area (km^2[square miles])***
13-inch polycarbonate piles with pile clipper 154 dB RMS for 0.42 hour per day	423 (1,378)	0.37 (0.14)
14- and 16-inch concrete piles with pile clipper 147 dB RMS for 0.42 hour per day	250 (820)	0.16 (0.06)
14- and 16-inch concrete piles with two pile clippers 150 dB RMS for 0.42 hour per day	250 (820)[2]	0.22 (0.08)
14- and 16-inch concrete piles with underwater chainsaw 150 dB RMS for 0.83 hour per day	229 (751)	0.14 (0.05)
14- and 16-inch concrete piles with diamond wire saw 156 dB RMS for 1.7 hours per day	575 (1,886)	0.63 (0.24)
14- and 16-inch concrete piles with vibratory hammer 152 dB RMS for 0.83 hour per day[3]	311 (1,020)	0.22 (0.09)

Notes:

[1] Distances to Level A and B thresholds were calculated using acoustic data compiled for NBPL in the 2020 San Diego Noise Compendium (NAVFAC SW 2020) except for use of vibratory hammer which is sourced from City of Seattle Pier 62 Project (Greenbusch Group 2018). The Level B ZOIs for pile removal are based on the distance for noise to decay to ambient levels (129.6 dB re 1 µPa).

[2] For concrete pile removal via multiple clippers, the maximum radial distance is the same as that for use of a single pile clipper but the total ZOI area is greater due to potential offset between individual clippers.

[3] Radial distances are based on in situ noise levels presented in the San Diego Noise Compendium (NAVFAC SW 2020), except for extraction of concrete piles via vibratory hammer which is calculated using a simple spreading loss model with a propagation value of 15.

Abbreviations:

dB re 1 µPa = decibels referenced to a pressure of 1 microPascal,

km^2 = square kilometers, m = meters, ft = feet

RMS = root mean square, ZOI = Zone of Influence (area encompassed within acoustic threshold boundary).

Source

Potential PSO Location

Proposed Dredge Footprint

Projected Distance to Level B Thresholds (154 dB RMS)

20m Buffered Shutdown Zone

423m - Practical Spreading Loss (0.37 sq. km / 0.14 sq. mi)

350m - Real Time Data (0.27 sq. km / 0.10 sq. mi)

1 inch = 300 feet

0 300 Feet

FIGURE 1-2

Level B ZOI for 13-inch Polycarbonate Pile Removal via Pile Clipper
Navy Base Point Loma
Maintenance Dredging
Fuel Pier Inboard Area

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P,

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FIGURE 1-3

Level B ZOI for 14- and 16-inch Concrete Pile Removal via Single Pile Clipper
Navy Base Point Loma
Maintenance Dredging
Fuel Pier Inboard Area

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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FIGURE 1-4

Level B ZOI for Multiple Concrete Pile Removal via Two Simultaneous Pile Clippers
Navy Base Point Loma Maintenance Dredging
Fuel Pier Inboard Area

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P,

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Source

Potential PSO Location

Proposed Dredge Footprint

Projected Distance to Level B Thresholds (150 dB RMS)

20m Buffered Shutdown Zone

229m - Practical Spreading Loss (0.14 sq. km / 0.05 sq. mi)

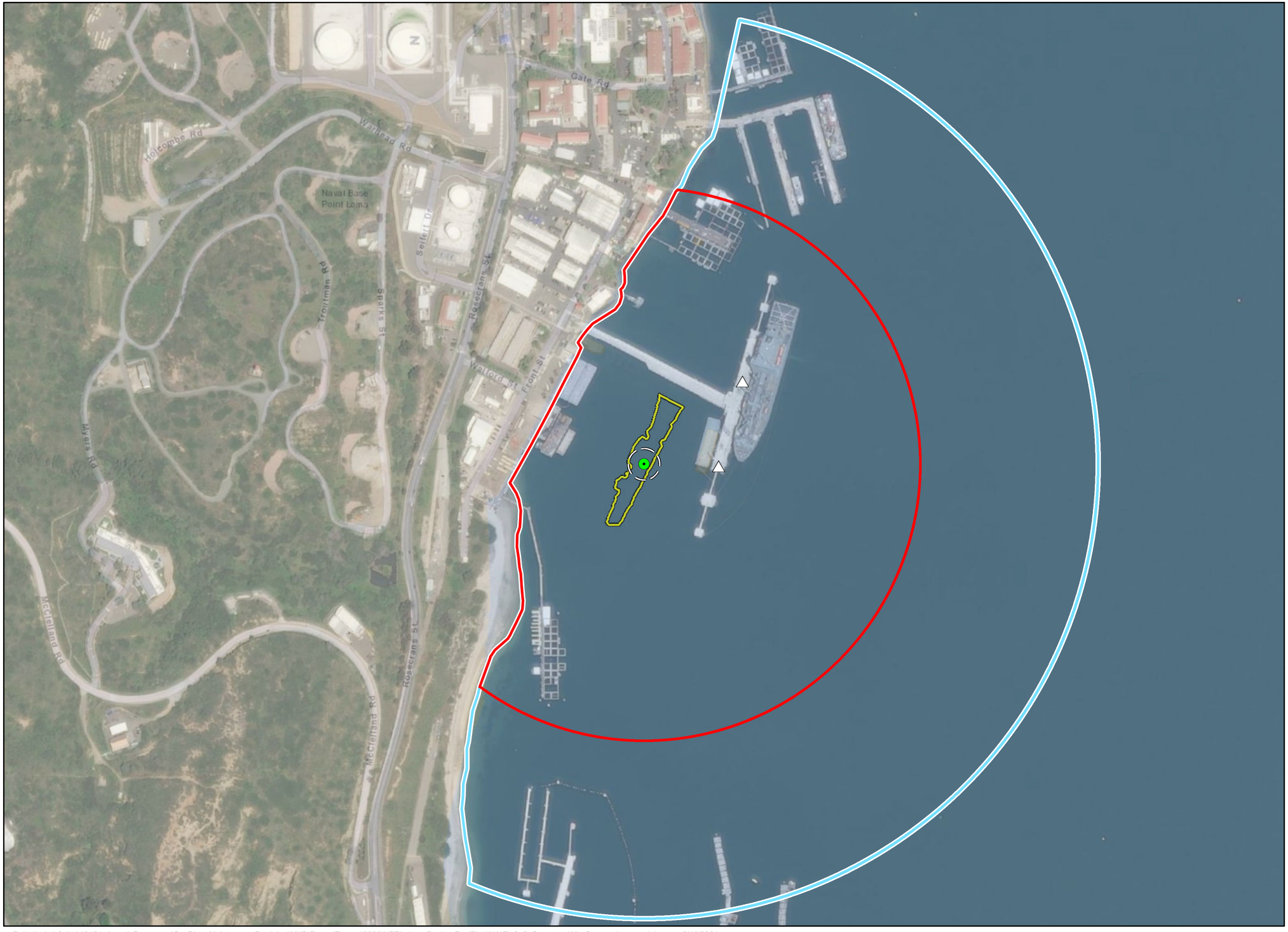
45m - Real Time Data (0.01 sq. km / <0.01 sq. mi)

1 inch = 250 feet

0 250 Feet

FIGURE 1-5

Level B ZOI for 14- and 16-inch Concrete Pile Removal via Hydraulic Chainsaw
Navy Base Point Loma
Maintenance Dredging
Fuel Pier Inboard Area



Source

Potential PSO Location

Proposed Dredge Footprint

Projected Distance to Level B Thresholds (156 dB RMS)

20m Buffered Shutdown Zone

575m - Practical Spreading Loss (0.63 sq. km / 0.24 sq. mi)

350m - Real Time Data (0.27 sq. km / 0.10 sq. mi)

1 inch = 400 feet

0 400 Feet

FIGURE 1-6

Level B ZOI for 14- and 16-inch Concrete Pile Removal via Wire Saw
Navy Base Point Loma
Maintenance Dredging
Fuel Pier Inboard Area

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P,

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Source

Potential PSO Location

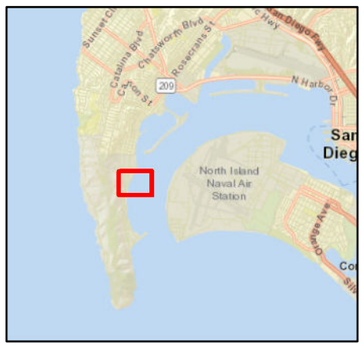
Proposed Dredge Footprint

Projected Distance to Level B Thresholds (152 dB RMS)*

20m Buffered Shutdown Zone

311m - Practical Spreading Loss (0.22 sq. km / 0.09 sq. mi)

*Note: Practical Spreading Loss only, no local real-time data available



1 inch = 250 feet

0 250 Feet

FIGURE 1-7

Level B ZOI for 14- and 16-inch Concrete Pile Removal via Vibratory Extraction
Navy Base Point Loma
Maintenance Dredging
Fuel Pier Inboard Area

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P,

1.3.2 Observer Monitoring Locations

In order to effectively monitor the Level A and Level B Harassment Zones, one or two PSOs will be positioned at the best practicable vantage point(s), taking into consideration security, safety, and space limitations. From one to two PSOs will be required as part of the monitoring activities, with the number of PSOs dependent on the size of the monitoring zone (see Figures 1-2 through 1-7). During activities requiring only one PSO, the PSO will be positioned with a clear view of the 20-meter (66-ft) buffered shutdown zone and will be responsible for halting in-water activities, as required. In the event that two PSOs are required, the PSO with the clearest view of the buffered shutdown zone will be designated as the monitoring coordinator ("Command" position) and will be responsible for halting in-water activities. Data will be collected on any marine protected species observed within the monitoring zones in accordance with monitoring and data collection procedures (Section 2.0).

1.4 Mitigation Measures

The following mitigation measures, as specified in the NOAA Fisheries IHA, shall be implemented during pile removal activities to avoid and minimize marine mammal exposure to Level A injury and to reduce to the greatest extent practicable exposure to Level B noise levels. Any mitigation measures identified in the IHA, beyond those identified below, will also be adhered to. The contractor is responsible for complying with all the mitigation measures listed below, whereas onsite Navy representatives will monitor the contractor's performance and require corrective action or stop work, if necessary, to ensure the requirements are met.

1) **Time Restriction:**
    - In-water pile removal activities will only be conducted when sufficient light is available for visual observations (generally 45 minutes after sunrise and up to 45 minutes before sunset).
2) **General Vessel & Machinery Stoppage**
    - Should a marine mammal come within 10 m (33 ft) during other in-water work using heavy machinery other than pile removal (e.g., vessel movement) the activity must cease operations and reduce vessel speed to the minimum level required to maintain steerage and safe working conditions.
3) **Pre-Construction Briefing**
    - Prior to the start of all in-water demolition activities, briefings will be conducted for construction supervisors and crews and the monitoring team and when new personnel join the work, in order to explain responsibilities, communication procedures, the marine mammal protocol, and operational procedures.

4) Establishment of Level A and Level B Harassment ZOIs During Pile Driving and Removal

- During all pile removal activities, a 20-m (66-ft) buffered shutdown zone will be monitored for marine mammals, and green sea turtles. The 20-m (66-ft) buffered shutdown zone also will avoid and minimize the potential for Level A acoustic injury since the largest calculated Level A ZOI is less than 10 m (33 ft) (see Section 1.3). Due to swim speeds of marine mammals potentially in the project area, adding the 10-m (33-ft) visual buffer is considered appropriate to reduce the likelihood a Level A take associated with an animal making a close approach to pile removal activities. If an animal enters the 20-m (66-ft) buffered shutdown zone, pile removal activities would be stopped until the individual(s) has left the zone of its own volition, or not been sighted for 15 minutes.
- If a marine mammal is observed entering the Level B ZOI, behaviors would be documented to assess for any potential behavioral changes due to exposure to project-related noise. Work would continue without cessation, unless the animal enters the buffered shutdown zone, at which point pile driving or extraction shall be halted.

5) Marine Protected Species Visual Monitoring

- Monitoring will be conducted for a 20 m (66-ft) buffered shutdown zone and within the Level B ZOIs before, during, and after pile removal activities. Monitoring will take place from 30 minutes prior to initiation through 30 minutes post-completion of pile removal activities.
- Monitoring will be conducted by qualified observers. All observers would be trained in marine mammal identification and behaviors, and have experience conducting marine mammal monitoring or surveys. Trained observers will be placed at the best vantage point(s) practicable (e.g., vantage points along the existing Fuel Pier) to monitor for marine mammals and implement shutdown/delay procedures, when applicable, by notifying the construction operator of a need for a shutdown.
- At least one , and up to two, PSOs will be deployed with a clear view of the buffered shutdown zone and ZOIs. The number of PSOs may vary depending on the construction or demolition activity and applicable size of the ZOI(s).
- Prior to the start of pile removal activity, the buffered shutdown zone will be monitored for 30 minutes to ensure that it is clear of marine protected species. Pile removal will only commence once observers have declared the buffered shutdown zone clear of marine protected species. Animals will be allowed to remain in the Level B ZOI and their behavior will be monitored and documented.

- If a marine protected species enters the buffered shutdown zone during the course of pile removal operations, pile removal will be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the buffered shutdown zone or 15 minutes have passed from the last observation time without a re-detection of the animal(s). A determination that the buffered shutdown zone is clear must be made during a period of good visibility (i.e., the entire buffered shutdown zone and surrounding waters must be visible to the naked eye).
- In the unlikely event that environmental conditions, such as heavy fog, prevent the visual detection of marine mammals within the buffered shutdown zone, in-water pile removal activities will not be initiated. If in water demolition activities have been initiated, and conditions deteriorate so that the buffered shutdown zone is not completely visible, then activities will be delayed until the full zone is visible.
- In the event that the Level B ZOI is not fully visible, an adjustment will be made for animals that were not actually observed during pile removal but were assumed to have been inside of the Level B ZOI.
- If a marine mammal species not covered in the IHA enters the Level B harassment zone, all pile removal activities shall be halted until the animal(s) has been observed to have left the Level B ZOI or has not been observed for at least one hour. NOAA Fisheries will be notified immediately with the species, and precautions made during the encounter. Pile removal will be allowed to proceed if the above measures are fulfilled for non-IHA species.
- If the take of a marine mammal species approaches the take limits specified in the IHA, NOAA Fisheries will be notified and appropriate steps will be discussed.

2.0 MARINE PROTECTED SPECIES MONITORING PROTOCOLS

2.1 Objectives

The primary objective of the visual monitoring is to detect and document impacts from Project-related activities on marine protected species. Monitoring will be conducted at all times during in-water pile removal activities to assess marine mammal use patterns and behavioral responses relative to Level A and Level B harassment ZOIs. Monitoring for green sea turtles will co-occur with the marine mammal monitoring.

2.2 Overview

The visual monitoring component of this Plan takes into consideration the logistical, environmental, and security requirements for working in the Project area. For the in-water pile removal activities, distances to regulatory thresholds (see Section 1.0, Tables 1-4 and 1-5) were estimated based on acoustic data for similar pile types and sizes (Greenbusch Group 2018; NAVFAC SW 2020) using the latest acoustic threshold guidance from NOAA Fisheries Technical Guidance (NOAA Fisheries 2018) and NOAA Fisheries User Spreadsheet (NOAA Fisheries 2020). The estimated distances to the ZOI boundaries were used to determine monitoring locations identified in this Plan.

During all pile removal activities, regardless of predicted sound pressure levels (SPLs), a 20-m (66-ft) buffered shutdown monitoring zone will be monitored for marine mammals. The 20-m (66-ft) buffered shutdown zone also will avoid and minimize the potential for Level A acoustic harassment since all Level A ZOI distances are less than 10 m (33 ft) (see Section 1.3). Due to swim speeds of marine mammals potentially in the project area, a 20-m (66-ft) buffered shutdown zone is considered appropriate to reduce the risk of a Level A take associated with pile installation or removal. If an animal enters the 20-m (66-ft) buffered shutdown zone, pile removal would be stopped until the individual(s) has left the zone of its own volition, or not been sighted for 15 minutes after its last observed time.

The Level A/B harassment ZOIs will be monitored throughout the time required to remove a pile. If a marine mammal is observed entering the Level B ZOI, an exposure would be recorded and behaviors documented. Work would continue without cessation, unless the animal approaches or enters the 20-m (66-ft) buffered shutdown zone, at which point pile removal will be halted.

If a marine mammal species not covered in the IHA approaches the Level B harassment zone, all pile removal activities shall be halted until the animal(s) has been observed to have left the area, or has not been observed for at least one hour from its last observation time. NOAA Fisheries will be notified as soon as possible to discuss the occurrence of the non-covered species, pertinent observations of the behavior and condition of the animal, and precautions that were, and would

be, taken to avoid unauthorized take. Pile removal will be allowed to proceed if the above measures are fulfilled for non-IHA species.

If the take of a marine mammal species approaches the take limits specified in the IHA, NOAA Fisheries will be notified and appropriate steps will be discussed.

During any monitored activity, the PSO with the clearest view of the buffered shutdown zone will be designated as the monitoring coordinator ("Command" position) will initiate shutdown procedures, if warranted, by notifying the construction crew via either verbal or visual communication procedures (e.g., signal flag). Other PSOs can initiate shutdown procedures by calling the "Command" PSO who will then stop pile removal activities by notifying the construction crew.

2.3 Observer Qualifications

The PSOs must be independent observers (i.e., not construction personnel), who are trained biologists with the ability to correctly identify the marine mammal species and accurately describe the relevant species-specific behaviors that may occur in proximity to in-water construction and demolition activities. The PSOs may either be biologists with prior training and experience to meet the qualifications in conducting marine mammal monitoring or must undergo applicable training to meet the qualifications. Additional qualifications and protocols of PSOs include the following:

- Will have the ability to conduct field observations and collect data according to the assigned protocol.
- Where a team of two or more observers are required, one observer will be designated as "Command" and will coordinate monitoring efforts. The "Command" PSO will have prior experience working as an observer.
- Will have experience or training in the field identification of marine mammals, including the identification of behaviors.
- Will have a minimum of a Bachelor's degree in biological science, wildlife management, mammalogy or related fields.
- Will have visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface, with the ability to estimate target size and distance; use of binoculars may be necessary to correctly identify the target.
- Will have sufficient training, orientation, or experience with pile removal and dredging operations to provide for personal safety during observations.
- Will have writing skills sufficient to prepare a report of observations including, but not limited to, dates and times when monitoring was conducted; the number and species of marine mammals observed; observed marine mammal behavior during monitoring

relative to Project-related in-water activities; and dates and times when in-water pile removal activities were suspended to avoid potential incidental injury from sound or physical interaction with operating equipment.

- 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.

2.4 Marine Species Data Collection

NOAA Fisheries requires that at a minimum, the following information be collected by PSOs:

- Date and time that pile driving or removal begins or ends;
- Construction activities occurring during each observation period;
- Weather parameters (e.g., wind, temperature, percent cloud cover, and visibility);
- Tide stage and sea state (The Beaufort Sea State Scale will be used to determine sea-state);
- Species, numbers, and, if possible, sex and age class of marine mammals;
- Marine mammal behavior patterns observed, including bearing and direction of travel, and if possible, the correlation to SPLs;
- Distance from pile removal activities to marine mammals and distance from the marine mammal to the observation point;
- Locations of all PSOs; and
- Other human activity in the area.

The required fields will be incorporated into an electronic tablet form or hardcopy datasheets that will be used by the PSOs (example provided in Appendix A). Data collection forms shall be submitted to the Navy point of contact for review within a mutually agreeable timeframe prior to the start of activities.

To the extent practicable, the PSOs will also record behavioral observations that may make it possible to determine if the same or different individuals are being "taken" as a result of Project activities over the course of a day.

In addition, the PSOs will document any occurrences of green sea turtles within the designated monitoring zones. Sighting information for green sea turtles will include all data that was collected for marine mammals (e.g., distance, bearing, and number of individuals).

The PSOs will monitor the applicable ZOIs before, during, and after all pile removal activities which will be monitored within the buffered shutdown zone only to avoid the potential for physical interaction with operating equipment.

2.5 Monitoring Equipment

Trained PSOs will be placed at the best vantage point(s) practicable (e.g., the pile removal barge, on shore at the Fuel Pier, or any other suitable location) to monitor for marine mammals and implement shutdown/delay procedures, when applicable, by notifying the equipment operator of a need for shutdown of construction.

2.5.1 Marine Species Observation Equipment

The following equipment would be used to conduct marine species monitoring:

- Hearing protection for all personnel working near heavy construction equipment;
- Portable marine radios for the observers to communicate with the monitoring coordinator, construction contractor, and other observers;
- Cellular phones (one per observing location), and the contact information for the other observers, and monitoring coordinator;
- Flags (one green, one red per observing location) as back-up for radio communication;
- Daily tide tables for the Project area within San Diego Bay;
- Watch or Chronometer;
- Binoculars with built-in compass (quality of 7x50 or better);
- Laser rangefinder;
- Plan, IHA permit, and/or other relevant permit requirement specifications in sealed transparent plastic cover;
- Notebook and/or electronic tablets with pre-standardized Marine Mammal Observation Record forms to record field monitoring data electronically or on waterproof paper (e.g., Rite-in-the Rain);
- Marine mammal identification guides on waterproof paper;
- Clipboard; and
- Pen / Pencil

2.6 Monitoring Methods

The Navy will conduct briefings between construction supervisors and crews and the PSO team prior to the start of all pile removal activities, and when new personnel join the work. These briefings will explain responsibilities, communication procedures, visual monitoring protocols, and operational procedures. All personnel working in the project area will have watched the Navy's Marine Species Awareness Training Module.

The PSOs will collect marine mammal sightings data, including behaviors, for the pre-, during, and post-pile removal periods. All observations will be logged, regardless of proximity to the Level A or Level B ZOIs, to eliminate potential for bias. An assessment of take will occur only if the animal or group enters the ZOIs during project-related activities that may generate noise levels that meet or exceed the values identified in the application for the IHA (Navy 2020). The efficacy of visual detection depends on several factors including the PSOs ability to detect the animal, the environmental conditions (visibility and sea state), and monitoring platforms.

Based on NOAA Fisheries requirements, this Plan includes the following procedures:

- Monitoring will be conducted during daylight hours. If lighting conditions do not allow PSOs to observe the buffered shutdown zone effectively, in-water construction or demolition activities will not be allowed to start (or continue) until conditions improve.
- For each type of pile removal activity (i.e., pile clipper, diamond wire saw, etc.), PSOs will be placed at the best vantage point(s) practicable (e.g., from the Fuel Pier, a small boat, construction barges, on shore).
- Up to two PSOs, as necessary, will be deployed at locations (i.e., from land, the pile removal barge, or on the Fuel Pier) with a clear view of the buffered shutdown zone and ZOIs. The actual monitoring location(s) will be based on providing the greatest visibility of the monitoring zone specific to each activity.
- When there are two PSOs, all will be in radio communication with each other to enhance tracking of marine mammals that may be moving through the area and to minimize duplicate observation records of the same animal by different PSOs (i.e., a re-sighting);
- During all monitoring activities, at least one PSO will be stationed with clear view of the buffered shutdown and physical interaction shutdown zone(s) and will be responsible for the collection of pile removal start and stop times, identification of all marine protected species in the vicinity of the pile being installed or removed, and notifying the contractor if construction or demolition must be delayed or stopped due to the presence of a marine protected species within the buffered shutdown zone.
- For activities with monitoring zones beyond the visual range of the “Command” PSO position, an additional monitoring location will be employed . Data will be collected on any marine protected species observed within the monitoring zones in accordance with monitoring and data collection procedures.
- Monitoring will be conducted before, during, and after pile removal activities.
- During all observation periods, the PSOs will use binoculars and/or the naked eye to search continuously for marine protected species.

- A 20-m (66-ft) buffered shutdown zone will be established around all in-water pile removal activities to avoid the potential for physical or Level A acoustic injury of marine protected species.
- If a marine protected species enters the buffered shutdown zone, all removal activities at that location must be halted. The animal(s) must be allowed to remain in the buffered shutdown zone (i.e., must leave of their own volition) and their behavior must be monitored and documented. Work will be allowed to restart once the animal has been observed either leaving the buffered shutdown area, or 15 minutes has elapsed since the last observation without re-detection of the animal.
- Results of all marine protected species observations during pre-activity, during activity, and post-activity monitoring will be recorded on electronic tablet or hardcopy datasheets.
- If an injured, sick, or dead marine mammal is observed, procedures outlined in Section 4.0 will be followed.

Pre-, during, and post-pile removal visual survey protocols are further described below.

2.6.1 Pre-Activity Monitoring

The following survey protocols will be implemented prior to the start of in-water pile removal activities:

- Visual surveys will occur for at least 30 minutes prior to the start of pile removal activities.
- If a marine mammal is present within the 20-m (66-ft) buffered shutdown zone, in-water activities will be delayed until either the animal has voluntarily left and been visually confirmed beyond the buffered shutdown zone, or 15 minutes has elapsed since the last observation time without a re-detection of the animal.
- The buffered shutdown zone(s) may only be declared clear, and pile removal started, when the entire buffered shutdown zone is visible (i.e., when not obscured by a poor light, rain, fog, etc.). If the buffered shutdown zone is obscured by fog or poor lighting conditions, activity at the location will not be initiated until the buffered shutdown zone is visible.
- If marine mammals are present within the Level B Behavioral Harassment Monitoring Zone, in-water construction or demolition will not need to be delayed.

2.6.2 During Activity Monitoring

The Monitoring Zones will be monitored throughout pile driving and removal. Distances and activity monitoring protocols for these zones are described below:

- If a marine protected species approaches, or appears to be approaching, the 20-m (66-ft) buffered shutdown zone, the PSO who first observed the animal will alert the "Command" PSO who will notify the construction crew of the animal's current status; in-water activities will be allowed to continue while the animal remains outside the buffered shutdown zone.
- If the marine protected species enters the 20-m (66-ft) buffered shutdown zone, a shutdown will be called by the "Command" PSO As the animal enters the buffered shutdown zone, all pile removal operations will be stopped and the animal(s) will be continually tracked. Once a shutdown has been initiated, all in-water activities that generate potentially impactful noise will be delayed until the animal has voluntarily left the buffered shutdown zone and has been visually confirmed beyond the buffered shutdown zone, or 15 minutes have passed without re-detection of the animal (i.e., the zone is deemed clear of marine protected species). The "Command" PSO will inform the construction contractor that activities can re-commence.
- If shutdown and/or clearance procedures would result in an imminent concern for human safety, then the activity will be allowed to continue until the safety concern is addressed. During that timeframe the animal will be continuously monitored, and the Navy point of contact will be notified and consulted prior to re-initiation of project-related activities.
- Shutdown shall occur if a species, for which authorization has not been granted, or for which the authorized numbers of takes have been met, approaches or is observed within the Level B ZOI. The monitoring coordinator or "Command" PSO shall notify the Navy point of contact, who will then contact NOAA Fisheries immediately. For non-IHA species, pile installation/removal will be allowed to proceed if the animal(s) is observed to leave the Level B ZOI, or if one hour has lapsed since the last observation.
- If a marine mammal is observed entering the Level B monitoring zones (see Table1-5, Figures 1-2 through 1-6), the pile segment being worked on will be completed without cessation, unless the animal enters or approaches the buffered shutdown zone. Regardless of location within the Level B monitoring zone, an initial behavior and the location of the animal(s) will be logged. Behaviors will be continually logged until the animal is either passed off to another PSO, the animal is no longer visible, or it has left the Level B monitoring zone.
- Previous monitoring efforts during the Fuel Pier Replacement Project used a method to calculate "extrapolated" accounts for instances where visual obstructions prevented

PSOs from observing the full monitoring zone. This methodology is based on three factors: 1) the amount of area not observed during individual pile removal activities, 2) an estimate of species density as described in Section 6 of the IHA Application (Navy 2020) based on previous Fuel Pier Replacement Project monitoring and NMSDD, and 3) the amount of time of potential exposure during individual pile removal activities as described in Section 2 of the IHA Application. This method will be implemented for this project as well and will provide a conservative estimate of unobserved "takes."

2.6.3 Post-Activity Monitoring

Monitoring of all zones will continue for 30 minutes following completion of pile removal activities. These surveys will record all marine mammal observations following the same procedures as identified for the pre-construction monitoring time period, and will focus on observing and reporting unusual or abnormal behaviors.

2.6.4 Concurrent Action

There is a possibility that an overlap of in-water pile removal activities could occur. If separate pile removal activities were to occur simultaneously, then two "Command" PSO positions would be in place if a single PSO is unable to observe the concurrent actions. These positions would act independently and would have the ability to shutdown proximate pile removal activities if a marine protected species entered the buffered shutdown zone under their observation. Sightings of marine protected species at one location that are moving towards the other location will be communicated among the PSOs, to increase the awareness of an incoming potential sighting.

3.0 ACOUSTIC MONITORING

The previous Fuel Pier Replacement Project resulted in collection of acoustic data for pile removal and installation within the Project Area over five years as summarized in the Compendium of Underwater and Airborne Sound Data during Pile Installation and In-Water Demolition Activities in San Diego Bay, California (San Diego Noise Compendium; NAVFAC SW 2020). Recorded noise sources include pile clippers (polycarbonate and concrete piles), hydraulic chainsaw, and diamond wire saw.

Standard acoustic monitoring specifications are included below to be implemented in the event that a new, previously unrecorded equipment type (i.e., not listed above) is used so relevant acoustic profiles may be obtained and verification of appropriate ZOIs may be developed.

3.1 Objectives

The purpose of acoustic monitoring is to empirically verify Level A and Level B ZOIs for specific underwater sound-generating activities by using in-situ acoustic data collection on sound source levels, and duration of activity; received levels at a range of distances, from which actual rates of transmission loss can be determined; and determining the distances at which the applicable NOAA Fisheries Level A and Level B thresholds for various marine mammal groups are reached. Depending on the results and concurrence from NOAA Fisheries, this information may be used to adjust the estimated Level A and B monitoring zones (see Section 1.0).

3.2 Equipment

Sound data acquisition, if required, during pile removal will utilize a combination of equipment, including survey vessel and specific acoustic data logging equipment. The equipment will be deployed to verify source levels at 10 m (33 ft) and received SPLs across a range of distances to confirm Level A and B ZOIs.

3.2.1 Survey Vessel

The vessel will include the following equipment for the safety of the crew:

- A fixed marine radio for the vessel operator to monitor channels independent of observers communicating on a dedicated channel;
- Cellular phones (minimum one per boat);
- A depth finder;
- Nautical chart and plotting tools;
- GPS unit.

The vessel will comply with all U.S. Coast Guard regulations and be able to pass a U.S. Coast Guard safety inspection.

3.2.2 Acoustic Measurement Equipment

Acoustic technicians (ATs) will conduct *in-situ* hydroacoustic monitoring of in-water construction and demolition activities. The following types of equipment will be used:

- A passive acoustic monitoring (PAM) system, with cabled underwater microphone (hydrophone) and specialized equipment and software for recording and processing received SPLs (e.g., digital audio recorder, data logger sound level meter, data processing hardware, sound analysis software, display hardware and software). The PAM system should allow the AT to determine dB RMS and PEAK (referenced to 1 µPa), and sound exposure level (SEL) (referenced to 1 μPa^2). The SEL_{cum} (SEL+10log(# pile strikes or pile driving/extraction duration)) metric will be calculated from collected data.
- The PAM system receiving sensitivity should be sufficient to measure very high acoustic pressures (e.g., 220 dB re: 1 µPa) within 10 m (33 ft) of pile driving activities without distortion.
- Pistonphone for calibration of hydrophones.

3.3 Methods

3.3.1 Overview

ATs will record SPLs during impulsive and non-impulsive pile removal activities. Data will be collected for a representative number of piles (three to five) at the start of each unique type of in-water activity (e.g., impact pulverization, pile clipping, clamshell bucket clipping, or chainsaw/"saws all" cutting). Data will be collected near the source (at, or as close as possible to, 10 m [33 ft] of the pile) and at various distances away to confirm SPLs, Level A and B ZOI monitoring zones, and rates of transmission loss for each separate in-water construction activity. While acoustic data will be recorded for a minimum number of piles according to each pile size and type and activity, collected acoustic data will be considered "sufficient" when the unique obtained values are demonstrated to be consistent and as expected over multiple recorded activities. Given that, there is the possibility that more acoustic data may need to be collected for some activities or pile sizes to be considered sufficient.

ATs may be co-located with the land-based PSO responsible for monitoring within 10 m (33 ft) of in-water pile removal activities. Acoustic surveys will be conducted using a vessel to confirm Level B ZOIs. This vessel will be free to move to any location needed to record acoustic data and will not interfere with the visual monitoring.

Hydroacoustic equipment and methods will follow NOAA Fisheries guidance for hydroacoustic data collection equipment considerations and methods during impact and vibratory pile driving.

3.3.2 Equipment Calibration

- All hydrophones and recording systems will be checked prior to deployment each day to ensure proper operation.
- Pistonphone calibration will be performed at least once per week to maintain consistent measurements.
- The PAM system should be calibrated by the manufacturer to National Institute of Standards and Technology standards at least annually.

3.3.3 Hydrophone Deployment and Data Collection

- Hydroacoustic monitoring stations will be located at source and at appropriate distances away from the in-water pile removal activities to confirm monitoring zone Level A and B ZOI distances and sound transmission loss.
- All underwater sound monitoring systems will deploy hydrophones at mid-water depth (as determined by direct measurement or vessel-based depth finder).
- The hydrophone will be deployed so as to maximize its distance from flat surfaces or structures that may produce excessive reflections.
- During all vessel-based recordings, the vessel will be anchored and the engine off.
- GPS coordinates will be recorded for all acoustic monitoring locations.
- Sound level meter will be set to applicable source sound type, impulsive or non-impulsive, depending on pile removal method. Recordings will be made for the duration of each individual pile removal activity.
- Data will be reported on electronic tablet or hardcopy data sheets.
    - Field data collection will include, but not be limited to: date, AT initials, general weather information (wind, waves, temperature), boat/ship traffic in area, pile number, hydrophone location, hydrophone depth, water depth, start/end time of activity, type of activity, and field-collected acoustic metrics.
    - The monitoring coordinator will supply the AT with the start and stop times for the activity; hammer model, size, energy settings, and blow counts (as relevant); pile clipper sizes; clamshell bucket size; and any changes to those values during the piles being monitored.

3.3.4 Sound Source Verification

- Sound source verification would occur if a removal technique not previously recorded/observed during the previous Fuel Pier demolition, and provided in the 2020 Acoustic Compendium, were to be used (NAVFAC SW 2020). Previously observed methods for which additional source verification would not be required include use of pile clippers, hydraulic chainsaw, or diamond wire saw.
- If the contractor determines that a new pile removal methodology for which no previous acoustic data have been recorded is necessary, sound source verification acoustic monitoring would be required for at least the first five piles removed using that method.
- For new equipment sound source level measurements, reports will include: duration per pile; mean, median, and maximum source levels (dB re 1 µPa); root mean square sound pressure level (SPL_{rms}); and cumulative sound exposure level (SEL_{cum}) (and timeframe over which the sound is averaged).
- One-third octave band spectrum and power spectral density plot.

3.3.5 Monitoring Zone Confirmation

- Initial hydro-acoustic monitoring will occur near the predicted ZOIs for Level A/B harassment ZOIs sufficient to document ZOI distances.
    - Empirically determine the Level B harassment distance by extrapolating from in-situ measurements of received SPLs at several points between 10 m and 500 m (33 ft and 1,640 ft) from the source. It is recommended that, at a minimum, measurements be taken at 10, 50, 250 and 500 m (33, 164, 820, and 1,640 ft) from the source, and that the best fit regression equation be used to estimate the Level B harassment distance. Alternatively, the Level B harassment distance can be determined by direct measurements to locate the distance where the received levels reach the ambient noise level (129.6 dB).

4.0 INTERAGENCY NOTIFICATION FOR INJURED OR DEAD MARINE MAMMALS

In the unanticipated event that the construction or demolition activities clearly cause the take of a marine mammal in a prohibited manner, such as an injury, serious injury, or mortality, the "Command" PSO will stop all active pile driving or extraction and immediately notify the Navy POC[1]. The Navy POC will immediately report the incident to the following agencies:

- NBPL Base Biologist (Caroline Jurca): 619-553-7525
- NMFS Office of Protected Resources (OPR): 301-427-8401.
- West Coast Region Marine Mammal Stranding Network(s);
    - Live animals – Sea World of California: 800-541-7325
    - Dead animals – NMFS Southwest Fisheries Science Center: 858-546-7162.

The report will include the following information:

- Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
- Species identification (if known) or description of the animal(s) involved;
- Condition of the animal(s) (including carcass condition if the animal is dead);
- Observed behavior of the animal(s), if alive;
- Description of marine mammal observations in the 24 hours preceding the incident;
- If available, photographs or video footage of the animal(s); and,
- General circumstances under which the animal was discovered.

In the event that an injured or dead marine mammal is discovered, and the "Command" PSO determines that the cause of the injury or death is unknown and the death is relatively recent (i.e., in less than a moderate state of decomposition as described in the next paragraph), the "Command" PSO will report to the Navy POC. Within 24 hours, the Navy POC will report the incident to the NBPL Base Biologist, the NMFS OPR, and the appropriate West Coast Region Marine Mammal Network Stranding Coordinators as noted above. The report will include the same information identified above. Pursuant to NOAA Fisheries instruction, activities may continue while the circumstances of the incident are under review. NOAA Fisheries will work with the Navy to determine whether modification in the activities are appropriate.

[1] The Navy POC will be determined prior the start of the Project and contact information will be provided to the monitoring crew.

In the event that an injured or dead marine mammal is discovered, and the "Command" PSO determines that the injury or death is not associated with, or related to, Project-related activities authorized in the IHA (i.e., previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), the "Command" PSO will report the incident to the Navy POC, who will report the animal(s) to the NBPL base biologist. The appropriate West Coast Region Marine Mammal Network Stranding Coordinators, as noted above, will be notified within 24 hours of the discovery. The Navy POC will not be required to contact the NMFS OPR for these cases. The PSOs will provide photographs or video footage (if available) or other documentation of the stranded animal sighting to the Navy POC under such a case. At no time should the PSO handle, or attempt to handle, a dead marine mammal.

5.0 REPORTING

A draft report will be submitted to NOAA Fisheries within 90 calendar days of the completion of acoustic measurements and marine mammal monitoring. The results will be summarized in textual, graphical, and tabular formats and include summary metrics, as applicable. A final report will be prepared and submitted to the NOAA Fisheries within 30 days following receipt of comments on the draft report from the NOAA Fisheries.

The marine mammal report shall contain informational elements including, but not limited to:

- Dates and times (begin and end of all marine mammal monitoring.
- Construction activities occurring during each daily observation period, including how many and what type of piles were driven or removed and by what method (i.e., impact or vibratory).
- Weather parameters and water conditions during each monitoring period (e.g., wind speed, percent cover, visibility, sea state).
- The number of marine mammals observed, by species, relative to the pile location and if pile driving or removal was occurring at time of sighting.
- Age and sex class, if possible, of all marine mammals observed.
- PSO locations during marine mammal monitoring.
- Distances and bearings of each marine mammal observed to the pile being driven or removed for each sighting (if pile driving or removal as occurring at time of sighting).
- Description of any marine mammal behavior patterns during observation, including direction of travel and estimated speed time spent within the Level A and Leve B harassment zones while the source was active.
- Number of individuals of each species (differentiated by month as appropriate) detected within the monitoring zone, and estimates of number of marine mammals taken, by species (a correction factor may be applied to total take numbers, as appropriate).
- Detailed information about any implementation of any mitigation triggered (e.g., shutdowns and delays), a description of specific actions that ensued, and resulting behavior of the animal, if any.
- Description of attempts to distinguish between the number of individual animals taken and the number of incidences of take, such as ability to track groups or individuals.
- Submit all PSO datasheets and/or raw sighting data (in a separate file from the Final Report referenced immediately above).

6.0 REFERENCES

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_____. 2020. Companion User Spreadsheet to: Technical Guidance for Assessing the Effects of Anthropogenic Noise on Marine Mammal Hearing: Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts (Version 2.0). U.S. Department of Commerce, NOAA. NOAA Technical Memorandum NMFS-OPR-59, 167 pp.

Naval Facilities Engineering Systems Command Southwest (NAVFAC SW). 2020. Compendium of Underwater and Airborne Sound Data during Pile Installation and In-Water Demolition Activities in San Diego Bay, California. Prepared for NAVFAC SW. Prepared by Tierra Data, Inc. October 2020.

U.S. Department of the Navy (Navy). 2021. Incidental Harassment Authorization Application for the Navy's Fuel Pier Inboard Pile Removal and Dredging Project at Naval Base Point Loma. Submitted to Office of Protected Resources, National Marine Fisheries Service, National Oceanic and Atmospheric Administration.

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APPENDIX A:

EXAMPLE MARINE SPECIES OBSERVATION RECORD FORM

Marine Species Monitoring Log (Page 1)

Date: _____ Observer(s): _____

Geneal Weather: AM _____ Daily Start Time: _____

PM _____ Daily End Time: _____

	Time	Species	# Indiv Water	# Indiv HO	Dist (m)	Bear (deg)	Sex	Age Class	Dir of Travel	1° Beh	2° Beh	2° Beh Time	Activity Type	Resight (Y/N)	Notes/Other Human Activity
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															

Species Abbreviations:

CSL	CA sea lion	CSL DD	Dead CSL	OTH	Other Species	ULWH	Unknown Large Whale
CBD	Coastal Bottlenose Dolphin	PGW	Pacific Grey Whale	Mixed	Multiple Species	GST	Green Sea Turtle
PHS	Harbor Seal	CLT	CA Least Tern	UPIN	Unknown Pinniped		
PWS	Pacific White-sided Dolphin	CMD	Common Dolphin	UDOL	Unknown Dolphin		

Marine Species Monitoring Log (Page 2)

	Station	Buoy #	Obs Lat	Obs Long	Sky Cover	Vis.	BSS	Photo (Y/N)
1								
2								
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Activity Type

IPD	Impact	**Post**	Post-con Monitoring
VPD	Vibratory	**OTH**	Other
Pre	Pre-con Monitoring		
ND	Non Driving Monitoring		

Sex

F	Female	**Mixed**	Mixed Group
M	Male	**U**	Unknown

Age Class

P	Pup	**A**	Adult
C	Calf	**U**	Unknown
J	Juvenile	**M**	Mixed
SA	Subadult	**N/A**	N/A

Primary Behavior

DV	Dive	**PP**	Porpoising
O	Other	**SW**	Swimming
SF	Suc Forage	**JH**	Jug Handling
UF	Unsuc Forage	**RF**	Rafting
LG	Logging	**EN**	Enter Water
BR	Bow Riding	**EX**	Exit Water
TS	Tail Slap	**HO**	Hauled Out
SH	Spyhop	**LO**	Look
ML	Milling		

Secondary Behavior

AD	Ab Change Dir	**BC**	Breach
IB	Inc Breath Rate	**FL**	Flush
IS	Inc Swim Rate		

Sky Cover

C	Clear	**F**	Fog
PC	Partly Cloudy	**HZ**	Hazy
CD	Cloudy	**LR**	Light Rain
O	Overcast	**HR**	Heavy Rain

Visibility

BD	bad (<0.5 km)	**GD**	good (10-20 km)
PR	poor (0.5-1.5 km)	**EX**	excellent (>20 km)
MD	moderate (1.5-10 km)		