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**MARINE MAMMAL MONITORING PLAN  
FOR THE NAVY'S  
FLOATING DRY DOCK PROJECT  
AT  
NAVAL BASE SAN DIEGO, CALIFORNIA**

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Submitted to:

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

Prepared by:

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For:

**Naval Base San Diego**



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**ACRONYMS AND ABBREVIATIONS**

μPa	microPascal
COL	commercial outlease
dB	decibel(s)
ESA	Endangered Species Act
FDD	Floating Dry Dock
ft	foot/feet
GPS	Global Positioning System
IHA	Incidental Harassment Authorization
kHz	kilohertz
m	meter(s)
MGBW	Marine Group Boat Works, LLC
MMPA	Marine Mammal Protection Act
Navy	U.S. Department of the Navy
NBSD	Naval Base San Diego
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
Plan	Marine Mammal Visual Monitoring Plan
POC	Point of Contact
Project	Floating Dry Dock Project
PSO	Protected Species Observer
PTS	Permanent Threshold Shift
re 1 μPa	referenced to one microPascal
RMS	root mean square
SEL	sound exposure level
SPL	sound pressure level
ZOI	zone of influence

## 1.0 INTRODUCTION

### 1.1 Purpose of the Monitoring Plan

The purpose of this Marine Mammal Visual Monitoring Plan (Plan) is to provide protocols for marine mammal monitoring during pile driving activities in accordance with the Marine Mammal Protection Act (MMPA) Incidental Harassment Authorization (IHA) issued in September 2020 by the National Marine Fisheries Service (NMFS) for the incidental take of California sea lion (*Zalophus californianus*). Incidental take is expected as a result of the U.S. Department of the Navy's (Navy's) commercial outlease (COL) Floating Dry Dock (FDD) (hereafter referred to as "Project") associated with the Naval Base San Diego (NBSD), California. No other marine mammal species are expected to occur in the Project area.

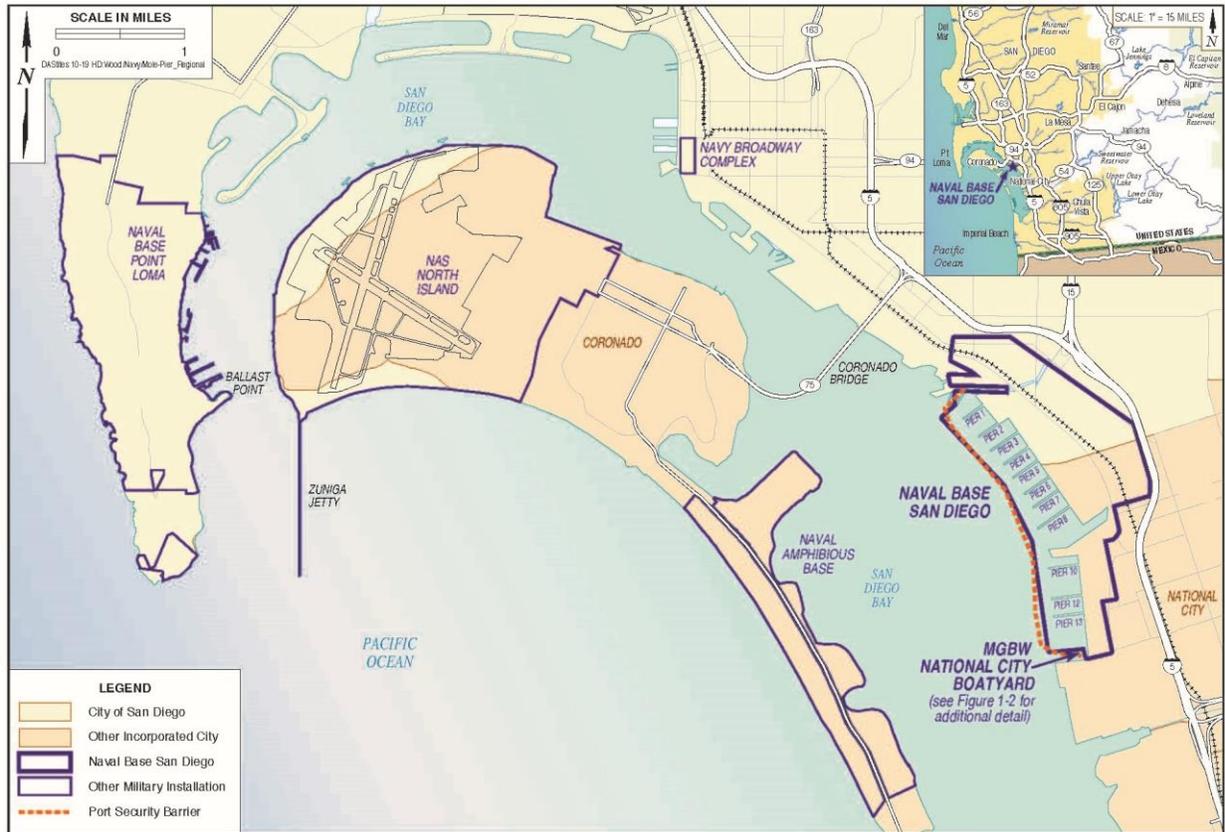
The Project will include emplacement of a FDD near the Marine Group Boat Works, LLC (MGBW) maintenance pier (Figure 1-1). Construction activities will include driving of piles using multiple methods and equipment including impact and vibratory hammers, and possibly high-pressure water jetting. The actual equipment used to install piles would be determined by the construction contractor. Pile installation activities that have the potential to result in MMPA take by acoustic harassment will be monitored. See the IHA application for a definition of MMPA take relative to this Project.

There are no known pinniped haul-out locations in the vicinity of the Project; therefore, airborne noise is not expected to result in incidental take and will not be monitored. The project also includes dredging and appropriate disposal of dredged sediments, which are not covered in this Plan.

The purpose of monitoring described herein is threefold:

- 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 B (behavioral disturbance) ZOIs; and
- 3) To document any differences in species, numbers, or behavioral effects associated with Project-related in-water activities.

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



**Figure 1-1. Regional Location of the Floating Dry Dock Project at MGBW COL FDD, Naval Base San Diego.**

Based on the IHA Application submitted as part of the MMPA permit process, 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 California sea lions in the Project area, provide for practical implementation of this Plan, reduce the risk of unauthorized take, and allow maintenance of construction schedules.

## 1.2 Summary of Activities to be Monitored

All relevant in-water construction activities that have the potential to result in Level A or Level B harassment of marine mammals will be monitored, including installation of piles via vibratory and/or impact pile driving, as well as use of high-pressure water jetting to assist pile installation.

In-water construction 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 marine mammal species, is prohibited and may result in modification, suspension, or revocation of the IHA.

Observers associated with this project will identify and document all protected marine species as part of their observation duties. As such, while the focus of this document is to address marine mammal monitoring, the observers will hereafter be referred to as Protected Species Observers (PSOs). The PSOs will monitor before, during, and after all pile driving activities within the acoustic ZOIs of those activities relative to the MMPA Level A and B acoustic thresholds. A separate Endangered Species Act Section 7 Consultation is on-going for green sea turtle (*Chelonia mydas*). All measures identified in the applicable ESA consultation documents will also be incorporated into monitoring protocols.

The proposed construction activities at the Project site are summarized in Table 1-1. In-water activities expected to result in incidental takes of marine mammals would occur for up to 50 days at the Project area (Table 1-1).

**Table 1-1. Activity Summary, Pile Installation, MGBW COL FDD.**

Pile Size/Type	Pile Installation Method	Anticipated Number of Piles	Pile Location/Purpose	Assumed Daily Maximum Number of Piles Installed	Anticipated Number of Days
24-inch Octagonal Concrete <sup>1</sup>	Impact Pile Driver	32	Forward and aft mooring dolphins (Structural)	1	32
	Impact Pile Driver	24	Ramp wharf and vehicle bridge (Structural)	3	8
24-inch Steel Pipe	Impact Pile Driver	8	Forward and aft mooring dolphins (Structural)	1	8
	Vibratory Pile Driver	8		1	
	Impact Pile Driver	2	Aft mooring dolphin (Fender)	1	2
	Vibratory Pile Driver	2		1	
<b>Total In-Water Pile Installation Days</b>					<b>50</b>

**Notes:**

- <sup>1</sup> High pressure water jetting may be used in conjunction with all concrete pile installation activities. If this pile installation technique is used, it could occur on up to 40 days of concrete pile installation.

### 1.3 Monitoring Zones

A simplistic modeling approach was used to calculate distances to Level A and Level B threshold criteria based on NMFS Technical Guidance (National Oceanic and Atmospheric Administration [NOAA] Fisheries 2018), and NMFS User Spreadsheet and practical spreading loss (15logR). Distances to the sea lion (Otariid functional hearing group) Level A acoustic threshold are based

on SELcum (SEL x 10 Log [number of strikes or duration per 24 hours]) given that the anticipated peak values at 10 meters (m; 33 feet [ft]) during pile driving are below injury thresholds. Distances to the sea lion in-water Level B acoustic threshold for continuous noise sources are based on average ambient underwater noise level (126 decibels [dB]) within the project area (Dahl and Dall'Osto 2019).

The distances to the acoustic thresholds are plotted as simple radial ZOIs, taking into account the natural and manmade barriers to sound transmission along the shoreline of San Diego Bay. The ZOIs were used to determine monitoring locations for the in-water activities identified in this Plan. Local conditions are expected to influence sound propagation in the Project area. Closer to land, adjacent piers will influence sound transmission, but the rate of reduction is uncertain. The ZOI areas influenced by piers are shaded on the monitoring zone figures presented below (Figure 1-2).

### **1.3.1 Level A and Level B Harassment Monitoring and Shutdown Zones**

Maximum potential distances to Level A and Level B acoustic harassment associated with the proposed pile driving are provided in Table 1-2 and shown on Figure 1-2. Because the Navy is not requesting Level A take for the Project, a buffer of 12 m (39 ft) was added to the largest Level A ZOI (13 m [43 ft]; Table 1-2) to reduce the likelihood of an animal being exposed to potentially project-related injurious sound. Regardless of activity, a 25 m (82 ft) buffered shutdown ZOI will be in place to stop all in-water activities if an animal approaches the pile driving rig.

Considering that animal density in the project area is unknown, with only two California sea lions observed during a survey in 2010 (Sorensen and Swope 2010), a conservative estimate of four California sea lions per day (n=4) were multiplied by the total number of project days (n=50). This would equate to a Level B take estimate of 200 California sea lions.

### **1.3.2 Monitoring Locations**

In order to effectively monitor the Level A and Level B Harassment ZOIs (Table 1-2), PSOs will be positioned at the best practicable vantage points, taking into consideration security, safety, and space limitations. At a minimum, one PSO (in the “Command” position) will be located with clear view of the buffered shutdown and Level B ZOIs and will be responsible for halting in-water activities, as required. For instance, given the relatively small ZOI of 117 (384 ft) for impact pile driving of 24-inch Octagonal Concrete piles, a single PSO would be employed.

For ZOIs larger than can be surveyed by one PSO, multiple PSOs will conduct the pre-activity survey of the entire monitoring area prior to in-water construction. Data will be collected on any marine species observed within the monitoring zones in accordance with monitoring and data collection procedures (Section 2.0). The PSOs will be best situated to detect any marine mammals that may approach, especially from the north (Figure 1-2). Prior studies have shown that marine mammal occurrence is rare in south-central San Diego Bay (Merkel and Associates, Inc. 2008; Sorensen and Swope 2010; Graham and Saunders 2014; Tierra Data Inc. 2016). The

number of land-based PSOs may be increased for the larger ZOIs, if warranted, based on actual marine species occurrence; however, only one boat-based PSO location is anticipated for this Project.

**Table 1-2. Calculated Radial Distance(s) to Underwater Noise Thresholds and Areas Encompassed within the Thresholds from Pile Installation Activities at the MGBW COL FDD.**

Pile Size/Type <sup>1</sup>	Pile Installation Method <sup>2</sup>	Minor Injury	Level A <sup>3</sup> (PTS Onset)	Behavioral Disturbance	Level B <sup>4, 5, 6</sup>
		Radial Distance (m)	ZOI Area (km <sup>2</sup> )	Distance (m)	ZOI Area (km <sup>2</sup> ) (Open Water/Around Piers)
24-inch Octagonal Concrete	Impact Pile Driver	4 <sup>7</sup>	N/A	117	0.027-0.043 (0.043/NA) [Source 1] (0.036/NA) [Source 2] (0.027/NA) [Source 3]
	High Pressure Water Jetting	<1	N/A	1,359	2.75 (1.57/1.18)
24-inch Steel Pipe	Impact Pile Driver	13	N/A	1,848	3.68 (2.76/0.92)
	Vibratory Pile Driver	<1	N/A	2,512	6.49 (4.94/1.55)

**Notes:**

- <sup>1</sup> Sound source levels measured at 10 m (33 ft) distance.
- <sup>2</sup> See the MMPA IHA Application for this Project for source levels used to calculate the acoustic ZOIs.
- <sup>3</sup> Distances to Level A thresholds were calculated based on SELcum using the 2018 NMFS User Spreadsheet, which assumes practical spreading loss. Assumes maximum of 600 strikes per pile, 10-minute duration for all non-impulsive sounds except for high-pressure water jetting (20-minutes), 1 pile installed per day for mooring dolphin structural piles and 8 piles per day for the wharf and vehicle bridge piles. Weighting Factor Adjustments of 2 kHz for impact pile driving and 2.5 kHz for non-impulsive sounds, and the representative frequency range for Otariids was used to calculate the distances to Permanent Threshold Shift (PTS) onset threshold (NMFS 2018).
- <sup>4</sup> Distances to Level B thresholds were calculated using practical spreading loss model.
- <sup>5</sup> Level B ZOIs for continuous noise sources were calculated to the average ambient underwater noise value of 126 dB re 1  $\mu$ Pa within the Project area (Dahl and Dall'Osto 2019).
- <sup>6</sup> Level B ZOI areas were calculated separately for open water versus areas around piers where the structure's influence on sound propagation is uncertain.
- <sup>7</sup> Per Table 1-1, impact pile driving for the mooring dolphins and wharf/bridges were based on 1 per day and 3 per day, respectively. The impact pile driving ZOI associated with the wharf/bridges resulted in the larger of the two ZOIs at 4 m (13.1 ft).

**Abbreviations:**

dB re 1  $\mu$ Pa = decibels referenced to a pressure of 1 microPascal; km<sup>2</sup> = square kilometers; m = meters; N/A = not applicable because the ZOI is contained within the shutdown zone (less than 10 m [33 ft] from source); PTS = permanent threshold shift; RMS = root mean square; SEL = sound exposure level; SELcum = Cumulative sound exposure level over 24 hours; ZOI = Zone of Influence (area encompassed within acoustic threshold boundary).

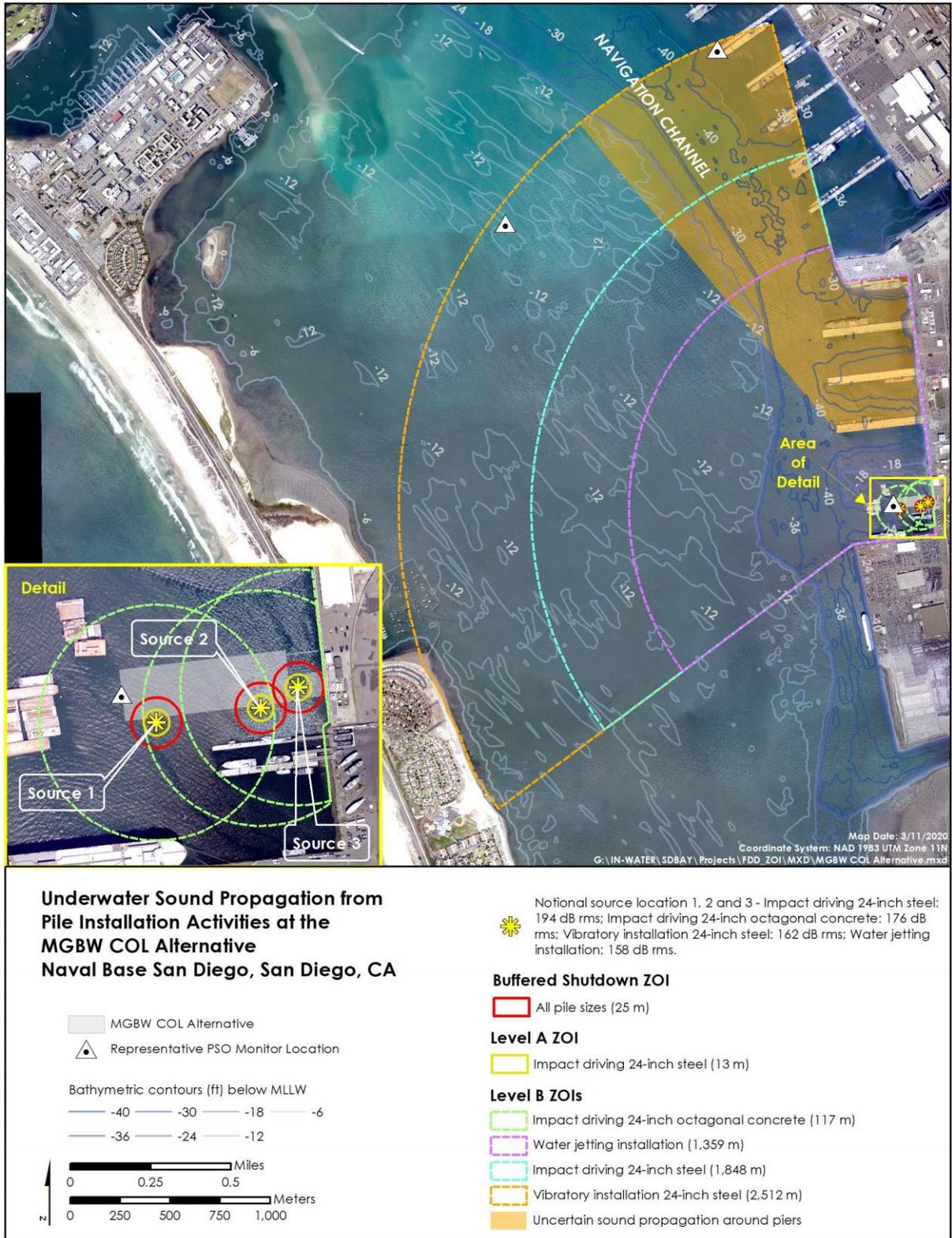


Figure 1-2. Monitoring and Shutdown Zones for the Proposed MGBW COL FDD.

## **1.4 Mitigation Measures**

The following mitigation measures, as specified in the NMFS IHA application (Navy 2019), shall be implemented during pile driving activities to avoid and minimize marine mammal exposure to Level A injury and to reduce to the lowest extent practicable exposure to Level B noise levels. Any mitigation measures identified in the final NMFS IHA, beyond those identified below, will also be incorporated into the monitoring protocols. The contractor is responsible for complying with all the mitigation measures listed below, whereas on-site Navy representatives will monitor the contractor's performance and require corrective action or stop work, if necessary, to ensure the requirements are met. NMFS will be notified of any change to the monitoring protocol(s) below.

### **1) Time Restriction:**

- In-water Pile driving will only be conducted at least 30 minutes after sunrise and up to 30 minutes before sunset. This time restriction may be changed, depending on the lighting conditions at the Project site.

### **2) Establishment of Level A and Level B Harassment ZOIs During Pile Driving**

- During all pile driving activities, regardless of predicted SPLs, a buffer will be added to the Level A injury prevention (shutdown) zones (see Table 1-2). To simplify monitoring efforts, if an animal is observed within 25 m (82 ft) of active pile driving, regardless of pile size, pile driving will be stopped until the individual(s) has left the buffered shutdown ZOI of its own volition, or it has not been sighted for 15 minutes. Due to swim speeds of marine mammals potentially in the project area, adding a buffer to a Level A ZOI is considered as appropriate to reduce the likelihood of a Level A take associated with pile installation.
- The Level A/B harassment ZOIs will be monitored throughout the time required to drive a pile. If a marine mammal is observed inside of the Level B ZOI, an exposure would be recorded and behaviors documented. Work would continue without cessation, unless the animal approaches or enters the buffered shutdown zone, at which point pile driving shall be halted.

### **3) Marine Mammal Visual Monitoring**

- Monitoring will be conducted for a 25 m (82 ft) buffered shutdown zone (as described above) and within the Level B ZOIs before, during, and after pile driving activities. Monitoring will take place at least 30 minutes prior to initiation through 30 minutes post-completion of installation activities.
- Monitoring will be conducted by qualified PSOs. All PSOs would be trained in marine mammal identification and behaviors, and have experience conducting marine mammal monitoring or surveys. Trained PSOs will be placed at the best vantage point(s) practicable (e.g., from a small boat, the pile driving barge, on shore, or any other suitable location) to monitor for marine mammals and implement shutdown/delay procedures, when applicable, by notifying the construction operator of a need for a shutdown.

- 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 activity and applicable size of the ZOI(s).
- Prior to the start of pile driving activity, the buffered shutdown zone and Level B ZOIs will be monitored for at least 30 minutes to ensure that they are clear of marine mammals. Pile driving will only commence once PSOs have declared the buffered shutdown zones clear of marine mammals; Animals will be allowed to remain in the Level B ZOI and their behavior will be monitored and documented.
- If a marine mammal enters the buffered shutdown zone during the course of pile driving operations, pile driving 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 a re-detection of the animal(s) from the last observation time.
- If a marine mammal species not covered in the IHA enters the Level B harassment zone, all pile driving 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. NMFS will be notified immediately with the species, and precautions made during the encounter. Pile installation will be allowed to proceed if the above measures are fulfilled for non-IHA species.
- In the unlikely event of conditions, such as heavy fog, that prevent the visual detection of marine mammals in the buffered 25 m (82 ft) shutdown zone, activities with the potential to result in Level A harassment will not be initiated. Impact pile driving would be curtailed, but vibratory pile driving would be allowed to continue if such conditions arise after the activity has begun.
- If the take of a marine mammal species approaches the take limits specified in the IHA, NMFS will be notified, and appropriate steps will be discussed.

#### **4) Soft Start:**

The use of impact pile driving soft-start procedure are believed to provide additional protection to marine mammals by providing a warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. The soft start procedure is described below:

- Prior to the start of impact pile driving each day, or after each break of more than 30 minutes of impact pile driving, the soft-start procedure will be used (i.e., three unfueled hammer blows separated by 30 seconds to allow any undetected animals in the area to voluntarily depart). Soft start procedures are not required for vibratory pile driving, or high-pressure water jetting

## **2.0 MARINE MAMMAL MONITORING PROTOCOLS**

### **2.1 Objectives**

The primary objective of the monitoring is to detect, and document impacts from Project-related activities on marine mammal species. Monitoring will be conducted at all times during in-water construction 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 construction driving activities, distances to regulatory thresholds (see Section 1.0 and Table 1-2) were estimated based on acoustic data for similar pile types and sizes (CALTRANS 2015; NAVFAC SW 2018) using the latest acoustic threshold guidance from NOAA Fisheries (2018). The estimated distances to the ZOI boundaries were used to determine monitoring locations identified in this Plan.

During all pile driving activities, regardless of predicted sound pressure levels (SPLs), a visual buffer will be added to Level A ZOIs out to 25 m (82 ft) for all pile driving activities with Level A ZOIs. The buffered shutdown zone will further minimize the potential for Level A take, since the largest calculated Level A ZOI is 12.8 m (42 ft), rounded to 13 m (43 ft) for monitoring purposes (see Section 1.3). Due to swim speeds of marine mammals potentially in the project area, adding a visual buffer is considered appropriate to reduce the likelihood a Level A take associated with pile installation. If an animal enters the 25-m (82-ft) buffered shutdown zone, pile driving would be stopped until the individual(s) has left the zone of its own volition, or it was not observed for 15 minutes after its last observed time.

The Level A/B harassment ZOIs will be monitored throughout the time required to drive 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 25-m (82-ft) buffered shutdown zone, at which point pile driving will shut down.

If a marine mammal species not covered in the IHA enters the Level B harassment zone, all pile driving 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 from its last observation time. NMFS will be notified immediately with the species, and precautions made during the encounter. Pile installation 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, NMFS will be notified and appropriate steps will be discussed.

During any monitored activity, the PSO located closest to the construction activities (“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 PSO/“Command,” who will then stop construction 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 driving 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 lead observer or monitoring coordinator and the lead observer will have had 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 the construction operation 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 construction activities were suspended to avoid potential incidental injury from construction 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**

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

- Date and time that pile driving 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 (using the Beaufort Sea State scale for 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 driving 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 of the hardcopy form provided in Appendix A). The final hard copy data collection forms shall be furnished to the Navy point of contact for review within a mutually agreeable timeframe prior to the start of construction.

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). All measures identified in the applicable ESA consultation documents will be incorporated into monitoring protocols.

## **2.5 Monitoring Equipment**

PSOs will be stationed at land-based observation locations and may be on a survey boat, depending on the size of the monitoring zones.

### **2.5.1 Survey Vessel**

Should a survey vessel be necessary, 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), and the contact information for the other observers, and monitoring coordinator;
- Flags (one green, one red per boat) as back-up for radio communication;
- Daily tide tables for the Project area within San Diego Bay;
- A depth finder;

- Nautical chart(s);
- Navigational plotting equipment; and
- Both fixed and handheld Global Positioning System (GPS) units.

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

### **2.5.2 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**

Briefings will occur between construction supervisors and crews and the PSO team prior to the start of all pile driving 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 driving 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 application (Navy 2019). 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 NMFS requirements, this Plan includes the following procedures:

- Monitoring will be conducted during daylight hours (30 minutes after sunrise, 30 minutes before sunset). If lighting conditions do not allow PSOs to observe the buffered Level A ZOI effectively, in-water construction activities will not be allowed to start (or continue) until conditions improve. This time restriction may be changed, depending on the lighting conditions at the Project site.
- For each type of construction with in-water activities, PSOs will be placed at the best vantage point(s) practicable (e.g., from a small boat, construction barges, on shore).
- PSOs will conduct the marine mammals monitoring depending on the activity and size of monitoring zones. When there are two or more PSOs, radio communication will be used 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).
- One land-/barge-based PSO (“Command” position) will be stationed with clear view of the buffered shutdown ZOI (25 m [82 ft]) and will be responsible for the collection of pile driving start and stop times, identification of all marine mammals in the vicinity of the pile being installed, and notifying the contractor if construction must be delayed or stopped due to the presence of a marine mammal within the buffered shutdown ZOI.

For activities with monitoring zones beyond the visual range of the PSO/Command position, additional monitoring locations or the use of a vessel may be used to ensure adequate coverage of the monitoring area. If a vessel is used, during pre-activity monitoring, the vessel will start from south of the Project area (where potential marine mammal occurrence is lowest) and proceed to the north. Data will be collected on any marine mammals observed within the monitoring zones in accordance with monitoring and data collection procedures. When the vessel arrives near the northern boundary of the ZOI, it will set up station so the PSO(s) are best situated to detect any marine mammals that may approach from the north (see Figure 1-2 for potential PSO locations).

- Monitoring will be conducted before, during, and after pile driving activities. Pile driving activities include the time to install a single pile or series of piles, as long as the time elapsed between use of the pile driver is no more than 30 minutes.
- During all observation periods, the PSOs will use binoculars and/or the naked eye to search continuously for marine protected;
- A 25-m (82-ft) buffered shutdown zone will be established around all in-water construction driving activities to avoid the potential for physical or Level A acoustic injury of marine mammals;

- If a marine mammal enters the buffered shutdown zone, all pile driving activities at that location must be halted. The animal(s) must be allowed to remain in the 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 shutdown area, or 15 minutes has elapsed since the last observation without re-detection of the animal; and
- Results of all marine mammal observations during pre-activity, during activity, and post-activity monitoring will be recorded on electronic tablet or hardcopy datasheets. Pre-, during, and post-pile driving visual survey protocols are further described below.
- If an injured, sick, or dead marine mammal is observed, procedures outlined in Section 0 will be followed.

### **2.6.1 Pre-Activity Monitoring**

The following survey protocols will be implemented prior to the start of pile driving:

- Visual surveys will occur for at least 30 minutes prior to the start of construction.
- If a marine mammal is present within the 25-m (82-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 may only be declared clear, and pile driving 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, the in-water activity will not be initiated until that zone is visible.
- If marine mammals are present within the Level B Behavioral Harassment Monitoring Zone, in-water construction will not need to be delayed.

### **2.6.2 During Activity Monitoring**

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

- If a marine mammal approaches, or appears to be approaching, the 25-m (82-ft) buffered shutdown zone, the PSO who first observed the animal will alert the PSO/“Command,” 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 mammal enters the 25-m (82-ft) buffered shutdown zone, a shutdown will be called by the PSO/“Command.” As the animal enters the shutdown zone, all pile 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 shutdown zone and has been visually confirmed

beyond the shutdown zone, or 15 minutes have passed without re-detection of the animal (i.e., the zone is deemed clear of marine mammals). The PSO/"Command" 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 lead PSO shall notify the Navy point of contact, who will then contact NMFS immediately. For non-IHA species, pile installation 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.
- The number, species, and locations of all marine mammals observed will be documented using electronic tablet or hardcopy datasheets in compliance with NMFS reporting requirements.
- If a marine mammal is observed entering the Level B monitoring zone (see Table 1-2 and Figure 1-2), 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.
- Due to the size of the larger Level B ZOIs (see Table 1-2 and Figure 1-2), some animals may enter the ZOIs unseen by the PSOs. For these cases, the number of California sea lions observed during active pile driving by the PSOs inside of the Level B ZOI will also be counted as unobserved animals inside of the ZOI, effectively doubling take on any given day. These unobserved animals will be considered as "estimated" takes, as opposed to "observed" takes reported by the PSOs. For any regular or final reporting, the "estimated" and "observed" take will be added together to generate a total take for the reporting period.

### **2.6.3 Post-Activity Monitoring**

Monitoring of all zones will continue for 30 minutes following completion of pile driving and high-pressure water jetting 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 construction activities could occur between the two mooring dolphins. If construction activities were to occur simultaneously, then two

PSO/“Command” positions would be in place. These positions would act independently and would have the ability to shutdown proximate construction if a marine mammals entered the buffered shutdown zone under their observation. Sightings of marine mammals at one Project location that are moving towards the other Project location will be communicated among the PSOs, to increase the awareness of an incoming potential sighting.

In the event that water jetting and pile driving occur at the same time, the action will be monitored as one sound source. The larger of the two Level B ZOIs associated with the louder of the two actions will be monitored for species presence.

### **3.0 INTERAGENCY NOTIFICATION FOR INJURED OR DEAD MARINE MAMMALS**

In the unanticipated event that the construction activities clearly cause the take of a marine mammal in a prohibited manner, such as an injury, serious injury, or mortality, the lead PSO will stop all active pile driving, and immediately notify the Navy Point of Contact (POC)<sup>1</sup>. The Navy POC will immediately report the incident to the following agencies:

- NBSD Base Biologist (Michelle Maley): 619-532-2686.
- 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 of the event will include the following information:

- Time, date, and location (latitude/longitude) of the incident;
- Description of the incident;
- Status of all sound source use in the 24-hours preceding the incident;
- Environmental conditions (i.e., wind speed and direction, sea state, cloud cover, visibility, and water depth);
- Description of marine mammal observations in the 24 hours preceding the incident;
- Species identification or descriptions of the animal(s) involved (including observed behaviors if alive or carcass condition if dead);
- The fate of the animal(s); and
- Photographs or video footage of the animal (if equipment is available).

Activities will not resume until NMFS is able to review the circumstances of the prohibited take. NMFS shall work with the Navy to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. The Navy will not resume activities until notified by NMFS via letter, email, or telephone.

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

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<sup>1</sup> The Navy POC will be determined prior to the start of the Project and will be provided to the monitoring crew.

whether modification in the activities are appropriate. At no time should the PSO handle, or attempt to handle, a dead marine mammal.

In the event that an injured or dead marine mammal is discovered, and the lead 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 lead PSO will report the incident to the Navy POC, who will report the animal(s) to the NBSD 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.

## 4.0 REPORTING

A draft report will be submitted to NMFS within 90 calendar days of the completion of 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 NMFS within 30 days following receipt of comments on the draft report from the NMFS. At a minimum, the report shall include:

- General data:
  - Dates and times of in-water construction driving activities and all monitoring periods (pre-activity, during activity, post-activity).
  - Dates and times for initiation and termination of monitoring periods.
  - Water conditions (e.g., sea-state).
  - Weather conditions (e.g., percent cloud cover, visibility).
- Specific data for monitored piles:
  - Description of the activities being conducted.
    - Size and type of piles.
    - Pile identification number.
    - The machinery used for in-water pile installation.
  - The power settings of the machinery used for installation.
  - The number of impact hammer pile strikes (as applicable).
  - Detailed log of in-water activity (machinery operation) start and stop times.
- Pre-activity observational survey-specific data:
  - Description of any marine mammals and their behavior (when possible) within the predicted ZOIs prior to initiation of in-water activities.
  - Actions performed to minimize potential impacts to marine mammals.
- During-activity observational survey-specific data:
  - Position (latitude, longitude) of PSO.
  - Detections of marine mammals within ZOIs associated with in-water activity, including time of sighting, species and numbers observed in the water or hauled out, distance and bearing to sighting, sex and age of individual(s) (when possible), and direction of travel of individual(s).
  - Description of any observable marine mammal behavior during monitoring and whether it may or may not have been related to the Project.
  - If possible, the correlation to underwater or airborne sound levels occurring at the time of this observable behavior.
  - Actions performed to minimize impacts to marine mammals.

- Times when in-water activities are stopped due to presence of marine mammals within the shutdown zones and time when pile driving resumes.
- Other human activities in the project area during monitoring.
- Note of whether a photograph or video footage was taken during the sighting.
- Post-activity observational survey-specific data:
  - Detections of marine mammals within ZOIs, including species and numbers observed distance and bearing to sighting, sex and age of individual(s) (when possible), and direction of travel of individual(s).
- A refined take estimate based on the number of marine mammals observed during the course of in-water construction.

## **5.0 REFERENCES**

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**APPENDIX A:**  
**EXAMPLE MARINE SPECIES OBSERVATION RECORD FORM**

**Marine Species Monitoring Log (Page 1)**

Date: \_\_\_\_\_ Observer(s): \_\_\_\_\_  
 General 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								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

**Sex**

<b>F</b>	Female	<b>Mixed</b>	Mixed Group
<b>M</b>	Male	<b>U</b>	Unknown

**Age Class**

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

**Primary Behavior**

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

**Secondary Behavior**

<b>AD</b>	Ab Change Dir	<b>BC</b>	Breach
<b>IB</b>	Inc Breath Rate	<b>FL</b>	Flush
<b>IS</b>	Inc Swim Rate		

**Sky Cover**

<b>C</b>	Clear	<b>F</b>	Fog
<b>PC</b>	Partly Cloudy	<b>HZ</b>	Hazy
<b>CD</b>	Cloudy	<b>LR</b>	Light Rain
<b>O</b>	Overcast	<b>HR</b>	Heavy Rain

**Visibility**

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

**Activity Type**

<b>IPD</b>	Impact	<b>Post</b>	Post-con Monitoring
<b>VPD</b>	Vibratory	<b>OTH</b>	Other
<b>Pre</b>	Pre-con Monitoring		
<b>ND</b>	Non Driving Monitoring		