

# FINAL SUMMARY REPORT

## NAVAL CONSTRUCTION GROUP-1 PORT DAMAGE REPAIR EXERCISES MAY 1, 2023 THROUGH APRIL 30, 2024 NAVAL BASE VENTURA COUNTY, PORT HUENEME, CALIFORNIA



**FEBRUARY, 2024**

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- Appendix A: Marine Species Observations
- Appendix B: Animal Location with Distance and Bearing to Piles

**ACRONYMS AND ABBREVIATIONS**

%	percent
ft	feet
hh:mm:ss	hours: minutes:seconds
IHA	Incidental Harassment Authorization
Ind.	Individuals
m	meters
MMPA	Marine Mammal Protection Act
n	Number (of records)
NBVC	Naval Base Ventura County
NCG-1	Naval Construction Group-1
NMFS	National Marine Fisheries Service
No.	Number
Obs.	Observations
Obser.	Observer
PDR	Port Damage Repair
PSO	Protected Species Observer
SeaBee	United States Naval Construction Force Battalions
SME	Subject Matter Expert
U.S.	United States
VPD	Vibratory Pile Driving
VPR	Vibratory Pile Removal

## 1.0 INTRODUCTION

In January 2023, the United States (U.S.) Department of the Navy (Navy) requested an Incidental Harassment Authorization (IHA) from the National Marine Fisheries Service (NMFS; NMFS 2023) for the incidental taking of marine mammals during multiple Port Damage Repair (PDR) training activities at Naval Base Ventura County, Port Hueneme (NBVC), California. The activities associated with PDR are military readiness activities that provide realistic training for West Coast-based United States Naval Construction Force Battalions (“SeaBees”) in controlled environments. These training activities are overseen by Naval Construction Group-1 (NCG-1) located at NBVC.

The IHA was signed on April 28, 2023, and authorized Marine Mammal Protection Act (MMPA) Level B “take” from May 1, 2023 through April 30, 2024, with the option to renew for one more year after the IHA expires (NMFS 2023). For military readiness activities, harassment is defined as “(i) any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment] or (ii) any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered [Level B harassment].” Of the stressors associated with the PDR training activities, the Navy determined that only underwater noise associated with pile driving/removal were anticipated to rise to the level of harassment as defined under the MMPA.

Per the IHA (NMFS 2023), up to four exercises were authorized per year at three locations in Port Hueneme (Figure 1): 1) South end of Wharf 4 (Wharf 4 South), 2) East face of Wharf 4 (Wharf 4 East), and 3) Delta Wharf (Wharf D). These locations were chosen to provide flexibility with regards to different working environments. Furthermore, a pile driving training facility is planned for the Wharf Delta location. This training facility will provide opportunities for training on multiple pile types, sizes, and materials in several different configurations.

Activities covered under the IHA (NMFS 2023) included both pile installation (via impact and vibratory pile driving) and removal (via vibratory pile extraction) of multiple piles sizes and types. Piles included in the IHA (NMFS 2023) include: 16-inch round timber piles; 14-inch steel H-piles; and 24-inch by 16.14-inch “Z” shape steel sheet piles.

The MMPA Level A and B Harassment authorized by the IHA were dependent on several different factors, including the number of piles driven per day, the functional hearing group (in this case Otariid and Phocid Pinnipeds) and the pile size/type. The minimum shutdown and Level B harassment zones were based on an acoustical analysis of all anticipated piles and assumptions provided by NCG-1. The calculated Level A (shutdown) zones ranged from 0 m (0 ft) to 170.6 m (560 ft). While most Level A zones were less than 12 m (39.4 ft), a buffer was added to extend the shutdown zones to 15 m (49 ft), 40 m (131 ft), or 175 m (574 ft), depending on the species, activity and pile type (Table 1).

### Activities Performed Under the IHA May 2023-April 2024

PDR exercises were initially scheduled for May and November 2023. However, due to issues with equipment, the November 2023 exercise was cancelled. Therefore, this report only addresses eleven days of PDR activities from May 10 to May 21, 2023.

For the May 2023 PDR exercise, 24-in steel sheet piles and 16-inch timber piles were driven/removed. The minimum shutdown zones were 15 m (50 ft) for both Phocid and Otariid Pinnipeds, while the effective Level B zone was 790 m (2,592 ft) based on the landforms in Port Hueneme. No acoustic data was collected as part of the PDR exercises. While the IHA (NMFS 2023) covers multiple locations and pile types, all pile driving/removal activities in May 2023 occurred at Wharf 4 South (Figure 1).



Figure 1. PDR Activity Locations Addressed in the IHA.

**Table 1. Monitoring and Shutdown Zones from the MMPA IHA.**

Activity <sup>1</sup>	Pile Description	Minimum shutdown zone (m [ft])		Harassment Zone (m [ft])
		Phocid	Otariid	
<b>Vibratory Installation / Removal</b>	<b>16-inch Timber Piles</b>	<b>15 (49)</b>	<b>15 (49)</b>	<b>6,310 (20,702)<sup>2</sup></b>
	14-inch Steel H Beam	15 (49)	15 (49)	631 (2,070)
	<b>24-inch Steel Sheet</b>	<b>15 (49)</b>	<b>15 (49)</b>	<b>4,379 (14,367)<sup>2</sup></b>
Impact Installation	16-inch Timber Piles	40 (131)	40 (131)	47 (154)
	14-inch Steel H Beam	175 (574)	175 (574)	216 (709)

**Notes:** <sup>1</sup>Bold text indicates the only activities that occurred during the May 2023 PDR exercise; <sup>2</sup>Noise propagation is restricted by the landforms in Port Hueneme. The maximum Level B Zones are approximately 790 m (2,592 ft) for Wharf 4 South, 795 m (2,608 ft) for Wharf 4 East, and 655 m (2,149 ft) for Wharf D.

## 2.0 TRAINING AND MONITORING PROTOCOLS

Prior to the start of the PDR training, all Protected Species Observers (PSOs) were required to attend a training session that provided details on their roles and responsibilities, as well as communication procedure, Level B and shutdown zones, data collection methodologies, and species identification. The training was provided by a Navy Subject Matter Expert (SME) who had experience with data collection for both activity and marine species monitoring during pile driving events, as well as experience in the identification of species addressed in the IHA (NMFS 2023). Furthermore, exercise-specific Standard Operating Procedures (SOPs) were developed to provide a summary of the training and monitoring procedures in one document if a question arose that needed further research and an experienced monitor was not available. The SOPs were made available to all PSOs and NCG-1 staff prior to the exercise.

All marine species and activity data collection occurred using crews of enlisted sailors and each crew member was restricted to one four-hour shift per day to ensure that fatigue did not impact their ability to visually identify marine mammals. After the PDR activities started, the same Navy staff member who provided the exercise-specific training stayed on site for multiple days to answer any questions from the PSOs and to adjust data collection, if needed.

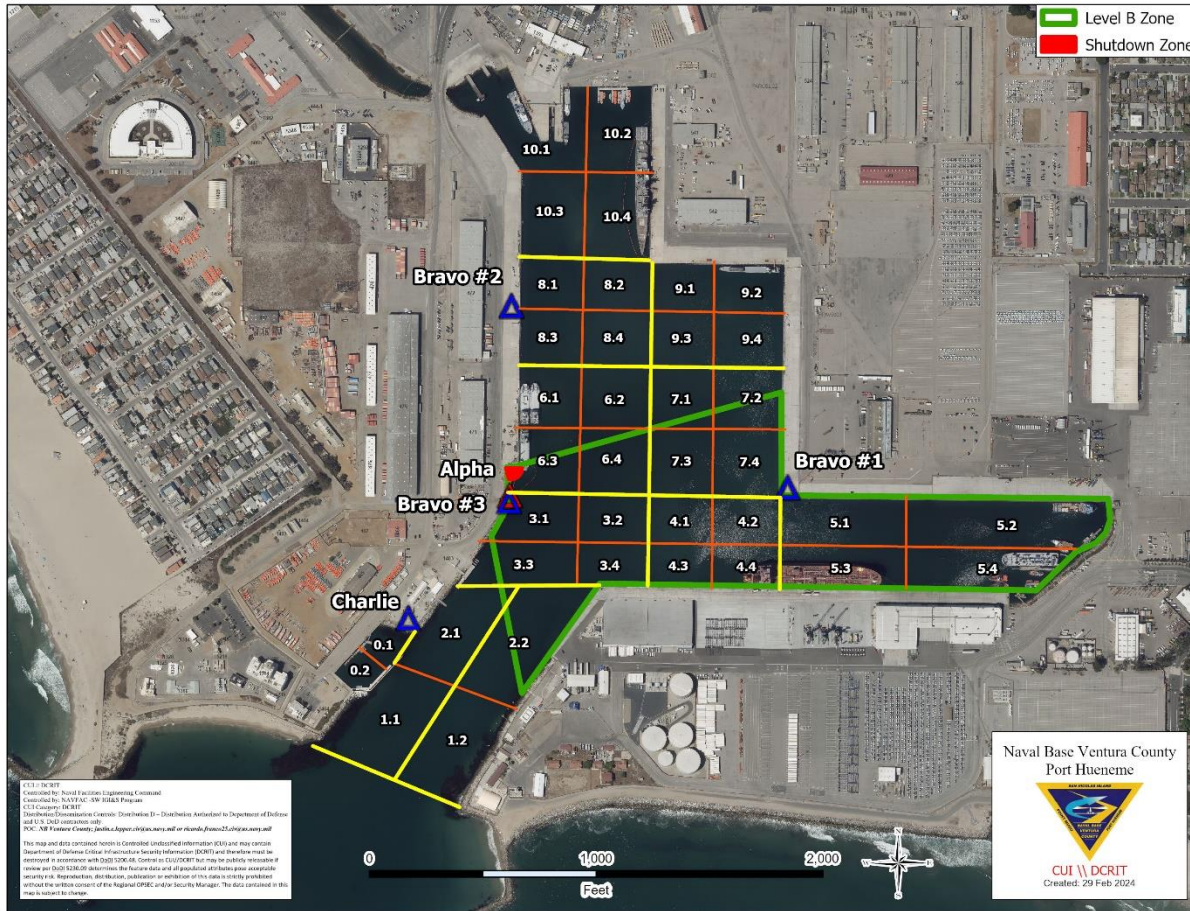
A total of three PSOs were used during all PDR activities involving either pile driving or removal. For clarity of communication, the positions were identified as Alpha, Bravo, and Charlie (Figure 2), with the Alpha position logging PDR activity data (starts and stops of pile driving/removal, delays and shutdowns as well as initiating work stoppages), while the Bravo and Charlie positions focused on logging marine species observations. The Alpha position also acted as a secondary PSO when they were not actively engaged in logging PDR activity data. The locations for the dedicated PSOs (Bravo and Charlie) were chosen to provide the best viewshed of the Level B harassment and shutdown zones in the Port during PDR activities. The Alpha position was located on a derelict boat lift that was approximately 40 meters (m; 121 feet [ft]) to the south of the PDR activities. Because Port Hueneme is an active Port with both military and commercial activities, there was a potential that the Bravo position's view of the Level B harassment zone may have been obstructed by large vessels. As a result, multiple potential monitoring locations were identified if the Bravo PSOs view was obstructed. The three positions included: 1) Across from the PDR activities on Wharf 2; 2) to the north of the PDR activities on Wharf 4; and 3) on the same derelict boat lift as the Alpha position. For this exercise, the third Bravo position, located adjacent to the Alpha position, was used throughout the exercise. The Charlie position was located at the entrance to the Delta Wharf with clear views of waters at the Delta Wharf and the Port Hueneme channel (Figure 2).



**Figure 2. Monitoring Locations During the PDR Exercises.**

Initially, both observation and activity data were collected using 9-inch tablets with a purpose-built Microsoft® Access data entry system. The database used multiple “tabs” to enter both activity and animal observation data from the same database, with the Alpha position using an “Activity Log” tab, while the Bravo and Charlie PSOs used two tabs identified as “Choose Animal Location” and “Observation Log”. Based on the relative inexperience of the PSOs, attempts were made to simplify the process for geolocating the marine mammal positions in the waters of Port Hueneme (in the “Choose Animal Location” tab). With that, Port Hueneme was divided into a grid system with 38 numbered squares. This allowed the PSOs to identify the location of the marine mammal based on the applicable square and then log the grid for the observation, rather than attempting to use a distance (in meters) and bearing (in compass degrees) from their location. The Level B and shutdown zones were also visible on the grid system for visual reference (see Table 1 above and Figure 3). After three days of using the tablets, the battery life became unreliable, and all data collection was switched to using paper-based data forms. At the end of each day, the data were then entered into the same database as was on the tablets, but on a desktop computer. The data were then emailed to an experienced Navy SME for review and checked for appropriate data entry for both activities and observations. If questions arose during the quality control process, they were emailed to the primary point of contact for the on-site monitoring efforts. All data was then collated into a “master” database for any analyses. Appendices A and B provide the raw data that was collected as part of the marine mammal logs for each day of monitoring.





**Figure 3. Grid System Used for Marine Mammal Observation Locations and the Level B and Shutdown Zones.**

Monitored activities included: 1) A pre-construction monitoring period (“Pre-con”) of 30 minutes; 2) Vibratory pile driving of 24-inch sheet piles; 3) Vibratory removal of 24-inch sheet piles; 4) Intermediate time between activities but when monitoring was still active (“Pre/Post”); 5) Work delays or shutdowns; and 6) A post-construction monitoring period (“Post-con”) of 30 minutes. All PDR activities occurred during daylight hours and in weather conditions that were conducive to monitoring the whole of the shutdown zone.

An assessment of Level B take was performed by looking at the activity at the time of the observation, then looking at the zone that the individual was observed in. If the animal(s) was observed inside of the green area (Level B Zone) in Figure 3 and during active pile driving/removal, then a Level B take was logged. Level B take was also identified by looking at the initial observation time and the time in the Level B zone. The time in zone was added to the initial observation time, and then if the animal was inside of the zone during an activity, a Level B take was logged.

### 3.0 RESULTS

The data below provides a brief summary of the exercise-related activities and marine species observations.

#### 3.1 Activity Data

Pile installation and removal occurred over the course of eleven days from May 10 to May 21, 2023, with approximately 83.5 hours of monitoring effort (Table 2). The PSOs were actively monitoring for an average of approximately seven and a half hours per day. The largest number of monitoring hours occurred during the Pre/Post monitoring activity, with just over 51 hours (68% of all efforts). When combining the activities that introduced noise into the water (pile driving and removal), there were a total of just under five-and-three-quarters hours (7.5% of all efforts), or an average of a just over 34 minutes per day. There were a total of eight shutdowns or delays for a total time of two hours and fourteen minutes, with shutdowns totaling almost twenty-one and a half minutes, and delays totaling just under one hour and fifty-two minutes (Table 2). The average minutes per day for delays was just under 11 minutes per day, while shutdowns were just under 2 minutes. A shutdown occurred when pile driving/removal was actively occurring and the work was stopped due to an animal entering the 15 m (49 ft) shutdown zone. A delay was logged when there was a delay to pile driving/removal if it had not started and an animal was inside of the shutdown zone.

**Table 2. Summarized Protected Species Observer Observation Time by Day and Activity.**

Date	Total Time of Each Monitoring Phase <sup>1</sup>						Total
	Pre-Con	Pre/Post	Delay	Shutdown	VPD/R	Post-Con	
5/10/2023	02:04:49	00:00:21	00:00:00	00:00:00	00:09:42	00:30:00	<b>02:44:52</b>
5/11/2023	00:31:10	06:40:10	00:00:00	00:00:00	00:33:10	00:30:29	<b>08:14:59</b>
5/12/2023	03:22:56	01:41:16	00:00:00	00:00:00	00:24:07	00:30:00	<b>05:58:19</b>
5/13/2023	02:01:09	02:42:32	00:22:50	00:15:00	00:24:17	00:30:00	<b>06:15:48</b>
5/15/2023	00:42:23	06:56:04	01:14:52	00:00:00	00:44:39	00:30:00	<b>10:07:58</b>
5/16/2023	02:30:49	03:16:49	00:06:30	00:00:00	00:48:04	01:00:00	<b>07:42:12</b>
5/17/2023	00:30:00	03:16:57	00:15:00	00:00:00	00:07:51	00:30:00	<b>04:39:48</b>
5/18/2023	00:30:00	07:37:11	00:00:00	00:06:27	01:31:24	00:30:00	<b>10:15:02</b>
5/19/2023	00:30:00	07:25:40	00:00:00	00:00:00	00:53:07	00:30:00	<b>09:18:47</b>
5/20/2023	00:30:00	08:29:56	00:00:00	00:00:00	00:19:58	00:30:00	<b>09:49:54</b>
5/21/2023	00:41:00	06:51:12	00:00:00	00:00:00	00:29:02	00:30:00	<b>08:31:14</b>
<b>Total</b>	<b>13:54:16</b>	<b>54:58:08</b>	<b>01:59:12</b>	<b>00:21:27</b>	<b>06:25:21</b>	<b>06:00:29</b>	<b>83:38:53</b>
<b>Average/Day<sup>2</sup></b>	<b>01:15:51</b>	<b>04:59:50</b>	<b>00:10:50</b>	<b>00:01:57</b>	<b>00:35:02</b>	<b>00:32:46</b>	<b>07:36:16</b>

**Note:** <sup>1</sup>All times in hh:mm:ss; <sup>2</sup>Averages across all pile driving/removal days.

#### 3.2 Visual Monitoring Data

California sea lions (*Zalophus californianus*) and harbor seals (*Phoca vitulina*) were the only two marine mammals observed during the monitoring efforts (Table 3; Figure 4). A total of 322 marine mammals were observed during 287 sightings over 11 days. Of those 322 animals, some were resightings of animals already observed by another PSO and then passed to another PSO for continuation of visual monitoring. When discounting resightings, there were 220 unique individual marine mammals during 196 sightings (Table 3; Figure 4). Of the 220 unique individuals observed, there were 174 California sea lions (79.1% of

all individuals) observed during 154 observations and 46 harbor seals (20.9% of all individuals) observed during 42 observations. All analyses, unless otherwise stated, do not include resightings.

**Table 3. Number of Individuals Observed by Construction Activity.**

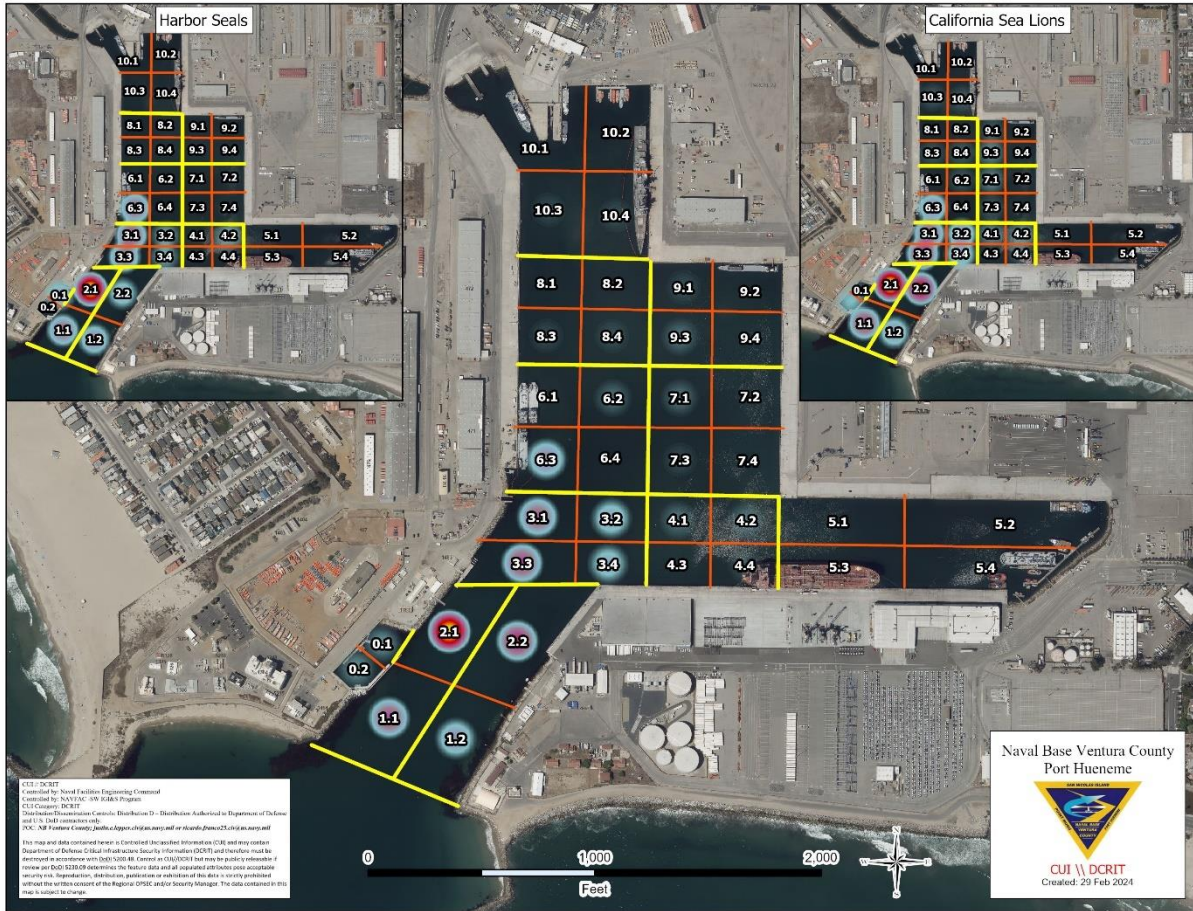
Species	Activity <sup>1</sup>							Total
	Pre-Con	Pre/Post	Delay	Shutdown <sup>2</sup>	V-PD	V-PR	Post-Con	
California Sea Lion	41 (17)	101 (46)	5 (2)	0 (1)	6 (10)	4 (0)	16 (11)	<b>174 (86)</b>
Harbor Seal	10 (3)	27 (9)	4 (3)	0 (0)	2 (0)	1 (0)	2 (1)	<b>46 (16)</b>
<b>Grand Total</b>	<b>51 (20)</b>	<b>128 (55)</b>	<b>9 (5)</b>	<b>0 (1)</b>	<b>8 (10)</b>	<b>5 (0)</b>	<b>18 (12)</b>	<b>220 (102)</b>

**Note:** <sup>1</sup>Numbers in parentheses indicate resights; <sup>2</sup>Animal first observed during a Pre/Post, then caused a shutdown.

Of the 38 zones used to identify the animal location (see Figure 3), animals were first observed in 23 (61%) of the zones (Table 4; Figure 4). Animals were primarily first observed in the channel and entrance to Port Hueneme (Zones 2.1 and 2.2). For all observations, regardless of species, the highest number of observations were in Zone 2.1 (n=55; 28.1%), followed by Zones 2.2 (n=25; 12.8%) and Zones 3.1 (n=20; 10.2%). When breaking out the observations by species, the percentages of observations in the top three zones for California sea lions were the same as above. The zone of first observation of harbor seals were similar to the California sea lions; However, harbor seals were observed in Zones 3.3 and 1.1 more often than in Zone 2.2 and were first seen less often in the inner portion of Port Hueneme than California sea lions (Figure 4).

**Table 4. Number of Observations by Zone.**

Zone	All Observations		California Sea Lions		Harbor Seals	
	No. of Obs. in Zone	Percent of all Obs.	No. of Obs. in Zone	Percent of all Obs.	No of Obs. in Zone	Percent of all Obs.
2.1	55	28.1%	40	26.0%	15	35.7%
2.2	25	12.8%	23	14.9%	2	4.8%
3.3	20	10.2%	16	10.4%	4	9.5%
1.1	19	9.7%	15	9.7%	4	9.5%
3.1	17	8.7%	12	7.8%	5	11.9%
6.3	12	6.1%	8	5.2%	4	9.5%
1.2	10	5.1%	7	4.5%	3	7.1%
3.2	8	4.1%	7	4.5%	1	2.4%
3.4	7	3.6%	6	3.9%	1	2.4%
0.2	3	1.5%	3	1.9%		
0.1	3	1.5%	1	0.6%	2	4.8%
9.3	2	1.0%	2	1.3%		
7.1	2	1.0%	2	1.3%		
6.2	2	1.0%	1	0.6%		
4.2	2	1.0%	2	1.3%	1	2.4%
4.1	2	1.0%	2	1.3%		
10.4	1	0.5%	1	0.6%		
10.3	1	0.5%	1	0.6%		
9.1	1	0.5%	1	0.6%		
8.4	1	0.5%	1	0.6%		
8.3	1	0.5%	1	0.6%		
7.3	1	0.5%	1	0.6%		
4.4	1	0.5%	1	0.6%		
<b>Total</b>	<b>196</b>		<b>154</b>		<b>42</b>	



**Figure 4. Hot Spot Map Showing Zones Where Animals Were Most Observed for the First Time.**

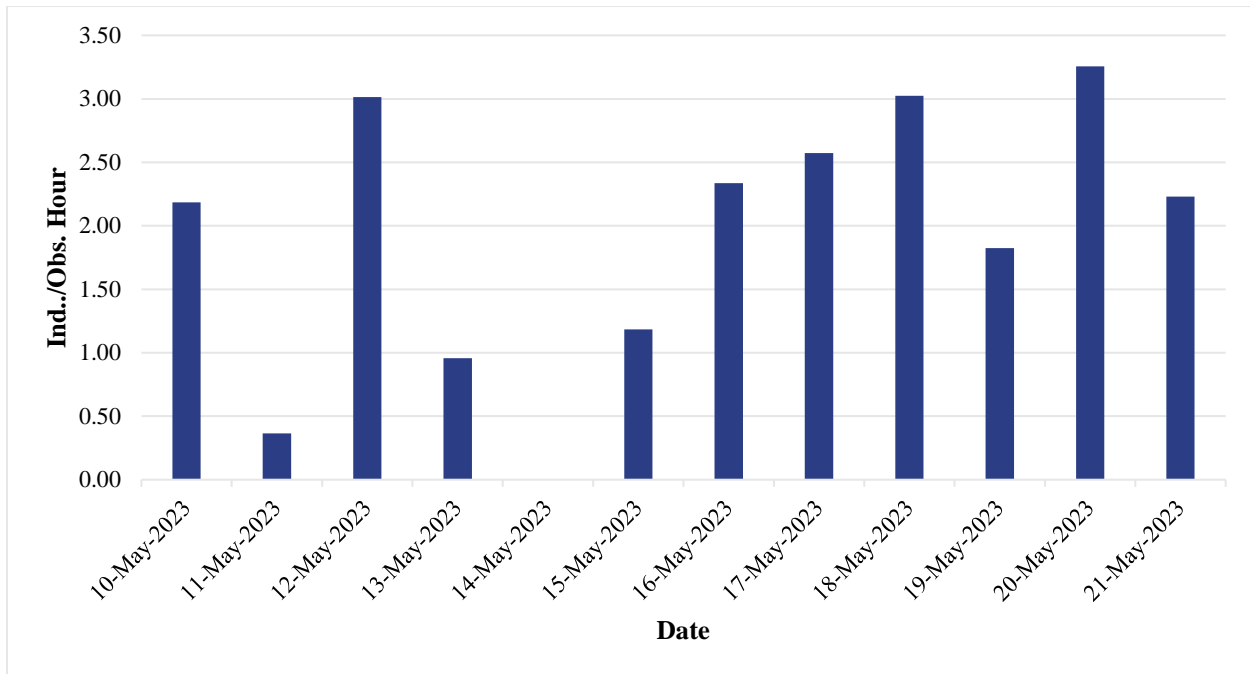
Monitors were requested to log the amount of time that an animal spent in the Level B zone, regardless of whether an activity was occurring at the same time as the observations or not. During the course of the monitoring efforts, marine mammals spent a total of 25 hours and 57 minutes in the Level B Zone. On average, animals spent 7 minutes and 57 seconds in the Level B Zone, with a maximum of 60 minutes and a minimum of 1 minute. When including resightings, animals spent a total of 41 hours and 15 minutes in the Level B zone, with an average of 8 minutes and 37 seconds. Analyses for time in zones by species are presented in sections 3.2.1 and 3.2.2.

**3.2.1 California Sea Lions**

California sea lions were predominantly seen during the monitoring efforts, with 174 individuals observed during 154 observations. Average Group Size was 1.13 individuals per group, with group size per day ranging from 1.00 to a maximum of 1.23 per day. The maximum group size was three individuals, with most observations of one or two individuals (Table 5). When accounting for observer effort, the overall individuals per observer hour was 2.08, with values ranging from 0.36 to 3.25, depending on the day (Table 5; Figure 5).

**Table 5. Number of California Sea Lion Individuals and Observations Per Day.**

Date	No. of Ind.	No. of Obs.	Mean	Min.	Max.	Monitoring Time/Day (hh:mm:ss)	Ind./Obs. Hour
10-May-2023	6	5	1.20	1	2	02:44:52	2.18
11-May-2023	3	3	1.00	1	1	08:14:59	0.36
12-May-2023	18	17	1.06	1	2	05:58:19	3.01
13-May-2023	6	6	1.00	1	1	06:15:48	0.96
15-May-2023	12	10	1.20	1	3	10:07:58	1.18
16-May-2023	18	16	1.12	1	2	07:42:12	2.34
17-May-2023	12	11	1.09	1	2	04:39:48	2.57
18-May-2023	31	27	1.15	1	2	10:15:02	3.02
19-May-2023	17	17	1.00	1	1	09:18:47	1.83
20-May-2023	32	26	1.23	1	2	09:49:54	3.25
21-May-2023	19	16	1.19	1	3	08:31:14	2.23
<b>Grand Total</b>	<b>174</b>	<b>154</b>	<b>1.13</b>	<b>1</b>	<b>3</b>	<b>83:38:53</b>	<b>2.08</b>



**Figure 5. California Sea Lion Individuals Per Observer Hour.**

A majority of the California sea lions observed were adults (n=101; 58.0%), followed by individuals of unknown sex (n=66; 37.9%). When accounting for both age and sex, adult males (n=48) were the most often observed, followed by adult females (n=36) and then by individuals of unknown age or sex (n=44; Table 6).

The behaviors at the time of the observations were logged as “primary behaviors,” with swimming being the predominant primary behavior (n=158; 90.8%), followed by looking (n=6; 3.4%). All other behaviors occurred 3 or fewer times (Table 7). When accounting for both behavior and sex, a majority of the

observations were of adults (males or females) swimming (n=94) through the zones, followed by unknown sexed individuals looking (n=63) with all other behaviors occurring either 1 or 3 times (Table 7).

To account for potential changes in behaviors relative to stimuli (project-related or otherwise), “secondary behaviors” were logged as separate values, along with a time of the behavior. A total of eight secondary behaviors were noted as part of the monitoring efforts. However, the values were inconsistent and did not add any value to the overall data. There was one recorded instance of an abrupt change in direction and another of an increased swim rate on separate observations. Both observations were of single California sea lions. However, the change in direction included a time that did not make sense relative to the initial observation (the individual was first observed at 11:15, but the time of the change in direction was listed as 19:51), and no time was noted for the increased swim rate. Also, there were seven observations (six California sea lions, and one harbor seal) that listed a secondary behavior time, but no specific behavior. See Appendix A for these individual records.

**Table 6. California Sea Lion Individuals and Age/Sex Classes.**

Sex Class	Age Class					Total
	Pup	Subadult	Adult	Mixed	Unknown	
Female	1		35		15	<b>51</b>
Male			48	2	4	<b>54</b>
Mixed			11		3	<b>14</b>
Unknown	4		7		44	<b>55</b>
<b>Total</b>	<b>5</b>	<b>0</b>	<b>101</b>	<b>2</b>	<b>66</b>	<b>174</b>

**Table 7. California Sea Lion Individuals and Primary Behaviors.**

Behavior	Age Class					Total
	Pup	Subadult	Adult	Mixed	Unknown	
Dive			1		2	<b>3</b>
Log			1			<b>1</b>
Look	5				1	<b>6</b>
Other			3			<b>3</b>
Successful Forage			3			<b>3</b>
Swim			93	2	63	<b>158</b>
<b>Total</b>	<b>5</b>	<b>0</b>	<b>101</b>	<b>2</b>	<b>66</b>	<b>174</b>

During the course of the monitoring efforts, California sea lions spent a total of 22 hours and 48 minutes in the Level B Zone. On average, animals spent 8 minutes and 53 seconds in the Level B Zone, with a maximum of 60 minutes and a minimum of 1 minute. Some animals did not enter the Level B Zone during their period of observation. When including resightings, animals spent a total of 34 hours and 40 minutes in the Level B zone, with an average of 9 minutes and 5 seconds.

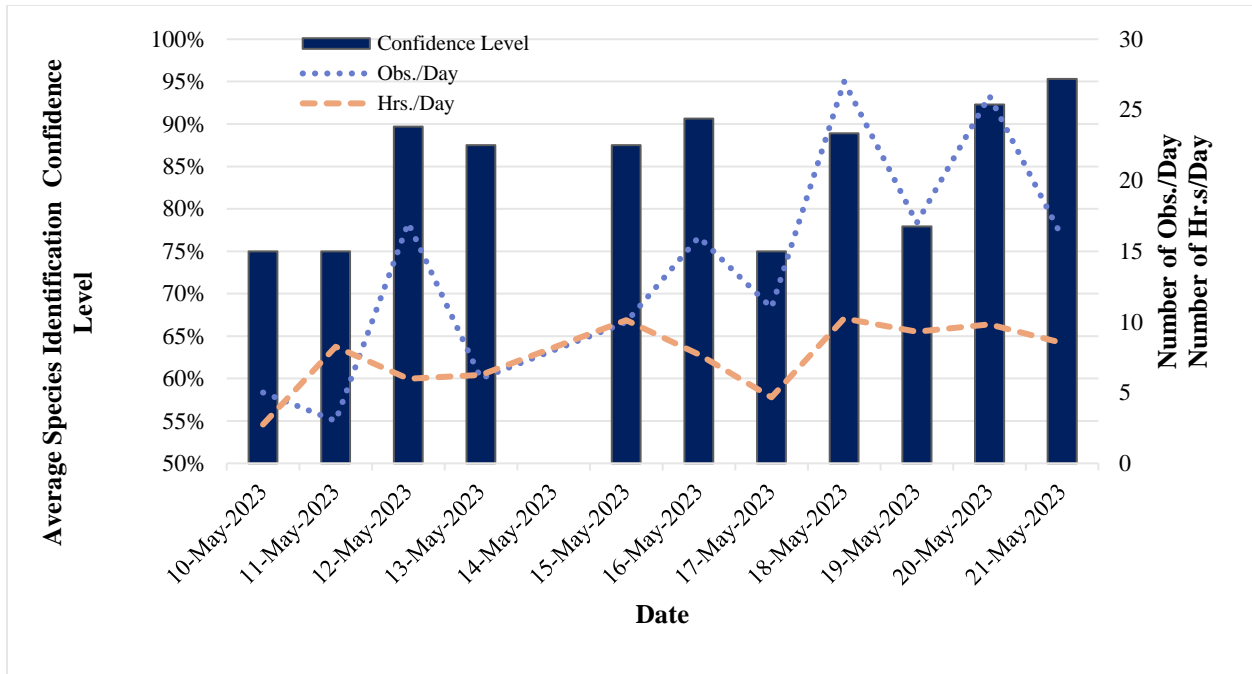
The PSOs were required to provide their level of confidence for species identification, with set levels of 0% (no confidence in species identification), 25%, 50%, 75% or 100% (absolute certainty with species identification). During the 11 days of monitoring effort, confidence level in species identification for California sea lions averaged 87.3% (Table 8), with the average confidence level ranging from 73% to 93%. The high confidence level indicates that the PSOs were relatively confident in their species identification.

On a per day basis, the number of observations per day steadily rose, while the observer hours remained relatively constant (Table 8; Figure 6). Given that the PSOs associated with the monitoring efforts were inexperienced with marine mammal monitoring, it would be safe to assume that, as the number of observations and the number of total hours monitoring increased, there would be a direct correlation to the confidence level in species identification; however, as the data shows, the average confidence level in species identification per day was at least 75% per day for all monitoring efforts.

The time spent in the Level B Zone for California sea lions varied depending on the activity. The greatest amount of time spent in the Level B Zone was during the Pre/Post period (13 hours and 59 minutes; 61.3%). Followed by Pre-con (6 hours 24 minutes; 28.1%) and Post-con (1 hour 3 minutes; 4.6%) (Table 9). When incorporating data relative to the number of observations, there is a direct correlation to the number of observations for a particular activity and the amount of time spent in the Level B Zone (Figure 7), with the higher the number of observations indicating the greater amount of time in the Level B Zone.

**Table 8. Daily Average Species Identification Confidence Level, Observations Per Day, and Hours of Observation Effort Per Day (California Sea Lions).**

<b>Date (2023)</b>	<b>Average Daily Confidence Level</b>	<b>Obs./Day</b>	<b>Hrs./Day</b>
10-May	75.0%	5	02:44:52
11-May	75.0%	3	08:14:59
12-May-2023	89.7%	17	05:58:19
13-May	87.5%	6	06:15:48
15-May	87.5%	10	10:07:58
16-May	90.6%	16	07:42:12
17-May	75.0%	11	04:39:48
18-May	88.9%	27	10:15:02
19-May	77.9%	17	09:18:47
20-May	92.3%	26	09:49:54
21-May	95.3%	16	08:31:14
		<b>154</b>	<b>83:38:53</b>

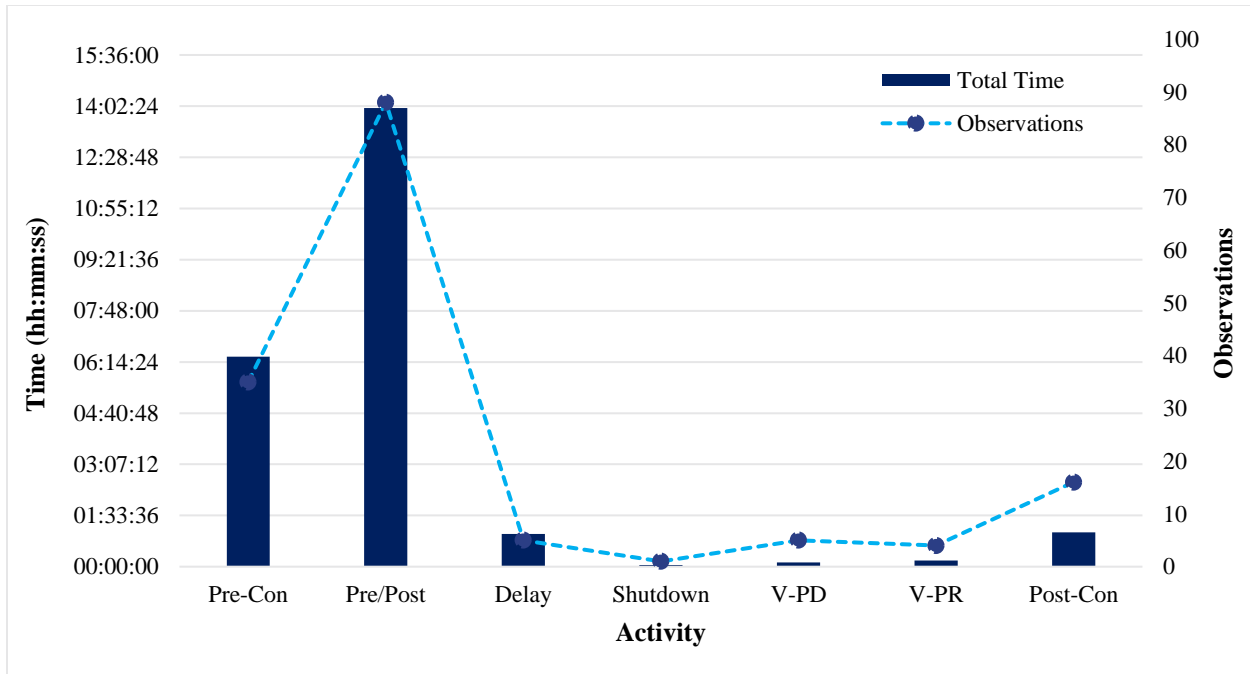


**Figure 6. Species Identification Confidence Level as Compared to Number of Observations and Monitoring Hours Per Day (California Sea Lions).**

**Table 9. Amount of Time Spent in the Level B Zone Per Activity (California Sea Lions).**

Activity	Observations	Hours (hh:mm:ss)			
		Total Time	% of Total Time	Avg	Max
Pre-Con	35	06:24:00	28.1%	00:10:58	00:37:00
Pre/Post	88	13:59:00	61.3%	00:09:32	01:00:00
Delay	5	01:00:00	4.4%	00:12:00	00:50:00
Shutdown	1	00:03:00	0.2%	00:03:00	00:03:00
V-PD	5	00:08:00	0.6%	00:01:36	00:05:00
V-PR	4	00:11:00	0.8%	00:02:45	00:08:00
Post-Con	16	01:03:00	4.6%	00:03:56	00:15:00
<b>Total</b>	<b>154</b>	<b>22:48:00</b>		<b>00:08:53</b>	





**Figure 7. Comparison of Time Spent in the Level B Zone and Number of Observations Per Activity (California Sea Lions).**

### 3.2.2 Harbor Seals

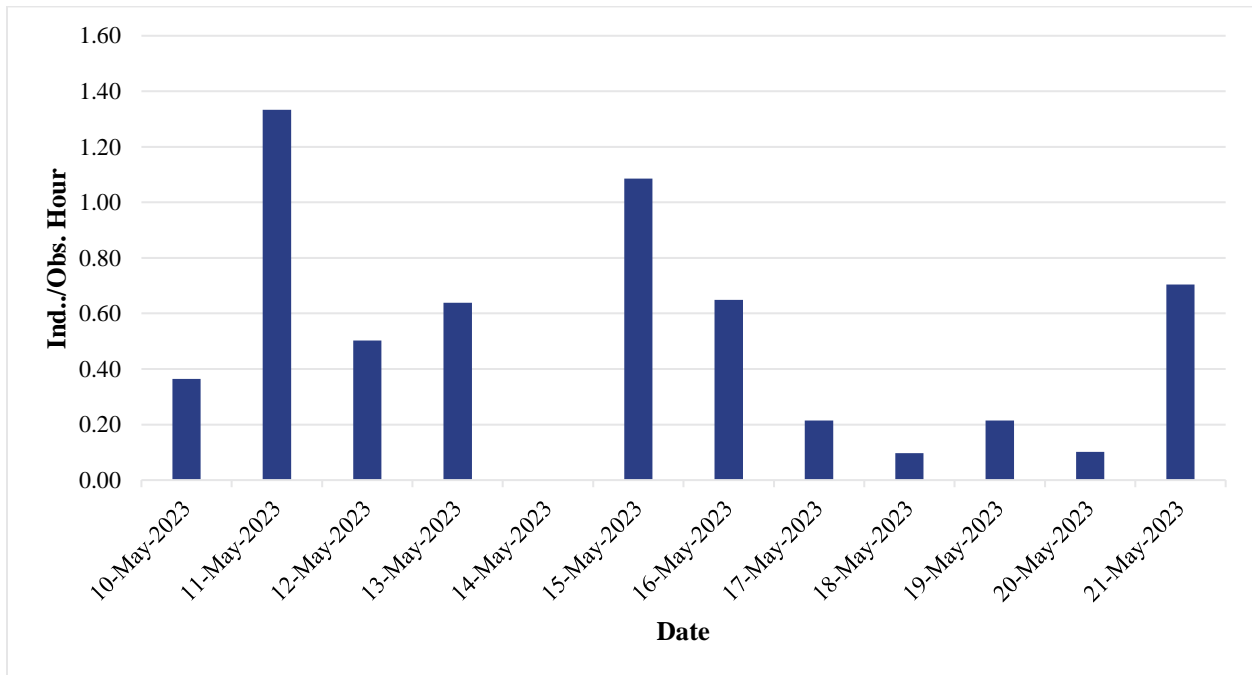
Harbor seals were the only other marine mammal observed during the 11 days of monitoring effort with 46 individuals observed during 42 observations. Average Group Size was 1.10 individuals per group, with group size per day ranging from 1.00 to a maximum of 1.50. The maximum group size was two individuals, with most observations of one individual (Table 10). When accounting for observer effort, the overall individuals per observer hour was 0.55, with values ranging from 0.10 to 1.33, depending on the day (Table 10; Figure 8).

Unlike California sea lions, the differences in harbor seal sexes are less apparent, with males only slightly larger than females. Given that most harbor seal observations are of individuals in the water with only their heads visible, telling the difference between a male and female harbor seal is hard, with the only clear indicator of sex when a pup is with a female. With that, the data indicates that PSOs identified multiple age classes (“adults,” “calves,” “pups,” and “juveniles”) and sex designations (“females,” “males,” “mixed,” and “unknown”). For example, there was a single observation of a single “pup,” with no adult present. Given the inexperience of the PSOs, and the unlikelihood of the PSOs being able to actually distinguish age classes and/or sex of harbor seals, for the purposes of this analysis all harbor seals will be considered as “unknown” age and “unknown” sex. The actual data for each harbor seal observations is presented in Appendix A. With this caveat, a majority of the observations were of animals swimming (n=33; 69.6%) through the zones, followed by looking (n=9, 19.6%), with all other behaviors observed either 1 or 4 times (Table 11).

**Table 10. Number of Harbor Seal Individuals and Observations Per Day.**

Date (2023)	No. of Ind.	No. of Obs.	Mean	Min.	Max.	Monitoring Time/Day (hh:mm:ss)	Ind./Obs. Hour
10-May	1	1	1.00	1	1	02:44:52	0.36
11-May	11	9	1.22	1	2	08:14:59	1.33
12-May	3	2	1.50	1	2	05:58:19	0.50
13-May	4	4	1.00	1	1	06:15:48	0.64
15-May	11	10	1.10	1	2	10:07:58	1.09
16-May	5	5	1.00	1	1	07:42:12	0.65
17-May	1	1	1.00	1	1	04:39:48	0.21
18-May	1	1	1.00	1	1	10:15:02	0.10
19-May	2	2	1.00	1	1	09:18:47	0.21
20-May	1	1	1.00	1	1	09:49:54	0.10
21-May	6	6	1.00	1	1	08:31:14	0.70
<b>Total</b>	<b>46</b>	<b>42</b>	<b>1.10</b>	<b>1</b>	<b>2</b>	<b>83:38:53</b>	<b>0.55</b>

**Note:** <sup>1</sup>All were solitary adults of unknown sex class, recorded as swimming.



**Figure 8. Harbor Seal Individuals Per Observer Hour.**

**Table 11. Harbor Seal Individuals and Primary Behaviors.**

Behaviors Recorded	Age Class
	Unknown
Diving	4
Logging	1
Looking	9
Swimming	32
<b>Total</b>	<b>46</b>

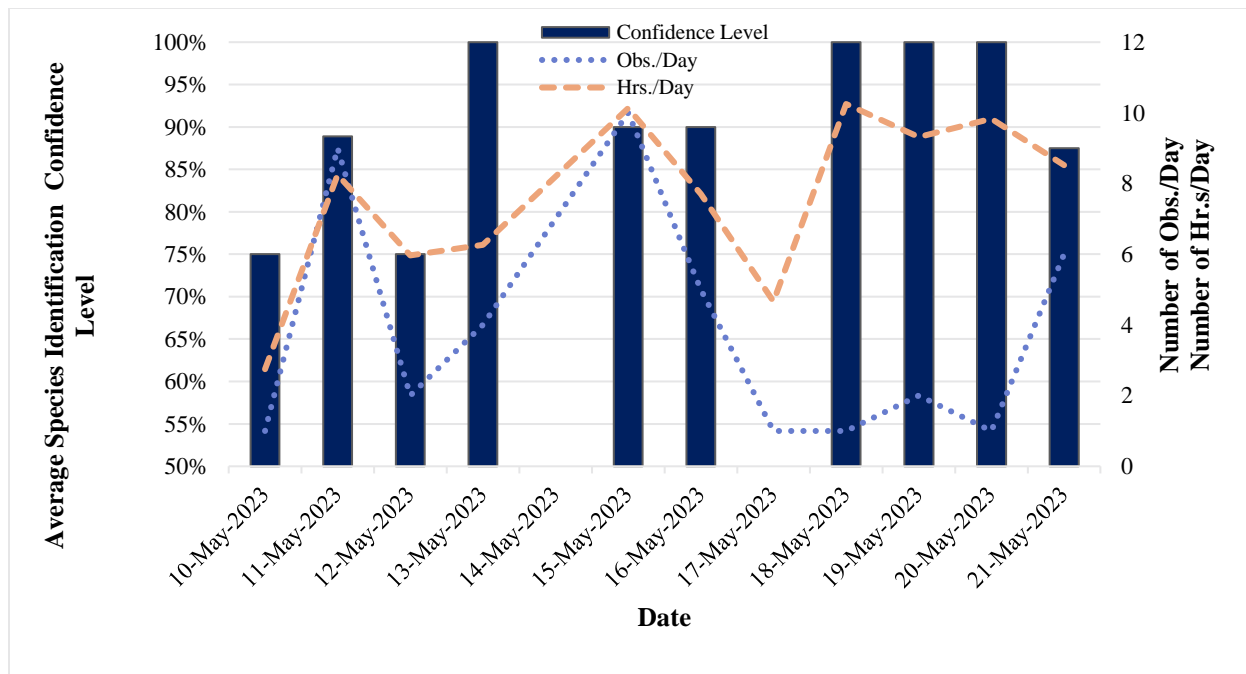
During the course of the monitoring efforts, harbor seals spent a total of 3 hours and 9 minutes in the Level B Zone. On average, animals spent 4 minutes and 30 seconds in the Level B Zone, with a maximum of 30 minutes and a minimum of 1 minute. Some animals did not enter the Level B Zone during their period of observation. When including resightings, animals spent a total of 6 hours and 35 minutes in the Level B zone, with an average of 6 minutes and 49 seconds.

The PSOs were required to provide their level of confidence for species identification, with set levels of 0% (no confidence in species identification), 25%, 50%, 75% or 100% (absolute certainty with species identification). During the 11 days of monitoring effort, confidence level in species identification for harbor seals averaged 86.9% (Table 12), with the average confidence level ranging from 50% to 100%; However, these low and high values are all based observations of a single individual. For observations with more than one individual, the average daily confidence level ranged from 75% to 100%, indicating that the PSOs were relatively confident in their species identification. On a per day basis, the number of observations per day fluctuated throughout the 11 days of effort, but there were always 10 or less observations per day (Table 12). Similar to the number of observations per day, the observer hours also fluctuated (Table 12; Figure 9), with no apparent correlation to the confidence levels.

The time spent in the Level B Zone for harbor seals varied depending on the activity. The greatest amount of time spent in the Level B Zone was during the Pre/Post period (2 hours and 59 36; 39.5%), followed by delays (2 hours 5 minutes; 31.6%) and Post-con (43 minutes; 10.9%) (). When incorporating data relative to the number of observations, there is a direct correlation to the number of observations for a particular activity and the amount of time spent in the Level B Zone (Figure 10), with the higher the number of observations indicating the greater amount of time in the Level B Zone.

**Table 12. Daily Average Species Identification Confidence Level, Observations Per Day, and Hours of Observation Effort Per Day (Harbor Seals).**

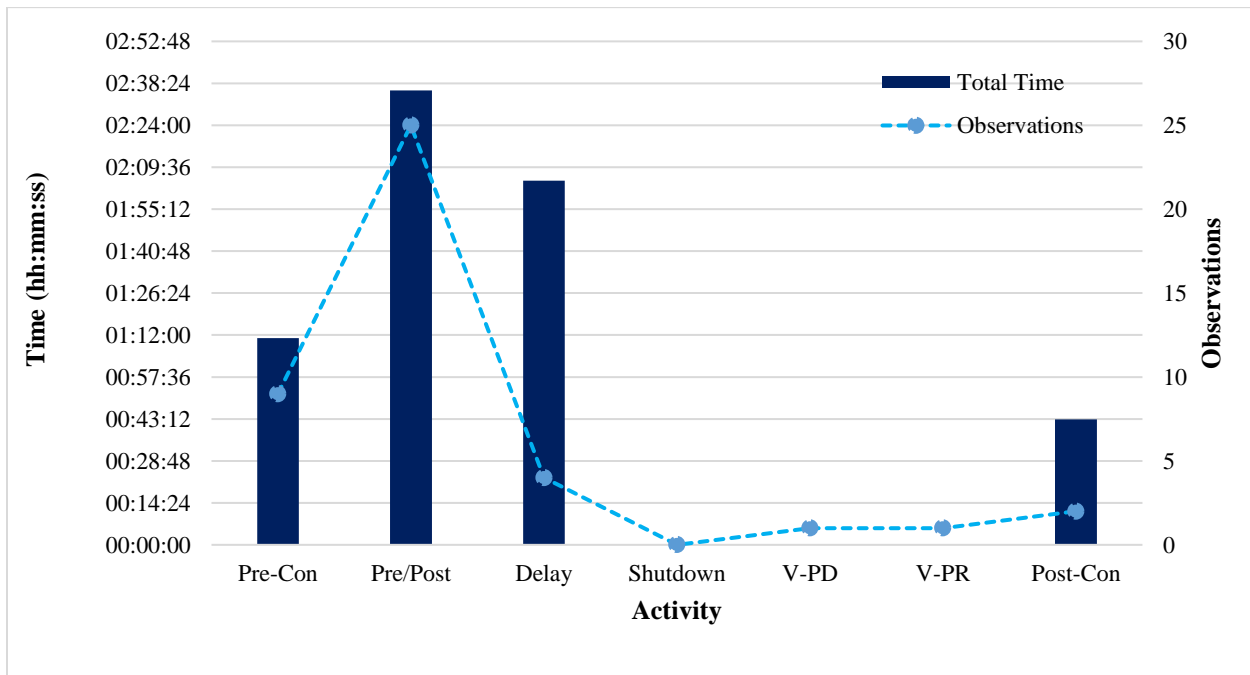
Date (2023)	Average Daily Confidence Level	Obs./Day	Hrs./Day
10-May	75.0%	1	02:44:52
11-May	88.9%	9	08:14:59
12-May	75.0%	2	05:58:19
13-May	100.0%	4	06:15:48
15-May	90.0%	10	10:07:58
16-May	90.0%	5	07:42:12
17-May	50.0%	1	04:39:48
18-May	100.0%	1	10:15:02
19-May	100.0%	2	09:18:47
20-May	100.0%	1	09:49:54
21-May	87.5%	6	08:31:14
		<b>42</b>	<b>83:38:53</b>



**Figure 9. Species Identification Confidence Level as Compared to Number of Observations and Monitoring Hours Per Day (Harbor Seals).**

**Table 13. Amount of Time Spent in the Level B Zone Per Activity (Harbor Seals).**

Activity	Observations	Hours (hh:mm:ss)			
		Total Time	% of Total Time	Avg	Max
Pre-Con	9	01:11:00	18.0%	00:05:55	00:20:00
Pre/Post	25	02:36:00	39.5%	00:04:35	00:39:00
Delay	4	02:05:00	31.6%	00:17:51	00:45:00
Shutdown	0	00:00:00	0.0%	00:00:00	00:00:00
V-PD	1	00:00:00	0.0%	00:00:00	00:00:00
V-PR	1	00:00:00	0.0%	00:00:00	00:00:00
Post-Con	2	00:43:00	10.9%	00:14:20	00:33:00
<b>Total</b>	<b>42</b>	<b>06:35:00</b>		<b>00:06:49</b>	



**Figure 10. Comparison of Time Spent in the Level B Zone and Number of Observations Per Activity (Harbor Seals).**

### 3.2.3 Environmental Data

The environment in Port Hueneme is generally very good for marine mammal visual monitoring efforts. All observations were during either Beaufort 1 or 2 (Table 14), with a majority of the individuals observed during “Good” visibility (n=115; 58.7%; Table 15). Sky cover was predominantly Hazy, (n=70; 35.7%) and Cloudy or Overcast (n=47; 24.0% for both; Table 16). The observations were evenly split between the ebb and flood tide with 98 observations during each tidal cycle (Table 17).

**Table 14. Beaufort Sea State Scale During Marine Mammal Observations.**

Species	1	2	3	4	5	6	Total
California Sea Lion	135	19	0	0	0	0	154
Harbor Seal	41	1	0	0	0	0	42
<b>Total</b>	<b>176</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>196</b>

**Table 15. Visibility During Marine Mammal Observations.**

Species	Bad (<0.5 km)	Poor (0.5-1.5 km)	Moderate (1.5-10 km)	Good (10-20 km)	Excellent (>20 km)	Total
California Sea Lion	0	27	19	94	14	154
Harbor Seal	0	9	7	21	5	42
<b>Total</b>	<b>0</b>	<b>36</b>	<b>26</b>	<b>115</b>	<b>19</b>	<b>196</b>

Abbreviation: km = kilometers.

**Table 16. Sky Cover During Marine Mammal Observations.**

Species	Clear	Partly Cloudy	Cloudy	Overcast	Hazy	Fog	Light Rain	Heavy Rain	Total
California Sea Lion	17	3	40	40	54	0	0	0	154
Harbor Seal	11	1	7	7	16	0	0	0	42
<b>Total</b>	<b>28</b>	<b>4</b>	<b>47</b>	<b>47</b>	<b>70</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>196</b>

**Table 17. Tidal State During Marine Mammal Observations.**

Species	Ebb	Flood	Total
California Sea Lion	74	80	154
Harbor Seal	24	18	42
<b>Total</b>	<b>98</b>	<b>98</b>	<b>196</b>

## 4.0 ASSESSMENT OF MMPA LEVEL B TAKE

Per the MMPA IHA (NMFS 2023) issued for the project, MMPA Level B harassment was authorized for California sea lions and harbor seals. Authorized Level B take was based on an assumption of a certain number of animals per day, multiplied by the number of days of the projected exercises each year. Based on these calculation, a total of 36,960 California sea lions and 2,016 harbor seals were authorized for Level B take.

To assess potential MMPA Level B take during the PDR activities, several factors were evaluated:

1. Was the animal identified as being inside of a grid square (see Figure 3) that had all, or a portion, of the Level B Zone intersecting it<sup>1</sup>?
2. Based on grid square at the time of the observation, the direction of travel, the time of initial observation, and the time inside of the zone, did the animal likely enter the Level B Zone after the initial observation?

<sup>1</sup> Because animal locations were based on a grid square, versus a pinpoint location, to be conservative, if a square had a portion of the Level B Zone intersecting it, then the whole grid square was considered as inside of the Level B Zone.

Because the waters in Port Hueneme are relatively confined, the locations of the PSOs provided an unobstructed view of the whole of the Level B Zone. A vessel was docked at the Bravo #1 location for the whole of the PDR activities, but the Bravo #3 position provided an alternative location that gave a clear view of the Level B Zone to the east and north, while the Charlie position had an unobstructed view of the channel and Delta Wharf. Therefore, we did not evaluate the potential for animals that were “unobserved” take (i.e., animals that may have been inside of the Level B Zone but were not visible during pile driving/removal).

When accounting for these factors there were a total 44 Level B take across both species observed during monitoring efforts, with 40 California sea lions, and 4 harbor seals (Table 18). Given that there were a relatively high number of authorized Level B take for each species, the total number of observed take were a very small percentage of the authorized take.

**Table 18. Assessment of Daily Level B Take During PDR Monitoring Efforts.**

Species	Total No. of Individuals <sup>1</sup>	Total No. of Observations <sup>1</sup>	Authorized Take	Observed Take	Percent of Authorized Take
California Sea Lion	260	229	36,960	40	0.11%
Harbor Seal	62	58	2,016	4	0.20%
<b>Total</b>	<b>322</b>	<b>287</b>	<b>38,976</b>	<b>44</b>	

**Note:** <sup>1</sup>Because there were several sightings considered as resights and were also Level B take, resights have been included here.

## 5.0 DISCUSSION

The monitoring efforts associated with the PDR exercises were generally successful with regards to collection of activity and marine mammal observation data, and the implementation of exercise delays or pile driving/removal stoppages when animals entered the shutdown zone. While using inexperienced PSOs was not ideal, with the training that was provided prior to the exercise, and the availability of written SOPs, the PSOs were able to collect useful data and fulfill the requirements of the MMPA IHA (NMFS 2023). Furthermore, having an experienced SME stay on site for several days after the exercise began was key to addressing the inevitable questions from PSOs who were experiencing the idiosyncrasies of marine mammal monitoring for the first time. A majority of the PSOs showed an interest in the monitoring efforts, and some were curious about the larger issues with marine mammals.

Because Port Hueneme is an active commercial port, there was a chance that a large vessel may dock in a position that would obstruct the view of the PSO at the Bravo #1 position. The wharf on the opposite side of Port Hueneme from the exercise wharf (Wharf 4) is a joint commercial/military use pier and is used to unload automobiles from car carrier vessels. If this were to happen, the exercise SOPs identified two other locations that provided a monitoring location with a viewshed of the Level B Zone. By incorporating contingency locations on Wharf 2 (Bravo #2), or on the boat lift off the south end of Wharf 2 (Bravo #3), the potential concern of having an obscured viewshed was addressed (see Figure 2). In the case of this PDR exercise, a vessel was docked at Wharf 4 for nearly the whole of the exercise. Also, another large research vessel was docked directly in front of the Bravo #2 location. With that, the PSO moved to the Bravo #3 location. This proved to be advantageous because the radio communications were somewhat problematic, and the Bravo #3 location was approximately 7 m (23 ft) from the Alpha position, which facilitated voice communication for shutdowns and/or delays. In the future, this could be considered as the primary location for the Bravo PSO due to its viewshed of the Level B Zone, as well as the proximity to the Alpha position. However, this position is over 700 m (2,300 ft) from the furthest extent of the Level B ZOI (to the East), and monitoring for animals at that distance is problematic.

When evaluating time in the Level B Zone, the data shows that the Pre/Post monitoring period had the largest amount of time for both the California sea lion (see Table 9 and Figure 7) and harbor seals (see Table 13 and Figure 10). As would be expected based on the higher number of California sea lions in Port Hueneme, the total amount of time in the Level B Zone was higher for the California sea lions (22 hours 48 minutes) than for the harbor seals (6 hours 35 minutes). There was a definite correlation to the amount of time spent in Port Hueneme during active noise making activities, and those monitoring periods when noise was not being generated (see

Table 9 and Table 13). While harbor seals were observed during the non-noise generating activities, they were not observed in the Level B Zone during active pile driving or removal, indicating that the PDR activity noise may have had an impact on harbor seal presence in Port Hueneme. California sea lions were observed inside of the Level B Zone during active noise-generating activities, but for much less time than during non-noise generating activities. Based on the assessment of Level B take, there were relatively few Level B take during the PDR activities, indicating that the application for the MMPA IHA (NMFS 2023) may have overestimated the number of individual animals in Port Hueneme.

Based on the inexperience of the PSOs used for the monitoring efforts, the assumption would have been that the species identification confidence level would have been low to begin with, then increase as the PSOs developed a search image for the species of concern. However, in looking at the data relative to the daily confidence level for California sea lions (see Table 8 and Figure 6) and harbor seals (see Table 12 and Figure 9), the average identification confidence level was 85.0% for California sea lions, and 86.9% for harbor seals. This is most likely because these two species have distinct behavioral and physical characteristics that differentiate them relatively easily, especially at close distances. Because the Port Hueneme entrance channel is only between 150 and 160 m (492 to 524 ft) wide, identifying a marine mammal, even for an inexperienced PSO is relatively easy.

## **6.0 CONCLUSION**

The use of non-biologists for PSO duties was generally successful, with species identification confidence levels relatively high during the monitoring efforts. Furthermore, there were successful shutdowns or delays based on observations of animals identified inside of the shutdown zone. While there were some setbacks early on with the PSOs calling all pinnipeds “seals,” after time with an experienced SME available for reference, and time spent in the field, the PSOs properly initiated PDR shutdowns/delays and no Level A harassment occurred during the PDR activities.

Therefore, the Navy has determined pile driving and removal during the May 2023 PDR exercise did not have any significant individual or population level impacts on marine mammals in the vicinity of the exercise.



## **7.0 REFERENCES**

Commander, United States Pacific Fleet (COMPACFLT). 2023. Request for Authorization for the Incidental Harassment of Marine Mammals Resulting from Pile Driving Training Exercises at Naval Base Ventura County, Port Hueneme.

National Marine Fisheries Service (NMFS). 2023. Marine Mammal Protection Act Incidental Harassment Authorization, May 1, 2023 through April 30, 2024. Issued: April 28, 2023.