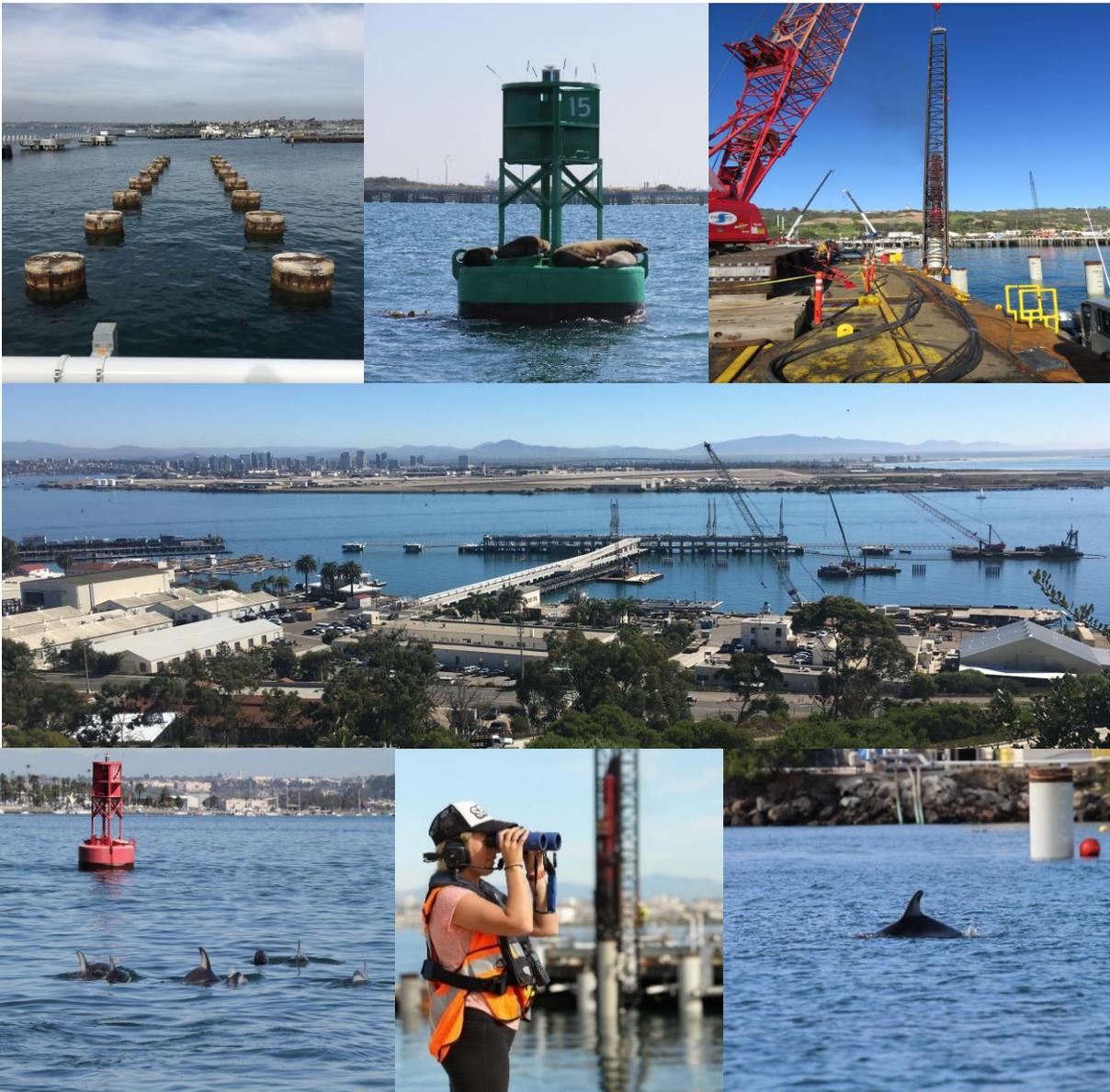


**MONITORING REPORT for
FUEL PIER REPLACEMENT PROJECT (P-151)
NAVAL BASE POINT LOMA, SAN DIEGO, CA
1 May 2017 to 7 October 2017,
ADDENDUM**

Including MMPA IHA (Acoustics and Marine Mammals) and ESA (Green Sea Turtle, and California Least Tern) Requirements



Prepared for:

Naval Facilities Engineering Command Southwest
Coastal Integrated Products Team
2730 McKean Street, Building 291
San Diego, California 92101
Point of Contact: Mr. Mitch Perdue, Senior Biologist

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Prepared by:

Tierra Data Inc.
10110 W. Lilac Road
Escondido, California 92026

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Acronyms and Abbreviations

%	percent
°	degrees
°C	degrees Celsius
°F	degrees Fahrenheit
μPa	microPascals
AT	Acoustic Technician
BSS	Beaufort Sea State
dB	decibel
DPS	distinct population segment
ESA	Endangered Species Act
ft	feet
hh:mm	hours:minutes
HDA	Harbor Drive Annex
HTI	High Tech, Inc
IHA	Incidental Harassment Authorization
km	kilometers
LD	Larson Davis
m	meters
MMO	Marine Mammal Observer
MMP	Marine Mammal Program
MMPA	Marine Mammal Protection Act
MOU	Memorandum of Understanding
MS	Microsoft
NAVFAC SW	Naval Facilities Engineering Command Southwest
Navy	U.S. Navy
NBPL	Naval Base Point Loma
NMAWC	Naval Mine Anti-Warfare Center
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
PM	Project Manager
Project	Fuel Pier Replacement Project
psi	pounds per square inch
re 1 μPa	referenced to one microPascal
rms	Root Mean Square
SLM	Sound Level Meter
SPL	Sound Pressure Level
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
USLM	Underwater Sound Level Meter
ZOI	Zone of Influence

1.0 Introduction

This report summarizes the avoidance, minimization, and monitoring efforts that the U.S. Navy (Navy) was required to undertake in compliance with the Marine Mammal Protection Act (MMPA) during the Fuel Pier Replacement Project at Naval Base Point Loma (NBPL) in San Diego, California (Project). Monitoring associated with this Project was conducted at two NBPL facilities, the NBPL Fuel Pier and the NBPL Harbor Drive Annex (HDA). The Navy's Marine Mammal Program (MMP) enclosures normally are located adjacent to the fuel pier, but were temporarily relocated near the Naval HDA during construction of the new fuel pier. During the current monitoring period, the MMP enclosures were moved back to their normal location after completion of construction of the new fuel pier. The temporary MMP facilities were demolished and reconstruction activities occurred to return the area to its prior marina configuration. While previous monitoring reports and Incidental Harassment Authorizations (IHAs) associated with this Project have referred to the temporary marine mammal relocation area as the Naval Mine Anti-Warfare Center (NMAWC), based on proximity to that facility, the monitored area discussed in this report is referred to as NBPL HDA because the reconstruction activities encompassed a greater area than just adjacent to the NMAWC facility.

The dates associated with the fourth Incidental Harassment Authorization (IHA #4) for the Project include all available working days from 8 October 2016 to 7 October 2017. A report was previously submitted in July 2017 that detailed the monitoring efforts from 8 October 2016 to 30 April 2017 (Naval Facilities Engineering Command Southwest [NAVFAC SW] 2017). From 1 May 2017 to 15 September 2017, in-water pile driving was stopped due to the California least tern (Tern; *Sternula antillarum browni*) breeding/nesting season. However, in-water demolition activities took place during this timeframe at both the NBPL Fuel Pier and the NBPL HDA locations.

This report addendum covers the period of 1 May 2017 to 7 October 2017, providing results of the monitoring during that period, as well as relevant tables and figures from the previous IHA #4 report (NAVFAC SW 2017), which were updated herein to include the May to October data. In addition, Appendices A1, B1, and D1 provide updated data for the May to October timeframe, and Appendix C1 provides all acoustic reporting metrics for the whole of the Project timeframe. Information that remained unchanged from the October 2016 to April 2017 timeframe, such as detailed descriptions of the Project, methods, monitoring specific to that timeframe, as well as other appendices are incorporated by reference in this addendum. The October 2016 to April 2017 report is hereafter referred to as the previous IHA #4 monitoring report (NAVFAC SW 2017).

1.1 Project Description

A complete description of the overall Project and facilities was provided in the previous IHA #4 monitoring report (NAVFAC SW 2017). During the timeframe discussed in this report, there were two distinct locations where Project-related monitoring efforts took place: at the NBPL Fuel Pier, and at the NBPL HDA. The NBPL HDA includes a marina that was reconfigured during IHA #1 (NAVFAC SW 2014) to temporarily accommodate the Navy's MMP, which is administered by Space and Naval Warfare Systems Command Systems Center (Figure 1-1). The MMP facilities, which are normally at piers to the north and south of the fuel pier, include pens designed to house both pinnipeds and cetaceans. Because of concerns with exposure to harmful underwater noise, the Navy MMP was temporarily relocated to the NBPL HDA, which is approximately 3 kilometers (km);

1.8 miles) northeast of the old fuel pier location and outside of the anticipated sound footprint for pile driving during construction of the new fuel pier. Project-related monitoring efforts at the NBPL HDA during the IHA #1 (NAVFAC SW 2014) were described in NAVFAC SW (2014). Project-related activities during the Year #4 IHA entailed removing some piles and reinstalling others in a similar marina configuration as to what was in place prior to the temporary relocation of the MMP. Unlike the piles discussed in NAVFAC SW (2017), the piles driven at NBPL HDA were guide piles, which have no structural or load-bearing requirements. They were installed at the end of finger piers which came off floating docks associated with the marina at the NBPL HDA.

From an environmental perspective, the NBPL Fuel Pier and NBPL HDA locations differ in water depths, bottom types, and use. The NBPL Fuel Pier location has served as a fuel depot for loading and unloading tankers, Navy replenishment vessels, Department of Homeland Security, Department of Defense, and foreign Navy vessels for the last 60-70 years. Water depths range from 3 meters (m; 9.8 feet [ft]) near the quay wall to 15.2 m (50 ft) on the outside of the new fuel pier. The deeper waters are required to accommodate Naval vessel drafts and are maintained by periodic dredging. Bottom type is predominantly medium to coarse sand and is subject to scour by ship propeller wash. The NBPL HDA area historically has been a marina for small recreational boats, and has relatively consistent water depths ranging from 2 m (6.5 ft) near the shoreline to 5 m (16.4 ft) at the entrance of the embayment. Also bottom types in the area are primarily soft mud, or sand, and scouring is minimal because of the smaller vessels using the area.

1.1.1 Pile Driving and Demolition Activities

Underwater noise generated by the activities at both Project-related locations did not overlap due to the distance between the two locations (3 km [1.8 miles]). As a result, Project-related monitoring activities were analyzed separately NBPL Fuel Pier and NBPL HDA.

1.1.1.1 Pile Driving

Pile driving during the 8 October 2016 to 30 April 2017 timeframe at NBPL Fuel Pier (Table 1-1) was discussed in NAVFAC SW (2017), and is incorporated herein by reference. Pile driving during the 1 May to 7 October timeframe discussed in this report included driving 16-inch round concrete piles at the NBPL HDA (Table 1-1).

1.1.1.2 Demolition Activities

Demolition activities at the old fuel pier during the 8 October 2016 to 30 April 2017 timeframe were discussed in NAVFAC SW (2017) and are incorporated herein by reference. Demolition during the 1 May to 7 October timeframe occurred at both the NBPL Fuel Pier and NBPL HDA locations. The goal of pile removal at the old fuel pier was to cut all piles at the mudline, with several techniques used, including pile clipping, pile jetting, or chainsaw cutting (Table 1-2). Other monitored activities included plasma torch cutting and pneumatic chipping, but these equipment, when employed, were used in concert with the aforementioned main pile removal techniques and are not separately listed in Table 1-2. The total amount of time for pile removal included all activities required to completely remove a pile to the mudline. Pile jetting was used to loosen piles that were removed by crane at NBPL HDA. Descriptions of the equipment used during these activities are provided below.



Figure 1-1. Map of the Project Areas.

Table 1-1. Summary of Pile Driving.

Pile Size and Type	Pile Driving Date Ranges	Number of Piles	Days of Pile Driving
8 Oct 2016 to 30 April 2017			
24×30 Concrete Fender (New Fuel Pier)	8 Oct 2016	3	1
16-inch Poly-concrete (NBPL Fuel Pier)	26 Oct to 27 Oct 2016	1	2
24×30 Concrete Fender (NBPL Fuel Pier)	8 Dec to 15 Dec 2016	24	5
30-inch Steel (Plumb) (NBPL Fuel Pier)	1 Feb to 22 Feb 2017	8	6
30-inch Steel (Batter) (NBPL Fuel Pier)	28 Feb to 23 Mar 2017	16	14
24×30 Concrete Fender (Breasting Dolphin) (NBPL Fuel Pier)	3 Apr to 14 Apr 2017	16	6
Subtotal		68	34
1 May 2017 to 7 Oct 2017			
16-inch Round Concrete Guide (NBPL HDA)	19 Sep to 27 Sep 2017	23	5
Subtotal		23	5
TOTAL		91	39

Table 1-2. Summary of Demolition Activities.

Demolition Activity	Demolition Activity Date Ranges	Number of Piles/Caissons Removed	Days of Demolition
8 Oct 2016 to 30 April 2017			
Pile Clipping ¹ (NBPL Fuel Pier [Old Pier-North])	10 Oct to 14 Oct 2016	12	5
84-inch Caissons ² (NBPL Fuel Pier [Old Pier-North])	12 Dec 2016 to 7 Feb 2017	18	27
Pile Clipping ^{1,3} (NBPL Fuel Pier [Old Pier-South])	15 Feb to 30 Apr 2017	278	37
Subtotal		308	69
1 May 2017 to 7 Oct 2017			
Pile Clipping ^{1,3} (NBPL Fuel Pier [Old Pier-South])	1 May to 6 Oct 2017	354	52
Pile Jetting ⁴ (NBPL Fuel Pier [Old Pier-South])	20 Jun to 7 Aug 2017	21	13
Underwater Chainsaw (NBPL Fuel Pier [Old Pier-South])	4 Oct to 5 Oct 2017	3	2
Pile Jetting ⁵ (NBPL HDA)	22 Aug to 25 Sep 2017	64	10
Subtotal		442	77
TOTAL		750	146

Note: ¹Includes concrete (14-inch, 18-inch, 24-inch), timber (18-inch), and polycarbonate piles (13-inch); ²One caisson was cut at mid-depth, but not removed. A second mid-depth cut will be required to remove the caisson, but this will occur during IHA #5; ³Some piles were clipped twice, once during the 8 Oct to 30 Apr timeframe and then a second time to remove remnants from the initial cut during the 1 May to 7 Oct 2017 timeframe; ⁴For 16-inch concrete piles; ⁵For 12-inch square and 16-inch round concrete piles.

1.1.2 Equipment

From May 1 to October 7, 2017, several different types of equipment and methods were used during pile installation and demolition activities, including cranes, an impact pile driving hammer, a pile clipper, an underwater chainsaw, and high-pressure water jets. During all monitoring efforts, no two pieces of equipment or methods were used at the same time at the same location, but may have been used at the same time at the two separate Project locations. A wire saw was used to cut 84-inch caissons before May 2017, and this demolition technique was described in NAVFAC SW (2017).

1.1.2.1 NBPL Fuel Pier

1.1.2.1.1 Cranes

During demolition activities at the NBPL Fuel Pier, a Manitowoc 888 hydraulic crawler crane was used to remove piles or debris if they were too large for the smaller Link-Belt RTC-8065 65-ton crane. The 888-crane had a 60.9-m (200-ft) fixed-length boom and was secured to a 54.9×15.2×3.7-m (180×50×12-ft) barge. The Link-Belt crane was positioned on a 17×17.25×2-m (56×57×6.5-ft) barge with an extendable boom with a maximum height of 35 m (115 ft). Several different sized materials barges were used to remove debris throughout the demolition process.

1.1.2.1.2 Pile Removal

- Pile Clipper

Five pile sizes were removed from the southern section of the old Fuel Pier using a Prime® Concrete Pile Cutter, Model 24. A majority of these piles were structural and fender square concrete piles, but there were a few round concrete and timber piles that were also clipped. The pile clipper was placed over the top of the pile and lowered to clip the pile as close to the mudline as possible (Photo 1-1). Either a Link-Belt 65-ton crane or the Manitowoc 888 crane was used to lower and retrieve the pile cutter and cut pile, depending on the pile size. The pile clipper cutting blade had a maximum operating pressure of 3,500 pounds per square inch (psi).



Photo 1-1. Photos of the a) Pile Clipper from underneath and b) Being Lowered Over a Pile.

- **Hydraulically-Actuated Chainsaw**

If the pile clipper could not cut the piles at the mudline due to debris, growth around the pile, or proximity to other piles, a Stanley DS-11 hydraulically-actuated chainsaw (Photo 1-2) was used to cut through the pile at the mudline. Because of the saw configuration, a diver was required to manipulate the saw underwater. During the use of the chainsaw, only the Link-Belt crane was used to remove the piles.



Photo 1-2. Hydraulically-Actuated Underwater Chainsaw.

- **High-pressure Water Jet**

Several batter (angled) and plumb (vertically oriented) structural support piles could not be clipped because they crossed over each other at the mudline and the clipper could not fit over the crossed piles. As a result, a high-pressure water jet was used to aid the removal of plumb piles to allow the clipper to cut the batter piles. The jet was lowered into the water next to the pile, and then moved around the pile to loosen the pile from the sediment so it could be pulled out with the Manitowoc 888 crane. Two types of jets were used during this pile removal method:

- Method 1: A 10-centimeter (cm; 4-inch) wide by 15.2-m (50-ft) long pipe with a single 5-cm (2-inch) nozzle on the end with a maximum pressure of 300 psi (Photo 1-3a,b).
- Method 2: A custom-made “spud jet” with four nozzles welded to the tip of a 24×24-inch hollow pile with a pointed tip. The high-pressure water system used 900 gallons per minute with a maximum of 300 psi (Photo 1-4).

- **Plasma Torch Cutter**

The pile clipper or chainsaw, in most cases, completely cut the piles prior to their removal. In cases where there rebar inside of the piles was not completely cut or small portions of the pile remained above the mudline, an underwater plasma torch cutter was used to remove the pile remnants above the mudline.

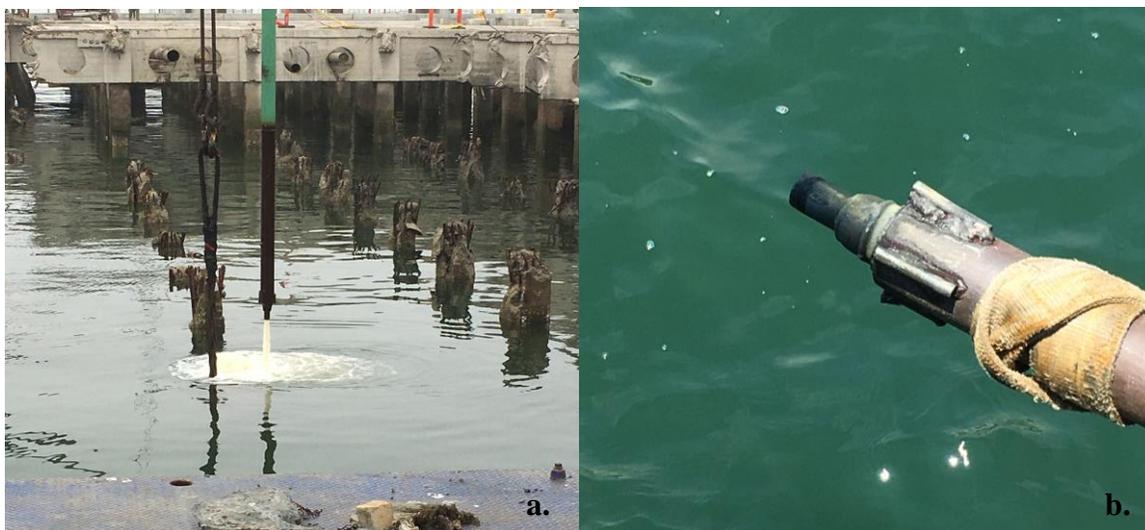


Photo 1-3. Single-nozzle High-pressure Water Jet a) In Use, and b) the End of the Nozzle that was Used.

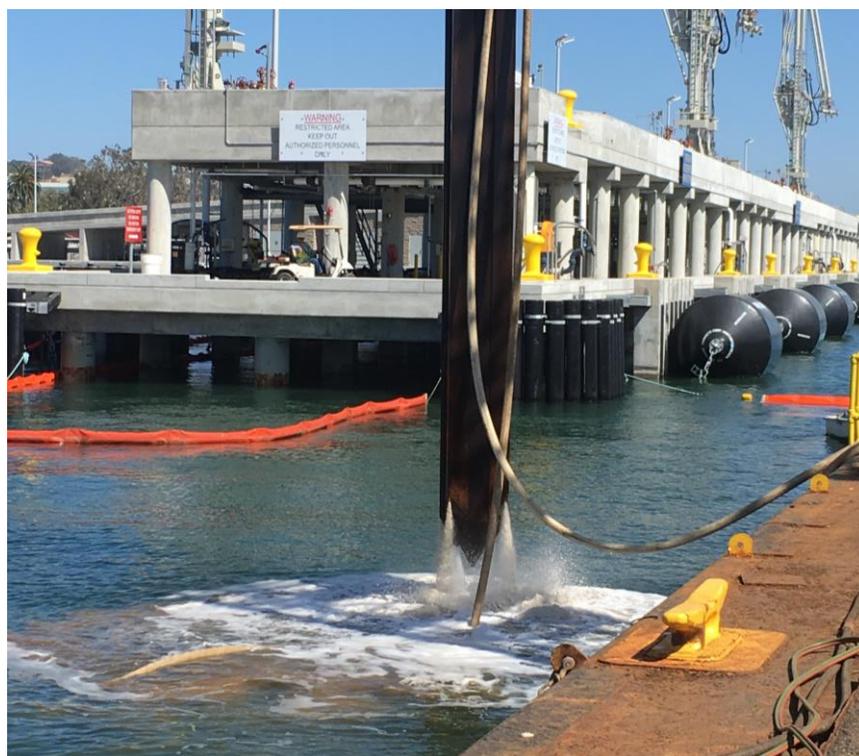


Photo 1-4. View of the Four Nozzles on the End of the 24-inch Square Steel Pile for Pile Jetting.

1.1.2.2 NBPL HDA

1.1.2.2.1 Cranes

During both demolition and pile installation activities at the NBPL HDA, the same Manitowoc 888 hydraulic crawler crane described above was used to remove or install all piles.

1.1.2.2.2 Pile Removal

- High-pressure Water Jet

A 10-cm (4-inch) wide by 15.2-m (50-ft) long pipe with a five-nozzle head (Photo 1-5) on the end, with a maximum pressure of 300 psi, was used to aid in the removal of piles at the NBPL HD. Similar to the pile removal at the NBPL Fuel Pier, the jet was lowered into the water near the pile, then moved around the pile to loosen the pile, which was pulled out via crane and placed on the materials barge.



Photo 1-5. Photo of the Five-nozzle Head used for Pile Installation/Removal.

1.1.2.2.3 Pile Installation

- High-pressure Water Jet

Two methods were used for high pressure water jetting during pile installation at the NBPL HDA. In both cases the water jet was used to “pre-bore” a hole to place the pile into before pile driving was used to drive the pile to the proper height. The methods included:

- Method 1: A 10-cm (4-inch) wide by 15.2-m (50-ft) long pipe with a five-nozzle head (see (Photo 1-5) on the end with a maximum pressure of 300 psi was used to jet a hole in the correct location prior to pile installation. This action only occurred once on one day as an experimental procedure to aid in pile installation.
- Method 2: The 16-inch round piles at the NBPL HDA were manufactured with a 5-cm (2-inch) pipe installed down the middle of the pile. A hose was attached to the top of the pile and water was pumped through the pile and exited at the bottom. The maximum allowable water pressure during this phase of water jetting was 300 psi. Except for the initial pile installed using Method 1 above, all other piles were installed using Method 2.

- **Pile Driving**

An American Piledriving Equipment, Inc. D-25 impact hammer was used to install 16-inch concrete guide piles at the NBPL HDA, with the Manitowoc 888 crane placing the hammer on the piles. A subset of the guide piles removed during demolition of the temporary MMP enclosures were reused and driven as guide piles for floating docks. These piles were 12.1-m (40-ft) long.

1.2 Purpose of the Monitoring Program

The acoustic and marine species monitoring program was implemented, along with the avoidance and minimization measures for pile driving activities, to minimize impacts to marine species. Objectives and protocols for both were established by the Navy in the Acoustic and Marine Species Monitoring Plan for the Navy's Fuel Pier Replacement Project at NBPL as part of the IHA #4 Application (Navy 2016) and submitted to NMFS for approval prior to the start of construction. The following sections outline the acoustic and marine species monitoring objectives.

1.2.1 Overview of the Acoustic Monitoring

Hydroacoustic monitoring systems were used to document underwater sound pressure levels (SPLs) during construction and demolition activities during IHA #4. The data were used to verify modeled zones of impact (ZOIs) for potential underwater Level A (physical injury) and underwater Level B (behavioral disturbance) thresholds during Project-related activities. Underwater acoustic data were collected near pile driving (referred to as source measurements, and typically measured 10 m [33 ft] from the pile being driven or removed) and at multiple distances away from the pile (referred to as far-field measurements). The Hydro DB Underwater Sound Level Meter (USLM) instrument developed by the University of Washington Applied Physics Laboratory was used to collect all underwater acoustic data. The Hydro DB USLM provided the capability to document and record real-time decibel (dB) root mean square (rms) SPLs. Airborne data were collected at the source (15.2 m [50 ft] from the piles) and multiple far-field locations using a Larson-Davis (LD) 831 sound level meter to verify the distances to the 100 dB and 90 dB isopleths.

1.2.2 Overview of the Marine Species Monitoring

Marine species monitoring was conducted before, during, and after pile driving activities within the modeled ZOIs for potential Level A (physical injury) and Level B (behavioral disturbance) harassment thresholds (Table 1-3). However, regardless of distances to the Level A/B regulatory thresholds, Marine Mammal Observers (MMOs) were tasked with tracking marine species in all of San Diego Bay, regardless of proximity to the Project-related activities. In doing so, the process for identifying "take" was separated from observer effort and allowed for any changes in the distances to regulatory thresholds. The marine mammal monitoring evaluated sightings relative to the type and number of species exposed to underwater and airborne sound levels that would constitute "takes" under the MMPA (see the application for IHA #4 [Navy 2016] for a definition of "take" under the MMPA). The MMOs documented the presence of any marine mammal species in northern San Diego Bay and recorded potential disruptions to behavioral patterns that might constitute Level B harassment. The MMOs also identified marine species that might enter the Level A harassment ZOI during pile installation or demolition. The number of MMOs varied relative to the pile size/type and the corresponding size of the Level A and B ZOIs during IHA #4 (NAVFAC SW 2017).

Table 1-3. Injury and Disturbance Thresholds for Underwater and Airborne Sounds.

Marine Mammal Group	Airborne Criteria ^{3,4} (re: 20 µPa)	Underwater Criteria (re: 1 µPa)			
		Vibratory Pile Driving ¹		Impact Pile Driving ²	
		Level A (Injury)	Level B (Behavioral)	Level A (Injury)	Level B (Behavioral)
Cetaceans	N/A	180 dB rms	120 dB rms	180 dB rms	160 dB rms
Harbors Seals	90 dB rms	190 dB rms	120 dB rms	190 dB rms	160 dB rms
All Other Pinnipeds	100 dB rms				

Notes: ¹Non-pulsed/continuous sounds; ²Pulsed sounds; ³Sound level at which pinniped haul out disturbance has been documented. Not an official threshold, but used as a guideline; ⁴dB rms is unweighted

Demolition activities continued during the stoppage of in-water pile driving (1 May to 15 September 2017 Tern nesting season), with pile driving able to re-start on 16 September 2017. Based on the protocols identified in the IHA #4 Navy's Acoustic and Marine Species Monitoring Plan (Navy 2016), a single MMO was required for monitoring efforts during all demolition activities, and at least two MMOs were required during pile driving. The number of assigned MMOs per activity was based on the size of the Level A ZOIs and the lack of Level A "take" as part of the IHA #4 permit. With demolition activities, the maximum SPLs were not anticipated to exceed the Level A regulatory thresholds, and a 10 m (33 ft) ZOI was used to reduce the likelihood of mechanical interaction between marine species and equipment. During impact pile driving at the NBPL HDA, the maximum Level A ZOI was anticipated to be 50 m (164 ft) at the NBPL HDA (Navy 2016). Because no Level A "take" was allowed, this distance was extended to 100 m (328 ft) to create a buffered "shutdown" ZOI. Two monitors were used during pile driving to reduce the likelihood of animals entering the Level A ZOI unnoticed.

This report addendum updates the monitoring results and the overall "take" estimates for the entire IHA #4 monitoring period from October 2016 to October 2017, including both observed and extrapolated "take". The "take" estimates were compared to the total Level B "takes" authorized under the IHA #4 for the following eight species: harbor seals (*Phoca vitulina*), California sea lions (*Zalophus californianus*), bottlenose dolphins (*Tursiops truncatus*), common dolphins (*Delphinus* sp.), northern elephant seals (*Mirounga angustirostris*), Pacific white-sided dolphins (*Lagenorhynchus obliquidens*), Risso's dolphins (*Grampus griseus*), and gray whales (*Eschrichtius robustus*).

1.3 Other Species Monitored

As part of the Endangered Species Act (ESA) consultations with the U.S. Fish and Wildlife Service (USFWS), monitoring of marine species also included the observation, documentation, and reporting of occurrences of the green sea turtle (*Chelonia mydas*) and California least tern (Tern; *Sterna antillarum browni*) within the Project area. Monitoring was conducted by the MMOs in conjunction with monitoring of marine mammal species, including before, during, and after in-water construction activities. All standard protocols and observational descriptors defined in IHA #4 were followed, and were consistent with the methods implemented during the Indicator Pile Program and previous IHAs for this Project. Updates on California least tern arrival and nesting progress to nearby Navy installations was provided by the Navy contractor technical representative and integrated into daily briefings of MMOs. In addition, the monitoring program was designed to document the foraging

success of these terns in the Project area during their breeding/nesting season. This report addendum updates the summary for these two species based on the monitoring efforts in May to October 2017.

1.3.1 California Least Tern

The Tern is a small migratory bird with long, narrow wings and a broad, forked tail. The species is listed as endangered under the ESA. The species establishes nesting colonies on sandy soils with little vegetation along the coast of California, including San Diego Bay. Nesting sites are located at Naval Air Station North Island and Naval Base Coronado, as well as other locations at Lindberg Field, San Diego Bay National Wildlife Refuge (D Street Fill/Sweetwater Marsh Unit, South San Diego Bay Unit), and Chula Vista Wildlife Reserve (Frost 2016). The Tern forages both in the bay and offshore, where they plunge-dive for small fish (e.g., anchovies and silversides; Atwood and Minsky1983; Frost 2016). The Navy and Port of San Diego have been monitoring Tern nesting and foraging locations in the bay for over 40 years.

The Navy has entered into a Memorandum of Understanding (MOU) with the USFWS that summarizes commitments to Tern conservation and enhancement in San Diego Bay. In accordance with the MOU, in-water construction activities in designated foraging zones during 1 April to 15 September require prior consultation with the USFWS. The Navy conducted an informal consultation with the USFWS under Section 7 of the ESA for the Fuel Pier Project, obtaining concurrence to allow in-water construction until 30 April each year during the Project.

1.3.2 Green Sea Turtle

The green sea turtle is a medium sized turtle characterized by a smooth, keelless, and light to dark brown shell with dark mottling. The species is globally distributed in subtropical and tropical waters. While there have been sightings along the entire U.S. West Coast, the species more typically occurs south of San Diego, California. The breeding population in Mexico was listed as endangered in July 1978; however, in April 2016 the range-wide and breeding population listings of the green sea turtle were removed, and replaced with listings (endangered or threatened) of distinct population segments (DPS; NMFS and USFWS 2016).

The East Pacific DPS, ranging from 40°N to 40°S and encompassing much of the coast of California, is listed as threatened under the ESA. Green sea turtles migrate north and south from Mexico breeding sites to feeding grounds, primarily coastal bays and lagoons (Benson and Dutton 2012). Green sea turtles forage in San Diego Bay, primarily in eelgrass beds, with mobile and sessile invertebrates and eelgrass their major dietary components (Lemons et al. 2011). The occurrence and growth rates of green sea turtles in the bay have been strongly associated with the warm water discharge from a power plant that operated in the southern part of the bay between the 1960s and 2010 (Eguchi et al. 2010, 2012; Benson and Dutton 2012; MacDonald et al. 2012). Since decommissioning of the power plant in 2010, green sea turtles no longer aggregate in the discharge channel, but a small group of 30 to 60 sea turtles still primarily reside in the southern portion of the bay (Madrak et al. 2016; National Oceanic and Atmospheric Administration [NOAA] Southwest Fisheries Center 2014; San Diego Unified Port District 2016).

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2.0 Methods

2.1 Overview of the Monitoring Program Methods

Marine species and acoustic monitoring occurred between 1 May 2017 and 7 October 2017, with effort focused within northern San Diego Bay. To fulfill the requirements of all applicable regulatory documents, the presence of marine species and acoustic data were collected during construction and demolition activities. Both the acoustic and marine species monitoring locations were based on distances of the measured and modeled marine mammal Level A and B ZOIs. These distances were determined using acoustic data from previous years monitoring efforts (NAVFAC SW 2014; 2015; 2016; 2017). While the MMOs focused on marine mammals, they were also responsible for identifying other important species (namely the Tern and green sea turtles).

2.2 Project Staffing

Staff included the Project manager (PM), field supervisor, assistant PM, acoustic technicians (ATs), database administrator, database technicians, MMOs, and boat drivers. The MMOs were experienced in marine species identification, and had extensive knowledge of the biology and behavior of locally occurring marine species. Furthermore, Prior to Project-related activities, all MMOs received training on the Project specifications and marine species likely to be present in San Diego Bay. The ATs were trained on how to use the acoustic data logging equipment, as well as run analyses on the output from the USLMs.

2.2.1 Roles and Responsibilities

The roles and responsibilities of the Project staff identified in the previous IHA #4 report (NAVFAC SW 2017) did not appreciably change for marine mammal and acoustic monitoring during the May to October 2017 timeframe.

2.3 Acoustic Monitoring Program Methods

The following sections provide an overview of the equipment and methods used in monitoring sound in the environment that were used during the May to October 2017 timeframe. Methods were similar to those described in more detail in the previous IHA #4 report (NAVFAC SW 2017). Hydroacoustic data collection methods were based on the most current NOAA guidance at the time the monitoring plan was developed for the IHA #4 Application (Navy 2016).

2.3.1 Acoustic Measurements

2.3.1.1 Acoustic Monitoring Equipment

Two separate types of hydroacoustic measurement systems were available to collect underwater acoustic data during construction activities (Table 2-1). The Hydro DB USLM was the primary acoustic measurement device and was used to collect real-time acoustic data at source and far-field locations. The Hydro DB USLM used a High Tech, Inc. (HTI) 96-min hydrophone, with 180 dB re: 1V/ μ Pa sensitivity. A Loggerhead® DSG-ocean acoustic data logger, equipped with a HTI 96-min hydrophone, was retained as a backup for the USLM, but was not used during the May to October 2017 timeframe.

For airborne sound recordings, a LD 831 SLM unit fitted with a preamplifier (PCB PRM 831) and microphone (PCB 377B02) were used to collect sound level recordings. The LD 831 SLM unit recorded continuously in 1 second time histories and at 16 kHz. Several metrics were archived, including LZ_{eq} and LZF_{max} . The LZF_{max} is the highest rms sound level collected over a 125-millisecond interval and was used during the analysis process.

Table 2-1. Sound Monitoring Equipment.

Item	Make	Model
Hydro DB USLM	Hydro DB	Custom
<i>Hydrophone (Hydro DB USLM)</i>	HTI	96-min
DSG-Ocean acoustic data logger	Loggerhead	DSG-Ocean
<i>Hydrophone (Loggerhead® DSG-Ocean)</i>	HTI	96-min
Sound Level Meter	Larson Davis (LD)	831
<i>Microphone (LD SLM)</i>	PCB	377B02
<i>Preamplifier for microphone (LD SLM)</i>	PCB	PRM 831
Pistonphone, Hi Pressure	ETMC Technologies	42AC

2.3.2 Instrument Calibration

Individual HTI hydrophones and PCB microphones were calibrated daily and, in the case of hydrophones, calibration tones recorded for thirty seconds to establish relative RVS relationships needed for post-processing. Calibrations were made using an ETMC 42AC piston phone equipped with a custom coupler designed for a 96-min hydrophone and PCB microphone. The piston phone generates a consistent 100 Pascal signal and calibrations were made at 163.9 dB re 1 μ Pa at 250 Hz for each hydrophone and 134.0 dB re 20 μ Pa at 250 Hz for airborne microphones each day. The Loggerhead® DSG-Ocean data logger sound recording files were intermittently compared to Hydro DB USLM data recordings for the same data collection time frames and locations to conduct reference calibrations and ensure consistent results.

2.3.3 Acoustic Data Collection and Management

Acoustic information was documented on hardcopy forms and then transferred to a Microsoft (MS) Access database. Information collected included: observation date/time, AT, station, general morning/afternoon weather information (wind, waves, and air temperature), pile number, hydrophone latitude/longitude, hydrophone depth, water depth, start/end time of activity, and type of activity. These data were then added to a master database that housed all acoustic and marine species data for the entire Project. Data records were double-checked during data entry and printed copies for each day were archived with the original field data forms. If applicable, additional data Quality Assurance/Quality Control was conducted using saximeter recordings provided by the construction contractor. The saximeter data also provided the number of strikes per pile, as well as the depth of the piles, which were used in the analysis of acoustic data. Acoustic terminology was described in detail in the previous IHA #4 monitoring report (NAVFAC SW 2017).

Underwater SPLs were recorded at approximately 10 m (33 ft; e.g., source measurements) as well as at various distances away (far-field measurements) from the active sound source. In all cases, the measurements were recorded at a depth equal to half of the water depth using piers, barges, or vessels. During all vessel-based sound recordings, the vessels engine and depth sounder were turned off and the vessel was placed at anchor, or adrift. GPS positions were logged for each individual sound recording file and location. All raw acoustic files were saved as *.BIN, which were then converted to *.TXT files. The *.TXT files were imported into MS Excel, where all mean, minimum, and maximum data on a per file, and per pile, were evaluated.

Airborne SPLs were measured starting at 15.2 m (50 ft) from active pile driving (e.g., source measurements) and then at successively increasing distances (far-field measurements) from the pile. The LD 831 SLM units were affixed to tripods adjusted to a 1.5 m (5 ft) height, and the start and stop times for each recording, as well as the file name, were documented for each recording. Raw data were processed in the LD SLM Utility-G3 software and then exported to MS Excel where they were then analyzed and archived.

2.4 Marine Species Monitoring Program Methods

2.4.1 Observer Training and Marine Species Visual Monitoring Protocols

The same protocols were followed for training and visual monitoring as described in the previous IHA #4 report (NAVFAC SW 2017).

2.4.1.1 Turbidity Monitoring

Because demolition work continued into the Tern breeding/nesting season (May 1 to September 15), turbidity monitoring was employed to track sediment plumes associated with high-pressure water jetting for both pile removal and installation. The intent of monitoring was to assess whether sediment plume sizes exceeded 10,117 m² (2.5 acres), or lasted greater than one hour. Two monitoring protocols were used to collect turbidity data for multiple pile installation or removal techniques using water jets:

- At the beginning of each phase using a different type of water jet, a dedicated turbidity monitor collected water transparency data utilizing a secchi disk. The disk was lowered into the water, and the depth at which it was not visible was noted using meter marks on the line. Monitoring stations were chosen based on their proximity to the pile being jetted, with each station progressively moving further away from the pile jetting in multiple directions to account for any tidal flow towards/away from the pile. The number of stations associated with this technique varied depending on the availability of safe locations on the barges used for pile removal/installation.
- During all pile jetting activities, the MMO used a hard copy data sheet to document pile number, as well as the plume size and duration for all piles.

2.4.1.2 Monitoring Zones

Based on *in-situ* acoustic data collected from May to October 2017, the Level A/B ZOIs were different depending on whether work was done at the NBPL Fuel Pier or the NBPL HDA. Bathymetry, bottom type and slope, as well as the area around the Project-related activities, contributed to the propagation of sound and the subsequent distances to the Level A/B thresholds. However, all visibly observed animals were logged regardless of their proximity to Project-related activities.

The IHA #4 monitoring report covering the period from 8 October 2016 to 30 April 2017 (2017) provided a table that identified the activities and associated approximate distances that an MMO could identify an object in the water as a species of interest, and identify to the species level via the naked eye or with binoculars (NAVFAC SW 2017; Table 3-2). In that table, the observable distances were based on the height above the water line and observer location. For both the NBPL Fuel Pier and NBPL HDA locations, barges were used that were approximately 1.8 m (6 ft) above the water line. Based on these observation platforms, it was determined that an MMO could effectively monitor for, and identify, animals at an estimated distance of 300 m (984 ft). However, for some monitoring efforts during IHA #4, visual obstructions may have reduced the ability of the MMOs to fully observe the Project area in all directions. Because a majority of the marine mammal sightings were of individuals transiting through the Project area, we felt that the animals that may have been obstructed from view during portions of the monitoring efforts were visually captured at some point while they were in the Project area and an extrapolation of unobserved animals during non-activity monitoring (before, in-between, and after pile removal and installation activities) was not warranted. However, to be conservative, during active pile removal or installation, an extrapolation of “take” was used to calculate “take” for the unobserved areas based on three factors: 1) the amount of area not observed during individual activities, 2) an estimate of species density based on the Project year with the highest density (see the IHA #3 Application, Navy [2015]), and 3) the amount of time of potential exposure during pile removal or driving activities during IHA #4. By incorporating a species density from a Project year with high abundance and density, we feel that an estimate of Project-related “take” during IHA #4 is conservative.

2.4.1.2.1 NBPL Fuel Pier

During the May to October timeframe, no pile driving occurred at the NBPL Fuel Pier, and pile demolition work did not generate noise levels at, or above, the Level A thresholds. Subsequently, to minimize the potential for mechanical interaction during demolition activities, a 10 m (33 ft) “shutdown” ZOI was implemented for any animals that approached the Project activities. During the May to October 2017 timeframe, the distances to the Level B thresholds were 80 m (262 ft) for the chainsaw and plasma torch cutting, 240 m (787 ft) for the high-pressure water jetting, and 320 m (1,050 ft) for the pile clipper (Figure 2-1). The 80 m Level B ZOI determined for the chainsaw was considered highly conservative during monitoring of plasma torch cutting. See NAVFAC SW (2017) for the distances associated with activities during the October 2016 to April 2017 timeframe. While 320 m (1,050 ft) for the pile clipper was slightly larger than the estimated 300 m (984 ft) distance for observations identified above, we felt that the MMOs could identify species at 320 m (1,050 ft), and we did not need to extrapolate Level B “take” area beyond of 300 m (984 ft).

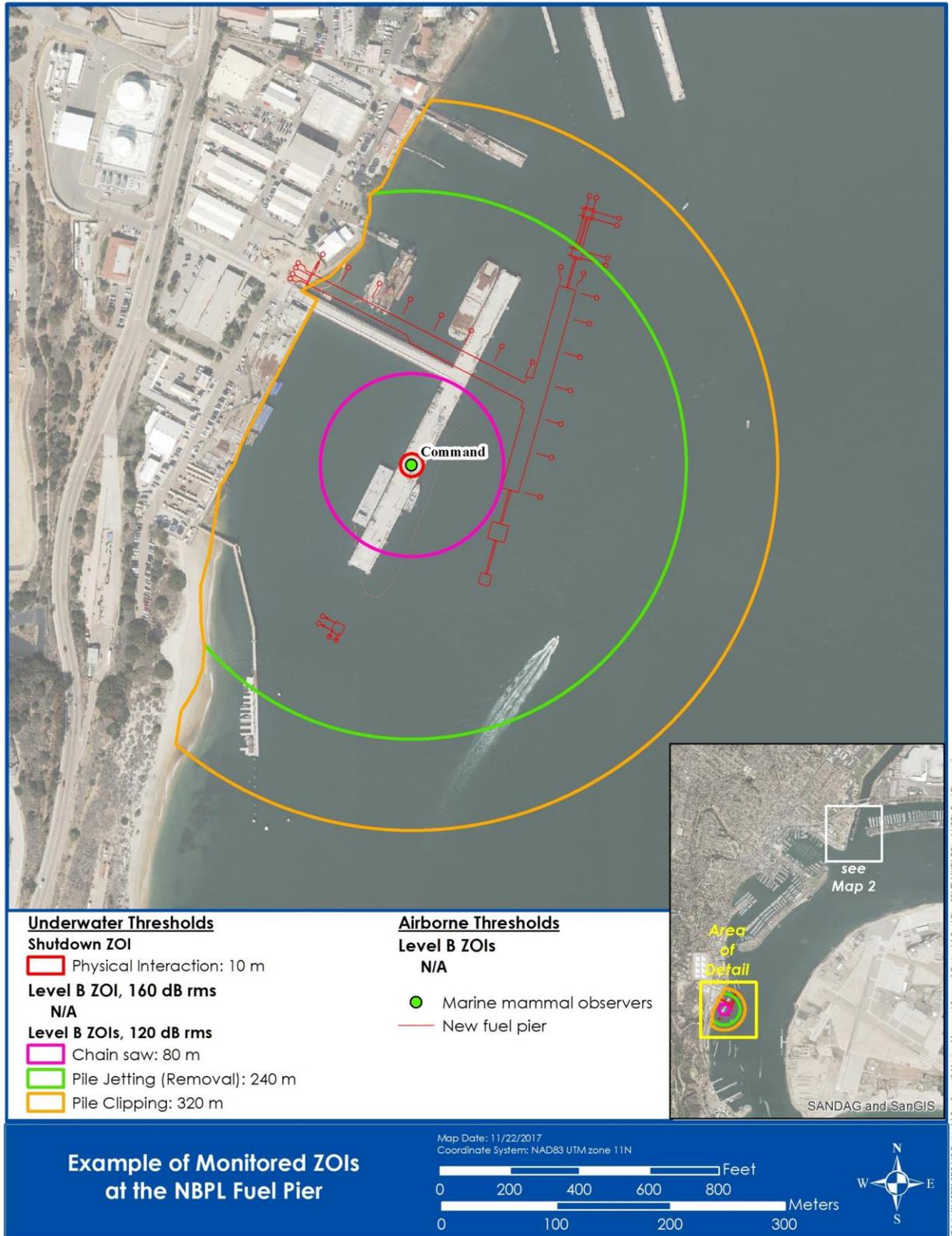


Figure 2-1. NBPL Fuel Pier Monitored “Shutdown” and Level B ZOIs Using a Sample Pile Location (Based on *in-situ* Acoustic Data).

During pile removal activities at the NBPL Fuel Pier, a single MMO was stationed on the crane barge associated with the activity. Based on the barge height, the MMO could wholly observe all Level B ZOIs to the south and southeast, but, due to the new Fuel Pier trestle and the double-decker new Fuel Pier, views were potentially obstructed to the east and north, depending on the barge location. Based on the generalized MMO position identified in Figure 2-1, an area of approximately 0.045 km² (11.3 acres) for pile jetting, and 0.087 km² (21.6 acres) for pile clipping were considered as “unobserved” during monitoring efforts relative to the potential for Level B “take.” Any unobservable area associated with the distance to the Level B ZOI for the chainsaw (80 m [262 ft]) was considered as too small to warrant an analysis for unobserved animals during pile removal activities.

2.4.1.2.2 NBPL HDA

Two pile removal and installation techniques were used at the NBPL HDA, including impact pile driving, and high-pressure water jetting for both pile removal and installation. *In situ* data collected during impact pile driving identified that the Level A ZOIs were less than 10 m (33 ft), and this ZOI was monitored to reduce the potential for physical interaction with Project-related activities. The initial Level B ZOI was predicted to be 126 m (413 ft) based on data collected during IHA #1 (NAVFAC SW 2014), but *in-situ* data collected during Year #4 showed that the Level B ZOI for impact pile driving was approximately 70 m (230 ft). While vibratory pile driving of concrete piles at the NBPL HDA was assessed as part of the IHA #4 Application (Navy 2016), this type of pile driving did not occur during Project-related activities. During high-pressure water jetting for both installation and removal of piles, no sound levels exceeded Level A thresholds. The Level B ZOI for pile jetting was determined to be approximately 560 m (1,837 ft).

During pile removal, a single MMO was positioned on the barge and had an unobstructed view of the Project area to the south. For pile installation, a MMO was positioned on the crane barge, and a second MMO was positioned at the entrance to the Project area (Figure 2-2). While there were portions of the Project area that were unobservable, and may have been exposed to noise associated with the Level B noise criteria for pile jetting, the natural “funneling” of marine mammals towards the MMO(s) decreased the likelihood of any marine mammal being missed as it entered or left the Project area. Also, given the high boat traffic in the channel to the north and the marina to the east of the Project area, the likelihood of unobserved marine mammals remaining in these areas during all monitoring efforts was considered so low as to be discountable. As a result, all visually observed marine mammals are considered as truly representative of the animals in the Project area. However, similar to the analysis at the NBPL Fuel Pier, a conservative estimate of “take” was based on the whole of the Project area potentially exposed to Level B noise, regardless of observed versus unobserved animals. Similar to the NBPL Fuel Pier, if we assume that an MMO could identify individual marine mammals at a distance of 300 m (984 ft) relative to the distance of 560 m (1,837 ft) for the distance to the Level B ZOI for pile jetting (see Figure 2-2), the area used to determine Level B “take” during jetting was 0.23 km² (56.8 acres).



Figure 2-2. NBPL HDA Monitored Buffered “Shutdown” and Level B ZOIs Using a Sample Pile Location (Based on *in-situ* Acoustic Data).

The methodology identified in the previous IHA #4 monitoring report (NAVFAC SW 2017) for the assessment of “take” did not change, with all sightings evaluated weekly relative to the Level A and B ZOIs on a per pile basis. The observation data were collected and analyzed relative to two types of monitoring:

1. Active construction/demolition monitoring:
 - a. During pile driving/demolition: When the hammer was actively hitting the pile during either soft-start or full-power pile driving, as well as during active demolition; and
 - b. Construction shutdowns: Construction stops, or delays, due to an animal entering the buffered Level A “shutdown” (see NAVFAC SW 2017 for the buffering methodology) or 10 m (33 ft) physical interaction ZOIs (Figure 2-1 and Figure 2-2).
2. Non-Active construction/demolition monitoring:
 - a. Pre-construction monitoring: At least 15 minutes before the active construction/demolition began;
 - b. Pre-/Post-construction: Time in-between active construction/demolition events (i.e. when pile driving was stopped for hammer adjustment); and
 - c. Post-construction monitoring: At least 30 minutes after the active construction/demolition had been completed.

Pile installation utilized an impact hammer and integrated the reduced power “soft start” technique; therefore, there were two types of construction that constituted “during” pile driving: soft start impact pile driving, and full-power impact pile driving. However, when evaluating observations relative to pile driving, both soft start and full-power pile driving activities were treated as “during” pile driving and the largest applicable ZOI was used for the assessment of “take.” For demolition activities, demolition was considered “active” when the machinery was actively cutting the piles.

Animals that approached or entered the 10 m (33 ft) “shutdown” zone caused an immediate shutdown or delay of pile installation or removal activities. If animals occurred within any other ZOI associated with the pile removal or installation, then they were considered as “take” and are reported as such in this document. If an animal was observed during pile driving, but was in an area that was acoustically shaded (i.e., south of Ballast Point) or outside of the Level B ZOI, then it was still logged but was not included in the assessment of “take.”

2.4.2 Monitoring Platforms and Locations

For all demolition activities, a single MMO was used to log both activity data as well as marine species in the area. Depending on the demolition activities, the MMO was situated on different barges close to the activities that were from 1.5 to 1.8 m (5 to 6 ft) above the water. The MMO position changed relative to the NBPL Fuel Pier as the barge moved around the area to remove piles. Figure 2-1 and Figure 2-2 show a general area where the barge/MMO would have been located relative to demolition work at both the NBPL Fuel Pier and HDA facilities. At the NBPL Fuel Pier, the MMO was restricted to the barge location and where activities were taking place. As a result, depending on the location of the barge, their line-of-sight to the east may have been

obstructed by the new NBPL Fuel Pier. At the NBPL HDA, while the MMO was still restricted to the barge, a majority of the work took place on the western side of the channel, leaving most of the Project area with unobstructed lines-of-sight to the south.

During pile driving at the NBPL HDA, two MMOs were used, with one MMO on the construction barge and a second MMO either on a boat or on the shore from 200 to 300 m (656 to 984 ft) from the pile driving. The MMO who was stationed on the construction barge during pile driving was in a much more dangerous position during pile driving than for other Project-related activities, and a second MMO was used to decrease the likelihood of missing animals entering the NBPL HDA area. For the boat-based position, a 5.2 m (17-ft) boat was used, placing the MMO approximately 0.9 to 1.2 m (3 to 4 ft) above the water line, while the shore-based position was on a wall that placed the MMO from 2.4 to 3 m (8 to 10 ft) above the water (Figure 2-2). For both the boat- and shore-based MMOs, they were positioned such that they had unobstructed lines of sight for any animals entering/leaving the NBPL HDA Project area.

2.4.3 Other Species Monitored

MMOs were also responsible for documenting observations of green sea turtles and Terns, including number of individuals, location, construction activity, and environmental conditions, if present within the ZOIs.

2.4.3.1 California Least Tern

Data on Terns was collected using the same categories as marine mammals, including time of observation, number, distance and bearing to the individual, sex and age, direction of travel, and construction activity at the time of the observation. However, as a further point of data collection, the MMOs also assessed foraging success by noting whether individuals dove from a hovering position and then rose from the water with a prey item in their beak, as well as any other behavioral observations.

2.4.3.2 Green Sea Turtle

Data on Pacific green sea turtle was collected using the same categories as marine mammals, including time of observation, number, distance and bearing to the individual, sex and age (if it could be determined), direction of travel, and construction activity at the time of the observation. Because no acoustic threshold criteria are available for sea turtles, the 10 m (33 ft) ZOI for physical interaction was used as a shutdown ZOI for any pile installation or removal activities.

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3.0 Results

The results of the acoustic and marine species monitoring efforts associated with this Project are presented below in Sections 3.2 and 3.3, respectively, following the Section 3.1 overview of the construction activities during the May to October monitoring period. Appendix A1 provides the results of turbidity monitoring at both Project locations. Appendix B1 updates all marine mammal sightings during the entire IHA #4 time-period. Appendix C1 provides a summary of all acoustic data. Appendix D1 provides updated information on shutdowns or delays of pile removal/installation due to marine mammal sightings. Because the two Project areas (the NBPL Fuel Pier and the NBPL HDA) are separated by both distance and environment, the data below is presented in separate sections for each location.

3.1 Overall results for the IHA #4 Timeframe

3.1.1 In-Water Pile Operations Effort

For the whole IHA #4 timeframe, there were a total of 152 days and 872:46 hours of monitoring effort at both Project locations (Table 3-1), with an average of 5:44 hours of monitoring effort per day. From 1 May 2017 to 7 October 2017, monitoring effort occurred on 69 of the 152 days (45% of all monitoring days) for 411:11 hours for turbidity, construction, and demolition activities, and an average of 5:57 hours per day. The amount of effort for turbidity in Table 3-1 was based on turbidity monitoring using dedicated equipment (a secchi disk) to identify the extent of the turbidity plumes during pile installation and removal using high-pressure water jets. Beyond the dedicated turbidity monitoring, the size of sediment plumes was logged by the MMOs during all activities that incorporated high-pressure water jetting for pile installation or removal. Reports for the dedicated turbidity monitoring, and for the pile-specific turbidity data collected by the MMOs are presented in Appendix A1.

Observers were on station from 45 minutes to just over 9 hours per day; however, MMOs were not necessarily monitoring throughout that full time-period and generally documented marine species observations only during the required monitoring periods for Project-related activities. During the monitoring effort from May to October 2017 for both Project areas, a majority of the observation effort (335:08 hours, or 82%) was for monitoring while construction or demolition was not occurring (pre-construction, pre-/post-construction and post-construction surveys). This high level of monitoring effort can be attributed to monitoring at both the NBPL Fuel Pier and the NBPL HDA during the month of September. This is also reflected in the number of monitoring days and average number of hours of effort per day (Figure 3-1). The remaining effort (76:03 hours, or 18%) was during active construction or demolition and included pile removal, pile driving, and turbidity monitoring. This result is similar to the previous reporting period (October 2016 to April 2017) which had more observation effort during the non-construction/demolition monitoring periods (313:38 hours, or 68%) than for the active construction/demolition monitoring periods (147:57 hours, or 32%).

Table 3-1. Monitoring Effort by Month (All Project Locations).

Month	Days of Monitoring Effort	Total Observation Time ^{1,2}	Avg. Hours per Day ¹	Marine Species Monitoring Type				Turbidity
				Construction ¹		Demolition ¹		
				Active Construction	Non-Pile Driving ³	Active Demolition	Non-Demolition ³	
October	8	34:58	04:22	00:20	08:42	04:36	21:20	00:00
November	0	00:00	00:00	00:00	00:00	00:00	00:00	00:00
December ⁴	12	107:43	08:58	03:01	23:58	44:15	34:32	01:57
January	14	67:35	04:49	00:00	00:00	37:37	29:58	00:00
February	10	71:39	07:09	03:50	21:49	25:46	20:14	00:00
March	21	85:46	04:05	09:46	42:56	06:27	26:37	00:00
April	18	93:54	05:13	06:21	32:02	04:01	51:30	00:00
Subtotal	83	461:35		23:18	129:27	122:42	184:11	01:57
May	11	39:59	03:38	00:00	00:00	02:19	37:39	00:00
June	11	56:55	05:10	00:00	00:00	14:37	35:04	07:14
July	8	37:24	04:40	00:00	00:00	06:52	30:31	00:00
August	14	61:19	04:22	00:00	00:00	18:45	41:29	01:04
September	20	184:30	09:13	04:46	61:20	14:45	103:38	00:00
October	5	31:02	06:12	00:00	00:00	05:38	25:23	00:00
Subtotal	69	411:11		04:46	61:20	62:58	273:47	08:18
TOTAL	152	872:46		28:04	190:47	185:40	457:58	10:15

Note: ¹All time in hh:mm; ²Includes cumulative time for all activities for each day of observation; ³Non-Pile Driving and Non-Demolition include times when active construction (e.g., pile driving/jetting) and demolition (e.g., pile clipping) were not occurring, but MMOs were actively observing for marine species in the Project area; ⁴Includes two days of dedicated turbidity monitoring. Marine mammal monitoring did not occur.

3.1.2 Marine Species Observations

From October 2016 to October 2017, four identifiable marine mammal species (California sea lions, harbor seals, coastal bottlenose dolphins, and gray whales), one bird species (Tern), and one marine reptile (green sea turtle) were observed at both Project locations (Table 3-2). There were also four observations of unidentified pinnipeds and dolphins during IHA #4. These sightings were of animals that were too far away to identify to the species level, or were brief observations of animals as they dove. Tables, figures, and discussions included in the previous IHA #4 report (NAVFAC SW 2017) have been updated with information collected during the May to October 2017 timeframe in this report, as applicable. For the full duration of IHA #4 (October 2016 to October 2017), there were 2,013 sightings of marine species and 6,101 individual animals observed across both Project locations, including resightings. Of those observations, 1,942 sightings (97%) and 6,011 individuals (99%) were observed at the NBPL Fuel Pier, with the remaining observations at the NBPL HDA. Data for the October 2016 to April 2017 timeframe was discussed in the NAVFAC SW 2017 and the discussion below will focus on observations during the May to October 2017 timeframe.

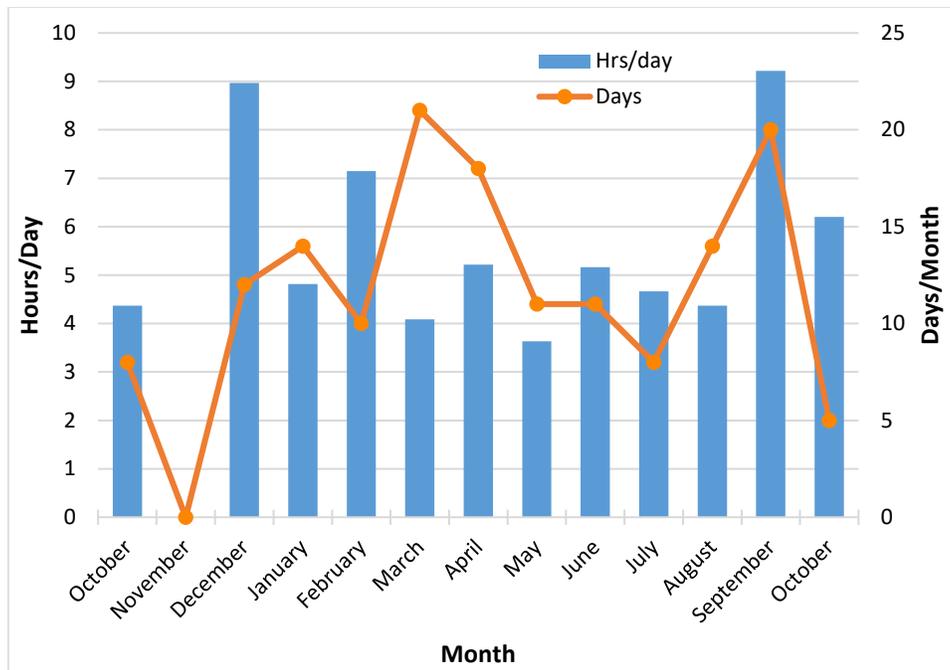


Figure 3-1. Hours per Day and Hours Days per Month for all Monitoring Effort (All Project Locations).

During monitoring efforts from May to October 2017, there were a total of 1,102 sightings (including re-sightings) of 3,757 live marine species (marine mammals, green sea turtles, and Terns) flying, in the water, or hauled out on buoys, barges, or docks (see Appendix B1 for a full listing for all observations during IHA #4). Of the species observed, there were 12 resightings (1% of all sightings) that accounted for 20 individuals (all California sea lions) in the water. A resighting occurred when one MMO “passed off” an animal to another MMO by verifying that the animal was the same individual via both visual and/or radio-communication between the MMOs. The second MMO would then either “pass off” the animal to another MMO, or watch it as it left visual range. Because the resightings were of the same animal, they were not included in the overall analysis. All Terns were observed to be in the air near the Project area, but for the purposes of simplicity in data collection, they were logged as “In Water” (Table 3-3). During the second half of monitoring effort, most sightings were of California sea lions, with 179 sightings of 2,006 individuals hauled out, and 859 sightings with 1,618 animals in the water (Table 3-2). The harbor seal and coastal bottlenose dolphin were the next most observed marine mammals with eight observations for each species wither hauled out or in the water. Pinnipeds that were hauled out during active construction or demolition did not contribute to in-water take, and so are not analyzed further in this document. Of the ESA-listed species (Table 3-3), the Tern was the most often observed animal with 75 individuals observed during 33 sightings.

Table 3-2. Total Number of Marine Mammal Individuals and Sightings by Species During IHA #4 (All Project Locations).

Species	Hauled Out					In Water				
	Total Number		Group Size			Total Number		Group Size		
	Indiv.	Sightings	Mean	Max	Min	Indiv.	Sightings	Mean	Max	Min
California sea lion										
Oct 2016-Apr 2017	1,392	243	5.73	84	1	645	474	1.36	25	1
May 2017-Oct-2017	2,006	179	11.21	100	1	1,618	859	1.88	40	1
Subtotal	3,398	422	8.05			2,263	1,333	1.70		
Harbor seal										
Oct 2016-Apr 2017	18	13	1.38	3	1	84	74	1.14	3	1
May 2017-Oct-2017	5	5	1.00	1	1	4	3	1.33	2	1
Subtotal	23	18	1.28			88	77	1.14		
Unidentified pinniped										
Oct 2016-Apr 2017	0	0	0.00	0	0	1	1	1.00	1	1
May 2017-Oct-2017	0	0	0.00	0	0	1	1	1.00	1	1
Subtotal	0	0	0.00			2	2	1.00		
Coastal bottlenose dolphin										
Oct 2016-Apr 2017	N/A					45	18	2.50	6	45
May 2017-Oct-2017						22	8	2.75	4	1
Subtotal						67	26	2.58		
Unidentified dolphin										
Oct 2016-Apr 2017	N/A					2	1	2.00	2	2
May 2017-Oct-2017						5	1	5.00	5	5
Subtotal						7	2	3.50		
Gray whale										
Oct 2016-Apr 2017	N/A					1	1	1.00	1	1
May 2017-Oct-2017						0	0	0.00	0	0
Subtotal						1	1	1.00		
Subtotal (Marine Mammals)										
Oct 2016-Apr 2017	1,410	256				778	569			
May 2017-Oct-2017	2,011	184				1,650	906			
TOTAL	3,421	440				2,428	1,441			

Table 3-3. Total Number of ESA-listed Individuals and Sightings by Species During IHA #4 (All Project Locations).

Species	Hauled Out					In Water				
	Total Number		Group Size			Total Number		Group Size		
	Indiv.	Sightings	Mean	Max	Min	Indiv.	Sightings	Mean	Max	Min
Green Sea Turtle										
Oct 2016-Apr 2017	N/A					1	1	1.00	1	1
May 2017-Oct-2017						1	1	1.00	1	1
Subtotal						2	2	1.00		
California Least Tern										
Oct 2016-Apr 2017	N/A					0	0	0.00	0	0
May 2017-Oct-2017						75	33	2.27	1	20
Subtotal						75	33	2.27		
Subtotal (ESA-listed Species)										
Oct 2016-Apr 2017	0	0				1	1			
May 2017-Oct-2017	0	0				76	34			
TOTAL	0	0				77	35			

3.2 NBPL Fuel Pier

3.2.1 In-Water Pile Operations Effort

There are approximately 818 structural and fender piles and caissons associated with the southern section of the old fuel pier and the pier trestle which provides access to the old fuel pier from the land. The trestle was built at the same time as the northern section of the old fuel pier, and both sections of the pier used twenty-five 84-in and thirty 60-in caissons as primary support structures, with non-structural fender piles of varying sizes. Also, several caissons had deteriorated over time and secondary support piles were installed to provide extra support for the pier deck. The southern section of the old fuel pier is newer and was built using 16-in structural piles, also with fender piles of varying sizes. During the IHA #4 timeframe (8 October 2016 to 7 October 2017), 610 of 818 (75%) of the caissons and structural piles were completely removed. Data for the piles that were completely or partially removed from the old fuel pier during from 8 October 2016 to 30 April 2017 are presented in NAVFAC SW (2017). During the period associated with this addendum (1 May 2017 to 7 October 2017), piles removed included 14-, 16-, and 18-in square concrete piles, 13-in round polycarbonate piles, and legacy timber piles of various sizes. The timber piles were remnants from previous pier modifications and were not on any plans associated with this Project.

There was a total of 286:14 hours of monitoring effort over 58 days for pile removal and turbidity (Table 3-4), or an average of 4:56 hours per day, at the NBPL Fuel Pier. During those monitoring efforts, pile removal accounted for 279:00 hours (97% of monitoring effort) and turbidity monitoring accounted for 07:14 hours (3% of effort). For pile removal using a water jet from 1 May to 16 September 2017, a dedicated turbidity monitor was used when several types of high-pressure water jets (see Photo 1-3 and Photo 1-4) were used to remove sediment around 16-inch concrete structural piles. The jetting was used to expedite the removal of the certain piles that hindered the removal of other piles, and to reduce the amount of setup time when using a pile clipper. No pile

driving occurred from May to October 2017 at the NBPL Fuel Pier. When evaluating the amount of monitoring effort during active versus non-active pile demolition, it was similar to the overall Project with 53:01 hours (19%) for active demolition monitoring, and 233:13 hours (81%) during non-active pile demolition monitoring.

3.2.2 Summary of Turbidity Monitoring

Various water jets were used (see Sections 1.1.2.1 and 2.4.1.1 for descriptions of the different methods) to facilitate the removal of fender or structural piles associated with the south section of the old Fuel Pier. The water jet was used on 26 individual piles over 13 days in June, July, and August. Some piles were jetted using multiple techniques, or multiple times, with a total of number 32 observations reported. Of those 32 observations, a majority (n=19, 63.3%) showed no plume. The remaining observations of visible sediment plumes had a mean plume time of one minute, and a mean plume size of 11.1 m² (0.003 acres). The maximum plume size of 13×13 m (42.7×42.7 ft), or 169 square meters (m²; 0.042 acres), and the maximum duration of a plume was 10 minutes for a 1×1 m (3.3×3.3 ft) plume. Data was missing, or unavailable, for two piles. Appendix A1 provides a listing of the results for the turbidity monitoring for each individual pile, as well as a summarization of the results for each dedicated turbidity monitoring effort.

Table 3-4. Monitoring Effort by Month (NBPL Fuel Pier).

Month	Days of Monitoring Effort	Total Observation Time ^{1,2}	Avg. Hours per Day ¹	Marine Species Monitoring Type				Turbidity
				Construction ¹		Demolition ¹		
				Active Construction	Non-Pile Driving ³	Active Demolition	Non-Demolition ³	
October	8	34:58	04:22	00:20	08:42	04:36	21:20	00:00
November	0	00:00	00:00	00:00	00:00	00:00	00:00	00:00
December ⁴	12	107:43	08:58	03:01	23:58	44:15	34:32	01:57
January	14	67:35	04:49	00:00	00:00	37:37	29:58	00:00
February	10	71:39	07:09	03:50	21:49	25:46	20:14	00:00
March	21	85:46	04:05	09:46	42:56	06:27	26:37	00:00
April	18	93:54	05:13	06:21	32:02	04:01	51:30	00:00
Subtotal	83	461:35		23:18	129:27	122:42	184:11	01:57
May	11	39:59	03:38	00:00	00:00	02:19	37:39	00:00
June	11	56:55	05:10	00:00	00:00	14:37	35:04	07:14
July	8	37:24	04:40	00:00	00:00	06:52	30:31	00:00
August	9	35:47	03:58	00:00	00:00	09:35	26:12	00:00
September	14	85:05	06:04	00:00	00:00	06:44	78:21	00:00
October	5	31:02	06:12	00:00	00:00	05:38	25:23	00:00
Subtotal	58	286:14		00:00	00:00	45:47	233:13	07:14
TOTAL	141	747:48		23:18	129:27	168:27	417:22	09:11

Notes ¹All time in hours: minutes (hh:mm); ²Includes cumulative time for all activities for each day of observation; ³Non-Pile Driving and Non-Demolition include times when active construction (e.g., pile driving/jetting) and demolition (e.g., caisson or pile clipping) were not occurring, but MMOs were actively observing for marine species in the Project area; ⁴Includes two days of turbidity monitoring when marine mammal monitoring did not occur. These days have been excluded from relevant tables in the following sections.

3.2.3 Summary of Acoustic Results

Several different underwater demolition activities occurred at the old fuel pier during the 1 May to 7 October 2017 period, including pile clipping, pile cutting using a chainsaw, and pile removal using jetting. Underwater acoustic data are summarized below according to type of activity and equipment used. All reported acoustic data were collected with the Hydro DB USLM. Appendix C1 provides a summary of all acoustic data collected during IHA #4.

3.2.3.1 Pile Clipping

Acoustic data were collected during pile clipping using the vibratory settings on the Hydro DB USLM in accordance with prior data review by an acoustic technical expert (NAVFAC SW 2017a). Figure 3-2 shows an example of the recently recorded data.

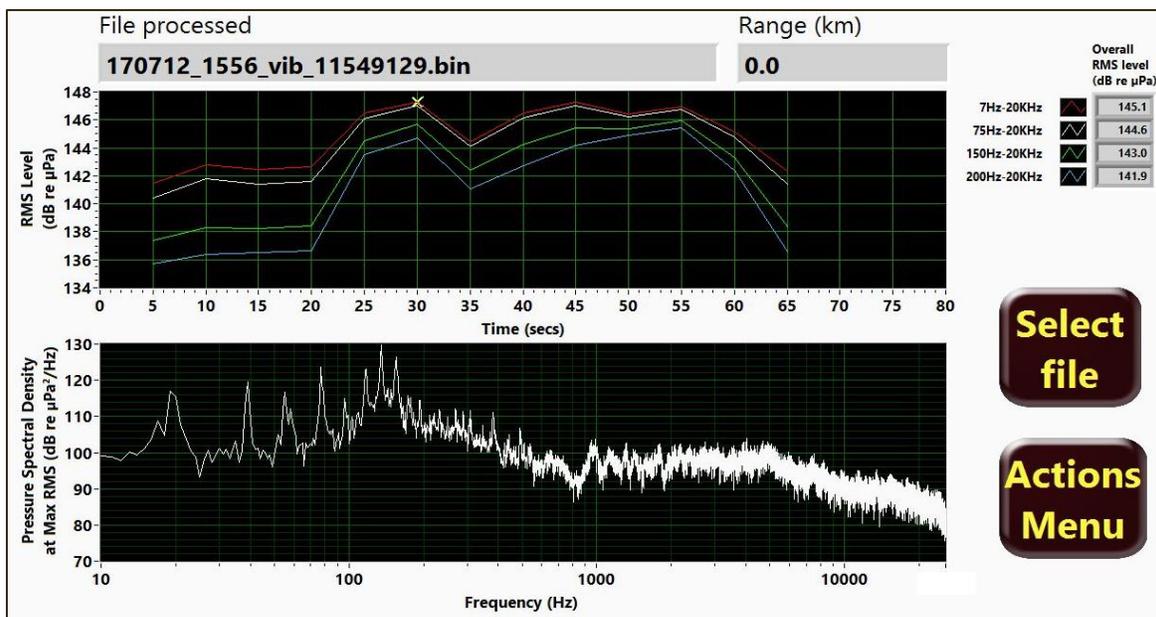


Figure 3-2. Example of Hydro DB USLM Data at the Source Distance (10 m, 33 ft) During Clipping of a 16-inch Square Concrete Pile.

Maximum underwater SPLs during clipping of 16-inch concrete piles ranged from 146.5 to 147.3 dB rms at the source distance (10 m [33 ft]), and ranged between 128.8 and 144.10 dB rms at far-field distances of 101 to 309 m (331 to 1,014 ft) (Table 3-5). Generally, maximum underwater SPLs were similar during clipping of 18-inch concrete piles, ranging from 146.4 to 154.3 dB rms at source, and between 125.0 and 142.8 dB rms at distances of 92 to 388 m (302 to 1,273 ft).

The pile clipping SPLs at source did not exceed the Level A thresholds (190 and 180 dB rms) for marine mammals. The distance to the Level B threshold for vibratory sound (120 dB rms) could not be determined due to masking by ambient underwater noise, which averages approximately 129.6 dB rms in the vicinity of the fuel pier (NAVFAC SW 2015).

Table 3-5. Average and Maximum Broadband SPLs (dB rms) at Source (10 m [33 ft]) and Far-field (27 to 388 m [89 to 1,273 ft]) Distances During Clipping of 16- and 18-inch Concrete Piles (NBPL Fuel Pier).

Date	Pile Number	Station	Distance (m [ft])	Underwater Acoustic Data	
				rms (dB re 1 μ Pa)	
				Average	Maximum
16-inch square concrete piles					
12-Jul-17	P03-C	Source	10 (33)	145.9	147.3
	P03-D			143.9	146.5
3-Jul-17	P10-AB	Far-field	27 (89)	137.4	143.8
	P11-AB		101 (331)	133.1	138.5
17-Apr-17	P40-C		141 (463)	128.3	128.8
3-Jul-17	P08-AB		155 (509)	142.7	144.1
	P09-AB			139.1	142.2
17-Apr-17	P41-B		196 (643)	131.0	132.0
	P41-D		197 (646)	131.8	132.7
	P41-E		198 (650)	134.3	138.0
	P40-E		201 (659)	131.3	133.2
3-Jul-17	P08-AP		215 (705)	129.0	130.0
13-Jul-17	P03-AP	309 (1,014)	130.2	131.8	
	P03-AB		125.6	129.9	
18-inch square concrete fender piles					
19-Sep-16 ¹	NWF05	Source	10 (33)	140.0	154.3
	NWF01			137.8	150.5
	NWF03			138.2	146.4
	NWF08	Far-field	92 (302)	136.8	139.6
	NWF10		169 (554)	135.8	139.3
	NWF12		175 (574)	128.6	142.8
9-Aug-17	TFS02		187 (613)	128.1	131.8
14-Aug-17	TFS11		206 (676)	134.6	141.3
	TFS08		223 (731)	126.1	126.7
	TFS09	224 (735)	135.1	137.3	
	TFS10	226 (741)	135.8	137.8	
13-Jul-17	SWF01	238 (781)	125.4	127.9	
14-Aug-17	TFS12	Far-field	253 (830)	131.4	135.0
	TFS06		280 (918)	123.9	126.6
	TFS13		297 (974)	129.3	130.9
	TFS14		335 (1,099)	126.6	132.3
				127.1	127.6
	TFS15		388 (1,273)	128.8	131.9
			124.3	125.0	

Note: ¹Data from 19-Sep-2016 is from IHA #3 (NAVFAC SW 2016a,b) and is included here for reference only.

SPLs at distance exhibited variability likely related to sound source levels of individual piles and other anthropogenic noise at the time of the recordings. The influence of other anthropogenic sources (primarily vessel traffic), as suggested by values fluctuating above and below the average ambient background noise level of 129.6 dB rms, was most noticeable at distances greater than 200 m (656 ft) (Figure 3-3a,b). Linear regression provided the best fit trendline for the decrease in maximum SPLs with distance from source (Figure 3-3a,b). The intersection of the trendline with the ambient noise level was considered as the ZOI, which was calculated as 295 m (968 ft) for 16-inch piles (Figure 3-3a) and 319 m (1,047 ft) for 18-inch piles (Figure 3-3b), respectively. The transmission loss rates based on linear regression were 0.06 and 0.08 dB/m for the 16- and 18-inch concrete piles, respectively. Utilizing the data from the 18-inch piles, Level B “take” was assessed relative to a Level B ZOI of 320 m (1,050 ft) for all pile clipping, regardless of pile size.

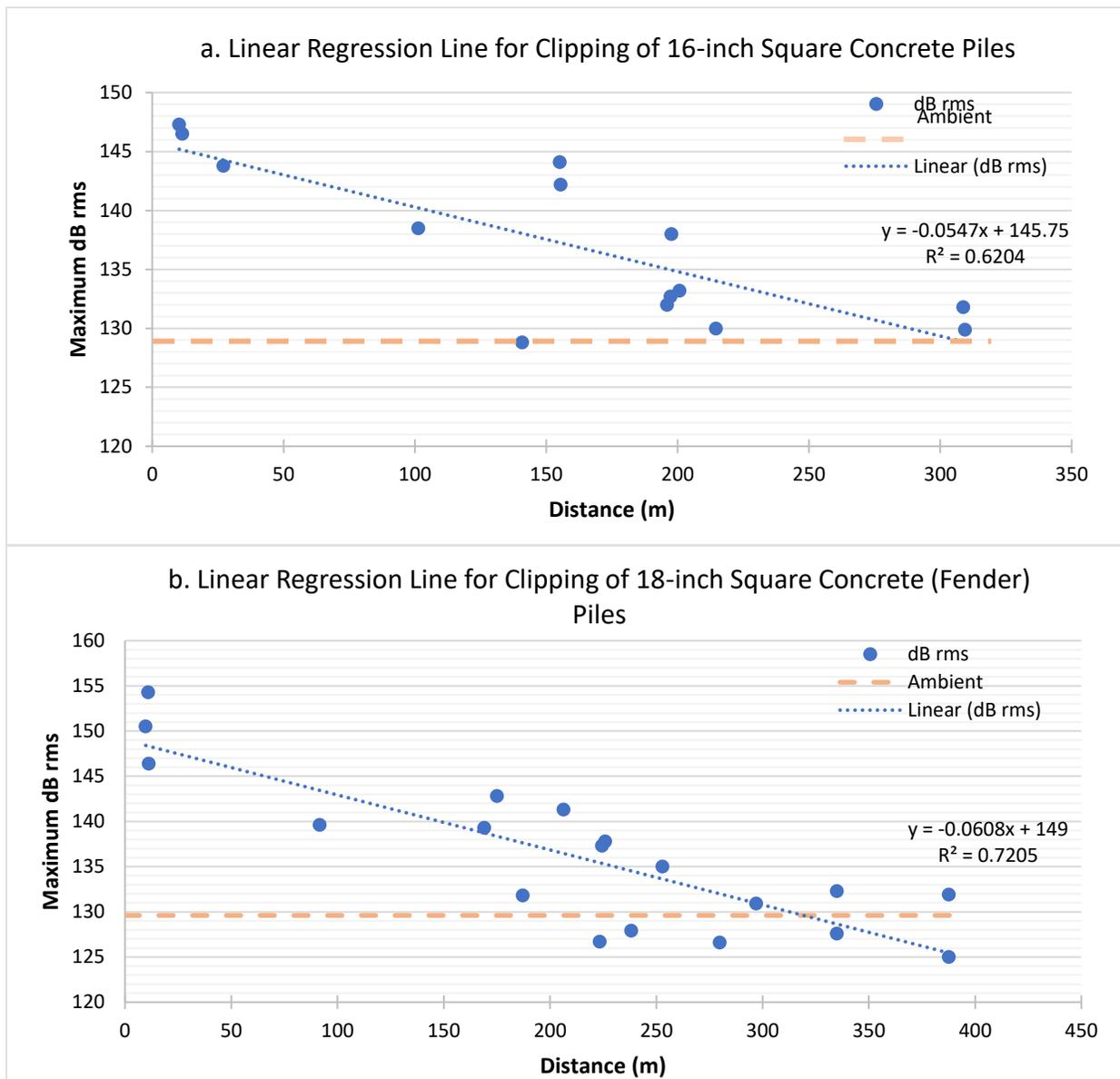


Figure 3-3a,b. SPLs Measured at Multiple Distances Using the Hydro DB USLM During Clipping of a) 16- and b) 18-inch Square Concrete Piles (NBPL Fuel Pier).

3.2.3.2 Pile Cutting (Underwater Chainsaw)

Acoustic data were collected during the use of an underwater chainsaw to cut 16-inch square concrete piles that could not be clipped with the pile clipper. The vibratory setting on the Hydro DB USLM was used; an example of collected data is shown in Figure 3-4.

Maximum underwater SPLs during chainsaw cutting of 16-inch concrete piles were 149.8 dB rms at the source distance (10 m [33 ft]), and ranged between 130.3 and 137.7 dB rms at far-field distances of 26 to 76 m (85 to 249 ft) (Table 3-6).

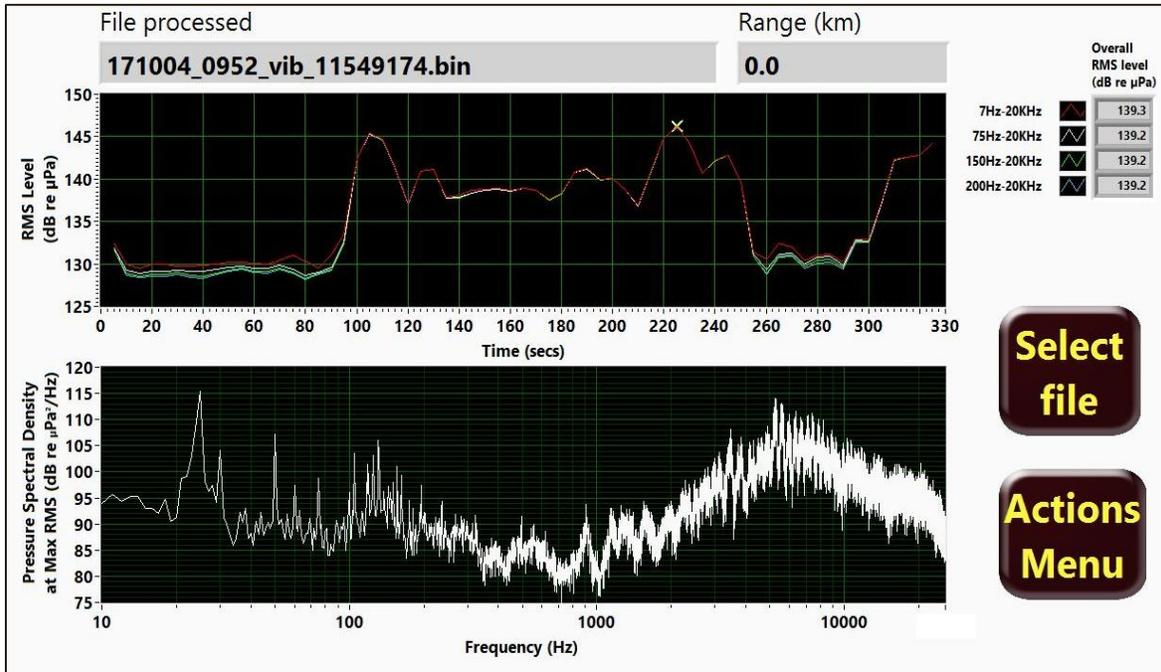


Figure 3-4. Example Hydro DB USLM Data at the Source Distance (10 m, 33 ft) During Chainsaw Cutting of a 16-inch Square Concrete Pile

Table 3-6. Average and Maximum Broadband SPLs (dB rms) at Source (10 m [33 ft]) and Far-field (26 to 76 m [85 to 249 ft]) Distances During Chainsaw Cutting of 16-inch Square Concrete Piles (NBPL Fuel Pier).

Date	Pile Number	Station	Distance (m [ft])	Underwater Acoustic Data	
				rms (dB re 1 μPa)	
				Average	Maximum
4-Oct-17	P21-FB	Source	10 (33)	140.9	149.8
			26 (85)	132.3	137.7
11-Oct-17	P13-FB	Far-field	42 (138)	128.5	133.6
			45 (148)	127.9	132.9
			60 (197)	128.2	133.9
			76 (249)	125.9	130.3

The chainsaw cutting sound levels at source did not exceed the Level A thresholds (190 and 180 dB rms) for marine mammals. Similar to pile clipping, the distance to the Level B threshold for vibratory sound (120 dB rms) could not be determined due to masking by higher ambient underwater noise levels.

The logarithmic regression curve provided the best fit trendline for the decrease in maximum SPLs with distance from the source (Figure 3-5). The intersection of the trendline with the ambient noise threshold (129.6 dB rms) was considered the ZOI, which was calculated as 71 m (233 ft), indicating a transmission loss rate of 0.28 dB/m. This ZOI was expanded to 80 m for the purposes of an assessment of Level B “take”.

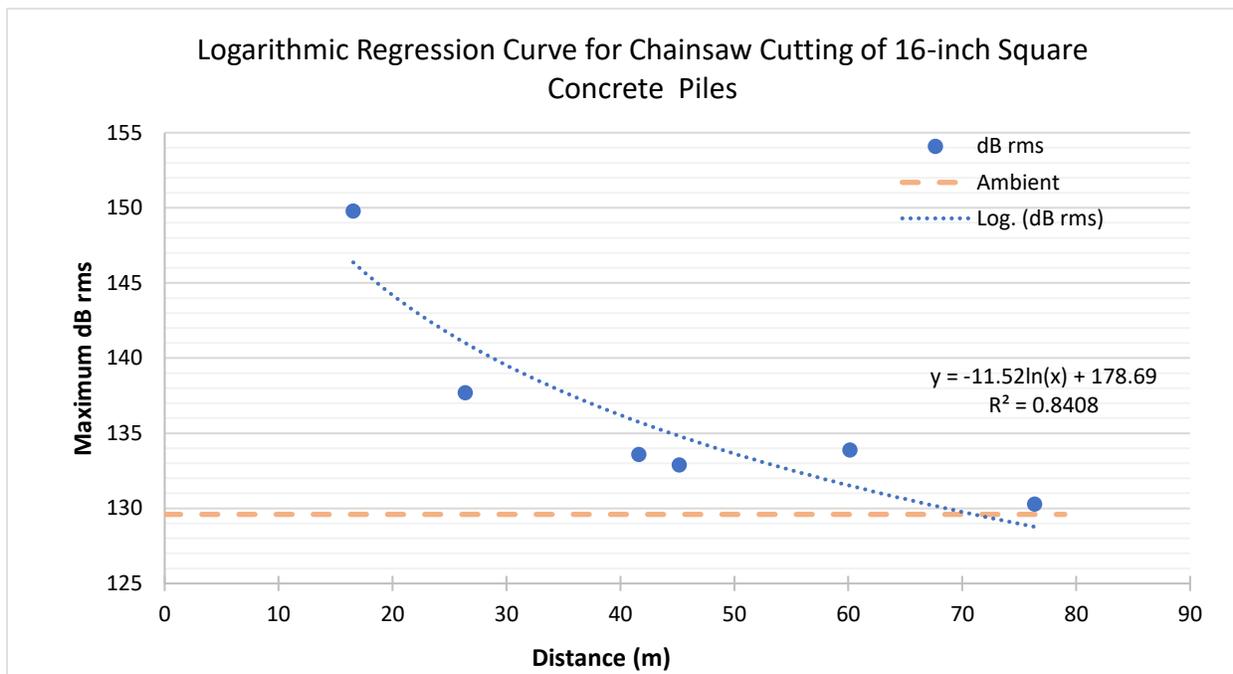


Figure 3-5. SPLs Measured at Multiple Distances Using the Hydro DB USLM During Chainsaw Cutting of 16-inch Square Concrete Piles (NBPL Fuel Pier).

3.2.3.3 Pile Jetting (Pile Removal)

A single-nozzle, high pressure water jet with a 2-inch tip was used to remove 16-inch square concrete piles associated with the old fuel pier. The vibratory setting on the Hydro DB USLM was used during acoustic monitoring; an example of collected data is shown in Figure 3-6.

Maximum underwater SPLs during jetting removal of 16-inch concrete piles ranged from 149.3 to 152.3 dB rms at the source distance (10 m [33 ft]), and ranged between 131.6 and 147.4 dB rms at far-field distances of 16 to 231 m (52 to 758 ft) (Table 3-7). Sound levels were higher when the jet nozzle was positioned just below the water surface compared to mid-depth and near the bottom; sound levels were lowest when the jet was directed below the mud line (Figure 3-7).

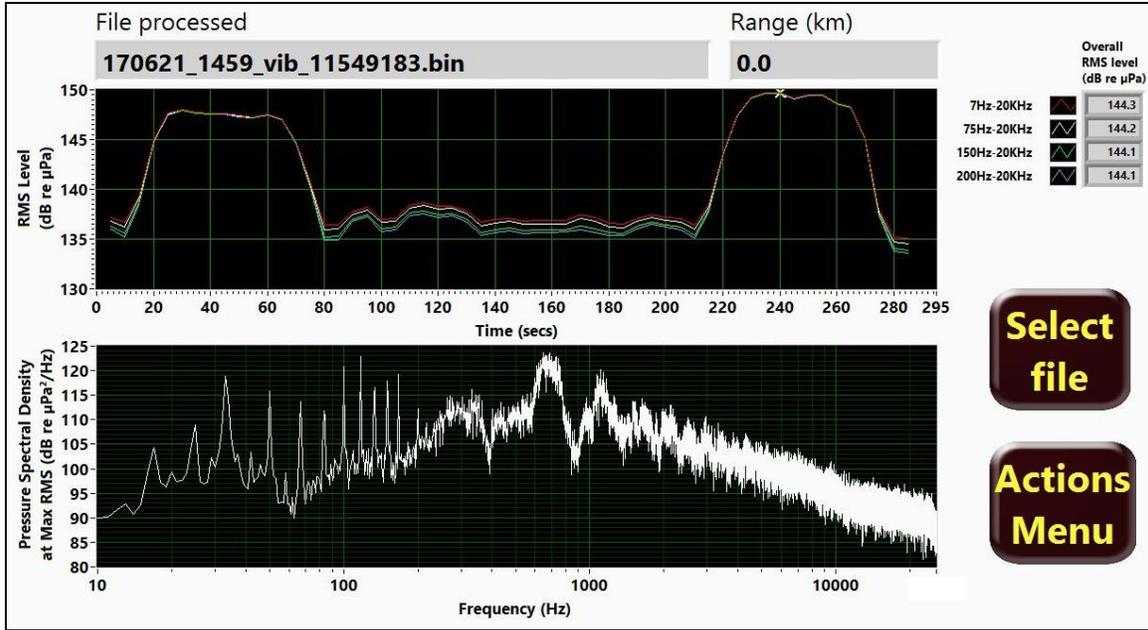


Figure 3-6. Example Hydro DB USLM Data at the Source Distance (10 m, 33 ft) During Jetting Removal of a 16-inch Square Concrete Pile.

Table 3-7. Average and Maximum Broadband SPLs (dB rms) at Source (10 m [33 ft]) and Far-field (16 to 231 m [52 to 758 ft]) Distances During Jetting Removal of 16-inch Square Concrete Piles (NBPL Fuel Pier).

Date	Pile Number	Station	Distance (m [ft])	Underwater Acoustic Data	
				rms (dB re 1 μPa)	
				Average	Maximum
21-Jun-17	P20-E	Source	10 (33)	138.2	152.3
30-Jun-17	P09-B			141.9	151.4
	P11-B			140.2	150.7
	P10-B			139.3	149.3
12-Jul-17	P04-B	Far-field	16 (52)	144.2	147.4
	P03-B		19 (62)	142.9	145.7
3-Jul-17	P06-B		49 (161)	129.6	135.4
	P08-B		70 (230)	131.5	139.3
			102 (335)	127.7	131.6
	P07-B		104 (341)	128.4	134.1
	P07-B		145 (476)	130.4	135.0
231 (758)			127.9	132.3	

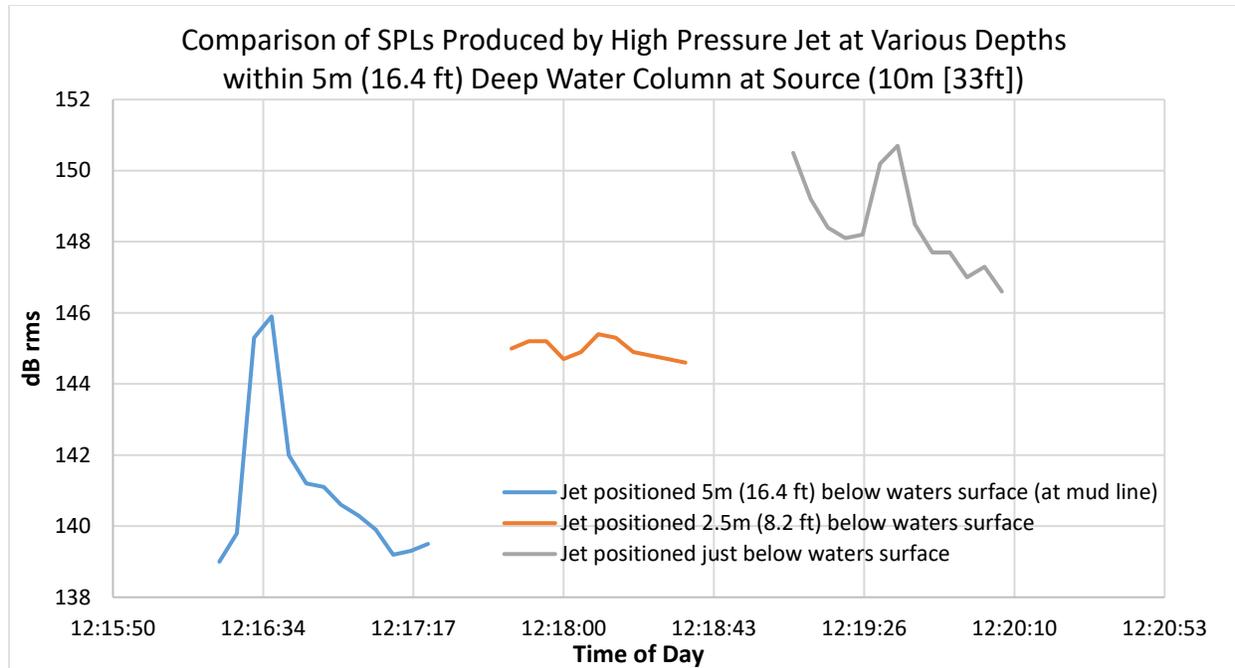


Figure 3-7. SPLs Measured at Different Water Depths During Jetting Removal of 16-inch Square Concrete Piles (NBPL Fuel Pier).

The jetting sound levels did not exceed the Level A thresholds (190 and 180 dB rms) for marine mammals. Similar to other demolition activities, the distance to the Level B threshold for vibratory sound (120 dB rms) could not be determined due to masking by higher ambient underwater noise levels.

The logarithmic regression curve provided the best fit trendline for the decrease in maximum SPLs with distance from the source (Figure 3-8). The intersection of the trendline with the ambient noise threshold (129.6 dB rms) was considered the ZOI, which was calculated as 234 m (767 ft), indicating a transmission loss rate of 0.1 dB/m. For an assessment of Level B “take” this ZOI was increased to 240 m (787 ft).

3.2.3.4 Plasma Torch

The plasma torch was used infrequently for a total of approximately 2 hours and 45 minutes out of the total of 185 hours and 40 minutes (1.5%) of active demolition. Plasma torch cutting may generate airborne dB levels upwards of 115 dB re 20 μ Pa (Hogan and Lewis 1976), depending on the power levels of the torch. However, transmission loss is high, with frequencies in the 5 to 20 kHz range (Hogan and Lewis 1976), again, depending on the power level of the torch. Sound levels in water are typically corrected by adding 26 dB to the airborne levels, which would place the approximate source levels for the plasma torch at approximately 141 dB. The frequency ranges are outside most of the marine mammals hearing range, with only the low-frequency cetaceans and pinnipeds likely to hear this activity (Southall et al. 2007).

Underwater noise data were not collected for the plasma torch because the source levels were not assumed to reach Level A threshold criteria, and the Level B ZOI was assumed to be small based on the low energy associated with the activity. A distance of 63 m (207 ft) was estimated using a simplistic

practical spreading loss model to generate a Level B ZOI based on a source level of 141 dB rms. To be conservative, a ZOI of 80 m (262 ft) was used for the assessment of Level B “take.”

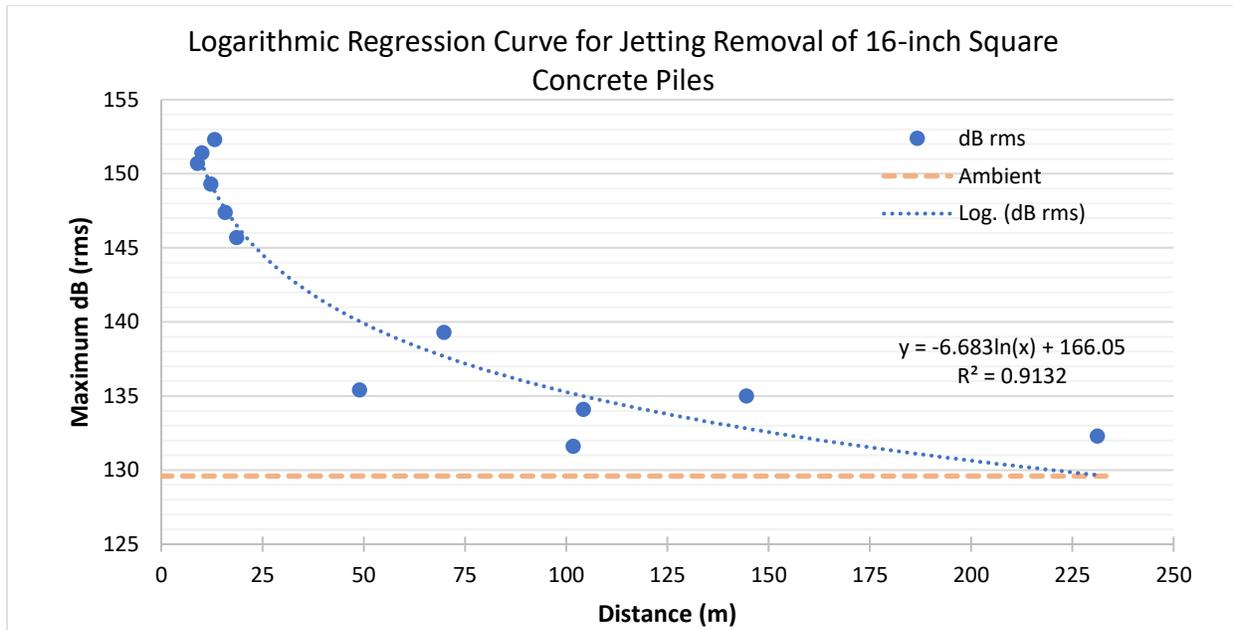


Figure 3-8. SPLs Measured at Multiple Distances During Jetting Removal of 16-inch Concrete Piles (NBPL Fuel Pier).

3.2.4 Summary of Marine Species Monitoring Results

Marine species were sighted during several all phases of the Project at the NBPL Fuel Pier, as well as during shutdown events when an animal caused a shutdown or delay of construction after it entered the buffered and/or actual Level A ZOIs for the cetaceans and pinnipeds. The construction shutdowns or delays were short (generally a few minutes) and were included as part of active construction/demolition. Table 3-8 provides a summary the number of individuals and sightings that occurred during each phase of active construction and demolition or, non-construction and non-demolition monitoring at the NBPL Fuel Pier. Species covered under the IHA included the California sea lion, harbor seal, coastal bottlenose dolphin, common dolphin, gray whale, northern elephant seal, Pacific white-sided dolphin, and Risso’s dolphins. The unidentified pinnipeds and dolphins in Table 3-8, are likely California sea lions and coastal bottlenose dolphin’s due to their prevalence in San Diego Bay. Data for the unidentified animals will be assessed in each of these species sections, respectively. Of the eight marine mammal species in IHA #4, only four were visually confirmed as present during monitoring efforts at the NBPL Fuel Pier. The Federally-listed ESA species green sea turtle and Tern were also documented during Project-related activities.

From May to October 2017, the most observed species at the NBPL Fuel Pier was the California sea lion (n=1,577 individuals in the water, 95.8% of all individuals observed), followed by Terns (n=43, 2.6%), and coastal bottlenose dolphins (n=17, 1.0%). All other species identified in Table 3-9 were observed less than 1% of the time. Tables, figures, and discussions included in the previous IHA #4 report (NAVFAC SW 2017) were updated with information collected during the May to October 2017 timeframe in this report section, as applicable.

Table 3-8. Summary of In-Water Marine Mammal Observations By Activity at the NBPL Fuel Pier.

Species	Pile Installation [Individuals (Sightings) ¹]					Pile Removal [Individuals (Sightings) ¹]						Non-Activity Monitoring [Individuals (Sightings) ¹]		
	Vibratory Pile Driving	Impact Pile Driving		Shut- down	Jetting- Install	Caisson Cutting	Pile Clipping	Torch Cutting	Jetting- Removal	Chain Saw	Shut- down	Pre-	Pre-/Post-	Post-
		Soft Start	Full Power											
California sea lion														
Oct '16-Apr '17	30 (17)	-	64 (48)	11 (9)	18 (11)	44 (37)	17 (15)	-	-	-	-	125 (89)	230 (183)	97 (57)
May '17-Oct '17	-	-	-	-	-	-	116 (55)	19 (9)	109 (67)	41 (13)	-	528 (197)	641 (385)	123 (95)
Subtotal	30 (17)	-	64 (48)	11 (9)	18 (11)	44 (37)	133 (70)	19 (9)	113 (71)	41 (13)	-	653 (286)	871 (568)	220 (152)
Harbor seal														
Oct '16-Apr '17	-	-	5 (5)	2 (1)	2 (1)	16 (16)	5 (3)	-	-	-	-	17 (14)	29 (27)	9 (7)
May'17-Oct '17	-	-	-	-	-	-	-	-	-	-	-	-	4 (3)	-
Subtotal	-	-	5 (5)	2 (1)	2 (1)	16 (16)	5 (3)	-	-	-	-	17 (14)	33 (30)	9 (7)
Unidentified pinniped														
Oct '16-Apr '17	-	-	-	-	1 (1)	-	-	-	-	-	-	-	-	-
May '17-Oct '17	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	1 (1)	-	-	-	-	-	-	-	-	-
Coastal bottlenose dolphin														
Oct '16-Apr '17	2 (1)	2 (1)	-	2 (2)	-	-	-	-	-	-	-	18 (6)	17 (7)	3 (1)
May '17-Oct '17	-	-	-	-	-	-	-	-	-	-	-	17 (5)	-	-
Subtotal	2 (1)	2 (1)	-	2 (2)	-	-	-	-	-	-	-	35 (11)	17 (7)	3 (1)
Gray whale														
Oct '16-Apr '17	-	-	-	-	-	1 (1)	-	-	-	-	-	-	-	-
May '17-Oct '17	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	1 (1)	-	-	-	-	-	-	-	-
Unidentified dolphin														
Oct '16-Apr '17	-	-	-	-	-	2 (1)	-	-	-	-	-	-	-	-

Species	Pile Installation [Individuals (Sightings) ¹]					Pile Removal [Individuals (Sightings) ¹]						Non-Activity Monitoring [Individuals (Sightings) ¹]		
	Vibratory Pile Driving	Impact Pile Driving		Shut- down	Jetting- Install	Caisson Cutting	Pile Clipping	Torch Cutting	Jetting- Removal	Chain Saw	Shut- down	Pre-	Pre-/Post-	Post-
		Soft Start	Full Power											
May '17-Oct '17	-	-	-	-	-	-	-	-	5 (1)	-	-	-	-	-
Subtotal	-	-	-	-	-	2 (1)	-	-	5 (1)	-	-	-	-	-
Green sea turtle														
Oct '16-Apr '17	-	-	-	-	-	1 (1)	-	-	-	-	-	-	-	-
May '17-Oct '17	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	-	1 (1)	-	-	-	-	-	-	-	-
California Least Tern														
Oct '16-Apr '17	-	-	-	-	-	-	-	-	-	-	-	-	-	-
May '17-Oct '17	-	-	-	-	-	-	2 (1)	-	4 (2)	-	-	2 (1)	31 (9)	4 (2)
Subtotal	-	-	-	-	-	-	2 (1)	-	4 (2)	-	-	2 (1)	31 (9)	4 (2)
Subtotals														
Oct '16-Apr '17	32 (18)	2 (1)	69 (53)	15 (11)	21 (13)	64 (57)	22 (18)	-	-	-	-	160 (109)	276 (217)	109 (65)
May '17-Oct '17	-	-	-	-	-	-	118 (56)	19 (9)	118 (70)	41 (13)	-	547 (203)	676 (397)	127 (97)
TOTAL	32 (18)	2 (1)	69 (53)	15 (11)	21 (13)	64 (57)	140 (74)	19 (9)	118 (70)	41 (13)	-	707 (312)	952 (614)	236 (162)

Notes: ¹“Pre-” = Pre-construction monitoring; “Pre-/Post-” = Pre-/Post-construction monitoring; “Post-” = Post-construction monitoring; Dash indicates no sightings occurred during the monitoring timeframe.

Table 3-9. Total Number of Individuals and Sightings by Species During IHA #4 (NBPL Fuel Pier).

Species	Hauled Out					In Water				
	Total Number		Group Size			Total Number		Group Size		
	Indiv.	Sightings	Mean	Max	Min	Indiv.	Sightings	Mean	Max	Min
California sea lion										
Oct 2016-Apr 2017	1,392	243	5.73	84	1	646	475	1.36	25	1
May 2017-Oct-2017	2,002	175	11.44	100	1	1,577	821	1.92	40	1
Subtotal	3,394	418	8.12			2,223	1,296	1.72		
Harbor seal										
Oct 2016-Apr 2017	18	13	1.38	3	1	84	74	1.14	3	1
May 2017-Oct-2017	5	5	1.00	1	1	4	3	1.33	2	1
Subtotal	23	18	1.28			88	77	1.14		
Unidentified pinniped										
Oct 2016-Apr 2017	0	0	0	0	0	1	1	1.00	1	1
May 2017-Oct-2017	0	0	0	0	0	0	0	0	0	0
Subtotal	0	0	0.00			1	1	1.00		
Coastal bottlenose dolphin										
Oct 2016-Apr 2017	N/A					45	18	2.50	6	1
May 2017-Oct-2017						17	5	3.40	4	1
Subtotal						62	23	2.70		
Unidentified dolphin										
Oct 2016-Apr 2017	N/A					2	1	2.00	2	2
May 2017-Oct-2017						5	1	5.00	5	5
Subtotal						7	2	3.50		
Gray whale										
Oct 2016-Apr 2017	N/A					1	1	1.00	1	1
May 2017-Oct-2017						0	0	0.00	0	0
Subtotal						1	1	1.00		
Green Sea Turtle										
Oct 2016-Apr 2017	N/A					1	1	1.00	1	1
May 2017-Oct-2017						0	0	0.00	0	0
Subtotal						1	1	1.00		
California Least Tern										
Oct 2016-Apr 2017	N/A					0	0	0.00	0	0
May 2017-Oct-2017						43	15	2.87	20	1
Subtotal						43	15	2.87		
Subtotals (October 2016 to October 2017)										
Oct 2016-Apr 2017	1,410	256				780	571			
May 2017-Oct-2017	2,007	180				1,646	845			
TOTAL	3,417	436				2,426	1,416			

3.2.4.1 Sightings of Marine Mammals Covered Under IHA #4

Four marine mammal species were conclusively identified during the whole IHA #4 timeframe at the NBPL Fuel Pier: California sea lions, harbor seals, coastal bottlenose dolphins, and gray whales. There were also two observations of dolphins and one observation of a pinniped that could not be identified to the species level due to the distance to the animals, or due to a partial observation of the individual as they surfaced/dove. Green sea turtles and Terns were also observed during IHA #4, with one green sea turtle and multiple observations of Terns observed at the NBPL Fuel Pier. Animals that were observed during the October 2016 to April 2017 timeframe are addressed in NAVFAC SW (2017), and data on those observations will be summarized here. During the May to October 2017 timeframe discussed in this report, three marine mammals were observed: California sea lions, harbor seals, and coastal bottlenose dolphins. Observations of Terns were documented in June, August and September. No green sea turtles were observed from May to October 2017 at the NBPL Fuel Pier.

During demolition monitoring efforts, a portion of the area to the north and east was sometimes obstructed by the new Fuel Pier trestle and the double-decker portion of the new Fuel Pier. Because the monitoring platform (e.g., the crane barge) moved depending on where the demolition work was taking place, the unobservable area also changed, allowing the MMO to see more or less of San Diego Bay (see Figure 2-1 for a general location for the MMO platform) depending on the barge location. While the areas to the east and north were sometimes obstructed, these areas were also sometimes visible based on the location of the barge or the tide level (i.e., a lower tide level allowed the MMOs to see underneath the pier, and the area to the north and east was visible). As a result, our determination is that the area that was obstructed, and the number of animals that may have been missed due to obstructed views, did not have an adverse impact on the results as presented below, and an assessment of the potential animals missed is not required. However, to be conservative, the potential for “take” will be assessed relative the potential area that was obstructed, and will be discussed in Section 3.2.4.5.

3.2.4.1.1 California Sea Lion

During the whole of the IHA #4 timeframe California sea lions were the most frequently observed marine mammal in the water at the NBPL Fuel Pier with a total of 1,296 sightings and a total of 2,223 individuals observed in the water during all monitoring efforts (Table 3-10). A majority of the observations were during the May to October time frame were of California sea lions, with 821 observations (63.3% of all observations) and 1,577 (70.9% of all individuals observed). The total number of California sea lions observed per month varied from 24 (May) to 923 (September; Figure 3-9). No construction or demolition work requiring MMOs occurred in November of 2016. Although the number of monitoring days varied by month, and likely contributed to differences in the total number of observed individuals per month, the average number of individuals sighted per day had a larger range in May to October 2017 (approximately 2 to 66 per day) when compared to October 2016 through April 2017 (approximately 2 to 13) (Table 3-10 and Figure 3-9). Similarly, the range of the number of individual animals per observer hour was larger in May to October (0.6 to 11.07) than in October 2016 to April (0.36 to 3.12) (Table 3-10 and Figure 3-10). Both actual numbers observed and data adjusted for effort showed that there was an increase in numbers of California sea lions from August to September relative to the other monitoring months (Figure 3-9 and Figure 3-10). A single dead pup was observed on a dock associated with P-122 in May of 2017 (see Figure 1-1 for this location relative to the project area). The pup was first observed on a Monday, with no work occurring during the weekend, and appeared to be a few days old based on the placental material that was in the area.

This observation has not been included in the data provided below, but the individual was reported to the NBPL standing coordinator for assessment.

The overall mean group size from sightings during the May to October 2017 monitoring effort was 1.92 individuals per sighting, with a range of 1.09 to 2.28 individuals per sightings, depending on the month. Overall mean group size during the previous pile driving effort (October 2016 through April 2017) was 1.36 and ranged from 1.25 to 1.53 individuals per sighting, also depending on the month. The addition of the data from May to October did not appreciably change the overall mean group size during all monitoring efforts, which was 1.71 individuals per sighting across all monitoring periods (Table 3-10).

Table 3-10. Summary of California Sea Lion Individuals and Sightings per Month at the NBPL Fuel Pier (In-water Only).

Month	Total Number per Month ¹		Group Size per Month			Monitoring Days	Indiv. per Day	Obs. Hours (hh:mm)	Indiv. per Obs. Hour
	Individuals	Sightings	Mean	Min	Max				
October	40	32	1.29	1	5	8	5.00	35:00	1.14
November	0	0	0.00	0	0	0	0.00	00:00	0.00
December	54	42	1.29	1	5	10	5.40	105:47	0.51
January	25	20	1.25	1	3	14	1.79	69:33	0.36
February	109	87	1.25	1	8	10	10.90	71:41	1.52
March	268	196	1.37	1	25	21	12.76	85:48	3.12
April	150	98	1.53	1	12	18	8.33	93:54	1.60
Subtotal	646	475				81			
May	24	17	1.41	1	3	11	2.18	39:59	0.60
June	37	33	1.12	1	3	11	3.36	56:55	0.65
July	36	33	1.09	1	2	8	4.50	37:24	0.96
August	396	174	2.28	1	40	9	44.00	35:47	11.07
September	923	462	2.00	1	40	14	65.93	85:05	10.85
October	160	101	1.58	1	8	5	32.00	31:02	5.16
Subtotal	1,577	821				58			
TOTAL	2,223	1,296				139			

Notes: ¹Includes unidentified pinnipeds

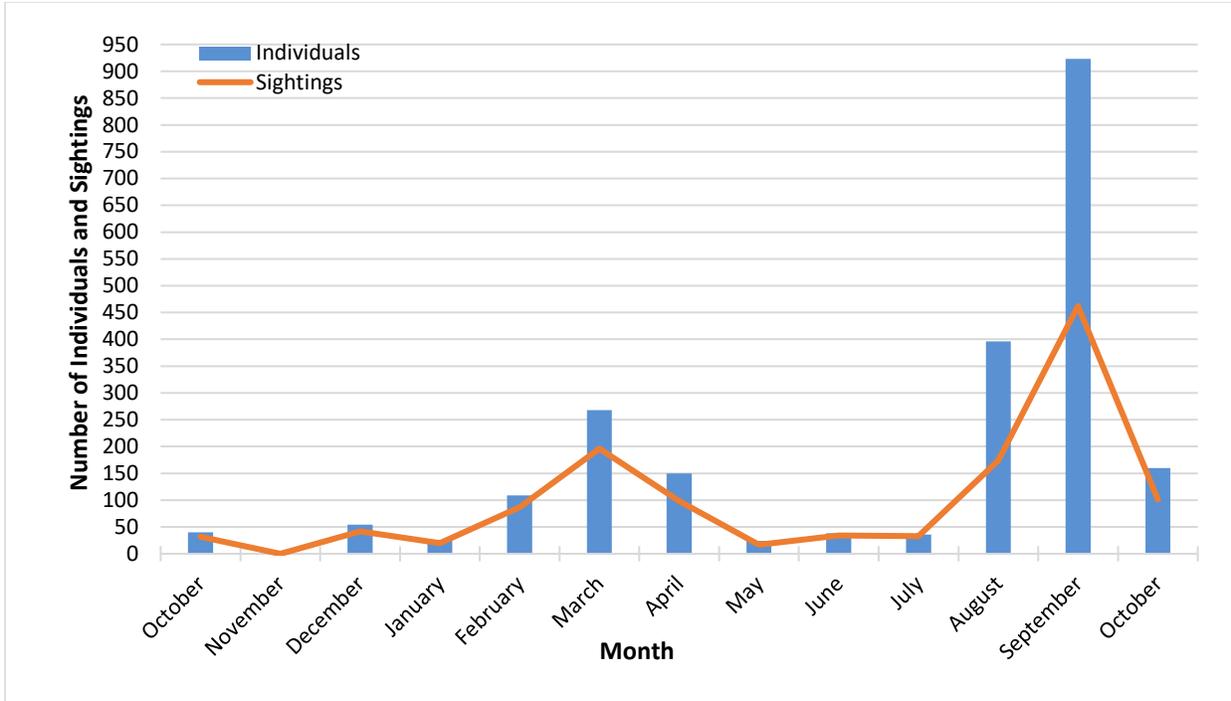


Figure 3-9. California Sea Lion Individuals and Sightings Per Month (NBPL Fuel Pier).

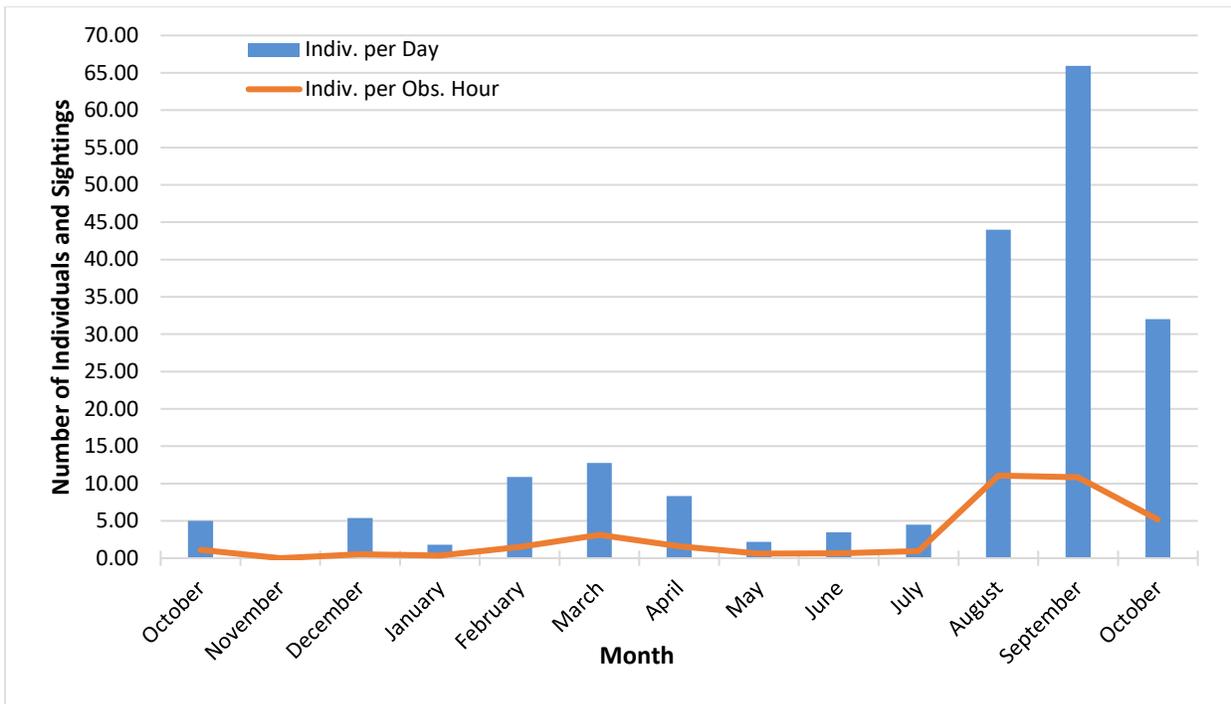


Figure 3-10. California Sea Lion Individuals per Day and per Observer Hour (NBPL Fuel Pier).

Figure 3-11 provides an update of sightings of California sea lions during monitoring associated with demolition activities at the NBPL Fuel Pier. Similar to the previously reported findings (NAVFAC SW 2017), the California sea lion sightings were clustered around the new Fuel Pier and were less dense at the extremes of the Level B ZOI to the north and south of the Fuel Pier (Figure 3-11). The higher density of sightings closer to the new Fuel Pier was likely due to higher observer effort near the Fuel Pier, but could also be related to floating docks used as haul out locations that attracted California sea lions to the general vicinity. It should also be noted that the observer locations during demolition activities, in most cases, restricted the MMOs' ability to see the channel, and this could also likely have had an impact on the distribution of sightings during demolition monitoring. Regardless of observer effort or potential haul out locations, the distribution of sea lions did not appreciably change before, during, or after pile installation of demolition near the Fuel Pier (Figure 3-11). While there were more observations during the 16-inch pile removal activities, this is related to the larger number of piles being removed, and the resulting higher observer effort during this activity. Similar to the previous reporting time period (NAVFAC SW 2017), there were more observations during the non-active demolition monitoring, but this is still related to the fact that there was a higher observer effort during these observation periods, rather than an increase in the number of animals in the area during non-active demolition (see Table 3-4).

Similar to the data provided in NAVFAC SW (2017) (Figure 3-12a), of the 1,577 total individuals observed during monitoring efforts from May to October 2017, 285 individuals (18.1%) were observed during active demolition, and 677 observations (82.5%) were observed before, in-between, or after demolition activities and 144 (17.5%) observations were during active demolition or construction (Table 3-11, Figure 3-12b). Mean group size during monitoring efforts for demolition ranged from 1.00 to 3.23 individuals per sighting, with an overall mean group size of 1.98 individuals per sighting for animals in the water. The most number of individuals and sightings (n=1,016 and n=619, respectively) were during the 16-inch piles, which had the largest number of piles removed from the old fuel pier, and subsequently the largest amount of observer effort (Table 3-11). These observations represent 64.4% of all individual California sea lions observed from May to October 2017. It should also be noted that the cutting of the 84-inch caissons generally took several hours, and the higher number of observations during this activity reflect this larger amount of monitoring during active caisson cutting. When evaluating all monitoring efforts for IHA #4, more observations occurred during the non-active monitoring phases (n=1,043, 80.5%) observations, than during the active construction or demolition phases (n=253, 19.5%; Table 3-11, Figure 3-12c).

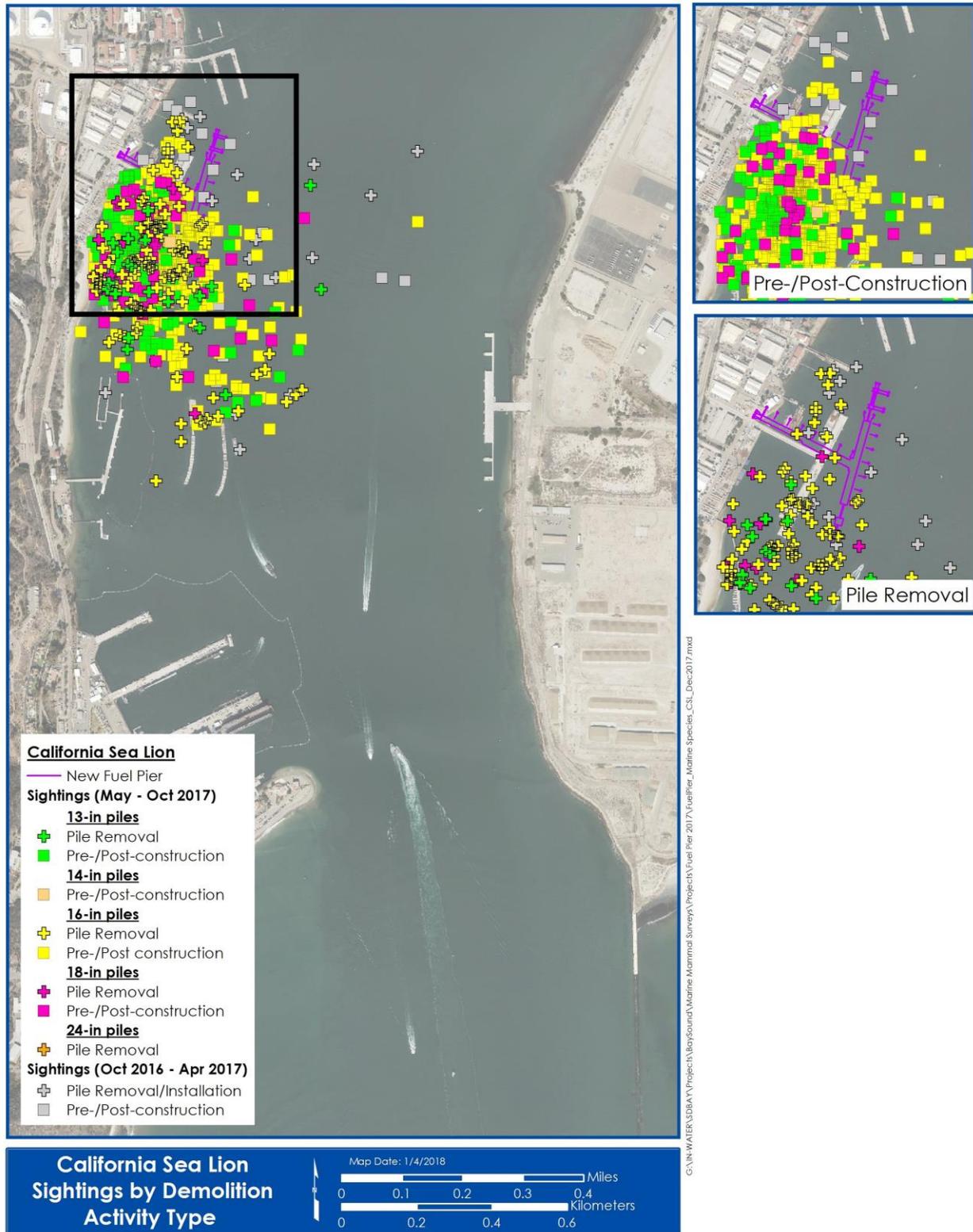


Figure 3-11. All California Sea Lion Sightings Before, During, and After Pile Installation or Removal Activities (NBPL Fuel Pier).

Table 3-11. Summary of California Sea Lion Sightings During Monitoring Efforts (NBPL Fuel Pier).

Type of Activity	Pile Size	All Monitoring Effort		During Construction/ Demolition			Non-Activity		
		Indiv.	Sightings	Indiv.	Sightings	Indiv. per Sighting	Indiv.	Sightings	Indiv. per Sighting
October 2016 to April 2017									
Construction	16-inch	12	12	1	1	1.00	11	11	1.00
	24×30 ^{1,2}	215	144	35	22	1.59	180	122	1.48
	30-inch	351	261	78	56	1.39	273	205	1.33
	Subtotal	578	417	114	79		464	338	
Demolition	13-inch	4	4	2	2	1.00	2	2	1.00
	14-inch	4	4	1	1	1.00	3	3	1.00
	16-inch	14	14	7	7	1.00	7	7	1.00
	18-inch	0	0	0	0	0.00	0	0	0.00
	24-inch	9	8	1	1	1.00	8	7	1.14
	84-inch	37	28	27	19	1.42	10	9	1.11
	Subtotal	68	58	38	30		30	28	
Subtotal	646	475	152	109		494	366		
May 2017 to October 2017									
Demolition	13-inch	405	134	45	20	2.25	360	114	3.16
	14-inch	1	1	0	0	0.00	1	1	1.00
	16-inch	1,016	619	198	111	1.78	818	508	1.61
	18-inch	155	67	42	13	3.23	113	54	2.09
	Subtotal	1,577	821	285	144		1,292	677	
TOTAL	2,223	1,296	437	253		1,756	1,043		

Notes: ¹Includes both jetting for pile installation and pile driving for 24×30 piles

²Includes one unidentified pinniped

The shutdown or delay of construction or demolition activities data for the October 2016 to April 2017 timeframe is summarized in NAFAC SW (2017) and is also provided in Appendix D1. From May to October 2017, there were five observations of seven California sea lions during demolition activities at the NBPL Fuel Pier that caused a shutdown or delay of project-related activities. Of those observations, two were for demolition shutdowns and three were delays to demolition activities. The total amount of time that construction was shut down or delayed was fifteen minutes and fifty-three seconds, for an average of one minute fifty-nine seconds per event, or an average of sixteen seconds per event when averaged over the 58 days of monitoring during this timeframe. During all of IHA #4 at the NBPL Fuel Pier, there were a total of 14 observations of 18 California sea lions that entered either the buffered (up to 450 m [1,476 ft]) or unbuffered (10 m [33 ft]) shutdown ZOIs. These animals either approached the shutdown ZOIs during active construction or demolition (causing a shutdown of activities), or during non-active pile installation or demolition (causing a delay to the start of activities). All shutdowns and delays due to California sea lions totaled fifty-five minutes and nine seconds, and averaged three minutes and fifteen seconds per event over the 141 days of monitoring effort. This equates to twenty-three seconds per event over the duration of IHA #4.

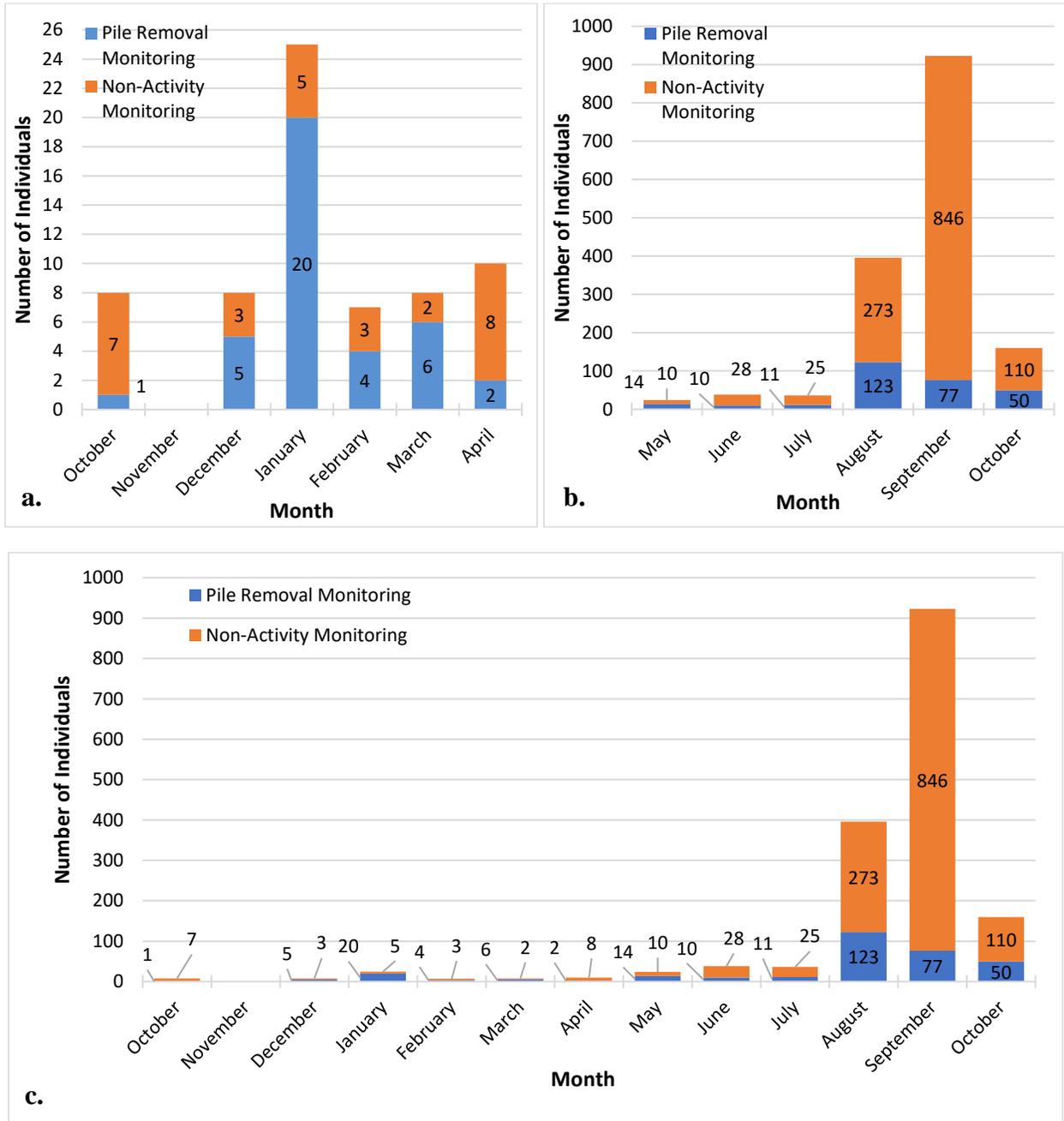


Figure 3-12a,b,c. California Sea Lion Observations per Month During Pile Removal and Non-Activity Monitoring for: a) Removal (October 2016 to April 2017), b) Removal (May to October 2017), and c) All Removal Activities (October 2016 to October 2017).

For every observation, the age class of individual, or groups of, California sea lions were tracked to evaluate fluctuations in the demography of sea lions in San Diego Bay. Similar to the demolition data for October 2016 to April 2017 (NAVFAC SW 2017; Figure 3-13a), observations with adult California sea lions (n=585, 71.3%) comprised the majority of the observations, followed by observations of mixed age class groups (n=116, 14.1%), subadults (n=67, 8.2%), individuals of an unknown age because they were too far away to classify (n=29, 3.5%), and juveniles (n=24, 2.9%) (Figure 3-13b). Demolition was the only activity to occur during the May to October 2017 timeframe. Construction and demolition activities were evaluated relative to age classes in NAVFAC SW (2017). When evaluating the two timeframes associated with IHA #4, adult California sea lions were the largest age class identified with 912 individuals (71.2%; Figure 3-13c).

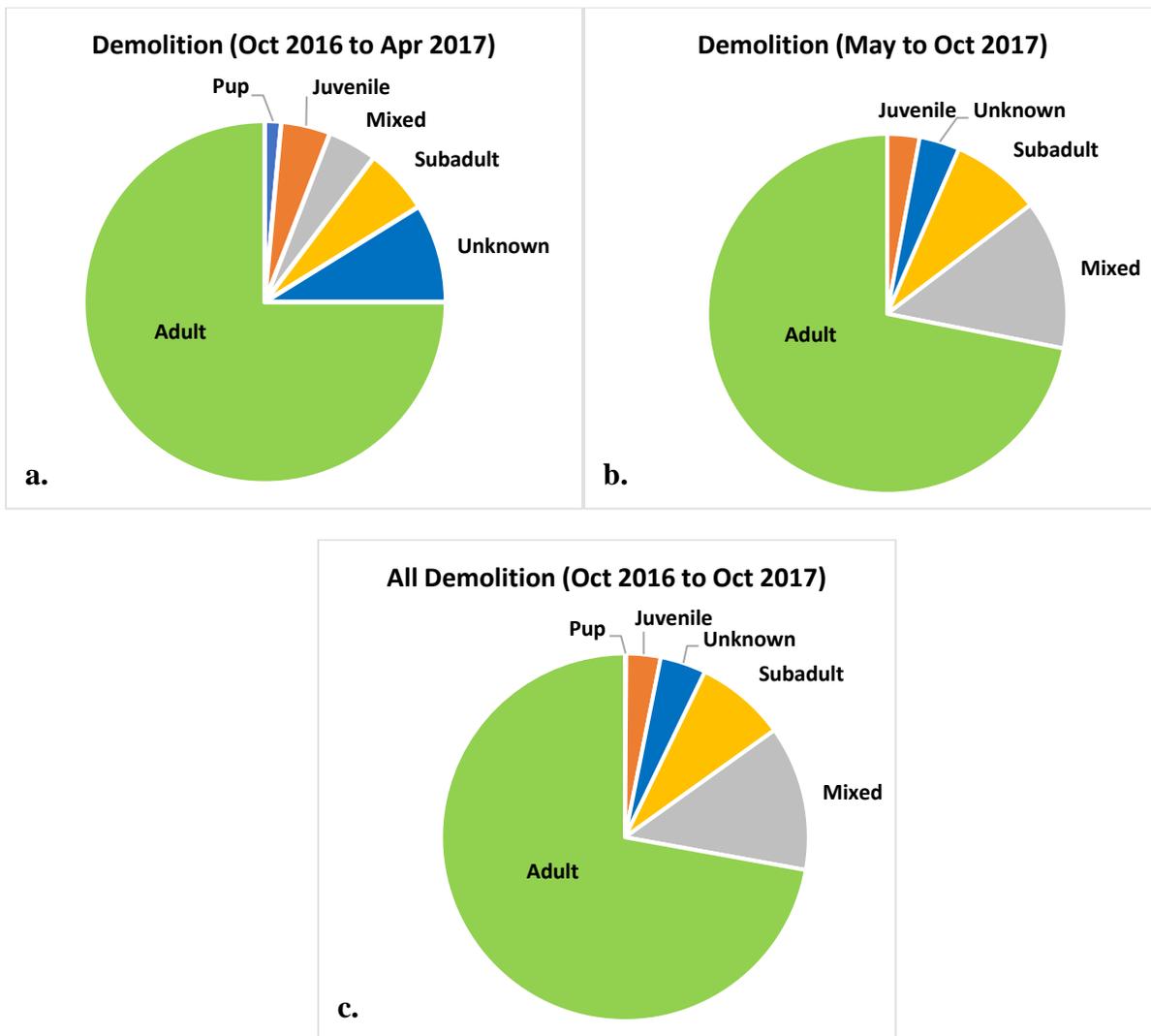


Figure 3-13a,b,c. Distribution of Age Classes for All California Sea Lion Sightings During:
a) Removal (October 2016 to April 2017), b) Removal (May to October 2017), and c) All
Removal Activities (October 2016 to October 2017).

When comparing the time of observation for demolition activities between the two timeframes for IHA #4, there is a general trend of an increase in observations and number of individuals throughout the morning starting during the 07:00 hour (the earliest observation was at 06:38), a plateau throughout the morning, and a steady decrease in observations in the early afternoon starting between 12:00 and 13:00 (Figure 3-14c). Mean group size remained relatively consistent throughout the day. However, it should be noted that the number of observations during demolition for the October 2016 to April 2017 timeframe (n=58) were considerably fewer than for the May to October 2017 (n=821). This smaller sample size is reflected in the mean group size with an apparent large increase in group size during the 16:00 hour from October to April (Figure 3-14a), which is based on one sighting of four individuals. There was also an apparent jump in the mean group size from May to October during the 06:00 hour, but this is based on nine sightings of forty-three individuals (or a mean group size of 4.78; Figure 3-14b), with one atypical observation of twenty individuals in the water near a known haulout location in the Project vicinity. Regardless of these potentially anomalous observations, the mean group size during demolition activities for all time periods increased from 1.17 individuals per group from October to April to 1.86 individuals per group during May to October. This is also reflected in the effort-adjusted data presented in Table 3-10, which indicates that there was a likely influx of individuals during August and September. When excluding the potentially anomalous mean group size data during the 16:00 (October to April) and 06:00 (May to October) hours, the next highest mean group size for all of IHA #4 (2.21 individuals per group) was during the 08:00 hour.

Data from October 2016 to April 2017 for behavioral observations for pile installation and demolition activities was provided in NAVFAC SW (2017). When evaluating demolition activities during both IHA time periods, swimming was the dominant behavior noted by the MMOs (n=836 individuals, 64.3%), followed by milling (n=140, 10.8%), and rafting (n=99, 7.6%). Of the eleven other behaviors noted during monitoring, each behavior was noted less than 50 times (<6%) during all demolition monitoring efforts. When assessing behaviors observed during demolition versus non-activity monitoring, the number of each type of behavior was higher during non-pile driving monitoring (n=1,292, 81.9%) than during active construction or demolition (n=285, 18.1%). However, this was most likely a direct result of the non-activity monitoring (pre-construction, pre/post-construction and post-construction monitoring phases) effort being much higher than active demolition monitoring efforts (see Table 3-4).

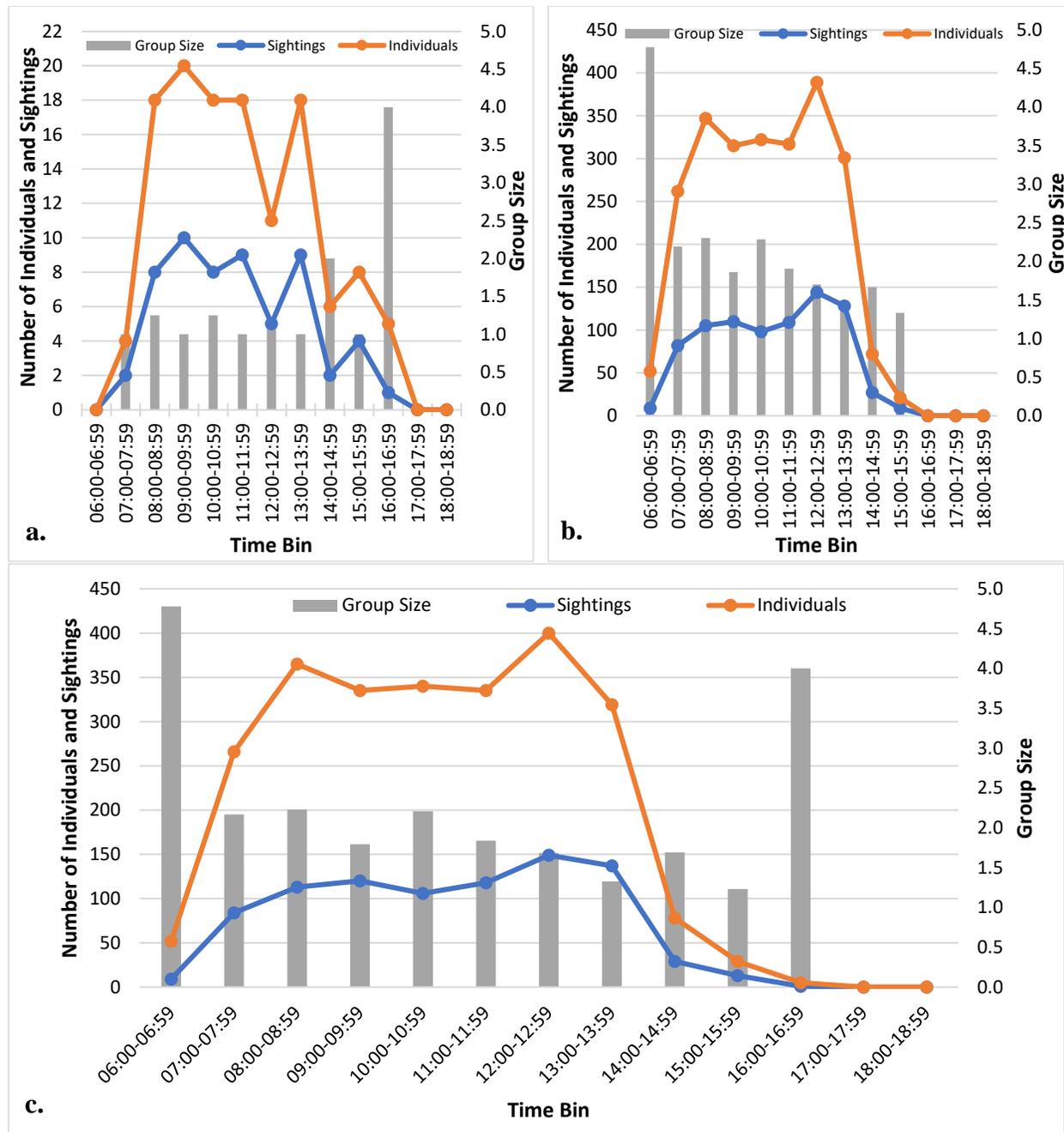


Figure 3-14a,b,c. California Sea Lion Sightings and Individuals per Hour During Pile Removal: a) Removal (October 2016 to April 2017), b) Removal (May to October 2017), and c) All Removal Activities (October 2016 to October 2017).

There was a total of thirty observations during monitoring from October 2016 through April 2017 (n=10) and from May and October 2017 (n=20) that could be categorized as a reaction to an obvious stimulus, or stimuli. The events for the October 2016 through April 2017 timeframe were described in NAVFAC SW (2017). During the May to October 2017 timeframe, these behaviors were flush (n=17, 149 individuals), and abrupt change in direction (n=3, 4 individuals). Of the seventeen flushes, five were as a direct result of animals being flushed off floats associated with the crane

barges. In all of these instances, animals were either on the floats as the crew arrived for the day, or exited the water onto the floats during demolition operations, and were flushed off for the safety of the crew and the animals. The remaining flushes were noted as occurring during normal operations associated with the Navy's MMP at P-122, or due to boats pulling alongside, or departing from, the Everingham Brothers Bait Company barges approximately 500 to 600 m (1,640 to 1,967 ft) to the south of the Project area. Of the three observations of individuals abruptly changing direction, one may have been directly attributable to demolition activities, while the other two were not associated with any obvious Project-related activities. For the one observation, the individual was initially observed during pre-/post-construction monitoring (in-between active demolition activities), but changed direction to move away from the Fuel Pier approximately two minutes after pile jetting for pile removal had begun. However, it should be noted that this individual was 175 m (574 ft) away from the active jetting, and other, unknown, factors could have contributed to its change in direction. For the observations of the animals that changed direction during monitoring, the MMO notes associated with the sightings did not indicate any outward signs of distress after their behaviors were observed, and the individuals simply left the area. However, they were tracked as Level B "take" because they were within the Level B ZOI at the time of the observations.

3.2.4.1.2 Harbor Seals

During the whole of the IHA #4 timeframe harbor seals were the second most observed marine mammal in the water at the NBPL Fuel Pier with a total of 77 sightings and a total of 88 individuals observed in the water over 139 days of observation (Table 3-12). A majority of the observations were during the October 2016 to April 2017 time frame with 74 observations (96.1% of all observations) and 84 individuals (95.5% of all individuals observed). The total number of observed harbor seals varied from none (October 2016 and June, August and October 2017) to 33 (March 2017) per month (Table 3-12 and Figure 3-15). No construction or demolition work requiring MMOs occurred in November of 2016. Although the number of monitoring days varied by month, and likely contributed to differences in the total number of observed individuals per month, the average number of individuals sighted per day had a larger range in October 2016 to April 2017 (from 0 to 1.70 per day) when compared to May through October 2017 (from 0 to 0.18 per day) (Table 3-12 and Figure 3-15). Similarly, the range of the number of individual animals per observer hour was larger from October 2016 to April 2017 (0 to 0.38) than in May through October (0 to 0.05) (Table 3-12 and Figure 3-16). Both actual numbers observed and data adjusted for effort showed that there was an increase in numbers of harbor seals in February, March, and April relative to the other monitoring months (Figure 3-15 and Figure 3-16).

The overall mean group size from sightings during the May to October 2017 monitoring effort was 1.33 individuals per sighting, with from 1.00 to 2.00 individuals per sightings, depending on the month. Overall mean group size during the previous pile driving effort (October 2016 through April 2017) was 1.14, and ranged from 1.00 to 1.38 individuals per sighting, also depending on the month. Because there were so few observations from May to October, the overall mean group size during all monitoring efforts did not appreciably change and stayed at 1.14 individuals per sighting across all monitoring periods (Table 3-12).

Table 3-12. Summary of Harbor Seal Individuals and Sightings per Month at the NBPL Fuel Pier (In-water Only).

Month	Total Number per Month		Group Size per Month			Monitoring Days	Indiv. per Day	Obs. Hours (hh:mm)	Indiv. per Obs. Hour
	Individuals	Sightings	Mean	Min	Max				
October	0	0	0.00	0	0	8	0.00	35:00	0.00
November	0	0	0.00	0	0	0	0.00	00:00	0.00
December	3	3	1.00	1	1	10	0.30	105:47	0.03
January	6	6	1.00	1	1	14	0.43	69:33	0.09
February	17	17	1.00	1	1	10	1.70	71:41	0.24
March	33	24	1.38	1	3	21	1.57	85:48	0.38
April	25	24	1.04	1	2	18	1.38	93:54	0.27
Subtotal	84	74				81			
May	2	1	2.00	2	2	11	0.18	39:59	0.05
June	0	0	0.00	0	0	11	0.00	56:55	0.00
July	1	1	1.00	1	1	8	0.13	37:24	0.03
August	0	0	0.00	0	0	9	0.00	35:47	0.00
September	1	1	1.00	1	1	14	0.07	85:05	0.01
October	0	0	0.00	0	0	5	0.00	31:02	0.00
Subtotal	4	3				58			
TOTAL	88	77				139			

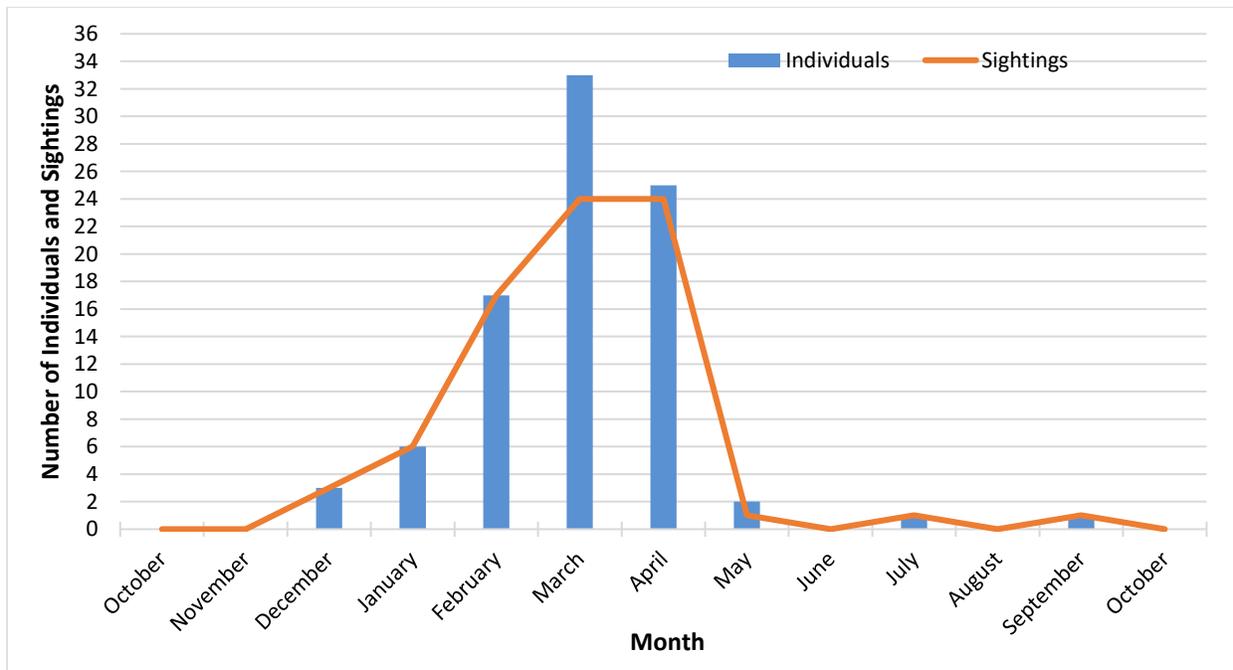


Figure 3-15. Harbor Seal Individuals and Sightings Per Month (NBPL Fuel Pier).

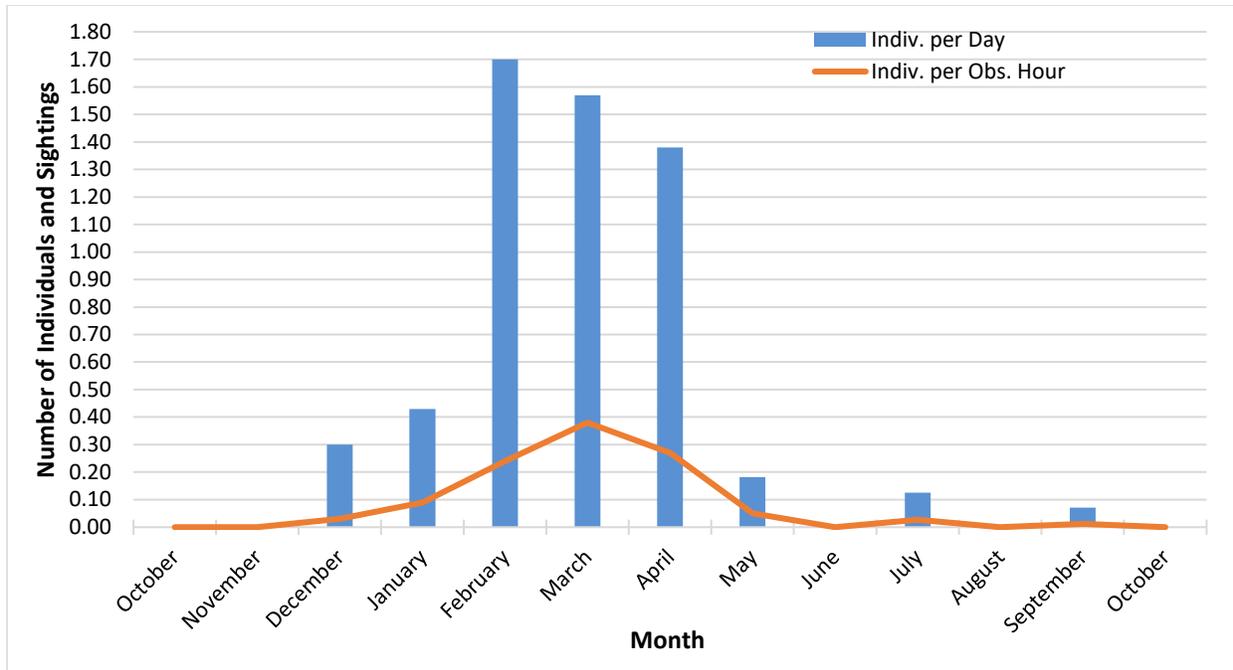


Figure 3-16. Harbor Seal Individuals per Day and per Observer Hour (NBPL Fuel Pier).

Figure 3-17 provides an update of harbor seals sightings during monitoring associated with demolition activities at the NBPL Fuel Pier. Similar to the previously reported findings (NAVFAC SW 2017), the three observations of harbor seals during the May to October 2017 timeframe were all around the NBPL Fuel Pier (Figure 3-17). While these three observations during the May to October 2017 timeframe are not necessarily indicative of any specific trends in distribution, their proximity to the NBPL Fuel Pier is likely a result of the potential haulout locations at P-122, which could attract harbor seals throughout the year. It should also be noted that the observer locations during demolition activities, in most cases, restricted the MMOs’ ability to see the channel, and this could also have had an impact on the distribution of sightings during demolition monitoring.

The three harbor seals observations from May to October 2017 all occurred in-between active demolition bouts for the 16-pile removal activities (Table 3-13 and Figure 3-18). The mean group size for these observations was slightly larger than during demolition of the 16-in piles in October 2016 to April 2017, but a specific trend in mean group size should not be inferred based on the small sample size.

A single delay in the start of demolition activities occurred in February 2017 due to the presence of two harbor seal approaching construction activities. The details of the observations are provided in NAVFAC SW (2017) and have also been provided in Appendix D1. No harbor seals caused a shutdown or delay in demolition activities during the May to October 2017 timeframe.

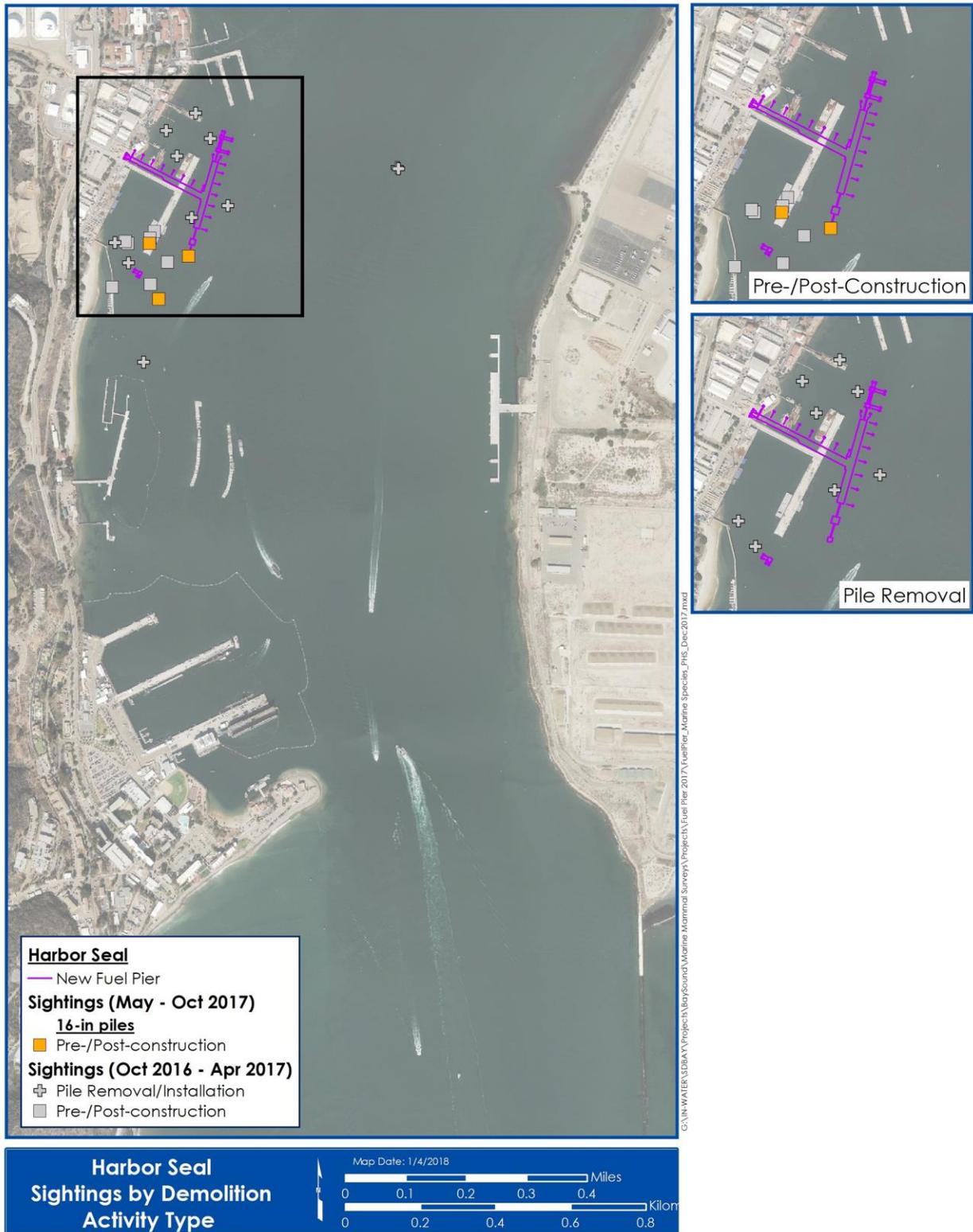


Figure 3-17. All Harbor Seal Sightings Before, During, and After Pile Installation or Removal Activities (NBPL Fuel Pier).

Table 3-13. Summary of Harbor Seal Sightings During Monitoring Efforts (NBPL Fuel Pier).

Type of Activity	Pile Size	All Monitoring Effort		During Construction/ Demolition			Non-Activity		
		Indiv.	Sightings	Indiv.	Sightings	Indiv. per Sighting	Indiv.	Sightings	Indiv. per Sighting
October 2016 to April 2017									
Construction	16-inch	0	0	0	0	0.00	0	0	0.00
	24×30 ¹	21	20	5	4	1.25	16	16	1.00
	30-inch	42	36	2	2	1.00	40	34	1.18
	Subtotal	63	56	7	6		56	50	
Demolition	13-inch	1	1	0	0	0.00	1	1	1.00
	14-inch	0	0	0	0	0.00	0	0	0.00
	16-inch	11	8	5	3	1.67	6	5	1.20
	18-inch	1	1	0	0	0.00	1	1	1.00
	24-inch	0	0	0	0	0.00	0	0	0.00
	84-inch	8	8	8	8	1.00	0	0	0.00
	Subtotal	21	18	13	11		8	7	
Subtotal	84	74	20	17		64	57		
May 2017 to October 2017									
Demolition	13-inch	0	0	0	0	0.00	0	0	0.00
	14-inch	0	0	0	0	0.00	0	0	0.00
	16-inch	4	3	0	0	0.00	4	3	1.33
	18-inch	0	0	0	0	0.00	0	0	0.00
	Subtotal	4	3	0	0		4	3	
TOTAL	88	77	20	17		68	60		

Notes: ¹Includes both jetting for pile installation and pile driving for 24×30 piles

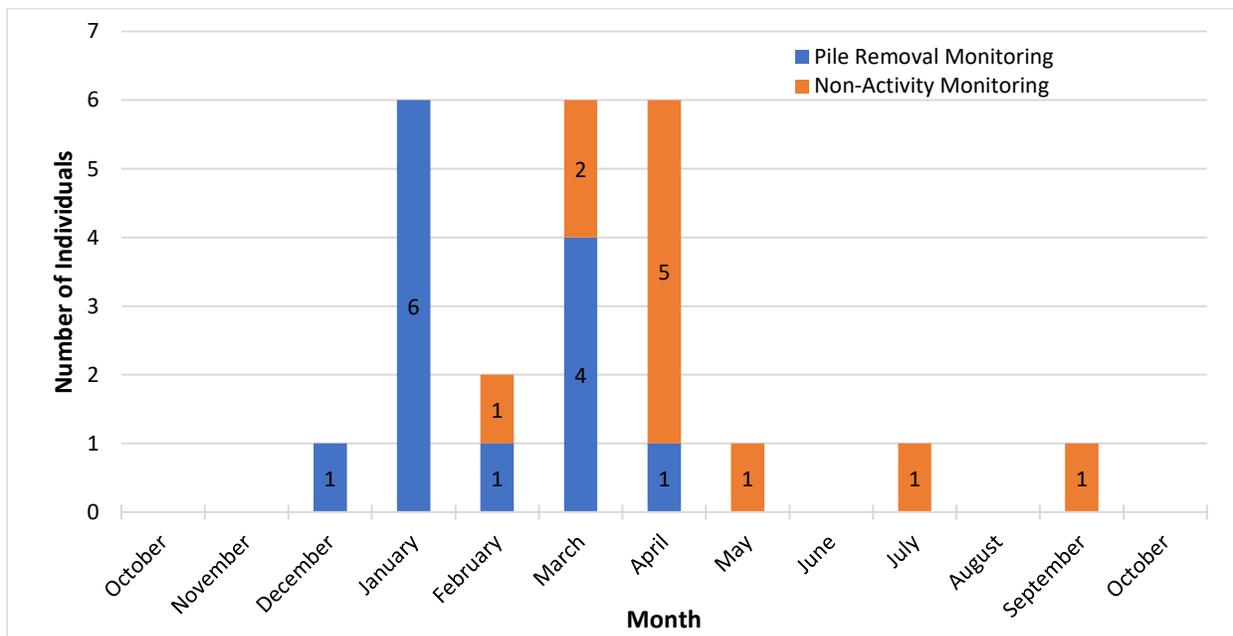


Figure 3-18. Harbor Seal Observations per Month During Pile Removal and Non-Activity Monitoring for All Removal Activities at the NBPL Fuel Pier (October 2016 to October 2017).

Most harbor seals observed throughout the Project timeframe were adults (n=65, 73.9%), followed by mixed ages (n=15, 17.0%), unknown age (n=7, 8/0%), and pups (n=1, 1.1%). A single pup also live-stranded on the beach to the west of P-122, and was brought to the local stranding network center for rehabilitation. For the four individuals observed during the May to October 2017 timeframe, there were two adults and two individuals of unknown age class. Similar to the observations of animals of unknown age during the October 2016 to April 2017 (NAVFAC SW 2017), the observation of the two individuals in May 2017 were at 200 m (656 ft) away, and the observer could not identify the age class due to the distance. However, given that a majority of the observations in the Project area are of adults, these two individuals were likely adults as well.

The overall time distribution of harbor seals during all of IHA #4 is presented in Figure 3-19. In general, harbor seals are more often observed from approximately the 10:00 hour to the 14:00 hour, with two peaks during the 10:00 and 13:00 hours. NAVFAC SW (2017) provides an analysis of the observations during the October 2016 to April 2017 timeframe. The three observations during the May to October 2017 timeframe were all during the morning with all observations before 11:00. These observations are not demonstrably different than the overall trends identified in NAVFAC SW (2017) and presented in Figure 3-19.

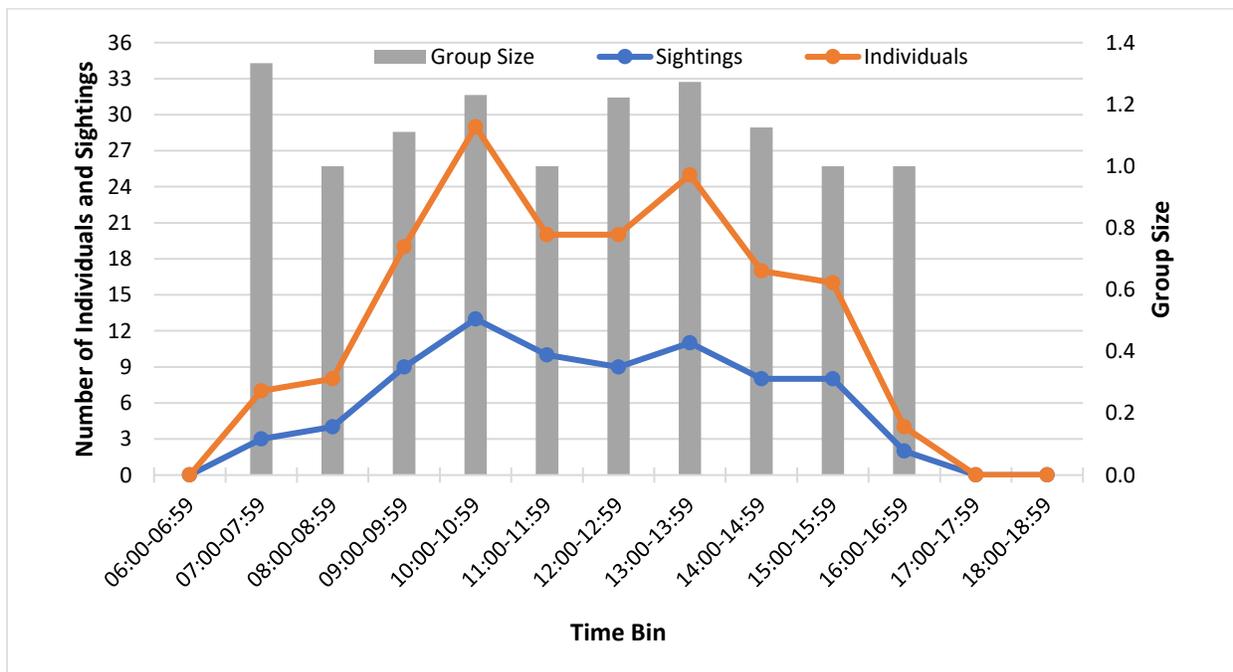


Figure 3-19. Harbor Seal Sightings and Individuals per Hour During All Pile Removal Activities at the NBPL Fuel Pier (October 2016 to October 2017).

The four harbor seals observed during the May to October 2017 timeframe were all observed swimming. When this data is included into the overall behavioral data for the whole IHA #4 timeframe, harbor seals were most often seen swimming (n=39, 44.3%), followed by milling (n=37, 42.0%). There were from one to four individuals observed with behaviors of diving, entering the water (from a dock), looking while in the water, or exiting the water (to a dock). While this new data reverses the top two behaviors when compared to the data presented in NAVFAC SW (2017), the overall behavioral data showing that harbor seals are most often seen swimming, or milling in the Project area did not change.

3.2.4.1.3 Coastal Bottlenose Dolphins

Coastal bottlenose dolphins were the third most observed species during the whole of the IHA #4 timeframe with 25 sightings and 69 individuals observed during the 139 days of observing effort (Table 3-14, Figure 3-20, and Figure 3-21). A detailed analysis of the observations from October 2016 to April 2017 is provided in NAVFAC SW (2017). During the May to October 2017 timeframe, there were six observations of twenty-two adult dolphins. No calves or juveniles were observed during this timeframe. In August, a single observation of five unidentified dolphins was observed at 12:37 approximately 1,300 m (4,265 ft) from the MMO, who was stationed on the new Fuel Pier trestle. Given that dolphin species diversity has been low inside of San Diego Bay in the last couple of years (NAVFAC SW 2016a,b; 2017), with all positively identified dolphins as coastal bottlenose dolphins, the assumption is that these animals were coastal bottlenose dolphins; however, given the distance from the animal location to the MMO location, the MMO could not positively identify the group to the species level. Also, it should be noted that 16 of 17 individuals observed in September were all observed on the same day between 09:17 and 09:53, and may have been the same group of 4 dolphins that was moving in and out of the MMOs field of view. Three of the four observations were at distances of greater than 600 m (1,967 ft), and the MMO could not positively identify individuals within the group(s) to differentiate whether they were multiple groups or of the same group. Another observation in September of a single individual occurred just after 8:00 fourteen days later. In cases where the MMOs are not sure that the multiple observations are of the same individual (or group), our protocols are to document each observation separately. If the assumption is that the individuals observed on the same day were the same group of 4 dolphins, then the 17 individuals observed in September would be reduced to 2 observations of 5 individuals on two separate days. This would change the number of observations from May to October 2017 to a total of 10 dolphins during 3 sightings (August: 5 individuals, 1 sighting; September: 5 individuals, 2 sightings). As a result, the September mean group size would change from 3.40 individuals per group to 2.00 individuals per group. Also, no shutdowns or delays of construction occurred during the May to October 2017 monitoring efforts. This is mainly due to the smaller shutdown ZOI of 10 m (33 ft) during all demolition efforts.

Table 3-14. Summary of Coastal Bottlenose Dolphin Individuals and Sightings per Month at the NBPL Fuel Pier (In-water Only).

Month	Total Number per Month		Group Size per Month			Monitoring Days	Indiv. per Day	Obs. Hours (hh:mm)	Indiv. per Obs. Hour
	Individuals	Sightings	Mean	Min	Max				
October	0	0	0.00	0	0	8	0.00	35:00	0.00
November	0	0	0.00	0	0	0	0.00	00:00	0.00
December	0	0	0.00	0	0	10	0.00	105:47	0.00
January	4	3	1.33	2	1	14	0.29	69:33	0.06
February	3	2	1.50	2	1	10	0.30	71:41	0.04
March	22	9	2.44	4	1	21	1.05	85:48	0.26
April	18	5	3.60	6	3	18	1.00	93:54	0.19
Subtotal	47	19				81			
May	0	0	0.00	0	0	11	0.00	39:59	0.00
June	0	0	0.00	0	0	11	0.00	56:55	0.00
July	0	0	0.00	0	0	8	0.00	37:24	0.00
August	5	1	5.00	5	5	9	0.56	35:47	0.14
September	17	5	3.40	4	4	14	1.21	85:05	0.20
October	0	0	0.00	0	0	5	0.00	31:02	0.00
Subtotal	22	6				58			
TOTAL	69	25				139			

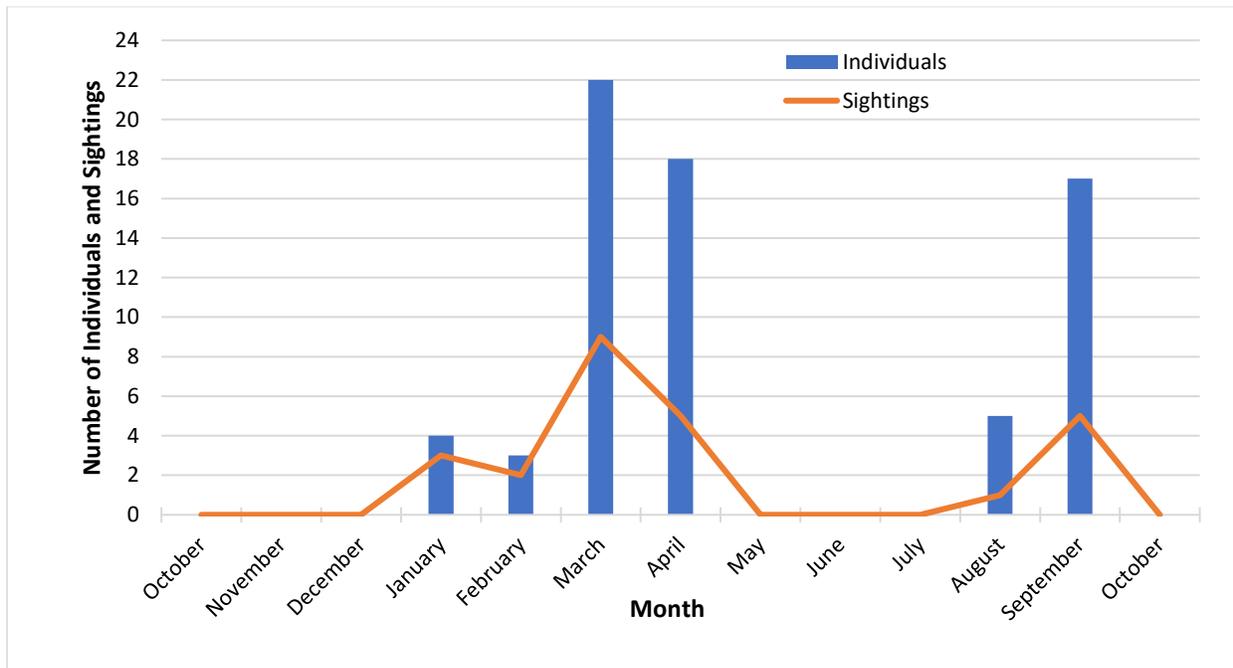


Figure 3-20. Coastal Bottlenose Dolphin Individuals and Sightings Per Month (NBPL Fuel Pier).

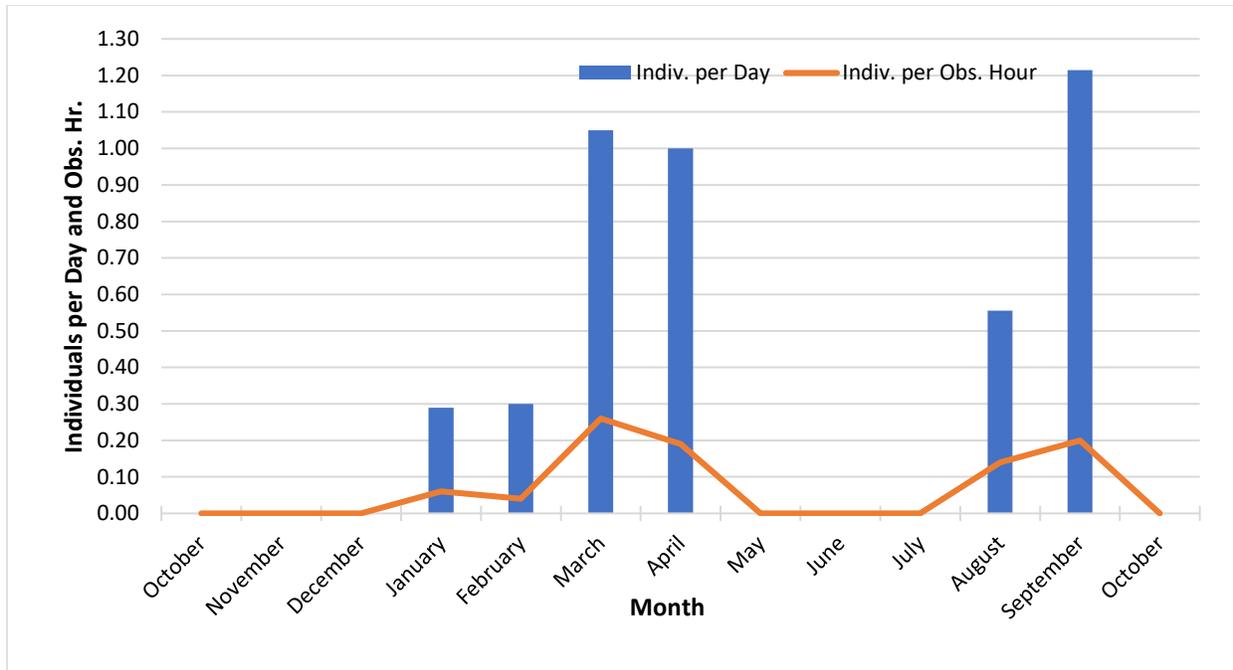


Figure 3-21. Coastal Bottlenose Dolphin Individuals per Day and per Observer Hour (NBPL Fuel Pier).

Figure 3-23 provides an update of sightings of coastal bottlenose dolphins during monitoring associated with demolition activities at the NBPL Fuel Pier. Similar to the previously reported findings for demolition activities (NAVFAC SW 2017), the observations of dolphins during the May to October 2017 timeframe were generally distributed to the east and southeast of the NBPL Fuel Pier Project area (Figure 3-23). This distribution pattern was more likely reflective of the monitoring effort (a single MMO was used for all demolition activities with restrictive views to the north and due east), rather than a reflection of a change in distribution patterns of the animals during demolition activities.

The five dolphin observations in September were during pre-construction surveys, and the observation in August was during pile jetting to remove a single 16-in pile (Table 3-15 and Figure 3-22). Because no pile installation occurred during the May to October 2017 timeframe, Figure 3-22 provides an update of the demolition activities only, with NAVFAC SW (2017) providing an analysis of construction data from October 2016 to April 2017. The data presented Table 3-15 and Figure 3-22 shows that throughout IHA #4 most observations were during non-activity monitoring efforts; however, with so few observations during the May to October 2017 monitoring efforts, the data may not necessarily represent any particular trend in dolphin observations during demolition from May to October 2017, but is more likely a reflection of the larger amount of time observing during non-activity monitoring.

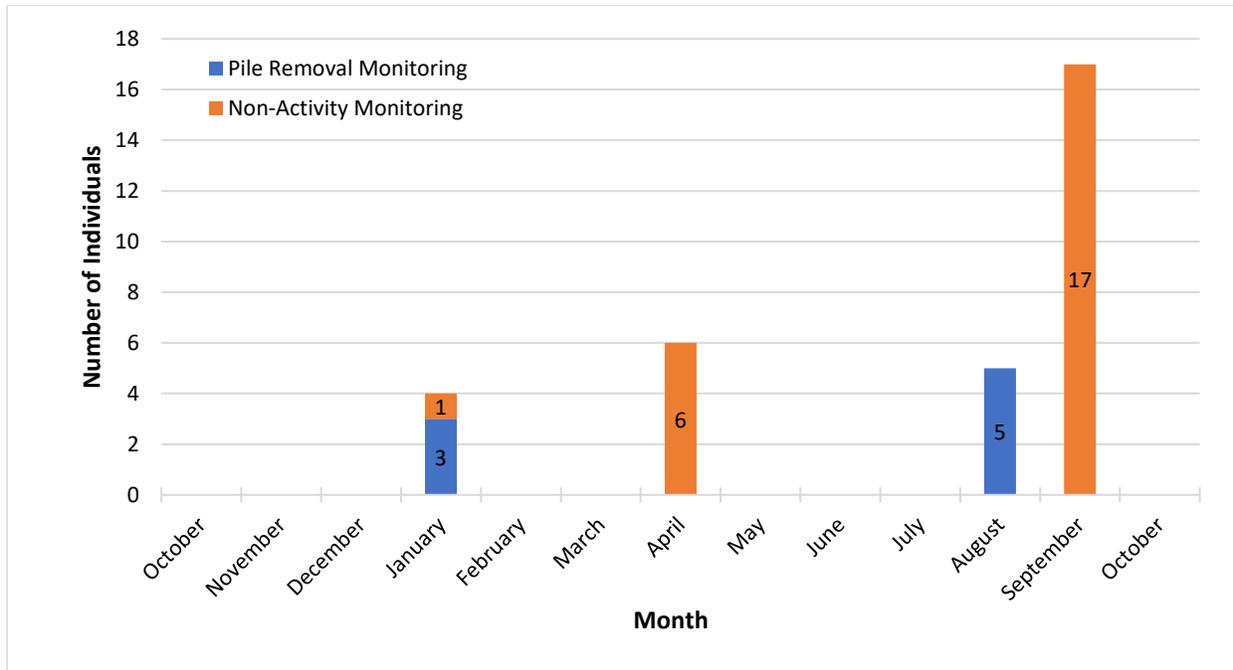


Figure 3-22. Coastal Bottlenose Dolphin Observations per Month During Pile Removal and Non-Activity Monitoring for All Pile Installation or Removal Activities at the NBPL Fuel (October 2016 to October 2017).

Table 3-15. Summary of Coastal Bottlenose Dolphin Sightings During Monitoring Efforts (NBPL Fuel Pier).

Type of Activity	Pile Size	All Monitoring Effort		During Construction/ Demolition			Non-Activity		
		Indiv.	Sightings	Indiv.	Sightings	Indiv. per Sighting	Indiv.	Sightings	Indiv. per Sighting
October 2016 to April 2017									
Construction	16-inch	0	0	0	0	1.00	0	0	0.00
	24×30 ¹	12	4	0	0	1.59	12	4	3.00
	30-inch	25	11	4	2	1.39	21	9	2.33
	Subtotal	37	15	4	2		33	13	0.00
Demolition	13-inch	0	0	0	0	1.00	0	0	0.00
	14-inch	6	1	0	0	1.00	6	1	6.00
	16-inch	0	0	0	0	1.00	0	0	0.00
	18-inch	0	0	0	0	0.00	0	0	0.00
	24-inch	0	0	0	0	1.00	0	0	0.00
	84-inch	41	3	3	2	1.42	1	1	1.00
	Subtotal	10	4	3	2		7	2	
Subtotal	47	19	7	4		40	15		
May 2017 to October 2017									
Demolition	13-inch	16	4	0	0	0.00	16	4	4.00
	14-inch	0	0	0	0	0.00	0	0	0.00
	16-inch ²	6	2	5	1	5.00	1	1	1.00
	18-inch	0	0	0	0	0.00	0	0	0.00
	Subtotal	22	6	5	1		17	5	
TOTAL	69	25	5	2		57	20		

Notes: ¹Includes both jetting for pile installation and pile driving for 24×30 piles²Includes one group of five unidentified dolphins

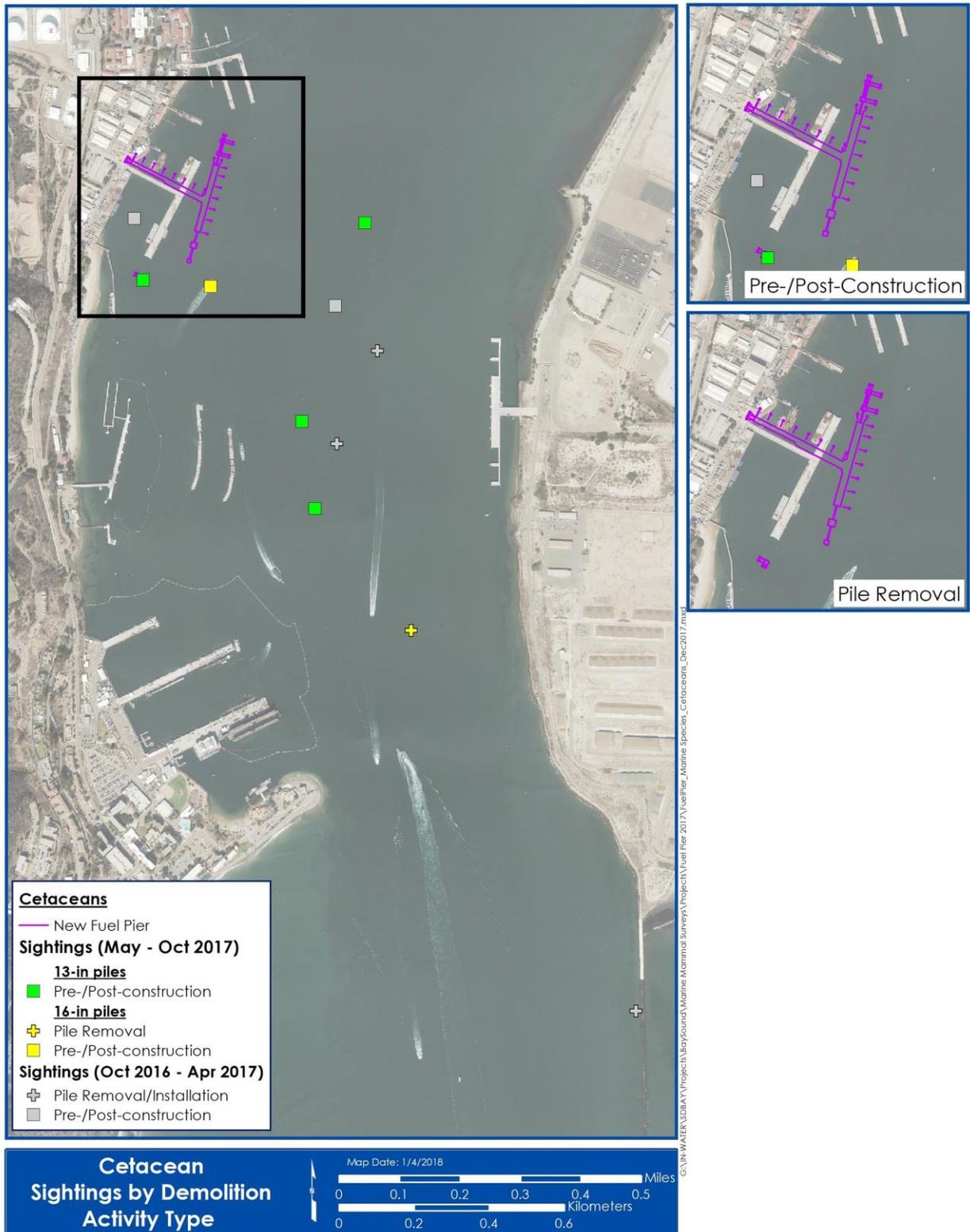


Figure 3-23. All Coastal Bottlenose Dolphin Sightings Before, During, and After Pile Installation or Removal Activities (NBPL Fuel Pier).

All of the observations during the May to October 2017 timeframe were in the morning, prior to the 10:00 hour. This fits with the data from NAVFAC SW (2017) which shows a peak in observations in the morning, followed by a second peak in the afternoon, with observations decreasing during the mid-afternoon (during the 14:00 hour; Figure 3-24). The data from May to October 2017 did not appreciably change the data provided in NAVFAC SW (2017), and a thorough analysis of the observation time data from the first half of IHA #4 is provided in NAVFAC SW (2017). Figure 3-24 provides an assessment of the time data for all of IHA #4.

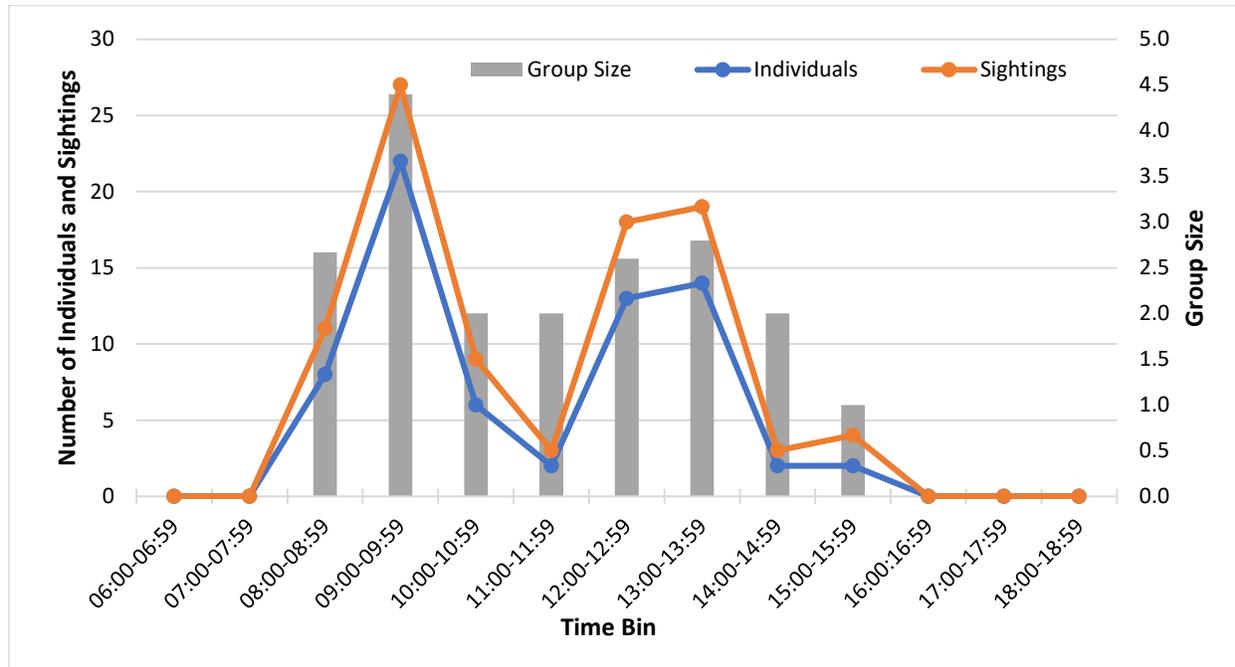


Figure 3-24. Coastal Bottlenose Dolphin Sightings and Individuals per Hour During All Pile Installation or Removal Activities at the NBPL Fuel Pier (October 2016 to October 2017).

The behavioral observations during the May to October 2017 timeframe were similar to the observations for the first half of IHA #4, with 14 individuals (63.6%) observed swimming and 8 individuals (36.4%) observed milling. During data collected from October 2016 to April 2017, swimming was the dominant behavior with 45 individuals observed (95.7%), followed by two individuals (4.3%) observed bowriding a ship leaving the bay (NAVFAC SW 2017). When all data from IHA #4 is taken into account, 59 individuals (85.5%) were observed swimming, eight individuals (11.6%) were observed milling, and two individuals (2.9%) were observed bowriding. During the May to October 2017 timeframe, no individuals were observed to potentially react adversely to stimuli. A full assessment of both general and reactive behaviors during the October 2016 to April 2017 timeframe is provided in NAVFAC SW (2017).

3.2.4.1.4 Unidentified Marine Mammals

An assessment of the unidentified marine mammals from October 2016 to April 2017 was provided in NAVFAC SW (2017). During the May to October 2017 timeframe at the NBPL Fuel Pier, a single observation of five unidentified dolphins occurred. The dolphins were roughly 1,300 m (4,265 ft)

away from the MMO (see Figure 3-23) and were approximately mid-channel heading into San Diego Bay. They surfaced twice during a bout of pile jetting before they were obscured by boat traffic in the area and were not observed again. Based on the MMOs notes, the fin size and shape relative to body size indicated that they were likely coastal bottlenose dolphins. Also, as explained above, with the low dolphin species diversity in San Diego Bay in recent years (NAVFAC SW 2016a,b; 2017), there is a higher likelihood that this group was of coastal bottlenose dolphins, and they were subsequently included in the coastal bottlenose dolphin analysis section.

3.2.4.2 Other Species Monitored

3.2.4.2.1 Green Sea Turtle

A single green sea turtle was observed during the IHA #4 timeframe at the NBPL Fuel Pier. This observation was during caisson cutting at the northern section of the NBPL Fuel Pier during the October 2016 to April 2017 timeframe (Figure 3-25). The data for this observation was reported in NAVFAC SW (2017).

3.2.4.2.2 California Least Tern

At the NBPL Fuel Pier, Terns were first observed in June of 2017, with the last observation in late September 2017. A total of 43 terns were observed during 15 observations (Figure 3-25), for a mean group size of 2.87 individuals per observation. The largest number of terns observed was 20 individuals approximately 100 m (328 ft) from the trestle of the new Fuel Pier and approximately 100 m (328 ft) from the quay wall and the southern end of the new Fuel Pier. Without this sighting, mean group size was 1.64 individuals per group.

A majority of the terns observed during all of IHA #4 (n=32, 74.4%) exhibited foraging behavior (i.e., hovering in place while looking at the water, or diving) followed by travelling through the area (n=11, 25.6%). Of the 32 individuals observed foraging in the area, three (9.4%) observed with fish in their mouth after a dive, and three (9.4%) observed without a fish in their mouth after a dive. The remaining 26 individuals (81.3%) that were observed exhibiting foraging behaviors (i.e., hovering in place) did not dive and eventually left the area. Of the 11 individuals that were observed to be traveling through the area, 10 individuals (90.9%) were heading to the North, and one individual (9.1%) was heading to the southeast. Three observations of six terns were during Project-related activities associated with demolition of the old Fuel Pier. The remaining 12 observations were during non-activity monitoring. Of those three observations, two individuals during one sighting were observed foraging but did not dive, and four individuals during two sightings were traveling through the area.

3.2.4.3 Sightings of Marine Mammals Not Covered Under IHA #4

All marine mammals observed at the NBPL Fuel Pier during the pile installation and demolition activities from 8 October 2016 to 7 October 2017 were addressed as part of the IHA #4. No species were observed that were not covered under IHA #4.

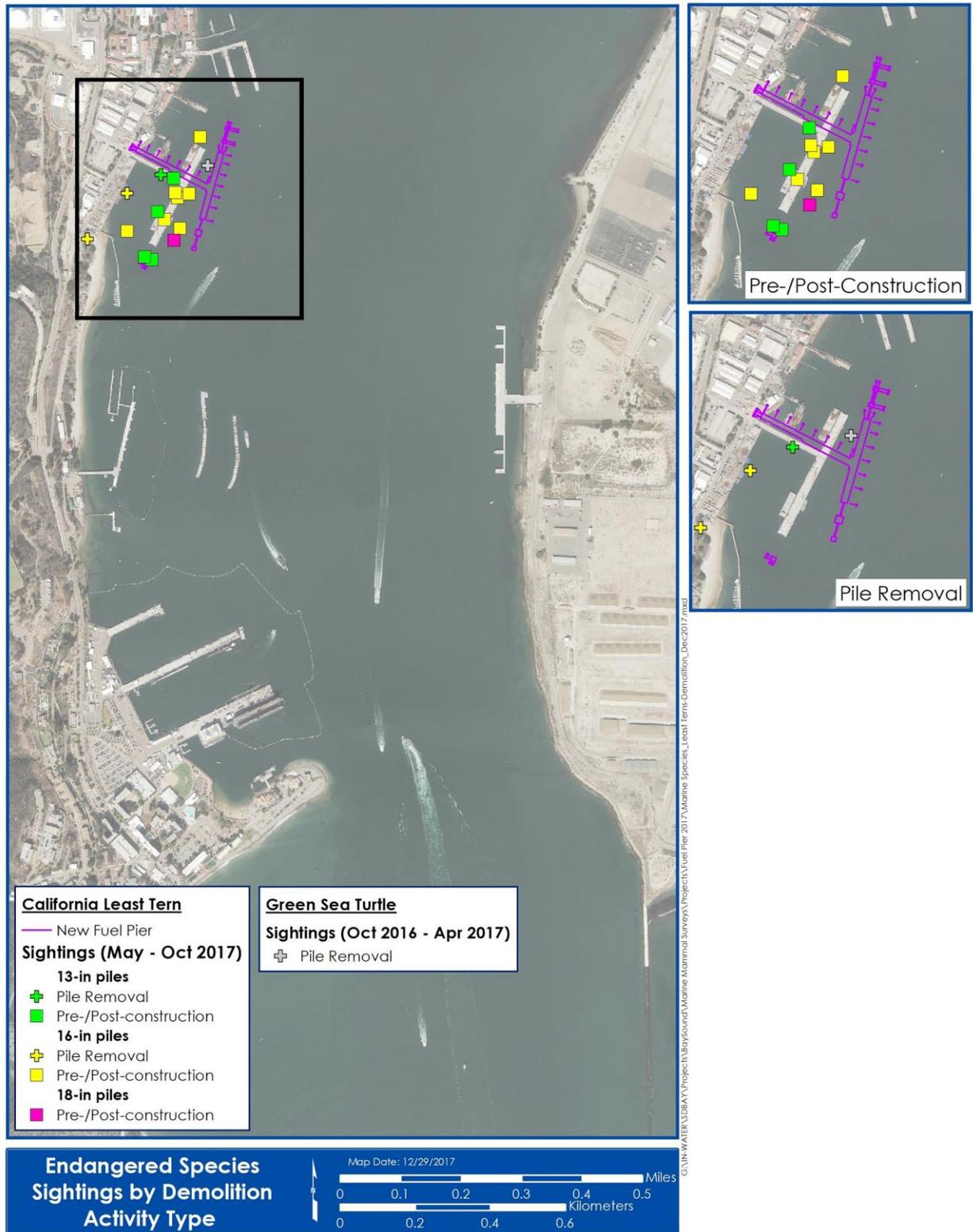


Figure 3-25. All ESA-listed Species Sightings Before, During, and After Pile Installation or Removal Activities (NBPL Fuel Pier).

3.2.4.4 Sightings of Marine Species and Environmental Conditions

Most sightings occurred during a Beaufort Sea State (BSS) of 1 or 2 (Figure 3-26), clear or cloudy conditions (Figure 3-27), and with good visibility of from 10 to 20 km (6.2 to 12.4 miles; Figure 3-28). Sea surface temperatures² during the both monitoring periods averaged 68.8 degrees Fahrenheit (°F; 20.44 degrees Celsius [°C]), with minimum and maximum temperatures of 60.1 °F (15.6 °C) in January and 78.8 °F (24.8 °C) in July, respectively. When evaluating the two monitoring timeframes, average temperatures increased from 65.6 °F (18.7 °C) across October 2016 to April 2017 to 72.5 °F (22.5 °C) across May to October 2017 (Figure 3-29). During all monitoring for IHA #4, there were more sightings during the ebb tide (n=1,017, 55.2%) than during the flood tide (n=827, 44.8%).

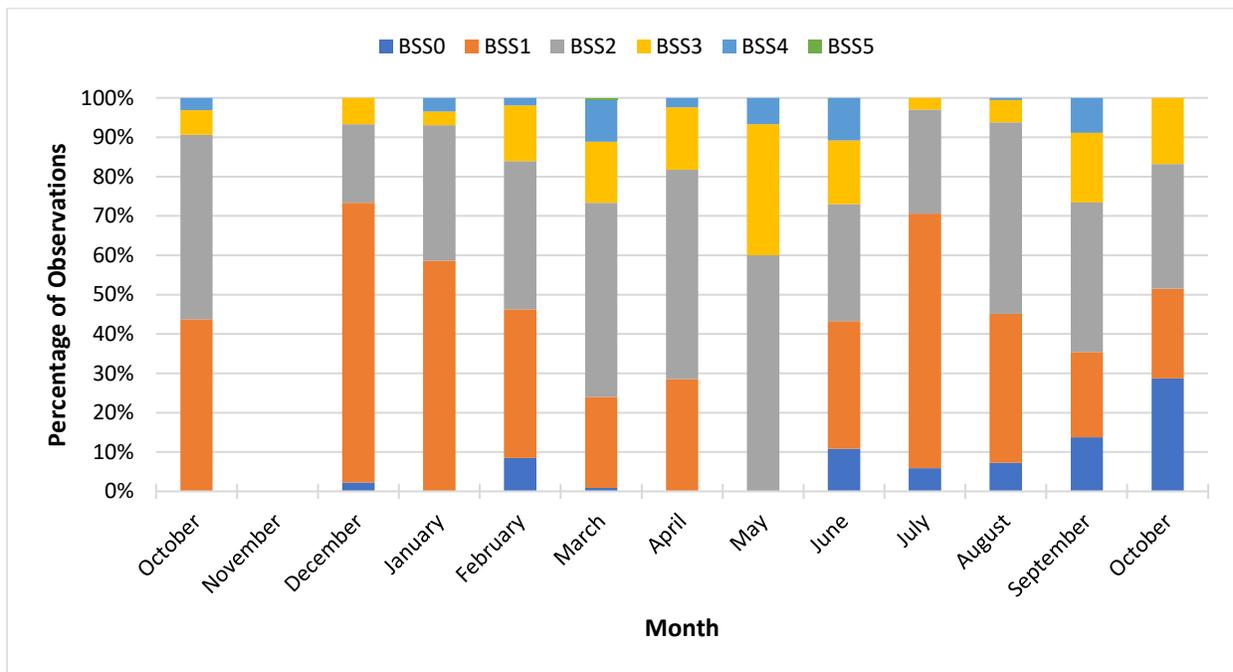


Figure 3-26. Sightings by Beaufort Sea State per Month (NBPL Fuel Pier).

² Water temperature data were from the National Data Buoy Center (Station #: 9410170) located in San Diego Bay at 32.714, -117.174 (NDBC 2017)

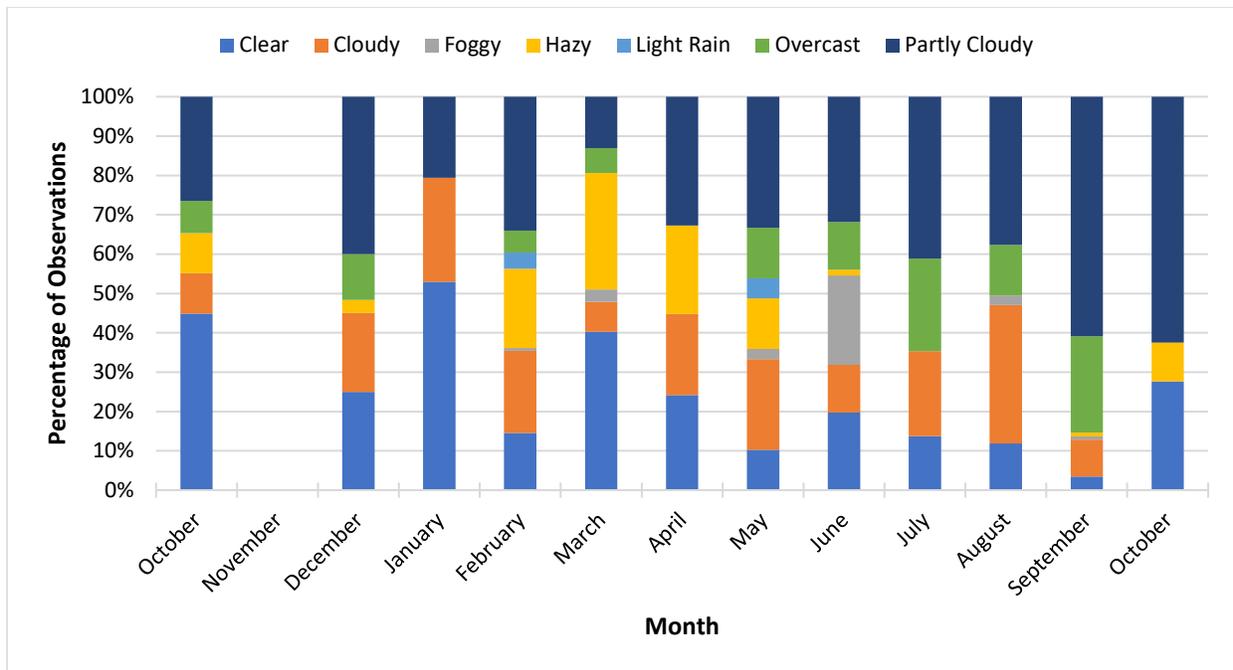


Figure 3-27. Sightings by Sky Cover per Month (NBPL Fuel Pier).

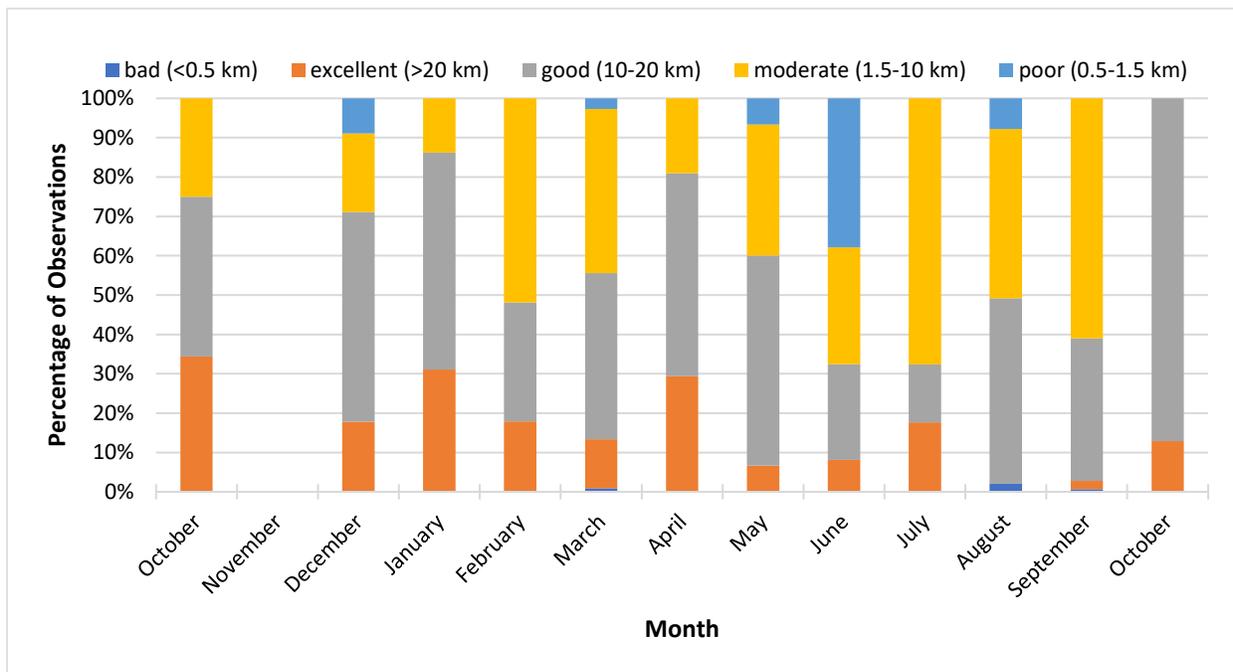


Figure 3-28. Sightings by Visibility per Month (NBPL Fuel Pier).

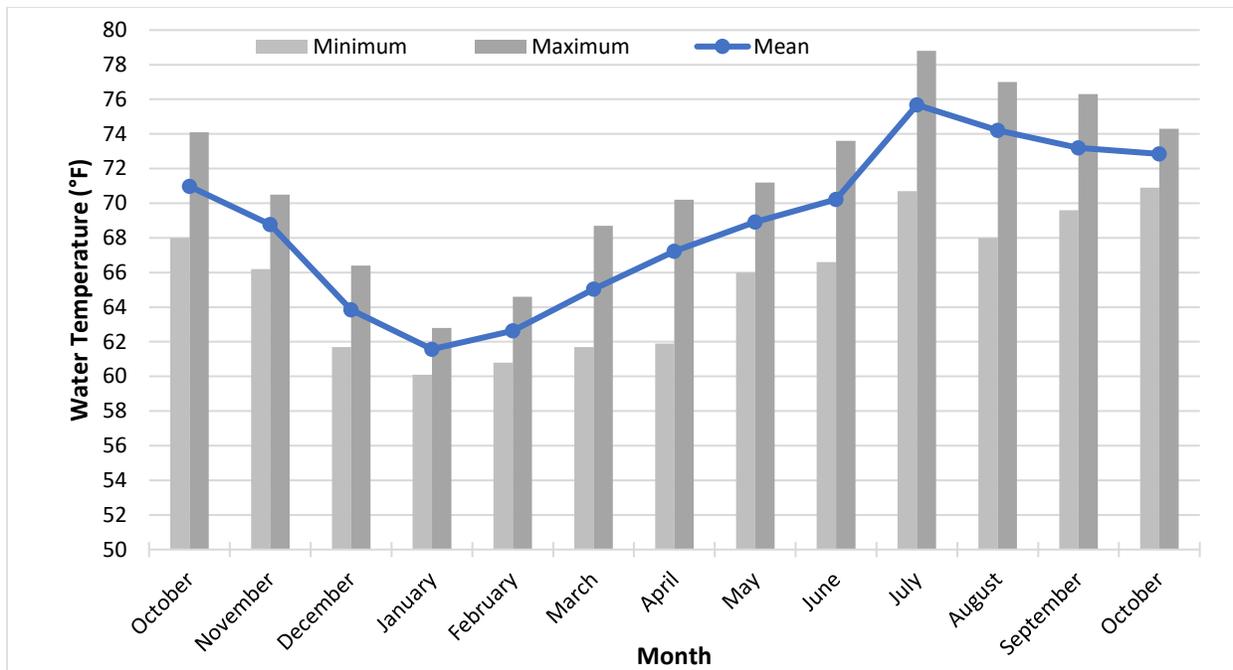


Figure 3-29. Water Temperature by Month (NBPL Fuel Pier).

3.2.4.5 Summary of Observed and Extrapolated “Take”

During demolition operations, the distances to the Level B ZOIs for each type of activity (pile clipping, jetting, or chainsaw cutting) were determined using *in-situ* acoustic data. Based on this data, the distances to the Level B ZOIs were determined to be 80 m (262 ft) for the chainsaw, 240 m (787 ft) for pile jetting, and 320 m (1,050 ft) for pile clipping. These distances to the Level B ZOIs were smaller than was projected in the IHA #4 Application (Navy 2016), as well as presented in NAVFAC SW (2017); however, more data points were collected for these activities, and the distances to the Level B ZOIs were adjusted accordingly. Furthermore, for pile clipping and pile jetting, NAVFAC SW (2017) only reported on source data (measured at 10 m [33 ft]) and used practical spreading loss to calculate the distance to the Level B ZOI for all activities using these techniques. No 24-in piles were removed during the second half of monitoring and, with more data points for the next largest piles removed (18-in piles), the distance of 320 m (1,050 ft) to the Level B ZOI was used as the most accurate representation of the Level B ZOI for all pile clipping during May to October 2017. Similar to pile clipping, more data were available for pile jetting, and the data provided in this report is considered to be the best available data for this activity as well.

Observed “take” was exclusively based on the number of marine mammals observed by the MMOs within the area potentially ensounded during pile driving and or pile removal activities. For all of IHA #4 there were a total of the 2,343 marine mammals observed at the NBPL Fuel Pier, with 412 (17.6%) identified as potentially exposed to noise within the regulatory thresholds (“take”; Table 3-16). These animals were considered as “take” based on an assessment of the observation relative to the activity that was occurring at the time of the observation, as well as the animal’s location relative to the Level B ZOI for that activity. Of the observed “take”, there were two reactions that may have been due to Project-related activities:

- A single adult female California sea lion had an apparent reaction to pile driving activities while exposed to Project-related noise. The animal was initially observed 200 m (646 ft) to the south of pile driving activities on a floating dock at P-122. Immediately after pile driving began, the animal looked in the direction of pile driving, and then “flushed” into the water four minutes after the pile driving had started. Considering that there were no obvious stimuli on the dock itself, this may have been related to the start of pile driving. It was not observed again by the MMO. However, this individual was readily identifiable by its facial features and was observed several times after this incident on other days.
- An adult male California sea lion was observed approximately 200 m (656 ft) to the south of the 30-inch pile driving activities, and was initially observed swimming north towards the new fuel pier; as pile driving began, it abruptly changed direction and headed back to the south. No adverse reactions that could have been attributed to pile removal activities were noted.

The number of observed Level B harassment “takes” for marine mammals during all of IHA #4 at the NBPL Fuel Pier are summarized in Table 3-16, and the number of extrapolated “take” is summarized in Table 3-17. No Level A harassment occurred during any Project-related activities.

Section 2.4.1.2 described the analysis process for the extrapolation of “take” for animals that may have been in the area during active demolition or construction but were not observed by the MMOs. In summary, the data presented in Table 3-17 is based on the following information: 1) the amount of area not observed during individual activities, 2) a conservative density of animals based on the Project year with the highest density (IHA #3 Application, Navy [2015]), and 3) the amount of time of potential exposure during Project-related activities during IHA #4. While these animals were not seen during monitoring efforts, we assume that these numbers are conservative given that they are based on density estimates that are likely high.

No extrapolation of “take” was performed for the four species that were authorized for taking under IHA #4 (NMFS 2016) but not observed during monitoring. While it was not possible to unequivocally rule out the potential presence of any of these four species within the unobserved portion of the larger Level B ZOIs extending beyond the visual range of the MMOs, the likelihood of their occurrence was very low. Three of the species are known to have rare occurrence within the Bay (common dolphin, Pacific white-sided dolphin, northern elephant seal) and one species (Risso’s dolphin) has the potential to occur but has not been previously reported within the Bay (NMFS 2016). Furthermore, the potential abundances of these species, had they been present, would have been expected to be low based on historical density (Table 3-18).

Table 3-16. Summary of Observed “Take” for Project-related Activities (NBPL Fuel Pier).

Species	Total Number of Animals Observed in the Water		Authorized Level B “Take”		Observed Level B “Take”	
	Indiv.	Sightings	Total ¹	Per Day ²	Total	Per Day ³ (% of Authorized “Take” per Day)
California sea lion⁴						
Oct ‘16-Apr ‘17	647	476	3,757	16.55	156	1.93 (11.6%)
May ‘17-Oct ‘17	1,538	826			231	3.29 (19.9%)
Subtotal	2,185	1,302			387	
Harbor seal						
Oct ‘16-Apr ‘17	84	74	118	0.52	21	0.26 (49.9%)
May ‘17-Oct ‘17	4	3			0	0.00
Subtotal	88	77			21	
Coastal bottlenose dolphin⁴						
Oct ‘16-Apr ‘17	47	19	295	1.3	4	0.05 (3.8%)
May ‘17-Oct ‘17	22	6			0	0
Subtotal	69	25			4	
Common dolphin						
Oct ‘16-Apr ‘17	0	0	361	1.59	0	0.00
May ‘17-Oct ‘17	0	0			0	0.00
Subtotal	0	0			0	
Risso's dolphin						
Oct ‘16-Apr ‘17	0	0	48	0.21	0	0.00
May ‘17-Oct ‘17	0	0			0	0.00
Subtotal	0	0			0	
Pacific white-sided dolphin						
Oct ‘16-Apr ‘17	0	0	12	0.05	0	0.00
May ‘17-Oct ‘17	0	0			0	0.00
Subtotal	0	0			0	
Gray whale						
Oct ‘16-Apr ‘17	1	1	27	0.12	0	0.00
May ‘17-Oct ‘17	0	0			0	0.00
Subtotal	1	1			0	
Northern elephant seal						
Oct ‘16-Apr ‘17	0	0	12	0.05	0	0.00
May ‘17-Oct ‘17	0	0			0	0.00
Subtotal	0	0			0	
Oct ‘16-Apr ‘17	779	570	4,630		181	
May ‘17-Oct ‘17	1,564	835			231	
TOTAL	2,343	1,405	4,630		412	

Notes: ¹ Includes underwater Level B “take” only; ² Based on an estimated 227 days of construction and demolition; ³ Based on an actual 81 (Oct’16 to Apr ‘17) and 69 (May’17 to Oct’17) days of monitoring during Project-related activities; ⁴ Includes unidentified pinnipeds and unidentified dolphins from Oct’16 to Oct’17.

Table 3-17. Summary of Extrapolated "Take" for Project-related Activities (NBPL Fuel Pier).

Species	Density Estimate (animals/km ²) ¹	Unmonitored Level B ZOI (km ²)	Estimated Abundance	Time (hh:mm)	Extrapolated Takes
Pile Clipping					
California sea lion					
Oct '16-Apr '17	15.9201	4.37	69.57	16:18	1,134.0
May '17-Oct '17		0.09	1.39	11:56	16.5
Subtotal		4.46	70.96	28:14	1,150.5
Harbor seal					
Oct '16-Apr '17	0.4987	4.37	2.18	16:18	35.5
May '17-Oct '17		0.09	0.04	11:56	0.5
Subtotal		4.46	2.22	28:14	36.0
Coastal bottlenose dolphin					
Oct '16-Apr '17	1.2493	4.37	5.46	16:18	89.0
May '17-Oct '17		0.09	0.11	11:56	1.3
Subtotal		4.46	5.57	28:14	90.3
Gray whale					
Oct '16-Apr '17	0.1150	4.37	0.50	16:18	8.2
May '17-Oct '17		0.09	0.01	11:56	0.1
Subtotal		4.46	0.51	28:14	8.3
Pile Jetting					
California sea lion					
Oct '16-Apr '17	15.9201	2.07	32.95	06:32	215.3
May '17-Oct '17		0.05	0.72	26:39	19.1
Subtotal		2.12	33.67	33:11	234.4
Harbor seal					
Oct '16-Apr '17	0.4987	2.07	1.03	06:32	6.7
May '17-Oct '17		0.05	0.02	26:39	0.6
Subtotal		2.12	1.05	33:11	7.3
Coastal bottlenose dolphin					
Oct '16-Apr '17	1.2493	2.07	2.59	06:32	16.9
May '17-Oct '17		0.05	0.06	26:39	1.5
Subtotal		2.12	2.64	33:11	18.4
Gray whale					
Oct '16-Apr '17	0.1150	2.07	0.24	06:32	1.6
May '17-Oct '17		0.05	0.01	26:39	0.1
Subtotal		2.12	0.24	33:11	1.7
Subtotals (October 2016 to October 2017)					
Oct '16-Apr '17		6.44		22:50	1,507.2
May '17-Oct '17		0.13		38:35	39.8
TOTAL		6.57		61:25	1,547.0

Note: ¹ Density estimates were based on those included in the IHA #3 Application (Navy 2015) for this Project.

Table 3-18. Potential Occurrence of Species Not Observed During IHA #4 Monitoring³ (NBPL Fuel Pier).

Species	Density Estimate (animals/km ²) ¹	Unmonitored Level B ZOI (km ²)	Estimated Abundance	Time (hh:mm)	Potential Abundance if Present Throughout Demolition
Pile Clipping					
Common dolphin					
Oct '16-Apr '17	1.5277	4.37	6.68	16:18	108.8
May '17-Oct '17		0.09	0.13	11:56	1.6
Subtotal		4.46	6.81	28:14	110.4
Risso's dolphin					
Oct '16-Apr '17	0.2029	4.37	0.89	16:18	14.5
May '17-Oct '17		0.09	0.02	11:56	0.2
Subtotal		4.46	0.90	28:14	14.7
Pacific white-sided dolphin					
Oct '16-Apr '17	0.0493	4.37	0.22	16:18	3.5
May '17-Oct '17		0.09	0.00	11:56	0.1
Subtotal		4.46	0.22	28:14	3.6
Northern elephant seal					
Oct '16-Apr '17	0.0508	4.37	0.22	16:18	3.6
May '17-Oct '17		0.09	0.00	11:56	0.1
Subtotal		4.46	0.23	28:14	3.7
Pile Jetting					
Common dolphin					
Oct '16-Apr '17	1.5277	2.07	3.16	06:32	20.7
May '17-Oct '17		0.05	0.07	26:39	1.8
Subtotal		2.12	3.23	33:11	22.5
Risso's dolphin					
Oct '16-Apr '17	0.2029	2.07	0.42	06:32	2.7
May '17-Oct '17		0.05	0.01	26:39	0.2
Subtotal		2.12	0.43	33:11	3.0
Pacific white-sided dolphin					
Oct '16-Apr '17	0.0493	2.07	0.10	06:32	0.7
May '17-Oct '17		0.05	0.00	26:39	0.1
Subtotal		2.12	0.10	33:11	0.7
Northern elephant seal					
Oct '16-Apr '17	0.0508	2.07	0.11	06:32	0.7
May '17-Oct '17		0.05	0.00	26:39	0.1
Subtotal		2.12	0.11	33:11	0.7
Subtotals (October 2016 to October 2017)-All activities					
Oct '16-Apr '17		6.44		22:50	155.2
May '17-Oct '17		0.13		38:35	4.1
TOTAL		6.57		61:25	159.3

Note: ¹ Density estimates were based on those included in the IHA #3 Application (Navy 2015) for this Project.

³ This data assumes that these animals may have occurred within the unobserved portion of the Level B ZOIs during Project-related activities.

3.3 NBPL HDA

3.3.1 In-Water Pile Operations Effort

At the NBPL HDA, piles that were removed or installed were only used as guide piles for floating docks associated with the former marina at the NBPL HDA facilities. The marina was initially re-configured during IHA #1 (NAVFAC SW 2014) to allow MMP pens to be moved from the NBPL Fuel Pier to the NBPL HDA. Both marine species and acoustic monitoring data for their re-configuration were reported in NAVFAC SW (2014). During IHA #4, a total of 63 12-in square and 16-in round concrete guide piles were removed either by dead-pull (only using the crane to pull the pile out of the sediment) or via high-pressure water jetting. Of those piles, 23 of the 16-in pile were re-installed in different locations to act as guide piles for the marina docks. The piles were first removed in August and September, and then some were re-driven in September.

Total monitoring effort at the NBPL HDA accounted for 124:56 hours during pile removal and driving, and for turbidity monitoring (Table 3-19), or an average of 5:28 hours per day. Monitoring effort for pile removal accounted for 57:25 hours (46.0% of effort) and pile installation accounted for 66:26 hours (53.2% of effort), with dedicated turbidity monitoring accounting for 01:04 hours (<1% of effort). Due to the Tern breeding/nesting season (May 01 to September 15, 2017), a dedicated turbidity monitor was used to monitor sediment plumes when a new high-pressure water jetting technique was used to install or remove piles. During all high-pressure water jet use, sediment plume size and duration was logged for each pile that these techniques were used on.

3.3.2 Summary of Turbidity Monitoring

Similar to the NBPL Fuel Pier, turbidity monitoring occurred at the NBPL HDA to assess whether high-pressure water jets used to remove or install piles had a lasting impact on water quality in the Project area. The water jet was used on 71 individual piles over 13 days in August and September. Some piles were jetted using multiple techniques, or multiple times, with a total of number 81 observations reported. Of those 86 observations, most (n=31, 36.0%) showed no plume. The remaining observations of visible sediment plumes had a mean plume time of two minutes, and a mean plume size of 131.7 m² (0.033 acres). The maximum duration and size of a plume was 12 minutes for a 5,000 m² (1.23 acres) plume. This large plume size was related to a pile that had a large amount of mud clinging to the pile as it was removed from the water. As it was moved in the air from its original location to the materials barge, large chunks of mud fell into the water leaving a 100 m (328 ft) plume trail. As the plume dissipated, it spread out and covered an approximately 100×50 m (328×164 ft) area. While several other piles also came were removed with mud clinging to them, this pile had a particularly large amount of mud that generated the large plume size. During pile jetting for this same pile, no sediment plume was observed. Data was missing, or unavailable, for seven piles. Appendix A1 provides a listing of the results for the turbidity monitoring for each individual pile, as well as a summarization of the results for each dedicated turbidity monitoring effort.

Table 3-19. Monitoring Effort by Month (NBPL HDA).

Month	Days of Monitoring Effort	Total Observation Time ^{1,2}	Avg. Hours per Day ¹	Marine Species Monitoring Type				Turbidity
				Construction ¹		Demolition ¹		
				Active Construction	Non-Pile Driving ³	Active Demolition	Non-Demolition ³	
October	0	00:00	00:00	00:00	00:00	00:00	00:00	00:00
November	0	00:00	00:00	00:00	00:00	00:00	00:00	00:00
Dec-04	0	00:00	00:00	00:00	00:00	00:00	00:00	00:00
January	0	00:00	00:00	00:00	00:00	00:00	00:00	00:00
February	0	00:00	00:00	00:00	00:00	00:00	00:00	00:00
March	0	00:00	00:00	00:00	00:00	00:00	00:00	00:00
April	0	00:00	00:00	00:00	00:00	00:00	00:00	00:00
Subtotal	0	00:00		00:00	00:00	00:00	00:00	00:00
May	0	00:00	00:00	00:00	00:00	00:00	00:00	00:00
June	0	00:00	00:00	00:00	00:00	00:00	00:00	00:00
July	0	00:00	00:00	00:00	00:00	00:00	00:00	00:00
August	5	25:31	05:06	00:00	00:00	09:10	15:17	01:04
September	17	99:25	05:50	04:46	61:40	08:01	24:57	00:00
October	0	00:00	00:00	00:00	00:00	00:00	00:00	00:00
Subtotal	22	124:56		04:46	61:40	17:11	40:14	01:04
TOTAL	22	124:56		04:46	61:40	17:11	40:14	01:04

Notes ¹All time in hours: minutes (hh:mm).

²Includes cumulative time for all activities for each day of observation.

³Non-Pile Driving and Non-Demolition include times when active construction (e.g., pile driving/jetting) and demolition (e.g., pile jetting) were not occurring, but MMOs were actively observing for marine species in the Project area.

3.3.3 Summary of Acoustic Results

Removal of temporary facilities and restoration of dock access at the NBPL HDA included jetting to remove piles, jetting to install relocated piles, and pile driving using an impact hammer. Underwater acoustic data are summarized below according to type of activity and equipment used. Airborne sound levels recorded during pile driving are summarized at the end of this section.

3.3.3.1 Pile Jetting (Pile Removal and Installation)

A five-nozzle head, high-pressure water jet was used to aid in the removal of 63 of the 12-inch square and 16-inch round concrete piles at the NBPL HDA. See Section 1.1.2.2 for a description of the different types of high-pressure water jets and methods that were used for pile removal and re-installation. Of the 63 12- and 16-inch piles removed, 23 of the 16-inch piles were saved for reuse as guide piles for floating docks. For one pile, the same five-nozzle water jet was used to experiment with “pre-drilling” a hole in the sediment to aid in placement of the piles in its correct location relative to the new docks. This action occurred on a day when the AT was not available, so the acoustic data were not collected for this action. All the 16-inch piles were manufactured with a 2-inch internal pipe that allowed pressurized water to exit at the bottom of the pile to aid in boring a hole into the sediment. This technique was used for the remaining piles that were re-installed, and all acoustic data presented in this section were collected for the jetting using the

internal piping. The tops of the reinstalled piles were left 2.7 to 3.1 m (8 to 10 ft) above the water surface to allow for follow-up impact pile driving to their final height.

The vibratory setting on the Hydro DB USLM was used during acoustic monitoring for both jetting removal and installation of piles; an example of collected data during jetting installation is shown in Figure 3-30.

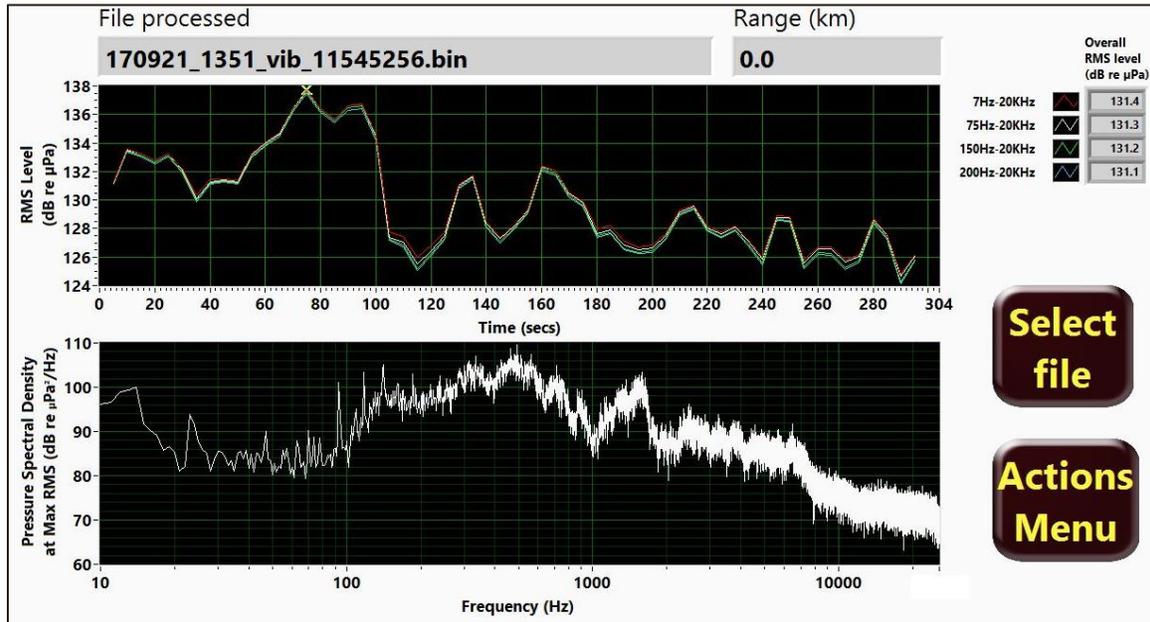


Figure 3-30. Example Hydro DB USLM Data at the Source Distance (10 m [33 ft]) During Jetting Installation of a 16-inch Round Concrete Pile.

Maximum underwater SPLs during jetting removal of 16-inch concrete piles ranged from 155.1 to 157.6 dB rms at the source distance (10 m [33 ft]), and ranged between 135.6 and 142.5 dB rms at far-field distances of 94 to 240 m (308 to 787 ft) (Table 3-20). The values during jetting installation were similar to those measured during jetting removal of 16-inch concrete piles at the fuel pier, described above (see Section 3.2.3.3 [Table 3-7]).

Generally, lower SPLs were measured during jetting installation compared to jetting removal of the concrete piles. Maximum underwater SPLs during jetting installation of 16-inch concrete piles ranged from 130.5 to 137.7 dB rms at the source distance (10 m [33 ft]), and ranged between 128.6 and 134.0 dB rms at far-field distances of 19 to 328 m (62 to 1,076 ft) (Table 3-20).

The jetting removal and installation SPLs at the NBPL HDA did not exceed the Level A thresholds (190 and 180 dB rms) for marine mammals. Similar to other demolition activities, the distance to the Level B threshold for vibratory sound (120 dB rms) was not determinable due to masking by higher ambient underwater noise levels.

Table 3-20. Average and Maximum Broadband SPLs (dB rms) at Source (10 m [33 ft]) and Far-field (19 to 328 m [62 to 1,076 ft]) Distances During Jetting Removal and Installation of 16-inch Round Concrete Piles (NBPL HDA).

Date	Pile Number	Station	Distance (m [ft])	Underwater Acoustic Data		
				rms (dB re 1 μ Pa)		
				Average	Maximum	
Jetting – Pile Removal						
22-Aug-17	548-B31	Source	10 (33)	154.2	157.6	
	548-B32			152.4	157.2	
	548-B30			147.3	155.1	
23-Aug-17	548-B34	Far-field	94 (308)	130.4	142.5	
25-Sep-17	619-B1		149 (489)	127.6	136.9	
23-Aug-17	548-B33		151 (495)	127.3	135.6	
25-Sep-17	619-B2		160 (525)	128.2	137.3	
23-Aug-17	548-B29		240 (787)	128.2	137.9	
Jetting – Pile Installation						
21-Sep-17	548-M9	Source	10 (33)	129.9	137.7	
13-Sep-17	607N-A9			123.7	130.5	
22-Sep-17	548-A10			Far-field	19 (62)	128.5
	548-H10	124.5	131.5			
	548-A10	175 (574)	127.3			131.3
	548-C10	196 (643)	126.1			128.6
	548-D10	206 (676)	126.9			130.0
21-Sep-17	607N-E9	328 (1,076)		130.4	134.0	
	607N-F9			128.6	132.7	

For jetting during removal, the logarithmic regression curve provided the best fit trendline for the decrease in maximum SPLs with distance from the source (Figure 3-31a). The intersection of the trendline with the ambient noise threshold (129.6 dB rms) was calculated as 558 m (1,830 ft), indicating a transmission loss rate of 0.05 dB/m. During pile installation, a logarithmic regression provided a poor fit to the data collected during jetting installation ($R^2 < 0.1$) (Figure 3-31b), and the use of the Practical Spreading Loss model suggested the ambient noise threshold would be reached at 34 m (112 ft) based on the maximum SPL (137.7 dB rms) during jetting installation. Because of the substantial disparity in the calculated distance to the ambient threshold using logarithmic regression for jetting removal and the Practical Spreading Loss model for jetting installation, the more conservative value of 558 m (1,830 ft) was used to estimate the ZOI for both jetting removal and installation activities at the NBPL HDA. Relative to an assessment of Level B “take,” the Level B ZOI was expanded to 560 m (1,837 ft).

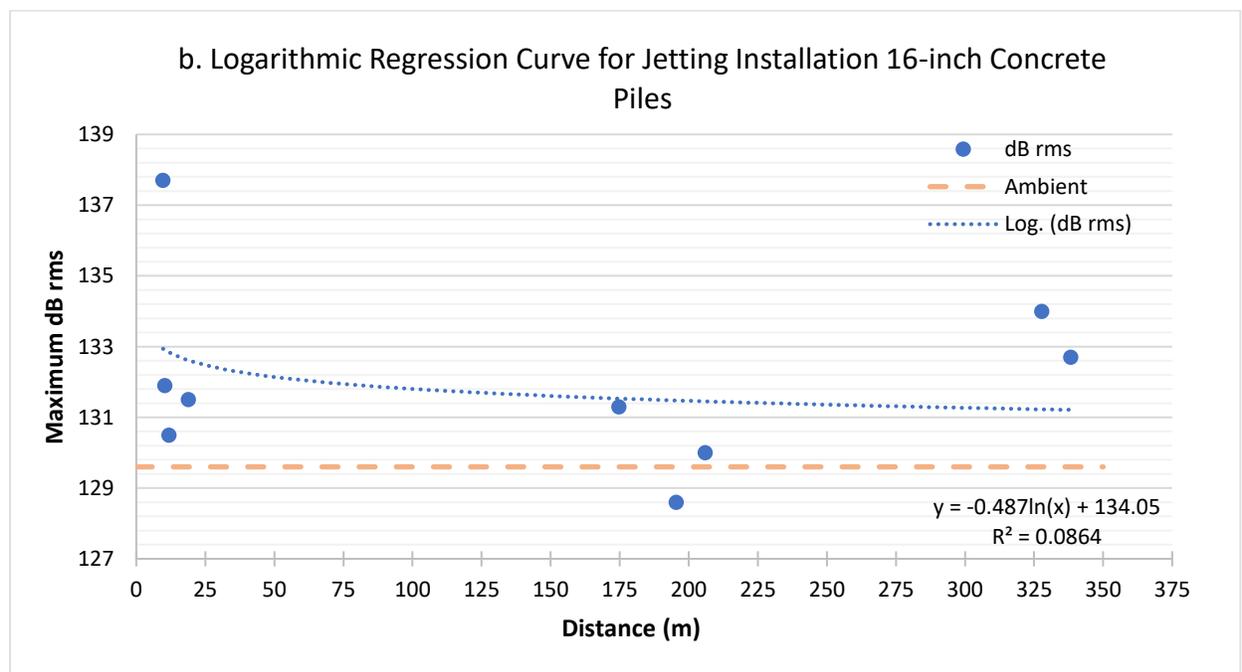
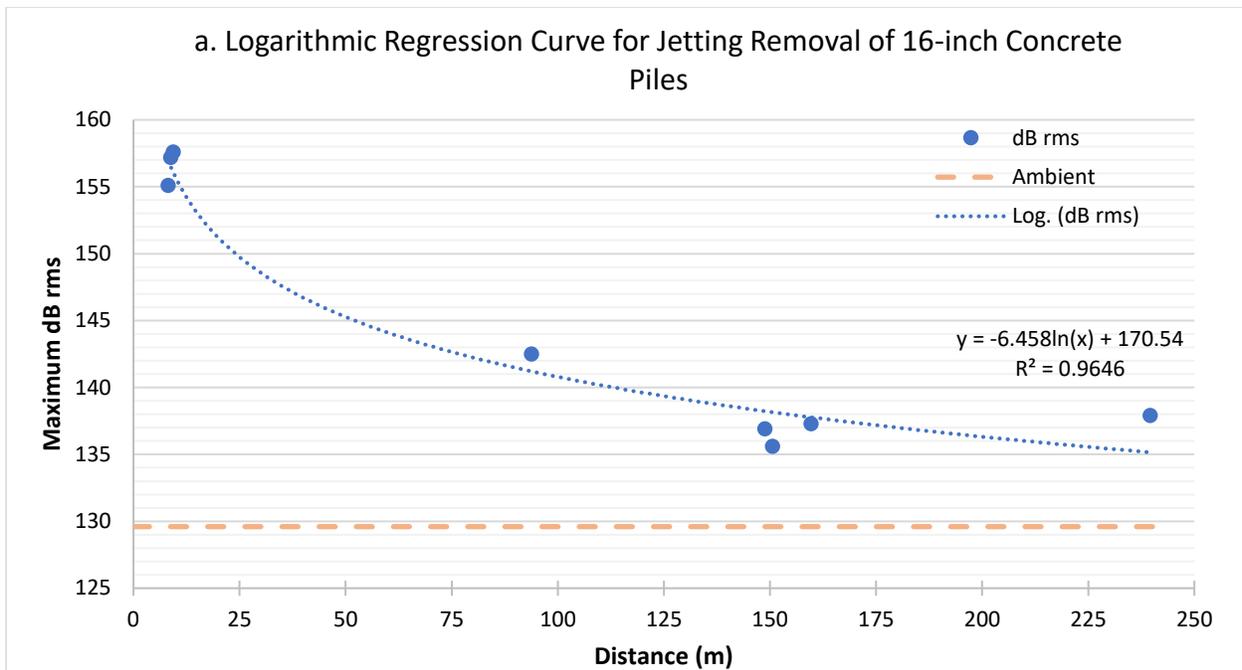


Figure 3-31a,b. Maximum SPLs Measured at Multiple Distances During Jetting for: a) Pile Removal and b) Pile Installation of 16-inch Round Concrete Piles (NBPL HDA).

3.3.3.2 Impact Pile Driving

Underwater Sound

Piles pre-sunk with jetting were driven to required depth using an impact hammer. An example of the acoustic monitoring output on the Hydro DB USLM is shown in Figure 3-32.

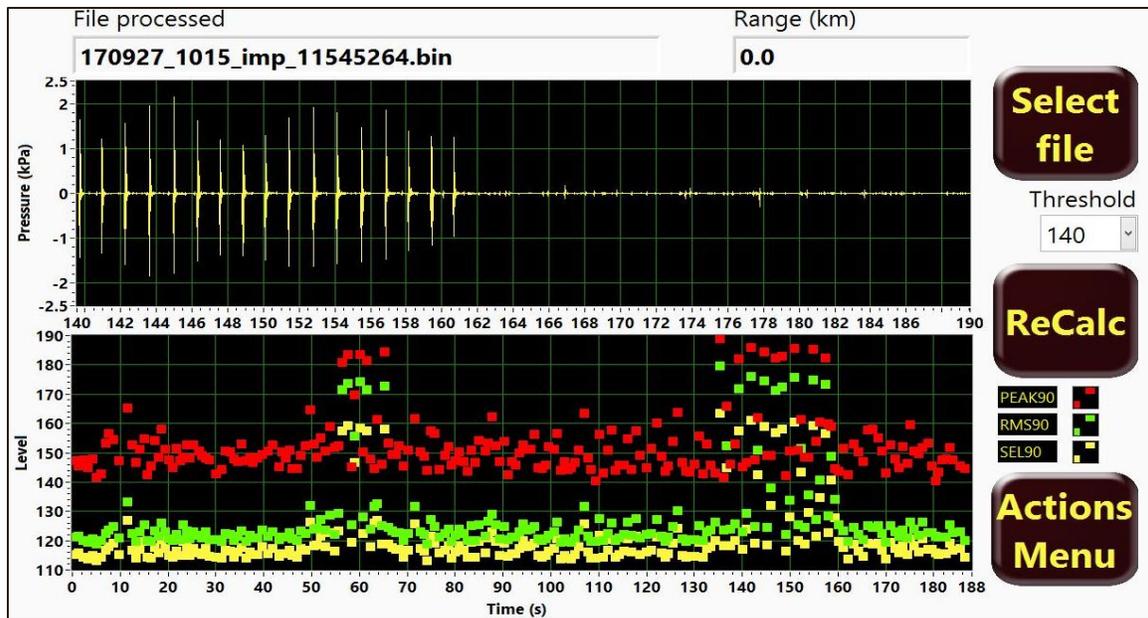


Figure 3-32. Example Hydro DB USLM Data at Source (10 m, 33 ft) During Impact Pile Driving of a 16-inch Concrete Pile.

Maximum underwater SPLs during pile driving of the 16-inch round concrete piles ranged from 170.0 to 181.3 dB rms at the source distance (10 m [33 ft]), and ranged between 135.3 and 160.2 dB rms at far-field distances of 73 to 374 m (240 to 1,227 ft) (Table 3-21). Impact pile driving at NBPL HDA predominantly occurred at the lowest power setting (Level 1) of the impact hammer, although acoustic data also were collected at the highest impact hammer setting (Level 4) for two piles (Table 3-21).

Maximum underwater SPLs for impact pile driving did not exceed the 190 dB rms Level A threshold for cetaceans. One maximum SPL value at the source distance (10 m, 33 ft) exceeded the 180 dB rms Level A threshold for pinnipeds, although most maximum values at the source distance were below that threshold (Table 3-21).

Based on the more extensive Level 1 data, the logarithmic regression curve provided the best fit trendline for the transmission loss with increasing distance from the source during impact pile driving (Figure 3-33). The intersection of the trendline with the ambient noise threshold (129.6 dB rms) for the Level A threshold distance was calculated as 6 m (20 ft) and the Level B threshold distance was calculated as 64 m (210 ft), indicating transmission loss rates of 0.2 to 0.3 dB/m, respectively. During active pile driving, the minimum ZOI (10 m [33 ft]) for physical interaction with Project-related equipment was monitored for any animals that could cause a shutdown of construction. For the Level B “take” assessment during impact pile driving, the Level B ZOI was expanded to 70 m (230 ft).

Table 3-21. Maximum Broadband SPLs (dB rms) at Source (10 m [33 ft]) and Far-field (73 to 374 m [62 to 1,076 ft]) Distances During Pile Driving of 16-inch Round Concrete Piles (NBPL HDA).

Date	Pile Number	Station	Distance (m [ft])	RMS 90% Max Pressure (dB rms)
20-Sep-17	607N-B9	Source	10 (33)	181.3
27-Sep-17	548-K10			179.8
	548-L10			179.6
	548-M10			177.2
	548-M9			173.6
	548-D10			170.0
25-Sep-17	548-B10	Far-field	73 (240)	160.2
	548-A10		83 (272)	150.1
				548-A9
21-Sep-17	607N-E9		328 (1,076)	143.6
	607N-F9		338 (1,109)	154.1
19-Sep-17*	607N-A9		353 (1,158)	142.2
	607N-C9	374 (1,227)	135.3	

Note: The impact hammer setting was at Level 1 for all reported values, except as indicated.

*Impact hammer setting at Level 4.

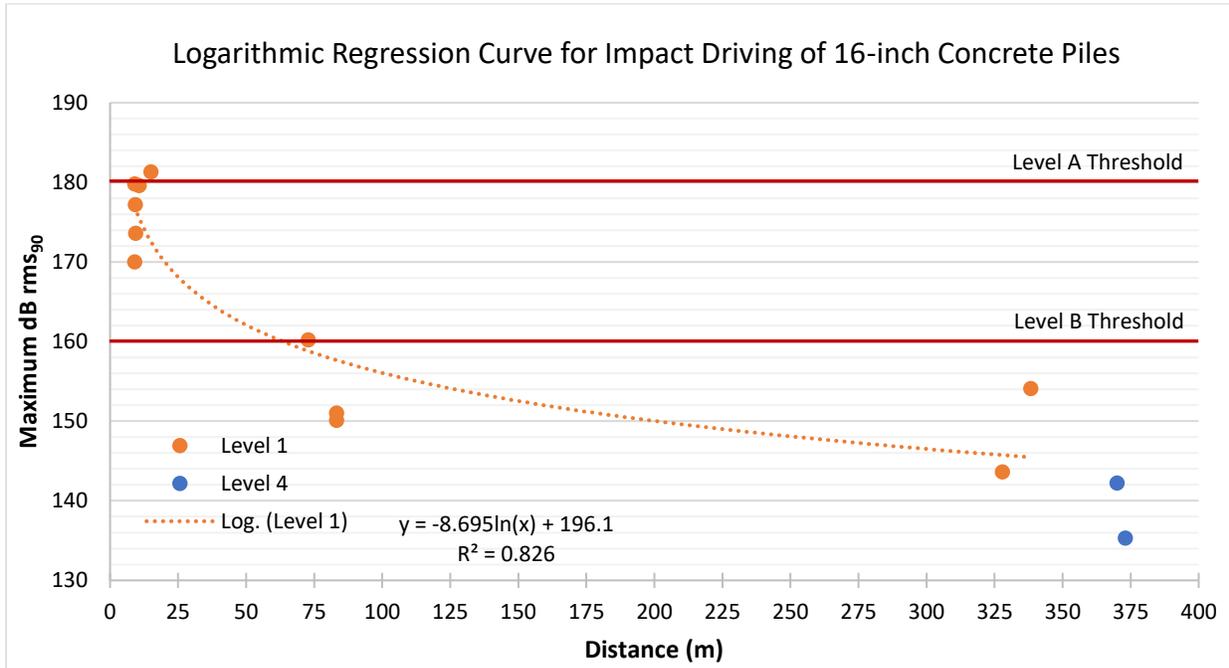


Figure 3-33. Maximum SPLs Measured at Multiple Distances During Impact Pile Driving of 16-inch Concrete Piles (NBPL HDA).

Airborne Sound

Airborne sound levels were recorded during impact pile driving of 16-inch round concrete piles at the NBPL HDA. The maximum airborne LZF_{max} value at source (15.2 m [50 ft]) was 112.8 dB re 20 μ Pa, with a range of average values from 101.2 to 106.9 dB re 20 μ Pa (Table 3-22). The maximum recorded airborne LZF_{max} values at far-field distances of 63 to 97 m (207 to 318 ft) ranged from 93.2 to 95.6 dB re 20 μ Pa, and average recorded values at those distances ranged from 86.2 to 94.1 dB re 20 μ Pa.

Table 3-22. Airborne SPL Values at Source (15.2 m [50 ft]) and Far-field (63 to 97 m [207 to 318 ft]) During Impact Pile Driving of 16-inch Round Concrete Piles (NBPL HDA).

Date	Pile Number	Duration (mm:ss)	Station	Distance (m [ft])	Value	LZF_{max}^1	LZ_{peak}^1	LZ_{eq}^1
27-Sep-17	548-K10	07:15	Source	15.2 (50)	Max	112.8	129.3	104.9
					Avg.	106.9	120.4	99.6
	548-M09	00:03			Max	111.9	125.7	105.4
					Avg.	109.8	120.8	99.9
	548-L10	03:48			Max	110.5	125.6	103.8
					Avg.	105.8	117.6	97.8
	548-M10	05:04			Max	110.2	126.8	104.1
					Avg.	107.5	120.9	99.3
	548-D10	00:07	Max	109.7	125.4	103.5		
			Avg.	101.2	114.9	95.1		
	548-M09	00:03	Far-field	63 (207)	Max	95.7	109.1	89.4
					Avg.	94.2	105.9	86.5
	548-L10	03:48		73 (239)	Max	94.5	110.0	88.8
					Avg.	90.6	102.4	84.1
548-K10	07:15	74 (243)		Max	96.7	114.2	90.6	
				Avg.	90.9	103.5	84.2	
548-M10	05:04			Max	95.1	111.5	88.4	
				Avg.	92.4	105.4	85.6	
548-D10	00:07	97 (318)	Max	93.3	110.6	86.6		
			Avg.	86.2	100.0	80.9		

Note: ¹All values presented in dB re 20 μ Pa

The maximum and average airborne sound levels exceeded the 90-dB airborne Level B threshold for harbor seals and 100 dB threshold for other pinnipeds at the source distance. Linear regression provided the best fit trendline for the decrease in airborne sound levels with distance from source (Figure 3-34). Based on the calculated transmission loss coefficient (approximately $20_{log}R$) for LZF_{max} average values, the 100 and 90 dB re 20 μ Pa thresholds were estimated at 27 and 83 m (89 and 272 ft), respectively (Figure 3-34).

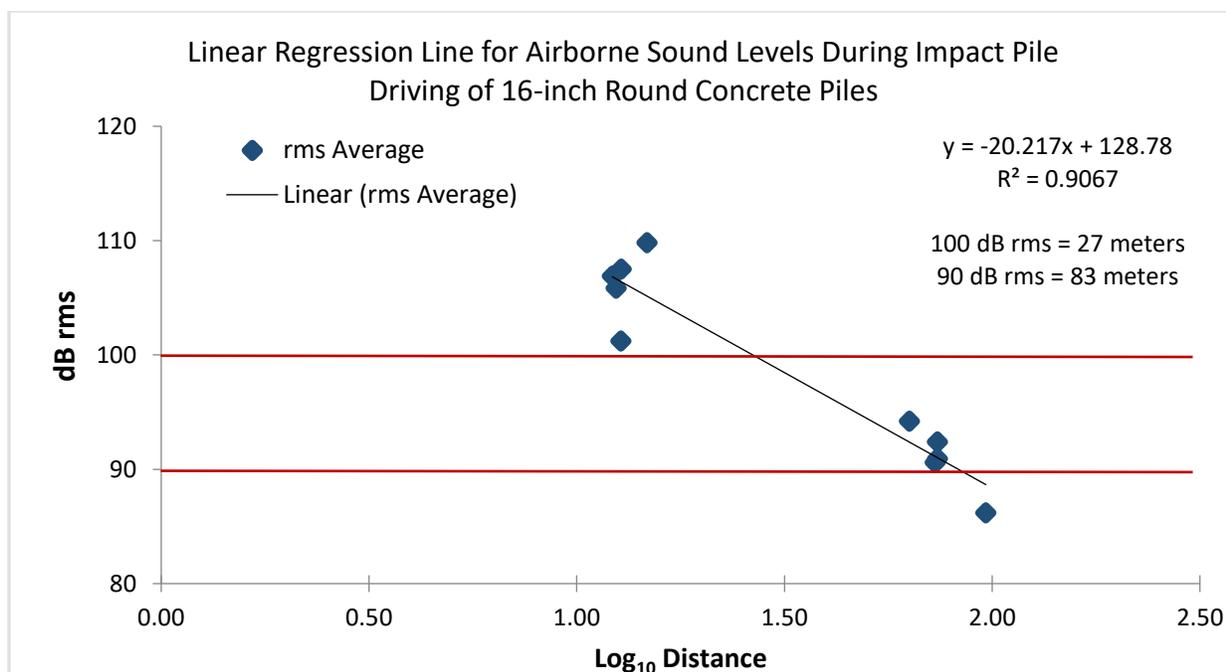


Figure 3-34. Airborne Sound Levels Measured at Multiple Distances Using the LD 831 During Impact Pile Driving of 16-inch Round Concrete Piles (NBPL HDA).

3.3.4 Summary of Marine Species Monitoring Results

Marine species were sighted during both pile removal and installation, as well as during shutdown events. The shutdown events were relatively short with the longest being just under six minutes and any observations during these events have been included as part of active pile removal or installation (Table 3-23). Of the eight marine mammals identified in IHA #4, only two were visually identified at the NBPL HDA: California sea lions and coastal bottlenose dolphins. Terns and a green sea turtle were also observed during monitoring efforts. An unidentified pinniped was likely a California sea lion, based on their presence in San Diego Bay, and, as a result, this individual has been included as part of the California sea lion analysis.

Table 3-23. Summary of In-Water Marine Mammal Observations By Activity (NBPL HDA).

Species	Pile Installation [Individuals (Sightings) ¹]				Pile Removal [Individuals (Sightings) ¹]		Non-Activity Monitoring [Individuals (Sightings) ¹]		
	Impact Pile Driving		Jetting-Install	Shut-down	Jetting-Removal	Shutdown	Pre	Pre-/Post-	Post
	Soft Start	Full Power							
California sea lion	-	2 (2)	1 (1)	-	4 (4)	1 (1)	6 (6)	23 (21)	4 (3)
Unidentified pinniped	-	-	-	-	-	-	1 (1)	-	-
Coastal bottlenose dolphin	-	-	-	-	-	-	1 (1)	4 (2)	-
Green sea turtle	-	-	-	-	-	-	-	1 (1)	-
California least tern	-	-	-	-	5 (2)	-	5 (3)	17 (10)	5 (3)
TOTAL	-	2 (2)	1 (1)	-	9 (6)	1 (1)	13 (11)	45 (34)	9 (6)

Notes: ¹ “Pre-” = Pre-construction monitoring; “Pre-/Post-” = Pre-/Post-construction monitoring; “Post-” = Post-construction monitoring; Dash indicates no sightings occurred during the monitoring timeframe.

The species most observed at the NBPL HDA was the California sea lion (n=42 individuals in the water, 52.5% of all individuals observed), followed by Terns (n=32, 40.0%), coastal bottlenose dolphins (n=5, 6.3%), and green sea turtles (n=1, 1.3%; Table 3-24).

Table 3-24. Total Number of Individuals and Sightings by Species During IHA #4 (NBPL HDA).

Species	Hauled Out					In Water				
	Total Number		Group Size			Total Number		Group Size		
	Indiv.	Sightings	Mean	Max	Min	Indiv.	Sightings	Mean	Max	Min
California sea lion	4	4	1.00	1	1	41	38	1.08	2	1
Unidentified pinniped	0	0	0.00	0	0	1	1	1.00	1	1
Coastal bottlenose dolphin	N/A					5	3	1.67	3	1
Green sea turtle	N/A					1	1	1.00	1	1
California least tern	N/A					32	18	1.78	3	1
TOTAL	4	4				80	61			

3.3.4.1 Sightings of Marine Mammals Covered Under IHA #4

Two marine mammal species identified in IHA #4 were conclusively identified during monitoring efforts at the NBPL HDA: California sea lions and coastal bottlenose dolphins. A single unidentified pinniped was observed in the channel to the southeast of the Project area, but was too far away to identify to the species level. Due to the likelihood of this individual being a California sea lion, this sighting has been included in the California sea lion analysis. Green sea turtles and Terns were also observed during monitoring efforts, with one green sea turtle and multiple observations of Terns observed at the NBPL HDA.

During monitoring efforts, the MMOs were positioned such that they could observe any animals entering/leaving the Project area at the NBPL HDA. During pile removal, a single MMO was positioned on the barge and had an unobstructed view of the Project area to the south, and during pile installation, a MMO was positioned on the crane barge, and a second MMO was positioned at the entrance to the Project area (see Figure 2-2). While there were portions of the Project area that were unobservable, and may have been exposed to noise associated with the Level B noise criteria for pile jetting, the natural “funneling” of marine mammals towards the MMO(s) decreased the likelihood of any marine mammal being missed as it entered or left the Project area. Also, given the high boat traffic in the channel to the north and the marina to the east of the Project area, the likelihood of unobserved marine mammals remaining in these areas during all monitoring efforts was considered so low as to be discountable. As a result, all visually observed marine mammals are considered as truly representative of the animals in the Project area. However, similar to the analysis at the NBPL Fuel Pier, a conservative estimate of “take” was based on the whole of the Project area potentially exposed to Level B noise, regardless of observed versus unobserved animals.

3.3.4.1.1 California sea lion

During both months of monitoring efforts at the NBPL HDA, California sea lions were observed throughout the Project area with 39 sightings and 42 individuals (Table 3-25), including one observation of a single unidentified pinniped. Mean group size was consistent between the two months of monitoring effort, with a mean group size of just over one individual per group per month. While the mean group size changed very little, the number of days per month was higher

during September, and the number of individuals per day was just over two-and-a-half times greater during August. After adjusting for the monitoring effort, the group size was also approximately three times higher in August than in September, indicating that there may have been more individuals in the area in August, even though more individuals were observed during monitoring efforts in September.

Table 3-25. Summary of California Sea Lion Individuals and Sightings per Month at the NBPL HDA (In-water Only).

Month	Total Number per Month		Group Size per Month			Monitoring Days	Indiv. per Day	Obs. Hours (hh:mm)	Indiv. per Obs. Hour
	Individuals	Sightings	Mean	Min	Max				
August	18	17	1.06	1	2	5	3.60	24:27	0.74
September	24	22	1.09	1	2	17	1.41	99:25	0.24
TOTAL	42	39				22			

California sea lion observations were generally evenly distributed to the south of the Project area, indicating that animals were most likely first observed as they entered the Project area (Figure 3-35). There was a cluster of observations around a small fueling dock to the east of the pile installation and removal activities where California sea lions were attracted to forage habitat due to existing pilings and dock structures associated with a marina. Recreational fisherman also sometimes cleaned fish and discarded the remnants into the water, with California sea lions observed to stay for longer periods of time in this area when this occurred. No sea lions were observed in the channels to the north or east of Project-related activities, and, outside of two buoys in the channel, no California sea lions were observed to exit the water to potential haul out structures near the Project area.

Of the 42 California sea lions observed at the NBPL HDA, most were observed during the 12- and 16-in pile removal activities (n=25, 59.5%), with the remaining individuals observed during pile installation (n=17, 40.5%) for the 16-in piles. When evaluating observations during the active pile removal or installation relative to non-activity observations, a majority (n=34, 81.0%) of the individuals were observed before, in-between, or after demolition or construction activities, and the remaining individuals (n=8, 19.0%) were observed during active demolition or construction (Table 3-26).

Table 3-26. Summary of California Sea Lion Sightings During Monitoring Efforts (NBPL HDA).

Type of Activity	Pile Size	All Monitoring Effort		During Construction/ Demolition			Non-Activity		
		Indiv.	Sightings	Indiv.	Sightings	Indiv. per Sighting	Indiv.	Sightings	Indiv. per Sighting
Construction	16-inch	17	15	3	3	1.00	14	12	1.17
Demolition	12-inch	4	4	2	2	1.00	2	2	1.00
	16-inch	21	20	3	3	1.00	18	17	1.06
TOTAL		42	39	8	8		34	31	

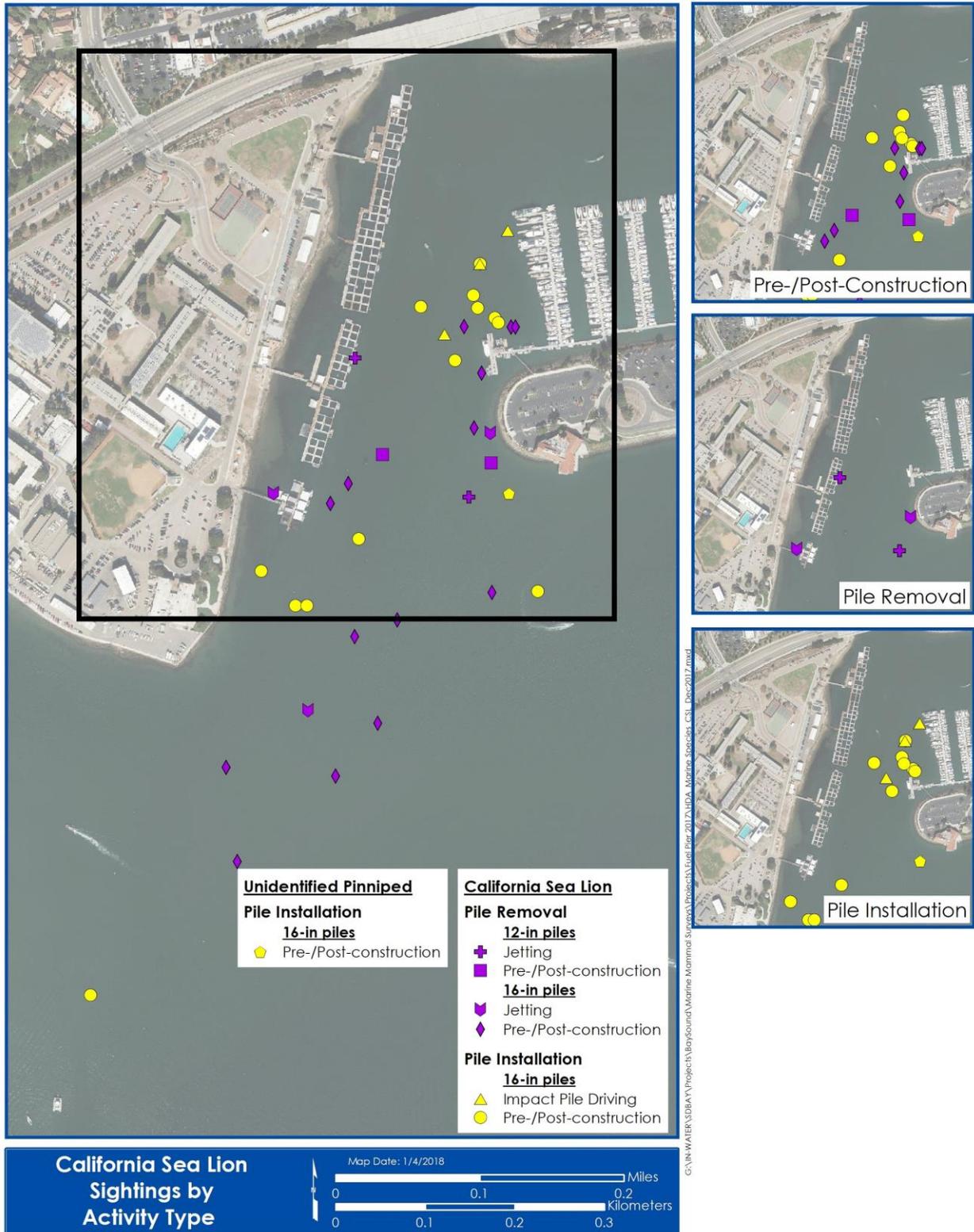


Figure 3-35. All California Sea Lion Sightings Before, During, and After Pile Removal or Installation Activities (NBPL HDA).

A total of three shutdowns occurred during the removal of piles using external high-pressure water jetting. All three shutdowns occurred due to adult male California sea lions on two separate days, with one male causing two shutdowns on one day (Appendix D1). The total time for the three shutdowns was eight minutes and nine seconds, with an average of two minutes forty-three seconds per event, or, if averaged over the 22 days of monitoring effort, twenty-three seconds per monitoring day.

Based on the ability to classify both age and sex of individuals, adults and subadults were the only two age groups that could be classified as male or female. For the individuals observed at the NBPL HDA, adult California sea lions comprised most of the observations (n=29, 69.0%), followed by subadults (n=9, 21.4%), unknown age class (n=9, 7.1%), and juveniles (n=1, 2.4%). Of the 38 adults or subadults that could be classified as male or female, most of the individuals were male (n=21, 50.0%), or female (n=8, 19.0%). The remaining observations were noted as mixed groups of males and females or individuals of an unknown age class.

Most of the individuals were observed in the mornings (before the 12:00 hour) with a reduction in the number of individuals observed after the 12:00 hour (Figure 3-36). Group size was also relatively consistent throughout the day with from one to two individuals per group seen throughout the duration of the observation periods. While the data below indicates that there were no observations during the 06:00, 17:00, and 18:00 hours, it should be noted that there was only just over two hours of effort during the 6:00 hour, just over one hour of monitoring during the 17:00 hour, and no monitoring effort after 18:00.

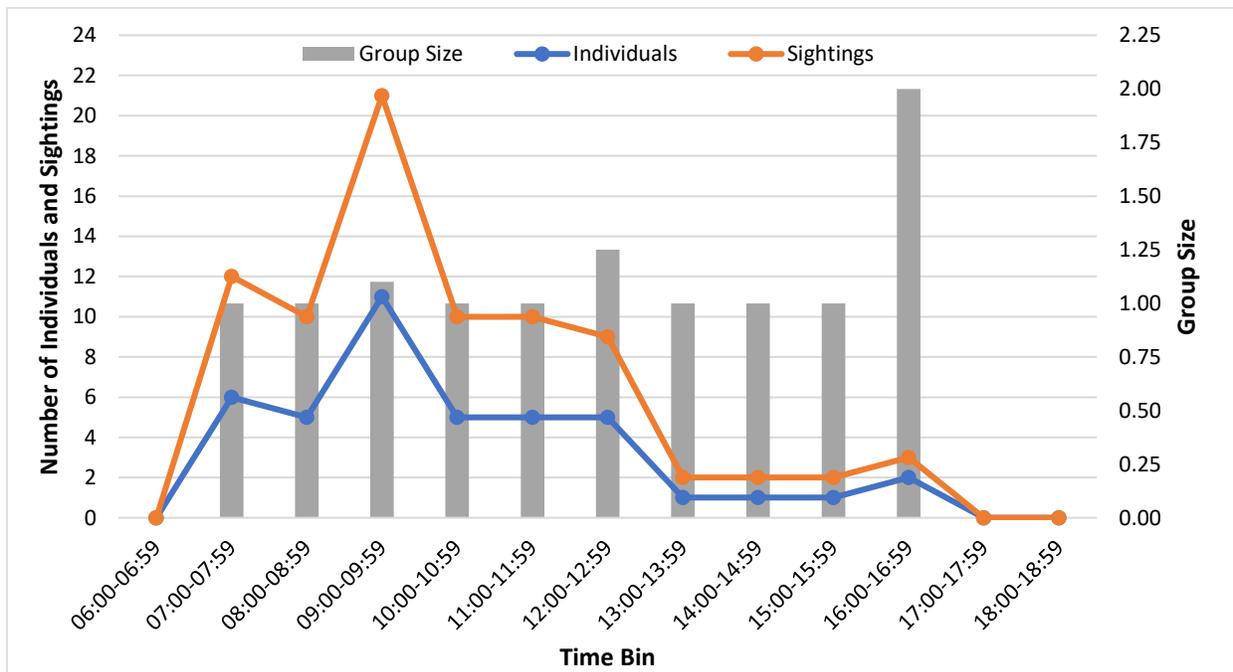


Figure 3-36. California Sea Lion Sightings and Individuals per Hour During Pile Removal and Installation (NBPL HDA)

Most California sea lions were observed swimming (n=23, 54.8%), followed by successful foraging (n=6, 14.3%), diving and milling (n=5, 11.9% for both behaviors), and rating (n=3, 7/1%). When evaluating behavior relative to pile removal versus pile installation, diving was the only

behavior that was not observed during pile installation, but swimming was still the most observed behavior across both activity types. Successful foraging was the second most observed behavior likely due to the forage habitat (pilings and docks associated with a marina, see Figure 3-35) that was close to the Project-related activities, with all of the observations of sea lions with unidentified fish in their mouths. No adverse behaviors were noted as potentially occurring as a direct result of a project-related stimulus or stimuli.

3.3.4.1.2 Coastal bottlenose dolphins

There were three sightings of five coastal bottlenose dolphins observed during monitoring efforts at the NBPL HDA (Figure 3-37). All were in September, with one observation of three individuals on 7 September at approximately 10:00 during the pile removal phase, and two observations of one individual each on 26 September (7:29 and 9:07, respectively) during the pile installation phase. Each observation was during the non-activity monitoring before the removal or installation activity had started, and they were not exposed to Level B noise.

The observation of the three individuals was outside of the embayment associated with the Project area closer to the shipping channel. This group did not enter the embayment and was heading to the southwest towards the entrance to the Bay. Both dolphins on 26 September were initially observed heading out of the embayment near the marina to the east of the crane barge, and then headed south towards the entrance of the Bay. This would indicate that they had been in either of the two channels to the north or east of the Project prior to the MMO arriving on station. All individuals were observed swimming with consistent inter-breath intervals, indicating that they were likely transitioning from one location to another (i.e., not foraging).

3.3.4.2 *Other Species Monitored*

3.3.4.2.1 Green sea Turtle

A single green sea turtle was observed at the NBPL HDA on 11 September at 09:16. It was initially observed approximately 5 m (16.4 ft) off the south end of the crane barge during a pre-construction survey for high-pressure water jetting for pile installation (Figure 3-38). The individual surfaced once near the barge, swam to the east, surfaced one more time as it appeared to be heading towards the marina to the east of the Project site, and then was not seen again.

3.3.4.2.2 California Least Tern

Terns were observed during both months of observation effort at the NBPL HDA, with the first observation on 31 August, and the last observation on 27 September. A total of 32 terns were observed during 18 observations (Figure 3-38), for a mean group size of 1.78 individuals per observation, with a maximum group size of three terns. Of the 32 individuals observed, a majority (n=28, 87.5%) exhibited foraging behavior (i.e., hovering in place while looking at the water, or diving), and the remaining individuals (n=4, 12.5%) were traveling through the area. Of the 28 Terns that showed a foraging behavior 14 (50.0%) were observed with fish in their beaks, and 14 (50.0%) were seen to be hovering or diving, but were too far away to see whether they had a fish in their beaks after a dive. There were two observations of five individual at 200 and 175 m (656 and 574 ft) to the south of the MMO that were observed during pile jetting to remove piles, with the behavior of both observations noted as successful foraging. Of the three observations of four individuals traveling through the area, there was one observation each of animals traveling to the south, north, and southwest.



Figure 3-37. All Coastal Bottlenose Dolphin Sightings Before, During, and After Pile Removal or Installation Activities (NBPL HDA).

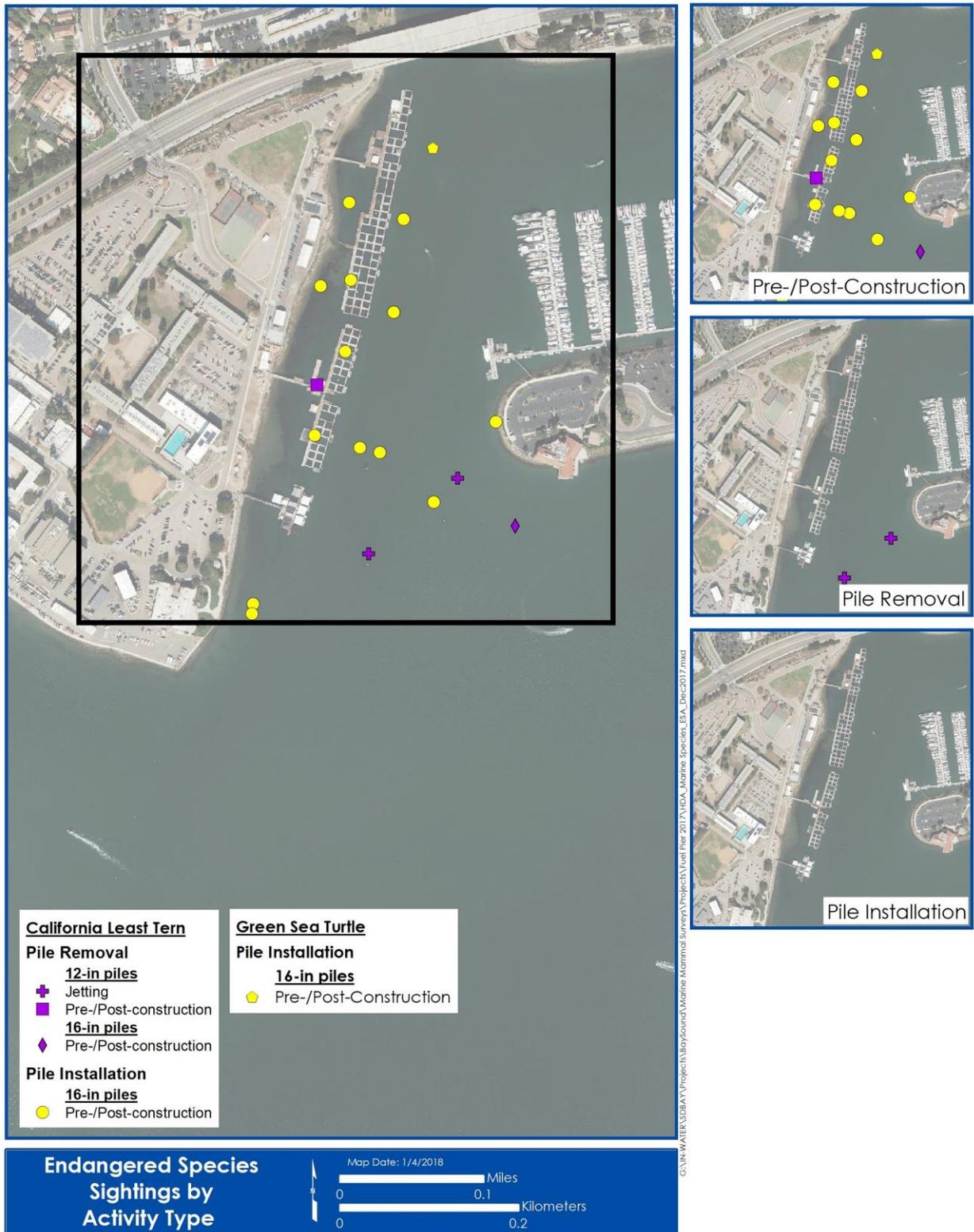


Figure 3-38. All ESA-listed Species Sightings Before, During, and After Pile Removal or Installation Activities (NBPL HDA).

3.3.4.3 Sightings of Marine Mammals Not Covered Under IHA #4

All mammals observed at the NBPL HDA during the pile installation and demolition activities from 8 October 2016 to 7 October 2017 were addressed as part of the IHA #4.

3.3.4.4 Sightings of Marine Species and Environmental Conditions

Environmental data during the two months of monitoring at the NBPL HDA were consistent with previous reporting periods. Most sightings occurred during a BSS of 1 or 2 (Figure 3-39), clear or cloudy conditions (Figure 3-40), and with moderate visibility of from 1.5 to 10 km (0.93 to 6.2 miles; Figure 3-41). Sea surface temperatures⁴ during the two months of monitoring averaged 73.7 °F (23.2 °C), with average temperatures 74.2 °F (23.4 °C) in August and 73.2 °F (22.9 °C) in September. Over the two months, the minimum and maximum temperatures of 68.0 °F (20.0 °C) and 77.0 °F (25.0 °C) were both recorded in August, respectively (see Figure 3-29 for the water temperature data for August and September). During all monitoring at the NBPL HDA, there were more sightings during the ebb tide (n=38, 62.3%) than during the flood tide (n=23, 37.7%).

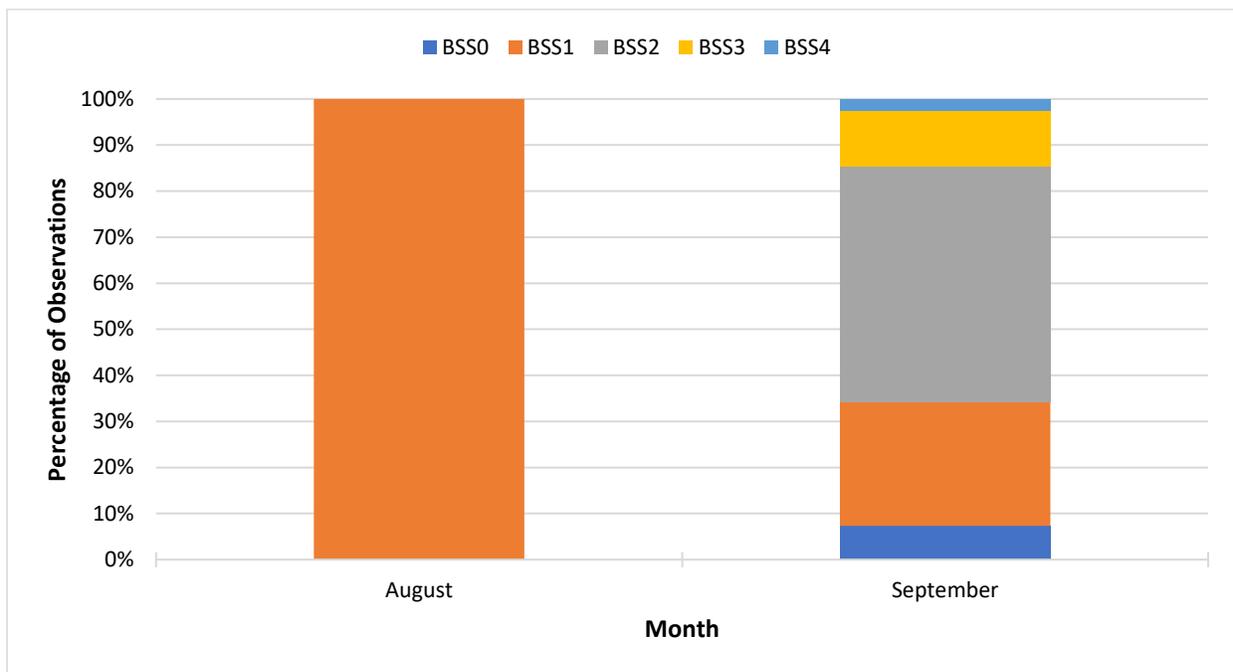


Figure 3-39. Sightings by Beaufort Sea State per Month (NBPL HDA).

⁴ Water temperature data were from the National Data Buoy Center (Station #: 9410170) located in San Diego Bay at 32.714, -117.174 (NDBC 2017)

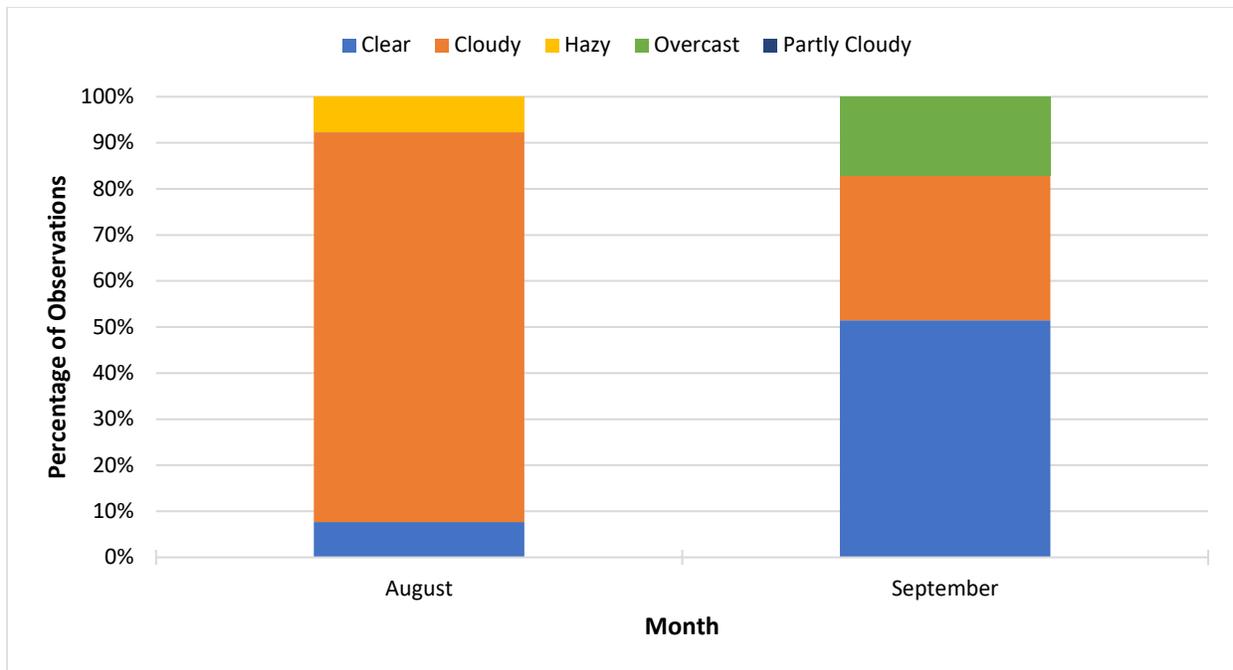


Figure 3-40. Sightings by Sky Cover per Month (NBPL HDA).

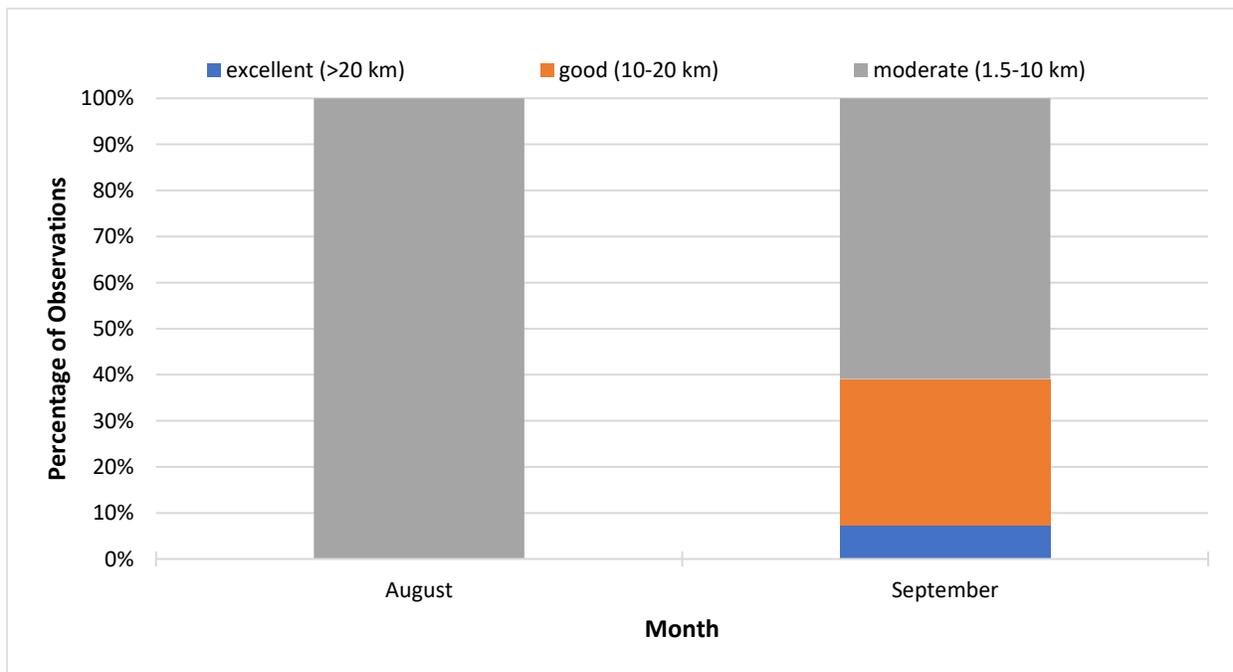


Figure 3-41. Sightings by Visibility per Month (NBPL HDA).

3.3.4.5 Summary of Observed and Extrapolated “Take”

During pile removal and installation operations, the distances to the Level B ZOIs for each type of activity (pile jetting and impact pile driving) were determined using *in-situ* acoustic data. Based on this data, the distances to the Level B ZOIs were determined to be 70 m (230 ft) for impact pile driving, and 560 m (1,837 ft) for pile jetting. These distances to the Level B ZOIs were smaller than was projected in the IHA #4 Application (Navy 2016), as well as presented in NAVFAC SW (2017).

Furthermore, for pile jetting, NAVFAC SW (2017) only reported on source data (measured at 10 m [33 ft]) and used practical spreading loss to calculate the distance to the Level B ZOI for all activities using this technique. With more data points collected for these activities, and in the specific area associated with the NBPL HDA, the distances to the Level B ZOIs were adjusted accordingly. During impact pile driving, the distances to the 100 dB and 90 dB ZOIs were estimated to be 27 m (88.6 ft) and 83 m (272.3 ft), respectively. However, with no animals observed as hauled out in the Project area, no airborne “take” occurred during pile driving efforts. Airborne noise associated with the pile jetting did not exceed either of the airborne regulatory thresholds. As such, no airborne “take” occurred during Project-related activities at the NBPL HDA.

As with the NBPL Fuel Pier data, an assessment of Level B “take” is exclusively based on the number of marine mammals observed by the MMOs within the area potentially ensounded during pile driving and or pile removal activities. Of the two marine mammal species observed at the Project site, comprising 47 individuals over 42 observations, six (12.8%) California sea lions were observed in the area and were exposed to noise (during pile jetting only) that would have been considered as a Level B “take” (Table 3-27). None of these animals showed behavioral reaction to pile jetting that may have been considered an adverse reaction.

Table 3-27. Summary of Observed “Take” for Project-related Activities (NBPL HDA).

Species	Total Number of Animals Observed in the Water		Authorized Level B “Take”		Observed Level B “Take”	
	Indiv.	Sightings	Total ¹	Per Day ²	Total	Per Day ³ (% of Authorized “Take” per Day)
California sea lion ⁴	42	39	3,757	16.55	6	0.27 (0.16%)
Harbor seal	0	0	118	0.52	0	0.00
Coastal bottlenose dolphin	5	3	295	1.3	0	0.00
Common dolphin	0	0	361	1.59	0	0.00
Risso's dolphin	0	0	48	0.21	0	0.00
Pacific white-sided dolphin	0	0	12	0.05	0	0.00
Gray whale	0	0	27	0.12	0	0.00
Northern elephant seal	0	0	12	0.05	0	0.00
TOTAL	47	42	4,630		6	

Notes: ¹ Includes underwater Level B “take” only; ² Based on an estimated 227 days of construction and demolition; ³ Based on an actual 22 (May’17 to Oct’17) days of monitoring during Project-related activities; ⁴ Includes one unidentified pinniped (May’17 to Oct’17).

The amount of “take” for the unobserved areas associated with the NBPL HDA was calculated based on the same criteria as for the NBP Fuel Pier, with three factors used to calculate the unobserved “take”: 1) the amount of area not observed during individual activities, 2) a conservative density of animals based on the Project year with the highest density (IHA #3 Application, Navy [2015]), and 3) the amount of time of potential exposure during Project-related activities during IHA #4. Section 2.4.1.2.2 describes the methodology and values that were used to calculate the unobserved area beyond 300 m (984 ft), which was the distance used to calculate the potential for animals to be inside of the ensounded area, but outside of the visual range of an MMO. At the HDA, the only activity that had a Level B ZOI that was beyond the 300 m (984 ft) visible area was the pile

jetting with a distance to the Level B ZOI of 560 m (1,837 ft). Table 3-28 provides the extrapolated “take” for those animals that were observed in the NBPL HDA Project area, but were potentially outside of the observed area.

Table 3-28. Summary of Extrapolated "Take" for Project-related Activities (NBPL HDA).

Species	Density Estimate (animals/km ²) ¹	Unmonitored Level B ZOI (km ²)	Estimated Abundance	Time (hh:mm)	Extrapolated Takes
Pile Jetting					
California sea lion	15.9201	0.23	3.66	21:20	78.1
Coastal bottlenose dolphin	1.2493		0.29		6.1
TOTAL		0.23		21:20	84.2

Note: ¹ Density estimates were based on those included in the IHA #3 Application (Navy 2015) for this Project.

No extrapolation of “take” was performed for the six species that were authorized for taking under IHA #4 (NMFS 2016) but not observed during monitoring at the NBPL HDA. While it was not possible to unequivocally rule out the potential presence of any of these four species within the unobserved portion of the larger Level B ZOIs extending beyond the visual range of the MMOs, the likelihood of their occurrence was very low. Four of the species are known to have rare occurrence within the Bay (common dolphin, Pacific white-sided dolphin, northern elephant seal, and gray whale) or Project area (harbor seal), and one species (Risso’s dolphin) has the potential to occur but has not been previously reported within the Bay (NMFS 2016). Furthermore, the potential abundances of these species, had they been present, would have been expected to be low based on historical density estimates (Table 3-29).

Table 3-29. Potential Occurrence of Species Not Observed During IHA #4 Monitoring (NBPL HDA).

Species	Density Estimate (animals/km ²) ¹	Unmonitored Level B ZOI (km ²)	Estimated Abundance	Time (hh:mm)	Potential Abundance if Present Throughout Demolition
Pile Jetting					
Common dolphin	1.5277	0.23	0.35	21:20	7.5
Risso’s dolphin	0.2029		0.05		1.0
Pacific white-sided dolphin	0.0493		0.01		0.2
Northern elephant seal	0.0508		0.01		0.2
Harbor seal	0.4987		0.11		2.4
Gray whale	0.1150		0.03		0.6
TOTAL		0.23		21:20	11.9

Note: ¹ Density estimates were based on those included in the IHA #3 Application (Navy 2015) for this Project.

3.4 Summary of All Project-Related “Take” for IHA #4 (October 8, 2016 to October 7, 2017)

Throughout the whole of the monitoring timeframe, there were 152 days of monitoring effort, with 141 days of effort at the NBPL Fuel Pier and 22 days of effort at the NBPL HDA. Of the 152 days of effort, there were 11 days of exclusive effort at the NBPL HDA, with 11 more days with effort at both locations on the same day. During the 11 days of overlapping monitoring effort at both

Project locations, there was the potential that some animals may have been observed at both locations during active pile removal or installation; however, because of the distance between the two locations, identification of the same individual animal, or groups of animals, between the two locations was not possible. Therefore, no attempt was made to cross-reference sightings during these days, and any “take” was considered as separate for the Project locations.

The total observed Level B “take” during the IHA #4 monitoring period was 418 and total extrapolated “take” was 1,631 (Table 3-30). Level B “take” did not exceed the authorized “take” for any species specified in the IHA #4 (NMFS 2016). On a per species basis, the combined observed and extrapolated Level B “take” was 55% or less than the authorized amount. The species covered under IHA #4 that were not observed during any monitoring efforts were not considered as having the potential for “take” based on low potential densities and the unlikelihood of these species being in the Project area.

Table 3-30. Summary of Total “Take” During All Pile Removal and Installation Activities (October 8, 2016 to October 7, 2017).

Species	Authorized Level B “Take”	All Level B “Take”			
		Observed	Extrapolated	Total (% of Authorized)	Per Day ¹
California sea lion	3,757	393	1,463	1,856 (49.4%)	12.21
Harbor seal	118	21	43	64 (54.6%)	0.42
Coastal bottlenose dolphin	295	4	115	119 (40.3%)	0.78
Common dolphin	361	0	0	0	0.00
Risso’s dolphin	48	0	0	0	0.00
Pacific white-sided dolphin	12	0	0	0	0.00
Gray whale	27	0	10	10 (37.1%)	0.07
Northern elephant seal	12	0	0	0	0.00
TOTAL	4,630	418	1,631	2,071 (44.7%)	

Notes: ¹Based on 152 days of pile driving during the IHA #4 monitoring timeframes.

4.0 Discussion

4.1 Acoustics

Several activities associated with demolition of the old fuel pier were acoustically evaluated between 1 May and 7 October 2017. In-water acoustic measurements were recorded during the demolition pile clipping of 16 and 18-inch square concrete piles, chainsaw cutting of 16-inch square concrete piles, and jetting to remove 16-inch square concrete piles at the old fuel pier. In-water acoustic measurements also were recorded during jetting removal and installation of 16-inch round concrete piles and impact pile driving of 16-inch round concrete piles at the NBPL HDA. Airborne acoustic data were recorded during impact driving of 16-inch round concrete piles at NBPL HDA. The purpose of the acoustic data evaluation was to assess whether source levels exceeded the Level A injury thresholds, and to determine distances to the Level B harassment thresholds, if appropriate. This monitoring report, in conjunction with all of the other monitoring reports from previous years (NAVFAC SW 2014; 2015; 2016a,b; 2017), provides extensive acoustic data for a variety of pile driving and demolition activities in San Diego Bay.

4.1.1 NBPL Old Fuel Pier Demolition

4.1.1.1 Pile Clipping

During the current monitoring period, pile clipping data were recorded for 16- and 18-inch square concrete piles, with data recorded at source (10m [33 ft]) and far-field (from 27 to 309 m [89 to 1,014 ft]) distances for 16-inch piles, and at far-field distances (from 92 to 388 m [302 to 1,273 ft]) for 18-inch piles. Data collected at the source distance for 18-inch piles were previously collected during 2016 (NAVFAC SW 2016b) but were included in Table 3-5 for reference purposes. Maximum SPLs did not exceed 147.3 for the 16-inch piles and 154.3 dB rms for the 18-inch piles at source (10 m [33 ft]); therefore, they were lower than the Level A (180 to 190 dB rms) but within the Level B (120 dB rms) threshold criteria. It was not possible to identify the distance to the Level B threshold due to higher ambient anthropogenic noise (i.e., vessel traffic). Therefore, the Level B threshold distance was estimated based on the average bay-wide ambient underwater sound level (129.6 dB rms) (NAVFAC 2015). Linear regression of data recorded at source and multiple far-field distances was used to estimate the distance to the average ambient underwater sound level as 295 m (968 ft) for 16-inch piles and 319 m (1,047 ft) for 18-inch piles.

The maximum SPL at the source distance during clipping of 18-inch piles during IHA #3 (154.3 dB rms) was similar to previous monitoring. A peak value of 153.4 dB rms was recorded during clipping of 18-inch concrete piles during IHA #2 (NAVFAC SW 2015). However, limited far-field data were collected during clipping of the 18-inch piles during the previous monitoring and the distance to the Level B threshold could not be estimated based on the collected data. As a result, a simple practical spreading loss model ($15_{\log R}$) model was used to predict the distance to the Level B ZOI. The additional collection of far-field acoustic data during IHA #4 allowed for a more realistic calculation of the Level B ZOI for the 18-inch concrete pile clipping based on *in situ* data, rather than a simplistic model which did not account for local environmental or bathymetric conditions.

4.1.1.2 *Pile Cutting (Underwater Chainsaw)*

An underwater hydraulically-actuated chainsaw was used for the first time during this monitoring period for pile cutting prior to removal. The maximum SPL at the source distance (10 m [33 ft]) during chainsaw cutting of 16-inch concrete piles (149.8 dB rms) was lower than the Level A threshold criteria (180 or 190 dB rms) but within the Level B (120 dB rms) threshold criteria. The Level B ZOI (using the bay-wide ambient sound level of 129.6 dB rms) was 71 m (233 ft) based on *in situ* data collected at multiple distances from source.

The maximum sound level of the underwater chainsaw (149.8 dB rms) was similar to that during clipping of 16-inch piles (147.3 dB rms) and 18-inch piles (154.3 dB rms). However, the underwater sound profile and ZOIs for these two types of equipment differed. During demolition removal of 16-inch square concrete piles, the underwater chainsaw had a greater sound attenuation rate (0.3 dB/m) compared to the pile clipper (0.06 dB/m); consequently, the Level B ZOI was smaller during chainsaw cutting (71 m [233 ft]) than pile clipping (295 m [968 ft]). This would indicate that the noise generated but the underwater chainsaw had a lower energy than other activities that had a Level B ZOI.

4.1.1.3 *Pile Jetting (Removal)*

A 2-inch nozzle high pressure water jet was used to loosen piles prior to crane removal at the old fuel pier. Maximum SPLs during jetting of 16-inch square concrete piles did not exceed 152.3 dB rms at source (10 m [33 ft]); therefore, they were lower than the Level A (180 to 190 dB rms) but within the Level B (120 dB rms) threshold criteria. The Level B ZOI (using the bay-wide ambient sound level of 129.6 dB rms) was 234 m (767 ft) based on *in situ* data collected at multiple distances from source. The distance to the Level B threshold during jetting removal of 16-inch square concrete piles was less than what was estimated during jetting removal of 16-inch round concrete piles at NBL HDA (see Section 4.1.2.1 below).

4.1.2 NBPL HDA

4.1.2.1 *Pile Jetting (Pile Removal and Installation)*

A five-nozzle high pressure water jet was used to loosen piles prior to crane removal at the NBPL HDA. Maximum SPLs during jetting of 16-inch round concrete piles did not exceed 157.6 dB rms at source (10 m [33 ft]); therefore, they were lower than the Level A (180 to 190 dB rms) but within the Level B (120 dB rms) threshold criteria. The Level B ZOI (using the bay-wide ambient sound level of 129.6 dB rms) was 558 m (1,830 ft) based on *in situ* data collected at multiple distances from source.

The Level B ZOI distance during jetting removal was nearly twice as large at NBL HDA (558 m [1,830 ft]) compared to that at the old fuel pier (234 m [767 ft]). There was a difference in the nozzle end of the water jet used at the old fuel pier (single 2-inch nozzle) compared to that at NBL HDA (five small nozzles), but the jet pipe diameter and length as well as water pressure used were the same at both locations. The maximum SPL at the source distance (10 m [33 ft]) was only slightly greater with the five-nozzles (157.6 dB rms) when compared to the 2-inch nozzle (152.3 dB rms), indicating that nozzle configuration did not fully account for the substantial difference in the Level B ZOIs during jetting pile removal between the two locations. The underwater sound

attenuation rate during jetting at the NBPL Fuel Pier (0.01 dB/m,) was half of that at the NBPL HDA (0.05 dB/m). The difference in the sound attenuation rate likely also related to water depths being shallower at NBPL HDA, which had water depths of approximately 3 to 4 m (10 to 13 ft). This is in comparison to the old Fuel Pier which had varying depths ranging from approximately 4.6 to 6 m (15 to 20 ft) directly around the old pier, but with depths of 12 to 18 m (40 to 60 ft) on the outside of the new Fuel Pier. However, as shown in Table 3-20, the acoustic data collected furthest from the source (240 and 328 m [787 ft and 1,076 ft] for pile removal and installation, respectively) had higher dB levels than dB levels collected closer to the pile. This is more likely due to the proximity to the San Diego Bay shipping channel rather than any Project-related noise associated with pile jetting. As a result, the calculated distance to the point at which 129.6 dB was reached for these actions may have been artificially increased (see Figure 3-31a,b) and the actual Level B ZOI is likely at a distance between 240 m (787 ft) and 558 m (1,830 ft) for pile removal and 328 m (1,076 ft) and 558 m (1,830 ft) for pile installation (using a single nozzle water jet). To be conservative, a rounded distance of 560 m (1,837 ft) was used for all assessment of Level B “take” for high-pressure water jetting during both pile installation and removal.

High pressure water jetting was used to install 16-inch round concrete piles, by focusing pressurized water through a 5 cm (2-inch) pipe centrally located in middle of the pile. The maximum SPL at the source distance (10 m [33 ft]) during jetting installation was considerably quieter (137.7 dB rms), likely due to the dampening effect of the outer concrete, than recorded during jetting removal (157.6 dB rms). However, while the source levels were approximately 20 dB rms lower for pile installation using the internal piping, the dB levels recorded at the far-field distances were similar (see Table 3-20). While a transmission loss rate could not be calculated for the pile installation due to a poor fit regression curve, this would indicate that the rate of transmission loss is higher for the single nozzle pipe than for the internal pipe.

4.1.2.2 Impact Pile Driving

Of the 63 12-inch square and 16-inch round concrete piles removed during demolition of the MMP facilities at NBL HDA, 23 of the 16-inch concrete piles were reused onsite to reconfigure the docks at that location. The 16-inch piles were driven with an American Piledriving Equipment, Inc. D-25 impact hammer after being pre-sunk via a high-pressure water jet. The maximum underwater SPLs (170.0 to 181.3 rms) at the source distance (10 m [33 ft]) ranged above and below the Level A threshold (180 dB rms) for pinnipeds, but no values exceeded the 190 dB rms Level A threshold for cetaceans (see Table 3-21). The 180 dB Level A ZOI was calculated to be less than 10 m (33 ft) and the Level B ZOI was measured to be 64 m (210 ft) based on *in situ* acoustic data recorded from multiple distances from source. As a result of the small 180 dB Level A ZOI, a minimum 10 m (33 ft) ZOI was monitored for the potential for physical interaction with pile driving activities. The maximum underwater SPLs at the source distance (170.0 to 181.3 rms) measured with the Hydro DB USLM during IHA #4 were similar to those recorded during impact pile driving of 45, 16-inch concrete piles during IHA # 1 (average maximum value of 176.6 dB rms) using the Larson Davis 831 using a Reson TC 4033 hydrophone.

Maximum airborne noise source values (measured at 15.2 m [50 ft]) during impact driving of 16-inch concrete piles ranged from 109.7 to 112.8 re 20 μ Pa, with average values ranging from 101.2 to 109.8 re 20 μ Pa. Based on these data, the airborne 90 dB Level B harassment threshold for harbor seals was measured at a distance of 83 m (272 ft), and the 100 dB Level B airborne harassment threshold for

California sea lions was measured at 27 m (89 ft). These data were similar to the airborne data collected during IHA 1 at the NBPL HDA, which had airborne source SPLs ranging from 104.5 to 111.3 dB re 20 μ Pa. While the values collected during IHA #4 showed that there were defined Level B airborne ZOIs, no pinnipeds were observed to haulout on docks near the NBPL HDA Project area during impact pile driving; therefore, no airborne “take” was evaluated as part of the monitoring protocols.

4.2 Marine Species

Monitoring efforts associated with the Project occurred on 152 days from 8 October 2016 to 7 October 2017, with this year the first year that all in-water Project-related activities did not stop due to the Tern breeding/nesting season (1 May to 15 September). Monitoring associated with previous IHAs for the Project primarily occurred on various numbers of days between October and April, and then again during September and October of the following year. Most of the monitoring days across multiple IHAs were during January to April, though. Review of data collected during the months of January through April indicates there were fewer individuals and sightings during IHA #4 (2016/2017) and the prior IHA #3 (2015/2016) when compared to IHA #2 (2014/2015), but that more animals were observed during IHA #4 than during IHA #3. Monitoring efforts during IHA #1 (2013/2014) also occurred during these months, but only on nine days at the new NBPL Fuel Pier or at the NBPL HDA, and were not necessarily comparable due to the limited number of monitoring days. When adjusting for effort during IHA #s 2, 3, and 4 (Table 4-1), the three species that were observed in all years were seen more often in 2014/2015 than in the following two years of monitoring effort in the same general area. However, when comparing last year (2015/2016) to the current year, and adjusting for effort, California sea lions and harbor seals both increased in numbers per day during the same time-period (Table 4-1), while coastal bottlenose dolphins slightly decreased on a per day basis. Because the last two years of monitoring effort showed only relatively small changes in individuals per monitoring day, the presence of these three species appear to have stabilized in the Bay since the monitoring efforts in 2014/2015.

Table 4-1. Summary of Previous and Current Years’ Individuals per Day.

Species	Individuals per Day ¹		
	IHA #2 (2014/2015)	IHA #3 (2015/2016)	IHA #4 (2016/2017) ²
California sea lions	88.52	8.05	14.67
Harbor seals	2.48	0.47	0.58
Coastal bottlenose dolphins	6.95	0.48	0.44

Notes: ¹Based on 100 (IHA #2), 51 (IHA #3), and 152 (IHA #4) days of monitoring effort

²Includes sighting from both Project locations.

More than likely the trend noted in Table 4-1 has been influenced by environmental fluctuations as part of the recent El Niño/La Niña event that has occurred in the Pacific Ocean since 2014. Warmer El Niño sea surface temperatures developed toward the end of 2014, persisted throughout 2015 and early 2016, weakened with La Niña conditions in the last half of 2016, and nearly neutral conditions occurred in 2017 (NOAA 2018c). Water temperatures during the months when monitoring occurred for all years (January through April) averaged 63.3°F (17.4°C) during the IHA #2, while average water temperatures were warmer during IHA #3 and IHA #4 at 65.1°F (18.4°C) and 64.1°F (17.5°C), respectively. These average temperatures were higher than the

average water temperature for the region between January to April 2005-2012, 60.4°F (15.8°C), a period influenced more by cooler La Niña conditions (NOAA 2018c). Figure 4-1 shows that winter-spring sea surface temperatures in San Diego Bay were highest during 2015 (strong El Niño period), intermediate during 2014, 2016 and 2017 (neutral to transitional periods), and lower in 2005 to 2012 and 2013 (more influenced by La Niña conditions).

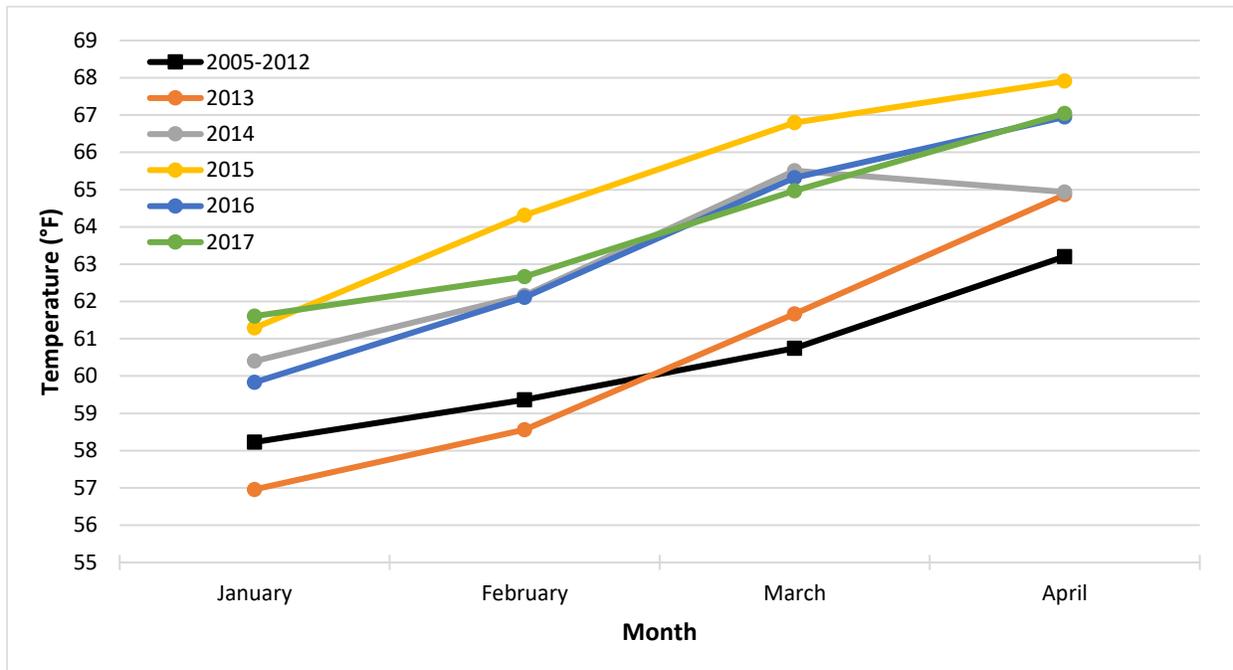


Figure 4-1. Comparison of Sea Surface Temperatures from January to April for 2005 to 2012 and 2013 to 2017.⁵

As another indication of changing environmental conditions during the project monitoring over the last few years, an Unusual Mortality Event was declared for California sea lions in 2013 (NOAA 2018a). California sea lion strandings data for 2016 (as of 01-July-2016) showed that strandings were much lower in 2016 than in 2015 but were still four times higher than from 2003 to 2012 (NOAA 2018b); strandings data through 2017 indicates that average California sea lion strandings may be returning closer to normal (NOAA 2018b).

During May 2017, there were two incidents of marine mammals reported to the NBPL stranding coordinator: 1) a single dead newborn California sea lion pup, and 2) a live-stranded harbor seal pup. The sea lion pup was born over a weekend (when no Project-related activities were occurring) on floating docks associated with P-122, which are known haulout sites for sea lions. When it was discovered, it still had placental material surrounding the carcass, with no obvious cause of death. An emaciated live-stranded harbor seal pup was observed on the beach to the east of P-122. It was reported to the NBPL stranding coordinator, who then brought it to the local stranding rehabilitation center for observation and rehabilitation. While these two strandings are more than the previous monitoring period (with no strandings reported during IHA #3), they are still far less

⁵ Water temperature data were from the National Data Buoy Center (Station #: 9410170) located in San Diego Bay at 32.714, -117.174 (NDBC 2017)

than the 2014/2015 (IHA #2) Project year which had 30 reports of dead or emaciated California sea lions in the Project area (NAVFAC SW 2015).

During both monitoring timeframes for IHA #4, the California sea lion was the most observed marine mammal during all Project-related activities across both Project locations in the water and hauled out, with 1,756 (93.3%) sightings. The harbor seals ($n=95$, 5.0% of all sightings) were the next most observed marine mammal, followed by the coastal bottlenose dolphin ($n=26$; 1.4% of all sightings), and gray whales ($n=1$, 0.1%). Four sightings of unidentified pinnipeds and unidentified dolphins made up the remainder of the sightings (<1%) during monitoring efforts. When comparing the two monitoring periods of IHA #4, the distribution of the three species present in the Bay during both monitoring timeframes (California sea lion, harbor seal, and coastal bottlenose dolphin) did not appreciably change, but there were generally more observations per day during the second half of monitoring efforts. When adjusting for monitoring effort for these three species (see Figure 3-10 [California sea lion], Figure 3-16 [harbor seal], and Figure 3-21 [coastal bottlenose dolphin]), the timing of their presence in the Bay per month fluctuated with each species. For instance, the California sea lions and coastal bottlenose dolphins had a higher number of individuals per observer day in September, but the harbor seals were present in higher numbers in March. The coastal bottlenose dolphin, however, also had a relatively high number of individuals per observer day in March/April as well. These fluctuations could be related to environmental variables associated with the change in the season, or possible prey availability in San Diego Bay. Beyond the data provided in this document, a full assessment of the potential factors that influence these species presence in the Bay during these timeframes would provide a better understanding of why their presence in the Bay fluctuates.

Similar to San Diego Bay, other construction projects have occurred along the western coast of the United States involving the installation of steel and concrete piles using vibratory and/or impact pile driving. In many of these areas, California sea lions are also common visitors or residents of the area and are known to haul out on man-made structures such as piers, docks, navigation buoys, and Naval vessels (Navy 2011; HDR 2012; Hart Crowser 2013; USCG 2013). In most cases, reported disturbance to marine mammal was minimal and included behavioral responses such as an increased alertness, barking, and/or looking in the general direction of the sound source (Navy 2011; USCG 2013). Animals occasionally left the immediate area, but it was also reported that many individuals did not exhibit any change in behavior and either remained in the area or continued on their original path of travel (HDR 2012; Hart Crowser 2013). In no report were behavioral changes such as increased swimming speeds, increased surfacing time, or decreased foraging observed (Navy 2011; HDR 2012; Hart Crowser 2013; USCG 2013). For the 8 October 2016 to 7 October 2017 timeframe, there were a total of 19 observations of 25 individual marine mammals (California sea lions: 17 observations, 21 individuals; harbor seals: 1 observation, 2 individuals; coastal bottlenose dolphins: 1 observation, 2 individuals) that apparently reacted to a stimulus that was either related or unrelated to Project activities (see Appendix D1). Of these observations, there were 5 (15.7%) abrupt changes in direction, and 27 (84.3%) flushes off piers and docks near the Project area, with 6 of these either directly, or possibly, related to the Project. While these behavioral changes appear to be a direct result of the Project-related activities, overall reactions to Project-related stimuli have been a rare occurrence during previous IHA monitoring periods for this Project (NAVFAC SW 2014; 2015; 2016a,b; 2017) when compared to the overall number of observations each year.

During demolition activities at the NBPL Fuel Pier for all of IHA #4, the activity with the longest time of use in one day was the caisson cutter with one day of just over four hours of constant use and one day of over eight hours of use across two wire saws on two different caissons. During the May to October 2017 timeframe, the activity with the longest average use per day was chainsaw with approximately forty-two minutes per day, and a measured distance to the Level B ZOI of 80 m (262 ft). However, while this activity had the longest amount of average time per use, and subsequently the longest average daily exposure of animals to noise that exceeded the Level B thresholds, it only had the sixth largest number of “take” (n=20). In comparison, pile clipping, which had a distance to the Level B ZOI of 320 m (1,050 ft) had the shortest average duration per use at two minutes and fourteen seconds, but was used on 94 days, and had the highest number of “take” (n=122) for any given activity. When evaluating the same variables at the NBPL HDA, the data shows that high-pressure water jetting for pile removal had both the highest average amount of time per use at nine minutes and fifty-four seconds on ten days as well as the largest number of “take” (n=4). This data indicates that the “take” at the NBPL Fuel Pier was more dependent on the number of days of exposure, rather than the duration of the exposure per activity. The “take” at the NBPL HDA was more correlated with both the number of days and amount of exposure per use.

When evaluating the effort data at both project locations (see Figure 3-1), the highest overall observer effort was in September (20 days, 184:30 hours), followed by December (12 days, 107:43 hours), and April (18 days, 93:54 hours). Based on this data it would be assumed that the most observations of marine species would occur during these months as well. However, when looking at the data for the NBPL Fuel Pier (where a majority of the observations occurred), most of the observations for all species occurred in March (21 days, 85:46) and September (Figure 3-9, Figure 3-15, and Figure 3-20). It should be noted that March had the highest number of observer days (n=21), followed by September (n=20), and April (n=18). When adjusting for effort, harbor seals and coastal bottlenose dolphins both had their highest number of individuals per observer hour in March (see Figure 3-16 and Figure 3-21), with the coastal bottlenose dolphins also seeing an increase in September as well. The California sea lions were most often observed in September, with another smaller increase in numbers in March (see Figure 3-16). Because this is the first year with year-round monitoring, this data provides a good estimate of the presence of these three species inside the northern portion of San Diego Bay. Based on an adjustment for observer effort, there seems to be two main periods when animals are present: March/April, and September. Water temperatures in March and April 2017 averaged approximately 65 and 67 °F (18.3 and 19.4 °C), respectively, and approximately 73 °F (22.8 °C) in September 2017, so a direct correlation between months with a large number of observations and water temperatures cannot necessarily be assessed. However, while a full assessment of the prey availability inside of the Bay was not part of this action, water temperature and prey species may be a contributing factor to presence of these three species in the Bay during these timeframes.

Environmental data during the two monitoring timeframes (October 2016 through April 2017, September to October 2017) were consistent with previous reporting periods, as well as between the two monitoring timeframes and did not limit the ability to observe marine mammals during the IHA #4 monitoring. Most of the monitoring occurred when the BSS ranged from 1 to 2 (Figure 3-26), with clear or cloudy conditions (Figure 3-27), and good visibility of from 10 to 20 km (6.2 to 12.4 miles; Figure 3-28). During both monitoring timeframes, most observations at the NBPL Fuel Pier were made at a BSS of 2 (n=587, 41.5%) followed by a BSS of 1 (n=424, 29.9%). When

evaluating mean group size relative to the BSS, overall average group sizes remained constant at from 1.56 animals per sighting at a BSS of 3 to 1.93 animals per sightings at a BSS of 1. Group size did not begin to shrink until a BSS of 4, when the average group size dropped to 1.28 animals per sightings. Mean group size did decrease between BSSs of 0/1/2 (1.74 individuals per sighting) when compared to BSSs of 3/4/5 (1.48 individuals per sighting), but the difference between the individuals per sighting relative to BSS was relatively small.

Per the monitoring protocol, a shutdown was called if an animal was seen crossing into, or was first observed inside, the buffered “shutdown” ZOI or the 10 m (33 ft) physical interaction ZOI. During monitoring for all of IHA #4, there were a total of 19 shutdowns or delays during pile removal or installation at both Project locations (n=16 NBPL Fuel Pier, n=3 NBPL HDA) totaling approximately one hour and twenty minutes, with an average of four minutes and twelve seconds per shutdown or delay. The longest delay of nineteen minutes and fifty-one seconds was initially caused by two harbor seals at the NBPL Fuel Pier that entered the ZOI from the north during pile driving for 30-inch piles. One of the individuals was not observed again, but the second individual loitered inside of the project area, dove, then was not observed again. The monitoring crew waited a full 15 minutes before allowing pile driving to begin. All other observations were of single individuals, or of a group of two individuals, and lasted from 35 seconds to sixteen minutes. The three shutdowns at the NBPL were all due to California sea lions approaching and diving under the crane barge during pile jetting operations. The barge had a width of 15.2 m (50 ft), and the shutdown was called because the animals could not be verified as outside of the ZOI while they were under water. The total number of delays or shutdowns for IHA #4 were comparable to the limited shutdowns or delays during IHA #3, but is in contrast to IHA #2, which had 138 shutdowns over 100 days of pile driving effort. During the first half of monitoring there were 11 shutdowns or delays at the Fuel Pier, and during the second half of monitoring there were 5 shutdowns at the NBPL Fuel Pier and 3 at the NBPL HDA due to a total of 25 animals (n=21 California sea lions, n=2 harbor seals, n=2 coastal bottlenose dolphins). No animals were first observed inside the actual Level A ZOIs. As has been the case with previous monitoring time periods (NAVFAC SW 2014; 2015; 2016a,b; 2017), construction or demolition shutdowns or delays due to animals entering the buffered or actual Level A ZOIs did not pose a significant delay to any Project-related activities. Appendix D1 provides a full accounting of all shutdowns or delays during both monitoring timeframes as well as at both locations.

Of the 19 observations that resulted in a construction shutdown or delay, a majority (n=12; 63.2%) of the sightings occurred during a pre-/post-construction survey time-period, followed by active pile installation or removal activities (n=2; 36.8%). No shutdowns occurred during vibratory pile driving. For the delays, the pile driving crew was generally performing maintenance on the hammer/crane and the shutdown did not directly affect their ability to drive piles. However, pile driving was considered as delayed because the pile driving crew was ready to drive at some point while the animals were inside of the shutdown ZOI. No animals were first observed inside the actual Level A or physical interaction ZOIs (10 m [33 ft], 20 m [66 ft], 50 m [164 ft], 75 m [246 ft], or 350 m [1,148 ft]) associated with the project, and no Level A “take” occurred during this project.

The maximum Level B (behavioral) harassment zone extended up to 3,000 m (9,843 ft) for vibratory pile driving and 2,000 m (6,561 ft) for impact pile driving at the NBPL Fuel Pier. Acoustic data was not collected at the NBPL Fuel Pier during the first half of monitoring to verify the distances to the

Level A/B ZOIs for pile driving because the data collected previously were considered as adequate for these actions. Acoustic data was collected for all other pile removal techniques at the both Project locations and ZOIs were adjusted accordingly. Based on acoustic data collected during the previous IHAs or collected during the October 2016 to April 2017 monitoring timeframe, the Level B ZOIs for all other pile sizes and activity types were smaller than provided in the IHA #4 Application (Navy 2016). An assessment of the distances to the Level A and the Level B ZOIs for pile driving at the NBPL HDA was needed to verify the distances provided in the IHA #4 Application (Navy 2016). Based on this data, the distance to the Level B ZOI for impact pile driving was reduced from 126 m (413 ft) to 70 m (230 ft). While high-pressure water jetting was not anticipated to occur at the NBPL HDA, the construction crew used this technique to both remove and install piles. As a result, acoustic data was collected at both source (10 m [33 ft]) as well as at varying far-field distances to identify the distances to the Level A/B. The resulting data indicated that Level A acoustic thresholds were not reached, and that the distance to the Level B ZOI was 560 (1,837 ft). For both monitoring timeframes and both Project locations, the MMOs were instructed to monitor for all marine mammal species anywhere in their visual range, irrespective of the distance, so that if the ZOIs expanded or contracted based on the *in-situ* acoustic data, any animal that was observed could be plotted relative to the adjusted ZOIs and an accurate assessment of “take” could occur, regardless of the animal location. Furthermore, this allowed the MMOs the greatest flexibility to document whether species not addressed in the IHA #4 Application (Navy 2016) were present in the project area. For instance, if a non-IHA marine mammal was observed as it entered the Bay, a complete shutdown of construction would be called, regardless of its proximity to the Level A/B ZOIs.

Four species authorized for Level B taking in IHA #3 were not observed during any of the marine mammal monitoring conducted during pile driving (i.e., common dolphin, Risso’s dolphin, Pacific white-sided dolphin, and northern elephant seal). The potential for any of these species to have been present within the unobserved portion of the Level B ZOIs during the pile installation or removal was considered very low based on their rare or undocumented occurrence within the Bay, low density estimates, and short duration of pile installation or removal activity that may have generated noise that extended outside of the Bay. If they had been present, the low potential number of individuals would not have changed the overall percentage of total Level B “take” relative to what was authorized.

Level B “take” did not exceed the authorized “take” for any species specified in the IHA #4 (NMFS 2016). The data presented in Table 3-30 show that the observed “takes” per day during the project timeframe were lower than anticipated based on the data provided in the IHA #4 Application (Navy 2016). On a per species basis, the combined observed and extrapolated Level B “take” was 55% or less than the authorized amount. The observed “take” for the three species (California sea lions, harbor seals, and coastal bottlenose dolphins) in IHA #4 was higher than observed during both IHA #2 (NAVFAC SW 2015) and IHA #3 (NAVFAC SW 2016a,b). IHA #4 covered 11 months of monitoring since demolition activities were allowed during the Tern breeding/nesting season; whereas, prior monitoring reports primarily covered construction activities over the 6-month period outside the Tern breeding/nesting season.

Green sea turtles were observed at both Project locations at different times of the year. The first green sea turtle observation was during active caisson cutting in January 2018 at the NBPL Fuel

Pier, while the second was observed during pile jetting at the NBPL HDA in September 2018. In both observations the individuals only surfaced once or twice, dove, and were not observed again. Also, both observations were in areas with lots of Project-related activity, with the NBPL Fuel Pier observation in-between the new Fuel Pier and the shoreline approximately 40 m (131 ft) from the active cutting, and the second individual was first observed very close (5 m [16.4 ft]) to the crane barge used for pile jetting, but during non-activity monitoring. Based on source levels associated with the wire saws used during caisson cutting (mean source levels from 136.1 to 151.0 dB rms [NAVFAC SW (2017a)]), the Level A threshold criteria were not reached, and a 10 m (33 ft) physical interaction ZOI was in place during caisson cutting. A shutdown was not called because the individual was observed to be heading away from the active demolition.

California least terns were also observed at both locations during Project-related activities. One of the primary concerns with Terns and the activities associated with the Project, is the ability to locate prey fish while hovering above the water and any potential impacts that Project-related activities would have on foraging success. As a result, during tern breeding/nesting season (1 May to 15 September), turbidity data was collected for all activities that used high-pressure water jets. Section 2.4.1.1 provides details on the methods that were used to collect the turbidity data. This data indicates that all demolition activities resulted in only small turbidity plumes that were visible at the surface. No plumes were observed that approached the 2.5 acres (10,117 m²) criteria that would have required halting and modifying those activities. The observation data also indicates that foraging behavior was the most observed behavior (65.5% of all behaviors), but the ability of the MMOs to observe successful versus unsuccessful foraging was hindered by the distances to the observed Terns (average of 113 m [370 ft]).

Turbidity data collected at both Project locations relative to the Tern breeding/nesting season showed that the activity with the highest likelihood of increasing sedimentation (high-pressure water jetting) in the Project areas did not exceed 10,117 m² (2.5 acres) or persist for longer than one hour. The maximum sediment plume was approximately half of the allowable maximum sediment plume size at 5,000 m² (1.23 acres) during pile removal at the NBPL HDA. This plume was a result of a pile that, when pulled, had a large amount of mud still on it as it was lifted out of the water. The size of the plume was also related to the pile being moved in the air from its installed position to the materials barge, it was shedding chunks of mud into the water along the path of the crane boom. Mean sediment plume size for the NBPL Fuel Pier (11.1 m² [0.003 acres]) was considerably smaller than at the NBPL HDA (131.7 m² [0.033 acres]). This was likely due to differences in environmental conditions at the two areas. The fuel pier location has deeper water depths (6 of 12 m [20 to 40 ft]) and sandy sediments; whereas, the NBPL HDA Project area has shallower water depths (3 to 4 m [10 to 13 ft]) and finer sediments.

Because this was the first year to monitor for most of the year (11 of the 12 months), the observation data associated with IHA #4 provides a good update to the presence/absence data for species specific to the Project area; however, because the monitoring for this Project was not based on a comprehensive survey protocol to assess abundance, this data should not be viewed as representative of the overall population of these species in northern San Diego Bay, but rather a simple estimate of the number of animals that occurred in the Project area.

5.0 Conclusion

No Level A “take” occurred during this IHA #4 reporting timeframe. The implementation of conservative marine species monitoring ZOIs and buffered shutdown zones reduced the likelihood of Level A injury “takes” without jeopardizing project objectives. There were relatively few shutdowns and the total time associated with shutdowns or delays was very small (0.2 %) relative to the total monitoring effort for construction and demolition during IHA #4.

Acoustic data collection accomplished the stated goals as identified in the IHA Application and Monitoring Plan, submitted as part of the IHA #4 Application (Navy 2016). Real-time measurements of underwater sound collected using the Hydro DB USLM effectively quantified SPLs of the various pile sizes, types, and in-water construction activities sufficient to validate established harassment ZOIs defined in the IHA (Navy 2016). Source SPLs during demolition activities (pile clipping, cutting, jetting) and pile installation jetting did not exceed existing Level A regulatory thresholds, and the Level B ZOIs were estimated relative to the average ambient noise level (129.6 dB rms) due to the difficulty of detecting the 120 dB rms threshold against the background influence of other anthropogenic noise (vessel traffic) in the Bay. Source SPLs during impact pile driving of 16-inch concrete piles ranged above and below the Level A threshold (180 dB rms) for pinnipeds, but no values exceeded the 190 dB rms Level A threshold for cetaceans. The 180 dB Level A ZOI was calculated to be less than 10 m (33 ft) and the Level B ZOI was measured to be 64 m (210 ft) based on *in situ* acoustic data recorded at multiple distances from source. The airborne Level B ZOIs during impact pile driving of 16-inch concrete piles were 27 m (89 ft) for California sea lions and 83 m (272 ft) for harbor seals; no pinnipeds were observed hauled out within these distances during the impact pile driving.

The total combined observed and extrapolated Level B “take” represented a small percentage (45%) of the total Level B “take” authorized for IHA #4. On a per species basis, the combined observed and extrapolated Level B “take” was 55% or less than the authorized amount. The extrapolated portion of the total “take” was likely overestimated since the calculation was based on density estimates when species occurrence was higher in the project vicinity. The relative abundance and diversity of marine mammals observed in San Diego Bay has substantially varied over the course of the monitoring program coincident with El Niño/La Niña conditions. Only four of the eight species associated with IHA #4 were observed during monitoring, and no marine mammal species was observed that was not covered under IHA #4. Overall, this project did not approach levels of “take” that would have required a re-consultation with NOAA.

ESA-listed species, green sea turtles and California least terns, were observed during monitoring efforts, but did not appear to have been impacted by Project-related activities. Two green sea turtles were observed in the Project area during demolition activities (caisson cutting, pile jetting). No physical injury occurred to the turtles and underwater SPLs were well below Level A thresholds for cetaceans. The primary behavior observed for California least terns during monitoring was foraging, although it was not always possible to discern foraging success due to their distance from Project-related activities. No turbidity plumes during pile jetting approached the 2.5 acres (10,117 m²) criteria that would have required halting and modifying those activities during the Tern breeding/nesting season.

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6.0 Acknowledgements

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7.0 List of Preparers

Project Oversight

Mitchell Perdue, Senior Biologist and Deputy Dive Safety Coordinator, NAVFAC SW, San Diego, CA.

Document Preparation

Karen Green, Project Manager/Senior Marine Scientist, Tierra Data Inc., Escondido, CA.

Todd McConchie, Senior Marine Scientist, Tierra Data Inc., Escondido, CA.

Mark Cotter, Marine Scientist, Tierra Data Inc., Escondido, CA.

Shannon Coates, Acoustic Technician, Tierra Data Inc., Escondido, CA.

Derek Langsford, Technical Reviewer, Tierra Data Inc., Escondido, CA.

Jim Kellogg, GIS Analysis/Data Analyst, Tierra Data Inc., Escondido, CA.

Scott Snover, GIS Analysis/Mapping, Tierra Data Inc., Escondido, CA.

Chelsea Snover, Publication Specialist, Tierra Data Inc., Escondido, CA.

Scientific Team

Dr. Peter Dahl, Principal Engineer and Professor, Applied Physics Laboratory and Department of Mechanical Engineering, University of Washington, Seattle, WA.

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Appendix A1¹: Turbidity Monitoring (8 October 2016 to 7 October 2017)

¹ This is an update to Appendix A from NAVFAC SW (2017)

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Introduction

The data in this appendix provides an accounting of all surface sediment plume size and duration data for each pile that was either installed or removed via high-pressure water jetting at both Project locations (NBPL Fuel Pier and NBPL HDA). Also, at the beginning of a new water jetting technique, underwater visibility was assessed via a secchi disk to identify sediment plumes that may not have been visible at the surface. The appendix is separated into subsections for each Project location with a table that identifies the sediment plume size and duration for each pile and location, and then separate reports for each monitoring effort using a secchi disk at that location. In some cases, the sediment plume size and duration data were lost due to technical issues. This data is identified by “Data unavailable” in the notes for each pile. However, given that the maximum plume size noted during all monitoring efforts did not exceed 10,117 m² (2.5 acres), or last longer than one hours, it is assumed that the sediment plumes for these piles were within regulatory parameters.

NBPL Fuel Pier

Date of Pile Jetting	Activity	Pile Number	Largest Extent of Plume (m)		Area		Plume Duration (hh:mm)	Notes
			L	W	m ²	acres		
20-Jun-17	Removal	12B	0	0	0	0.000	0:00	No visible plume.
		13B	0	0	0	0.000	0:00	No visible plume.
		21B	0	0	0	0.000	0:00	No visible plume.
21-Jun-17	Removal	19B	2	2	4	0.001	0:03	
		20B	3	3	9	0.002	0:02	
		20E	-	-	-	-	-	Data unavailable
		21E	0	0	0	0.000	0:00	No visible plume.
22-Jun-17	Removal	20E	3	3	9	0.002	0:02	
		21E	3	3	9	0.002	0:02	
23-Jun-17	Removal	14B	1	1	1	0.000	0:01	
		15B	0	0	0	0.000	0:00	No visible plume.
		16B	1	1	1	0.000	0:01	
		17B	0	0	0	0.000	0:00	No visible plume.
		18B	0	0	0	0.000	0:00	Pile was too far to be able to see the sediment plume.
30-Jun-17	Removal	9B	3	3	9	0.002	0:10	
		10B	0	0	0	0.000	0:00	No visible plume.
		10B	10	10	100	0.025	0:02	Second time jet was on this pile
		11B	13	13	169	0.042	0:03	
3-Jul-17	Removal	6B	0	0	0	0.000	0:00	No visible plume.
		7B	0	0	0	0.000	0:00	No visible plume.
		8B	2	2	4	0.001	0:03	
7-Jul-17	Removal	5B	3	3	9	0.002	0:05	
12-Jul-17	Removal	3B	0	0	0	0.000	0:00	No visible plume.
		4B	0	0	0	0.000	0:00	No visible plume.

Date of Pile Jetting	Activity	Pile Number	Largest Extent of Plume (m)		Area		Plume Duration (hh:mm)	Notes
			L	W	m ²	acres		
14-Jul-17	Removal	2B	0	0	0	0.000	0:00	No visible plume.
17-Jul-17	Removal	1E	-	-	-	-	-	Data unavailable
3-Aug-17	Removal	12E	0	0	0	0.000	0:00	No visible plume.
4-Aug-17	Removal	11E	0	0	0	0.000	0:00	No visible plume.
		12E	0	0	0	0.000	0:00	No visible plume.
7-Aug-17	Removal	12E	3	3	9	0.002	0:05	Spud Jet
		12E	0	0	0	0.000	0:00	Regular water jet
		13E	0	0	0	0.000	0:00	Spud Jet

Turbidity Monitoring for Caisson Jetting (23 December 2016)

Introduction:

Turbidity monitoring for sediment jetting around Caisson P-K-3 occurred on 23 December 2016 from approximately 1050 to 1330. Monitoring of turbidity occurred using a secchi disk at multiple locations along the piers (Figure 1), as well as visual monitoring during the entirety of jetting operations. The monitoring stations were chosen as representative locations that would provide the best assessment of whether any turbidity plumes exceeded 2.5 acres (10,117 square meters [m²]).

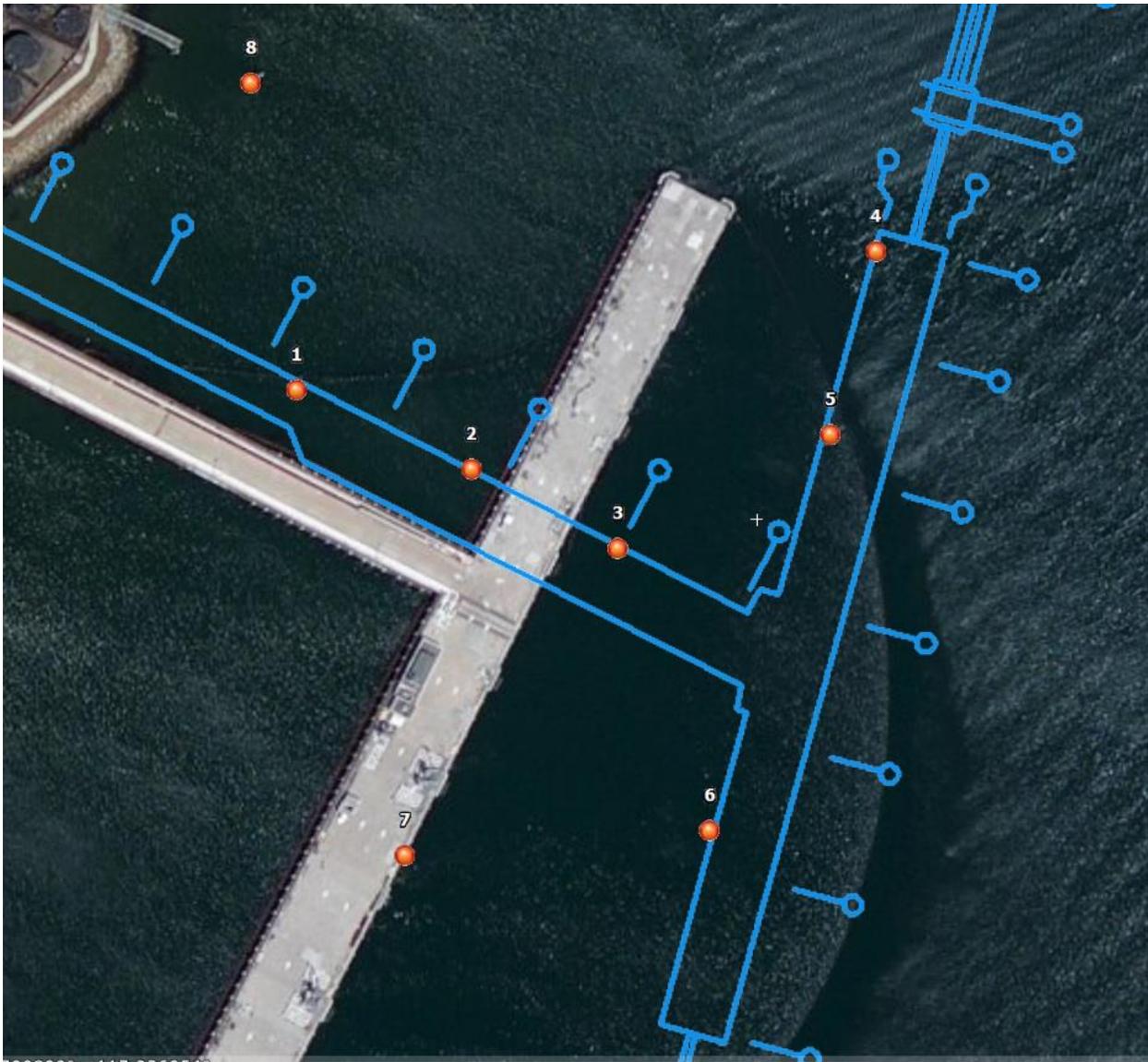


Figure 1. Turbidity Monitoring Stations.

Methods:

Ambient conditions were established between 1050 and 1130 at the eight locations on the new pier trestle, the new pier itself, and the old pier (see Figure 1). The secchi disk was lowered into the water until it was no longer visible, with marks on the line in increments of 3.28 feet (ft; 1 meter [m]). The depth at which the disk was not visible in the water column was recorded at each station. After jetting had started, at approximately 1200 and 1300, measurements were taken using the same methods as used to collect ambient conditions.

Results:

The low tide was at approximately 1220, and the jet was in use from 1143 to 1330. After the jet had been turned on and applied to the sediment, the visible plume extended to a maximum area of approximately 0.005 acres (20 m²; Figure 2). However, a majority of the plume dissipated quickly (within 3 to 5

minutes), and was not visible other than in the area near the caissons right after the jet was turned on (Photos 1, 2, & 3). In Figure 2, the red plume is at 1221 (11 minutes after a jetting session began and approximately at slack tide), the purple plume is at 1258 (6 minutes after a jetting session began) and the green plume is at 1326 (10 minutes after a jetting session began).



Figure 2. Visible Plumes at 1221 (Red), 1258 (Purple), and 1326 (Green).





Photo 1,2,3. Plume During Jetting (Photo 1: 1143, Photo 2: 1145, Photo 3: 1155)

The stations closest to the jetting (Stations #2 and 3) showed very little difference from ambient conditions (Table 1). There were some reductions in the secchi disk readings during the 1200 timeframe (1.6 to 3.28 ft [0.5 to 1 m] difference at three locations). The readings at the 1300 timeframe had more differences (<1 ft to 2.4 ft [0.25 to 0.75 m] difference at five locations).

Table 1. Results of Secchi Disk Readings.

Station #	Ambient		Measurement #1 (app 1200)			Measurement #2 (app 1300)		
	Time	Value	Time	Value	Value Diff from Ambient ²	Time	Value	Value Diff from Ambient ²
1	11:22	3.00	12:06	3.00	0.00	13:17	2.75	-0.25
2	10:50	3.50	12:00	3.00	-0.50	13:19	3.00	-0.50
3	10:55	3.00	11:55	3.00	0.00	13:15	3.25	0.25
4	11:12	3.50	12:08	3.00	-0.50	13:11	3.25	-0.25
5	11:08	4.00	12:10	3.00	-1.00	13:08	3.25	-0.75
6 ¹	11:20	3.00	12:11	3.25	0.25	-	-	-
7	11:30	3.50	12:33	3.50	0.00	13:22	3.75	0.25
8	11:25	3.00	12:28	3.25	0.25	13:00	2.75	-0.25

Notes: ¹Jetting stopped before a reading at Station 6 could be collected for Measurement #2.

²Yellow highlight indicates a negative change (decrease in visibility) from ambient.

Conclusions:

Overall, the visible plume during jetting was small, and did not approach the 2.5 acres (10,117 m²) area needed to stop jetting activities. The reduction in the overall plume over time may have been associated with the change from the incoming tide to the outgoing tide; however, no visible plume was observed to the south of the piers during jetting activities, or after jetting was completed.

Turbidity Monitoring for Caisson Jetting (28 December 2016)

Introduction:

Turbidity monitoring for sediment displacement around Caisson P-K-11 occurred on 28 December 2016 from approximately 0805 to 0850. Sediment removal utilized a pipe that sucked the sediment away from the caisson and discharged it into the water column (“airlifting”). Turbidity was monitored for this operation because it was a different technique than was used on 23 December 2016 (“jetting”).

Monitoring of turbidity occurred using a secchi disk at multiple locations along the piers (Figure 1). The monitoring stations were chosen as representative locations that would provide the best assessment of whether any turbidity plumes exceeded 2.5 acres (10,117 square meters [m²]).

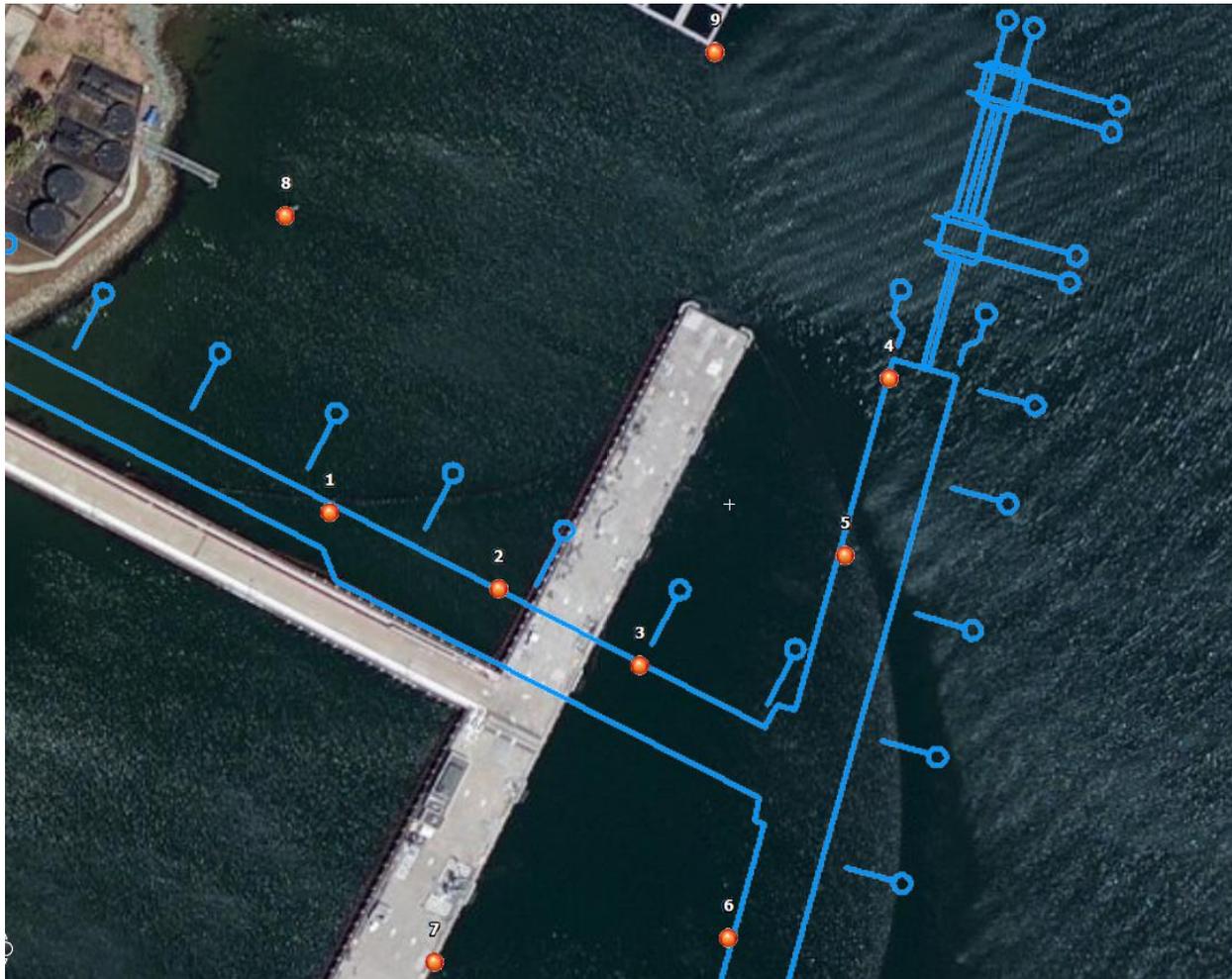


Figure 3. Turbidity Monitoring Stations.

Methods:

Ambient conditions were established between 0705 and 0750 at the nine locations on the new pier trestle, the new pier itself, the old pier, and one location via boat to the north of the piers (see Figure 1). A ninth monitoring location was added to the eight stations from 23 December 2016 due to the incoming tide. The secchi disk was lowered into the water until it was no longer visible, with marks on the line in increments

of 3.28 feet (ft; 1 meter [m]). For readings during ambient and airlifting operations, the depth at which the disk was not visible in the water column was recorded at each station.

Results:

After the airlifter had been turned on and applied to the sediment, the visible plume extended to a maximum area of approximately 0.001 acres (5 m²; Figure 4). High tide was at approximately 0800, transitioning to an outgoing tide until a low at approximately 1500. During both sessions of airlifting (at 0805 and 0848), the visible plume was small and dissipated quickly in the water column (within 3 to 5 minutes) and was not visible in the water column near the caissons (Photos 1, 2, & 3). At approximately 0900, airlifting was stopped due to a fuel leak from a hose that had been disturbed during airlifting operations.



Figure 4. Area of Visible Plume After the Airlifter was Turned On.

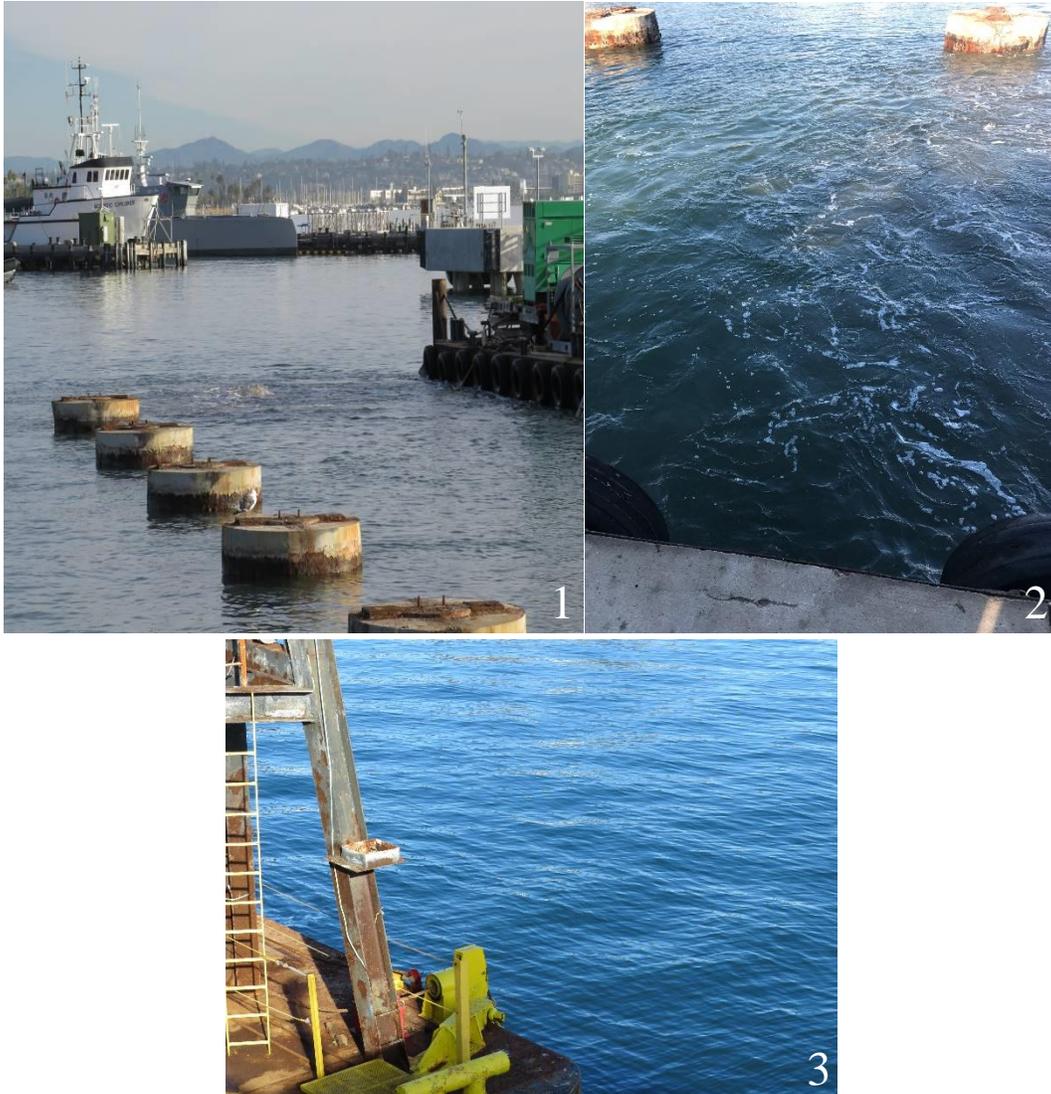


Photo 2. Airlifting Operations (Photos 1 & 2: ~0815, Photo 3: ~0915)

During ambient data collection, a tugboat was in the area, and ambient readings at Stations 2 and 7 were likely influenced as a result. Looking at ambient data from 23 December 2016, values were 3.50 m (11.5 ft) for both stations and are likely a better representation of ambient conditions at these two stations. Based on the 23 December 2016 ambient values, visibility increased relative to the data collected during airlifting.

The stations closest to the jetting (Stations #4, 5, and 9) showed very little difference from ambient conditions (Table 1). Only Stations 3 and 9 showed a change in visibility, but the differences were small and may have been influenced by factors outside of the airlifting operations.

Table 2. Results of Secchi Disk Readings.

Station #	Ambient		Measurement #1		
	Time	Value	Time	Value	Value Diff from Ambient ²
1	7:10	3.00	8:12	3.75	0.75
2 ¹	7:13	1.00	8:15	3.75	2.75
3	7:16	4.00	8:17	3.25	-0.75
4	7:20	3.50	8:20	3.75	0.25
5	7:25	3.50	8:22	3.50	0.00
6	7:30	3.50	8:25	4.00	0.50
7 ¹	7:36	2.00	8:29	3.75	1.75
8	7:05	3.00	8:06	4.00	1.00
9	7:50	4.50	8:50	4.25	-0.25

Notes: ¹The ambient values were influenced by a sediment plume caused by a tugboat in the area.

²Yellow highlight indicates a negative change (decrease in visibility) from ambient.

Conclusions:

Overall, the visible plume during airlifting was small, and did not approach the 2.5 acres (10,117 m²) area needed to stop airlifting activities. The reduction in the overall plume over time may have been associated with the change from the incoming tide to the outgoing tide; however, no visible plume was observed to the south of the piers during jetting activities, or after jetting was completed.

Turbidity Monitoring for Pile Jetting (22 June 2017)

Introduction:

On 22 June 2017, turbidity monitoring for sediment jetting around Pile Numbers 20E and 21E occurred from approximately 0751 to 1205. Monitoring of turbidity occurred using a secchi disk at two locations associated with a crane barge used to hoist the jetting equipment into place (Figure 1), as well as visual monitoring during the entirety of jetting operations. The monitoring stations were chosen as representative locations that would provide the best assessment of whether any turbidity plumes exceeded 2.5 acres (10,117 square meters [m²]). The white area in Figure 1 and Figure 2 identifies the approximate amount of pier decking that has been removed as of 22 June 2017.



Figure 5. Turbidity Monitoring Stations.

Methods:

Ambient conditions were established between 07:00 and 07:05 at two locations associated with the crane barge (see Figure 1). The secchi disk was lowered into the water until it was no longer visible, with marks on the line in increments of 3.28 feet (ft; 1 meter [m]). The depth at which the disk was not visible in the water column was recorded at each station. After two episodes of jetting had started, at approximately 07:50 and 10:34, measurements were taken using the same methods as used to collect ambient conditions. Station 1 was from 13.5 to 15 m (44.5 to 50 ft) from the two piles, and station 2 was from 27 to 30 m (89 to 102 ft) from the two piles. More stations were not used due to logistical and safety issues related to ongoing demolition activities.

Results:

The high tide was at approximately 09:00, and the jet was in use periodically from 07:51 to 12:05. After the jet was turned on and applied to the sediment, the visible plume extended to a maximum area of approximately 3x3 m (9.8x9.8 ft), or 0.007 acres (28.3 m²; Figure 2). However, a majority of the plume dissipated quickly (within 3 to 5 minutes), and was not visible other than in the area directly adjacent to the piles right after the jet was turned on (Figure 2 and Photo 1).

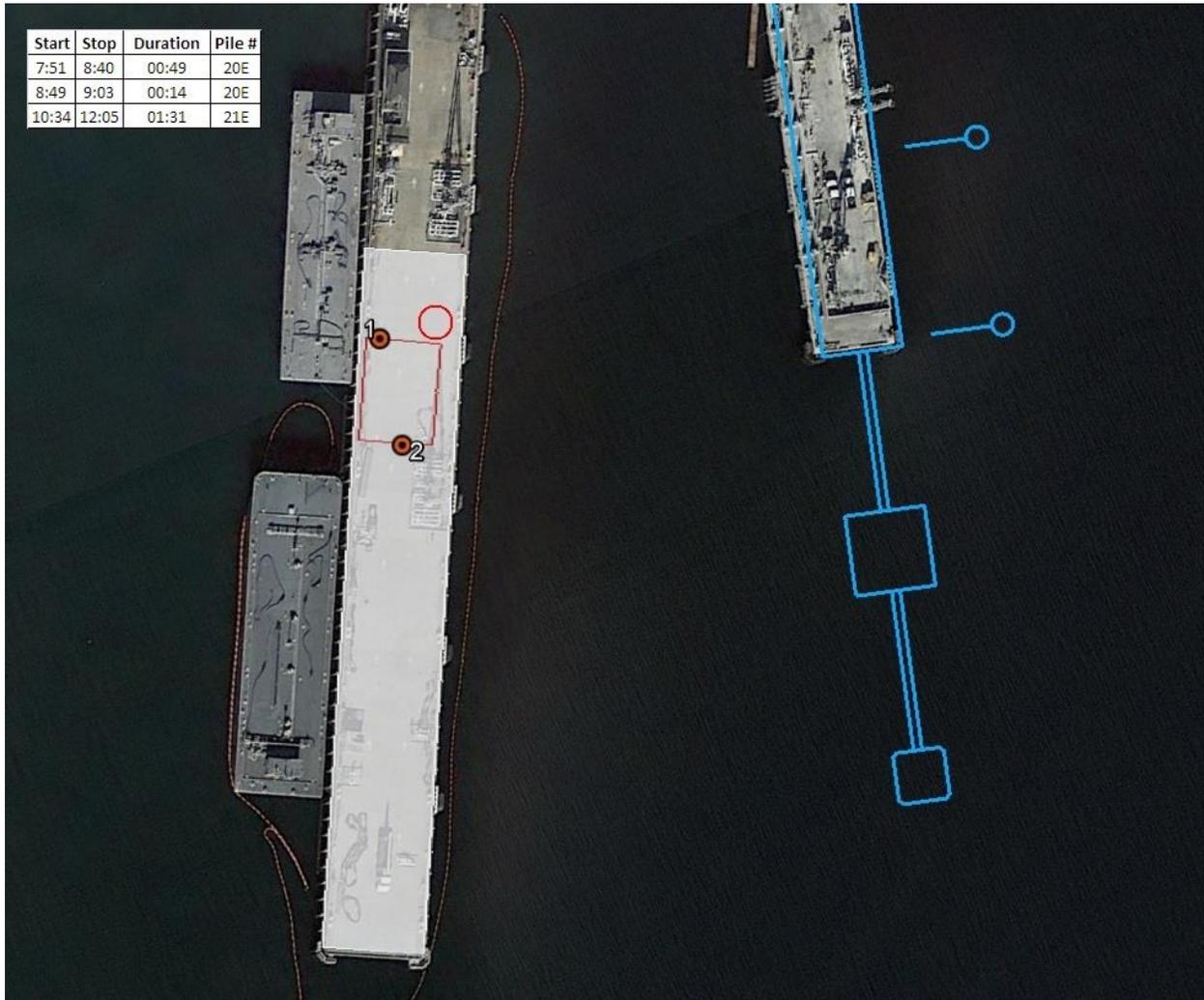


Figure 6. Are of the Visible Plume After the Pile Jet was Turned On



Photo 3. Visible Surface Plume During Jetting

Data collected with the secchi disk at both stations showed little to no difference from ambient conditions. Data for the first measurement was taken during an incoming tide, which would have pushed the sediment away from the station. However, with the change to an outgoing tide at approximately 09:00, a sediment plume would have been pushed towards the stations during the second set of measurements. Regardless, during this second set of measurements the water depth reading for the secchi disk at Station 1 increased by 0.25 m (0.82 ft), while the measurement for Station 2 did not change (Table 1).

Table 3. Results of Secchi Disk Readings.

Measurement #	Station #	Time	Value	Difference from Ambient
Ambient	1	7:00	2.00	
	2	7:13	2.25	
#1	1	8:23	2.00	0.00
	2	8:21	2.25	0.00
#2	1	11:16	2.25	0.25
	2	11:17	2.25	0.00

Conclusions:

Overall, the visible plume during jetting was small, and did not approach the 2.5 acres (10,117 m²) area needed to stop jetting activities. The secchi disk measurements showed little to no change relative to pile jetting, regardless of the tidal flow. This data is consistent with all other jetting techniques used thus far for project-related activities. Visual monitoring of sediment plumes will occur for all jetting techniques, and will be documented on a per pile basis. This data will be compiled at the end of the project and provided as an appendix to the report. If new sediment removal techniques are used throughout this project, turbidity monitoring following the same methods described herein will be followed and reported.

Turbidity Monitoring for Pile Jetting (30 June 2017)

Introduction:

On 30 June 2017, turbidity monitoring for sediment jetting around Pile Numbers 11B, 10B, and 9B occurred from approximately 10:15 to 13:15. Monitoring of turbidity occurred using a secchi disk at two locations associated with a crane barge used to hoist the jetting equipment into place (red box in Figure 1), as well as visual monitoring during the entirety of jetting operations. The monitoring stations were chosen as representative locations that would provide the best assessment of whether any turbidity plumes exceeded 2.5 acres (10,117 square meters [m²]). The white area in Figure 1 identifies the approximate amount of pier decking that has been removed as of 30 June 2017.

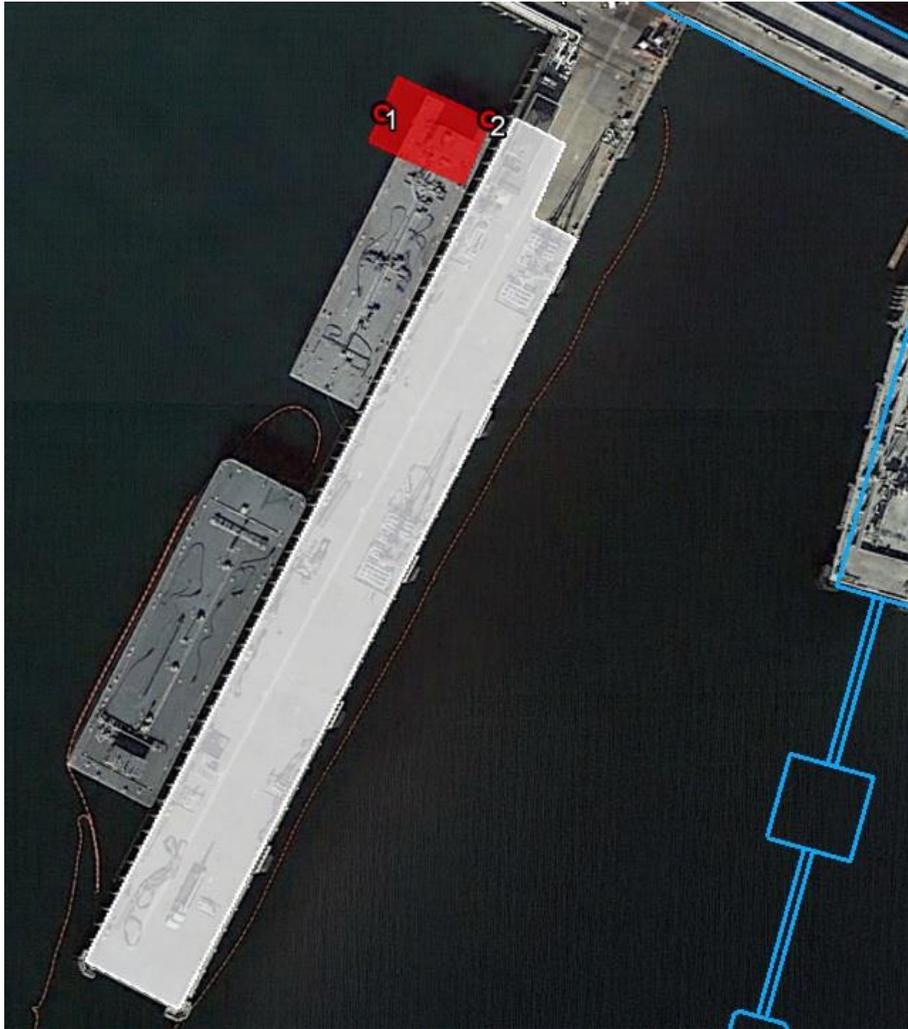


Figure 7. Turbidity Monitoring Stations.

Methods:

Ambient conditions were established between 09:40 and 09:45 at two locations associated with the crane barge (see Figure 1). The secchi disk was lowered into the water until it was no longer visible, with marks on the line in increments of 3.28 feet (ft; 1 meter [m]). The depth at which the disk was not visible in the water column was recorded at each station. After jetting had started, measurements were taken using the

same methods as used to collect ambient conditions. Station 1 was from 13.5 to 15 m (44.5 to 50 ft) from the piles, and station 2 was from 27 to 30 m (89 to 102 ft) from the piles. More stations were not used due to logistical and safety issues related to on-going demolition activities.

Results:

The high tide was at approximately 09:00, and the jet was in use periodically from 10:12 to 13:15. After the jet was turned on and applied to the sediment, the visible plume extended to a maximum area of approximately 13x13 m (42.6x42.6 ft), or 0.04 acres (169 m²; Figure 2) for the first pile jetting episode (Pile # 11B). All other visible plumes were smaller than this pile. Regardless, a majority of the largest plume dissipated relatively quickly (within 10 minutes), and was not visible other than in the area directly adjacent to the piles right after the jet was turned on (Figure 2). For the other two piles, the plumes dissipated within 2 to 3 minutes.



Figure 8. Area of the Maximum Visible Plume After the Pile Jet was Turned On.

Data collected with the secchi disk at both stations showed little to no difference from ambient conditions. Data for the all measurements were taken during an outgoing tide, which would have pushed the sediment away from the station, but the visible plumes did not show any visible lengthening away from the pile

after the initial bout of jetting activity. All data collected with the secchi disk were consistent with the ambient values, with the only difference observed during the third measurement (approximately 3 hours after the ambient data collection time). During this set of measurements, the water depth reading for the secchi disk at Station 2 increased by 0.25 m (0.82 ft), while the measurement for Station 1 did not change (Table 1).

Table 4. Results of Secchi Disk Readings.

Measurement #	Station #	Time	Value	Difference from Ambient
Ambient	1	09:40	2.00	-
	2	09:42	2.25	
#1	1	10:16	2.00	0.00
	2	10:18	2.25	0.00
#2	1	10:55	2.00	0.00
	2	10:56	2.25	0.00
#3	1	12:51	2.00	0.00
	2	12:48	2.00	-0.25

Conclusions:

Overall, the visible plume during jetting was small, and did not approach the 2.5 acres (10,117 m²) area needed to stop jetting activities. The secchi disk measurements showed little to no change relative to pile jetting, regardless of the tidal flow. This data is consistent with all other jetting techniques used thus far for project-related activities. Visual monitoring of sediment plumes will occur for all jetting techniques, and will be documented on a per pile basis. This data will be compiled at the end of the project and provided as an appendix to the report. If new sediment removal techniques are used throughout this project, turbidity monitoring following the same methods described herein will be followed and reported.

NBPL HDA

Date of Pile Jetting	Activity	Pile Number	Largest Extent of Plume (m)		Area		Plume Duration (hh:mm)	Notes
			L	W	m ²	acres		
22-Aug-17	Removal	P548 B30	0	0	0	0.000	00:00	
		P548 B31	0	0	0	0.000	00:00	
		P548 B32	12	12	144	0.036	00:05	
		P548 B35	0	0	0	0.000	00:00	
23-Aug-17	Removal	548 B-26.5	-	-	-	-	-	Data unavailable
		548 B-27.5	-	-	-	-	-	Data unavailable
		548 B-28	-	-	-	-	-	Data unavailable
		548 B-29	-	-	-	-	-	Data unavailable
		548 B-33	-	-	-	-	-	Data unavailable
		548 B-34	-	-	-	-	-	Data unavailable
24-Aug-17	Removal	P548 B13	0	0	0	0.000	00:00	
		P548 B14	0	0	0	0.000	00:00	
		P548 B16	0	0	0	0.000	00:00	
		P548 B17	10	20	200	0.049	00:03	Jet turned on above mud line
		P548 B20	3	3	9	0.002	00:03	Directly associated with start of Jetting
		P548 B22	0	0	0	0.000	00:00	During removal via jetting
		P548 B22	100	50	5000	1.236	00:12	At 09:04:36 a 50 x 100m plume was noticed after a change in position with a better view. This was from pile B22 that was extracted at 08:47. It had a lot of mud on it as it was lifted out of the water. The plume was not visible at the surface by 09:16:00.
		P548 B24	0	0	0	0.000	00:00	
		P548 B26	0	0	0	0.000	00:00	
31-Aug-17	Removal	P548 B02	0	0	0	0.000	00:00	
		P548 B03	0	0	0	0.000	00:00	
		P548 B04	0	0	0	0.000	00:00	
		P548 B05	0	0	0	0.000	00:00	
		P548 B07	10	10	100	0.025	00:05	
		P548 B08	0	0	0	0.000	00:00	
		P548 B10	0	0	0	0.000	00:00	
		P548 B11	20	10	200	0.049	00:05	
1-Sep-17	Removal	P548 B01	10	5	50	0.012	00:06	During removal via jetting
		P548 B01	40	10	400	0.099	00:08	Second plume with extraction of pile; 40m x 10m for 00:08 min
		P548 Sign N	10	5	50	0.012	00:05	During removal via jetting
		P548 Sign N	40	10	400	0.099	00:06	Second plume with extraction of pile; 40m x 10m for 00:06 min

Date of Pile Jetting	Activity	Pile Number	Largest Extent of Plume (m)		Area		Plume Duration (hh:mm)	Notes
			L	W	m ²	acres		
		P607 S D35	20	5	100	0.025	00:09	During removal via jetting
		P607 S D35	10	5	50	0.012	00:05	Second plume with extraction of pile; 10m x 5m for 00:05 min
		P607 S D36	30	10	300	0.074	00:07	
		P607 S D36	10	5	50	0.012	00:03	Second plume with extraction of pile; 10m x 5m for 00:03 min
		P607 S D37	0	0	0	0.000	00:00	
		P607 S Sign S	0	0	0	0.000	00:00	
5-Sep-17	Removal	P607 S D28	10	10	100	0.025	00:03	During removal via jetting
		P607 S D28	3	3	9	0.002	00:02	Second plume with extraction of pile; 3m x 3m for 00:02 min
		P607 S D29	30	30	900	0.222	00:05	Plume created when jet lifted to just above mud line
		P607 S D30	5	5	25	0.006	00:01	Plume created with extraction of pile only
		P607 S D31	0	0	0	0.000	00:00	
		P607 S D32	5	5	25	0.006	00:01	Plume created with extraction of pile only
		P607 S D33	5	10	50	0.012	00:03	Plume created with extraction of pile only
6-Sep-17	Removal	P607 N D18	15	5	75	0.019	00:02	Crew knocked mud off float therefore creating a bigger plume
		P607 N D18	20	20	400	0.099	00:03	Removing pile
		P607 S X-1	0	0	0	0.000	00:00	
		P607 S D22	10	3	30	0.007	00:05	Jetting
		P607 S D22	3	10	30	0.007	00:07	Removing pile
		P607 S D23	5	5	25	0.006	00:05	Jetting
		P607 S D23	5	3	15	0.004	00:05	Removing pile
		P607 S D24	0	0	0	0.000	00:00	
		P607 S D25	3	2	6	0.001	00:02	Plume created with extraction of pile only
		P607 S D26	15	5	75	0.019	00:05	
		P607 S D27	5	3	15	0.004	00:05	Plume created with extraction of pile only
P607 S D28	0	0	0	0.000	00:00			
7-Sep-17	Removal	P607 N B.5	5	3	15	0.004	00:01	Removing pile
		P607 N F04	0	0	0	0.000	00:00	
		P607 N F06	2	2	4	0.001	00:02	Removing pile
		P607 N F08	2	2	4	0.001	00:02	Removing pile
		P607 N F09	20	10	200	0.049	00:03	Removing pile (large chunks of clay fell into water)
		P607 N F11	15	3	45	0.011	00:01	Removing pile
		P607 N F14	2	2	4	0.001	00:01	Removing pile
P607 N G03	20	10	200	0.049	00:03	Removing pile (large chunks of clay fell into water)		

Date of Pile Jetting	Activity	Pile Number	Largest Extent of Plume (m)		Area		Plume Duration (hh:mm)	Notes	
			L	W	m ²	acres			
		P607 N H01	5	5	25	0.006	00:03	Removing pile (large chunks of clay fell into water)	
8-Sep-17	Removal	P619 A03	10	5	50	0.012	00:02	Jetting	
		P619 A03	40	10	400	0.099	00:03	Removing pile, lots of mud fell into water	
		P619 B04	0	0	0	0.000	00:00		
		P619 B05	0	0	0	0.000	00:00		
		P619 C03	10	2	20	0.005	00:05	Moving muddy pile. Left trail of mud in water	
11-Sep-17	Install	P607 N P09	2	2	4	0.001	00:03	Jetting pile install	
		P607 N N09	0	0	0	0.000	00:00		
12-Sep-17	Install	P607 N L09	0	0	0	0.000	00:00	Jetting pile install	
		P607 N M09	0	0	0	0.000	00:00	Jetting pile install	
		P607 N P09	0	0	0	0.000	00:00	Jetting pile install	
13-Sep-17	Install	P607 N A09	5	3	15	0.004	00:05	Jetting pile install	
		P607 N J09	3	3	9	0.002	00:02	Jetting pile install	
		P607 N J09	3	3	9	0.002	00:03	Jetting pile install. Second attempt	
		P607 N J09	4	4	16	0.004	00:02	Jetting pile install	
14-Sep-17	Install	P548 A09	20	10	200	0.049	00:05		
		P548 A09	20	10	200	0.049	00:05		
		P607 N B09	0	0	0	0.000	00:00		
		P607 N C09	0	0	0	0.000	00:00		
		P607 N D09	-	-	-	-	-	-	Data unavailable
		P607 N K09	10	15	150	0.037	00:05	Visible plume after initial jet. No plume with supplemental jets	

Turbidity Monitoring for Pile Jetting (31 August 2017)

Introduction:

On 31 August 2017, turbidity monitoring for sediment jetting around Pile Numbers 548 (B-11) and 548 (B-10) occurred from approximately 09:46 to 10:50. Monitoring of turbidity occurred using a secchi disk at four locations associated with a crane barge used to hoist the jetting equipment into place (red box in Figure 1), as well as visual monitoring during the entirety of jetting operations. Given the logistical considerations of being in an active construction site, the monitoring stations were chosen as representative locations that would provide the best assessment of whether any turbidity plumes exceeded 10,117 square meters (m²; 2.5 acres).



Figure 9. Turbidity Monitoring Stations.

Methods:

Ambient conditions were established between 07:36 and 07:45 at the four locations identified in Figure 1. The secchi disk was lowered into the water until it was no longer visible, with marks on the line in increments of 1 meter (m; 3.28 feet [ft]). The depth at which the disk was not visible in the water column was recorded at each station. After jetting had started, measurements were taken using the same methods as were used to collect ambient conditions. The closest station (Station 1) was from 7 to 12 m (23 to 39 ft) from the piles, and furthest station (Station 3) was from 50 to 55 m (164 to 180 ft), depending on the pile being jetted. More stations were not used due to logistical and safety issues related to on-going demolition activities.

Results:

The high tide was at approximately 07:30 with a low tide at approximately 12:00. Minor differences in the secchi disk reading were observed during monitoring, with a max difference of a 0.5-meter (m) decrease in visibility, up to 1.75 m increase in visibility, depending on the station (

Table 5). The marine mammal observer also monitored for sediment plumes independent of the dedicated turbidity monitor, with a maximum plume size for these two piles of 200 m² (0.049 acres) that lasted for five minutes for Pile 548 (B-11). The blue circles in Figure 10 represent the approximate relative size of the visible plume, as compared to the 10,117 m² (2.5 acres; orange circle). As seen in Figure 10, the area covered by the sediment plume (200 m² [0.049 acres]) was relatively small when compared to the area for 10,117 m² (2.5 acres). For the data provided in

Table 5, it should be noted that the ambient readings were taken in the early morning with an overcast sky, and at approximately 9:00, the conditions changed to partly sunny. With Stations 3 and 4 facing the morning sun (see Figure 1), ambient light conditions likely played a role in the increase in underwater visibility. Furthermore, drops in underwater visibility for Stations 1 and 2, were likely related to shadowing effects from the barge, rather than an increase in turbidity.

Table 5. Results of Secchi Disk Readings.

Pile #	Measurement #	Station #	Dist. from Pile	Time	Value	Difference from Ambient
N/A	Ambient	1	N/A	07:36	2.75	N/A
		2		07:40	2.5	
		3		07:43	2.5	
		4		07:45	2.25	
548 (B-11)	#1	1	12	09:46	2.25	-0.50
		2	25	09:49	2.25	-0.25
		3	5	09:51	3.00	0.50
		4	23	09:54	2.50	0.25
	#2	1	12	09:57	2.25	-0.50
		2	25	09:59	2.00	-0.50
		3	5	10:01	4.00	1.50
		4	23	10:03	3.75	1.50
	#3	1	12	10:05	2.25	-0.50
		2	25	10:06	2.25	-0.25
		3	5	10:08	4.00	1.50
		4	23	10:10	4.00	1.75
548 (B-10)	#4	1	7	10:25	2.75	0.00
		2	20	10:28	2.25	-0.25
		3	50	10:30	3.75	1.25
		4	23	10:33	4.00	1.75
	#5	1	7	10:36	2.25	-0.50
		2	20	10:38	2.00	-0.50
		3	50	10:40	4.00	1.50
		4	23	10:42	4.25	2.00
	#6	1	7	10:44	2.25	-0.50
		2	20	10:45	2.25	-0.25
		3	50	10:47	4.25	1.75
		4	23	10:50	3.25	1.00

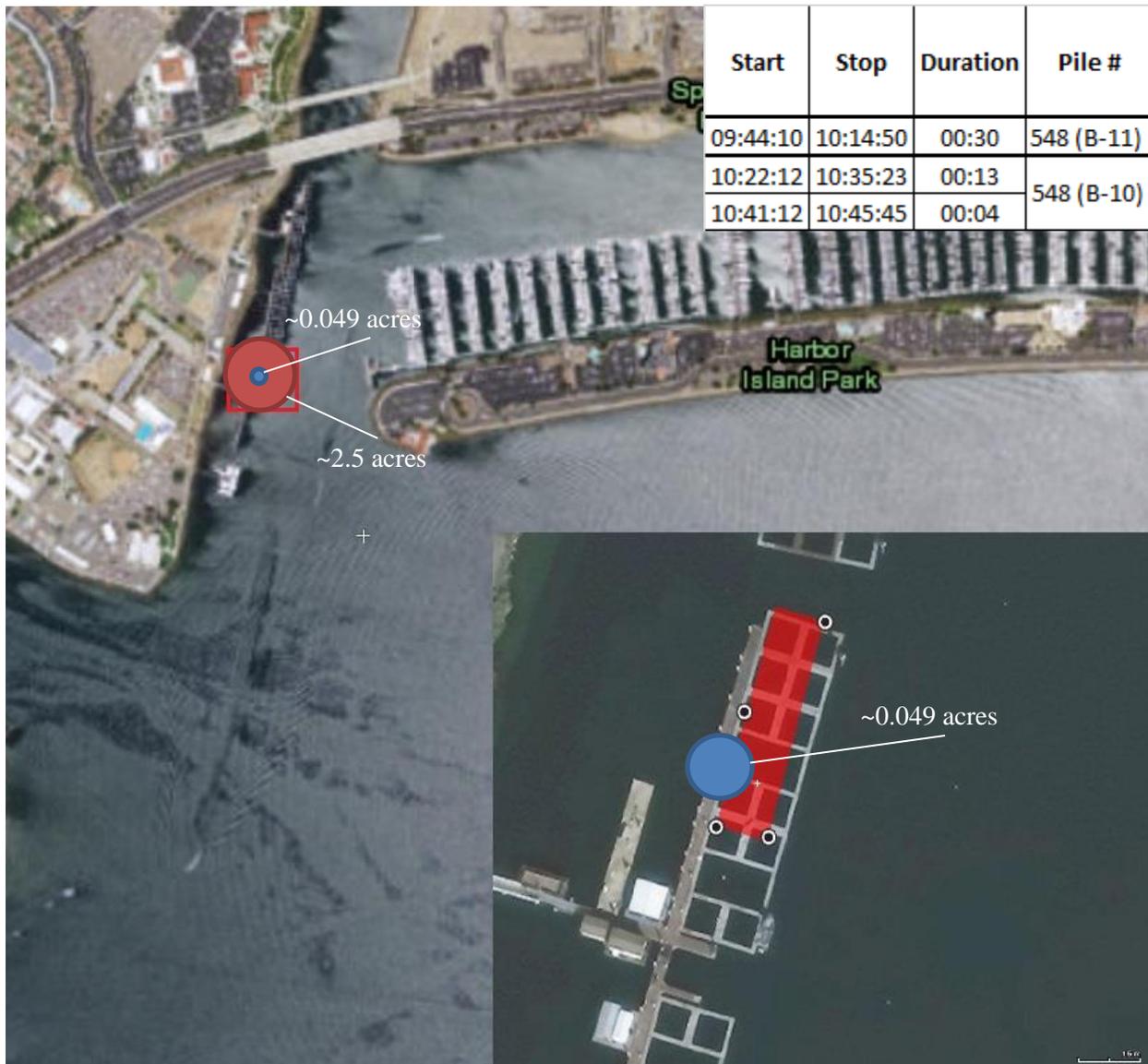


Figure 10. Visible Plume During Turbidity Monitoring Efforts.

Conclusions:

Overall, the visible plume during jetting was small, and did not approach the 10,117 m² (2.5 acres) area needed to stop jetting activities. The secchi disk measurements showed little to no change relative to pile jetting, regardless of the tidal flow, and ambient lighting conditions likely affected the underwater visibility. This data is consistent with all other jetting techniques used thus far for project-related activities. Visual monitoring of sediment plumes will occur for all jetting techniques, and will be documented on a per pile basis. This data will be compiled at the end of the project and provided as an appendix to the report. If new sediment removal techniques are used throughout this project, turbidity monitoring following the same methods described herein will be followed and reported.

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Appendix B1¹: All Marine Mammal Sightings During Monitoring Efforts (8 October 2016 to 7 October 2017)

¹ This is an update to Appendix F from NAVFAC SW (2017)

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Color-codingKey:

	Impact Soft Start (ISS-PD) of Impact Pile Driving (I-PD)
	Vibratory Pile Driving (V-PD)
	Pile Installation/Removal (Water jetting or Torch Cutting)
	Demolition (Pile clipping, caisson cutting, torch cutting)
	During Shutdown of Pile Driving

Abbreviations:

Location: FP: Fuel Pier, HAD: Harbor Drive Annex

Activity: Pre-: Pre-construction Survey, Pre-/Post-: Pre-/Post-construction survey, Post-: Post-construction survey, I-PD: Impact pile driving, ISS-PD: Impact pile driving (soft start), V-PD: Vibratory pile driving, Jetting-I: High-pressure water jetting (pile installation), Jetting-R: High-pressure water jetting (pile removal), N/A: Not Applicable,

Species: CSL: California sea lion, CSL (DD): Dead California sea lion, PHS: Harbor seal, CBD: Coastal bottlenose dolphin, PGW: Gray whale, CLT: Californai least tern,

GST: Green sea turtle, UPIN: Unidentified pinniped, UDOL: Unidentified dolphin, No Obs.: No observations for the day

No of Individuals: HO: Hauled out

Behavior: 1° (Primary): BR: Bow Riding, DV: Dive, EN: Enter Water, EX: Exit Water, HO: Hauled Out, JH: Jug Handling, LO: Look, ML: Milling, O: Other, PP: Porpoising, RF: Rafting, SF: Successful Foraging, SH: Spy Hopping, SW: Swimming, UF: Unsuccessful Foraging; 2° (Secondary): AD: Abrupt change in direction, FL: Flush

Sky Cover: C: Clear, CD: Cloudy, PC: Partly Cloudy, O: Overcast, F: Fog, HZ: Hazy, LR: Light Rain

BSS: Beaufort Sea State

Location	Date	Time	Station	Activity	Species	No. of Indiv		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	8-Oct-16	7:55:09	Sierra	Pre-	CSL	12	0	32.69500	-117.23438	HO			Mixed	Mixed	Flood	C	1	excellent
FP	8-Oct-16	8:00:37	Command	Pre-	CSL	0	1	32.70195	-117.23597	ML			Male	Adult	Flood	C	1	good
FP	8-Oct-16	8:05:24	Sierra	Pre-	CSL	1	0	32.69626	-117.23190	HO			Female	Adult	Flood	C	1	excellent
FP	8-Oct-16	8:08:22	November	Pre-	CSL	1	0	32.70246	-117.23649	HO			Male	Adult	Flood	C	1	excellent
FP	8-Oct-16	8:13:32	November	Pre-/Post-	CSL	2	0	32.70279	-117.23565	HO			Unknown	Mixed	Flood	C	1	excellent
FP	8-Oct-16	8:15:51	November	I-PD	CSL	0	4	32.70218	-117.23268	SW		O-05B	Male	Adult	Flood	C	1	excellent
FP	8-Oct-16	8:40:06	Sierra	Pre-/Post-	CSL	2	0	32.69671	-117.22998	HO			Female	Adult	Flood	C	1	excellent
FP	8-Oct-16	9:04:24	November	I-PD	CSL	0	4	32.70262	-117.23476	SW		O-05D	Mixed	Mixed	Flood	C	1	excellent
FP	8-Oct-16	9:22:05	November	Pre-/Post-	CSL	0	1	32.70203	-117.23516	SW			Female	Subadult	Flood	C	1	excellent
FP	8-Oct-16	9:41:31	November	Pre-/Post-	CSL	0	1	32.70204	-117.23466	SW			Male	Adult	Flood	C	1	excellent
FP	8-Oct-16	9:43:13	November	Pre-/Post-	CSL	0	1	32.70196	-117.23521	SW			Unknown	Subadult	Flood	C	1	excellent
FP	8-Oct-16	10:09:59	November	Post-	CSL	0	2	32.70412	-117.22843	SW			Unknown	Unknown	Flood	C	1	excellent
FP	8-Oct-16	10:12:47	Sierra	Post-	CSL	0	1	32.69953	-117.23513	SW			Female	Subadult	Flood	C	1	excellent
FP	8-Oct-16	10:13:02	November	Post-	CSL	0	1	32.70154	-117.23610	SW			Male	Adult	Flood	C	1	excellent
FP	8-Oct-16	10:13:27	November	Post-	CSL	0	1	32.70177	-117.23643	RF			Male	Adult	Flood	C	1	excellent
FP	8-Oct-16	10:21:52	November	Post-	CSL	0	1	32.70188	-117.23517	SW			Male	Adult	Flood	C	1	excellent
FP	8-Oct-16	10:28:01	Sierra	Post-	CSL	0	1	32.69984	-117.23474	SW			Male	Adult	Flood	C	1	excellent
FP	11-Oct-16	7:05:24	Clipper	Pre-	CSL	1	0	32.70248	-117.23678	HO			Male	Adult	Ebb	O	2	moderate
FP	11-Oct-16	10:00:25	Clipper	Pre-/Post-	CSL	0	1	32.70276	-117.23621	SW			Male	Adult	Ebb	CD	2	good
FP	11-Oct-16	13:35:34	Clipper	Pre-	CSL	1	0	32.70235	-117.23675	HO			Male	Adult	Flood	CD	2	good
FP	11-Oct-16	15:42:24	Clipper	Pre-/Post-	CSL	0	1	32.70127	-117.23740	SW			Male	Adult	Flood	CD	2	good
FP	12-Oct-16	10:35:44	Clipper	Pre-	CSL	0	2	32.70153	-117.23681	SW			Male	Adult	Ebb	O	2	moderate

Location	Date	Time	Station	Activity	Species	No. of Indiv		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	12-Oct-16	11:42:47	Clipper	Clipping	CSL	0	1	32.70113	-117.23701	SW		NEB11	Male	Subadult	Ebb	O	2	moderate
FP	12-Oct-16	11:59:22	Clipper	Post-	CSL	0	1	32.70062	-117.23723	SW			Male	Adult	Ebb	O	2	moderate
FP	12-Oct-16	14:55:20	Clipper	Pre-	CSL	1	0	32.70241	-117.23704	HO			Male	Adult	Flood	PC	3	excellent
FP	12-Oct-16	14:55:44	Clipper	Pre-	CSL	5	0	32.70254	-117.23674	HO			Male	Adult	Flood	PC	3	excellent
FP	12-Oct-16	14:57:18	Clipper	Pre-	CSL	7	0	32.70285	-117.23633	HO			Unknown	Mixed	Flood	PC	3	excellent
FP	13-Oct-16	9:47:34	Clipper	Pre-	CSL	2	0	32.70271	-117.23656	HO			Male	Adult	Ebb	C	2	good
FP	13-Oct-16	13:09:43	Clipper	Pre-	CSL	0	1	32.70267	-117.23684	EX			Male	Adult	Ebb	C	2	good
FP	13-Oct-16	13:12:28	Clipper	Pre-	CSL	0	1	32.70255	-117.23659	SW			Male	Adult	Ebb	C	2	good
FP	13-Oct-16	13:14:52	Clipper	Pre-	CSL	1	0	32.70270	-117.23655	HO			Female	Adult	Ebb	C	2	good
FP	13-Oct-16	13:42:10	Clipper	Pre-	CSL	0	1	32.70137	-117.23755	RF			Male	Subadult	Ebb	C	2	good
FP	26-Oct-16	12:44:01	November	Pre-	CSL	2	0	32.70636	-117.22875	HO			Unknown	Unknown	Ebb	PC	3	good
FP	26-Oct-16	12:45:01	November	Pre-	CSL	1	0	32.69561	-117.23099	HO			Unknown	Unknown	Ebb	PC	3	good
FP	26-Oct-16	12:45:44	November	Pre-	CSL	2	0	32.69577	-117.23318	HO			Mixed	Adult	Ebb	PC	3	good
FP	26-Oct-16	13:14:04	November	Pre-	CSL	0	1	32.70227	-117.23620	SW			Male	Adult	Ebb	PC	3	good
FP	26-Oct-16	13:23:52	Command	Pre-	CSL	0	1	32.70080	-117.23474	SW			Male	Adult	Ebb	PC	4	good
FP	26-Oct-16	14:09:43	Command	Pre-	CSL	0	1	32.70096	-117.23541	SW			Female	Adult	Flood	PC	3	good
FP	26-Oct-16	15:02:04	Command	Pre-	CSL	0	1	32.70064	-117.23451	SW			Male	Adult	Flood	PC	2	good
FP	26-Oct-16	15:30:10	Command	I-PD	CSL	0	1	32.70064	-117.23152	RF		I-07A	Male	Adult	Flood	PC	2	good
FP	26-Oct-16	15:38:03	Command	Pre-/Post-	CSL	0	1	32.70052	-117.23500	SW			Male	Adult	Flood	PC	2	good
FP	26-Oct-16	16:48:09	Command	Pre-/Post-	CSL	0	1	32.70064	-117.23526	SW			Male	Adult	Flood	PC	2	good
FP	27-Oct-16	13:16:07	November	Pre-	CSL	2	0	32.69561	-117.23099	HO			Unknown	Unknown	Ebb	HZ	2	moderate
FP	27-Oct-16	13:17:01	November	Pre-	CSL	2	0	32.69577	-117.23318	HO			Male	Mixed	Ebb	HZ	2	moderate
FP	27-Oct-16	13:44:04	Command	Pre-	CSL	0	1	32.70132	-117.23544	SW			Male	Adult	Ebb	CD	1	moderate
FP	27-Oct-16	13:51:31	Command	Pre-/Post-	CSL	0	1	32.70010	-117.23541	SW			Male	Adult	Ebb	CD	1	moderate
FP	27-Oct-16	13:59:18	November	Pre-/Post-	CSL	0	1	32.70215	-117.23645	SW			Male	Adult	Ebb	HZ	2	moderate
FP	27-Oct-16	14:57:41	November	Post-	CSL	0	1	32.70274	-117.23596	SW			Male	Adult	Flood	HZ	2	moderate
FP	27-Oct-16	15:00:59	November	Post-	CSL	0	1	32.70215	-117.23686	SW			Male	Adult	Flood	HZ	2	moderate
FP	8-Dec-16	10:02:32	Sierra	Pre-	CSL	6	0	32.69435	-117.23540	HO			Mixed	Mixed	Ebb	C	1	excellent
FP	8-Dec-16	10:03:40	Sierra	Pre-	CSL	2	0	32.70177	-117.22927	HO			Unknown	Adult	Ebb	C	1	excellent
FP	8-Dec-16	10:13:34	November	Pre-	PHS	0	1	32.70251	-117.23593	ML			Unknown	Adult	Ebb	C	1	good
FP	8-Dec-16	11:10:25	November	Pre-	CSL	0	1	32.70550	-117.22869	SW			Unknown	Unknown	Flood	C	1	good
FP	8-Dec-16	11:18:45	November	Pre-/Post-	CSL	0	1	32.70390	-117.23003	SW			Unknown	Unknown	Flood	C	1	good
FP	8-Dec-16	12:10:29	Sierra	Pre-/Post-	CSL	0	1	32.69981	-117.23604	SW			Male	Adult	Flood	C	1	excellent
FP	8-Dec-16	12:28:47	November	Pre-/Post-	CSL	0	1	32.70261	-117.23582	SW			Male	Adult	Flood	C	1	good
FP	8-Dec-16	12:38:07	Sierra	Pre-/Post-	PHS	0	1	32.69966	-117.23609	SW			Unknown	Adult	Flood	C	1	excellent
FP	12-Dec-16	15:41:35	Sierra	Caisson	CSL	0	1	32.69893	-117.23618	SW		P-K-7	Female	Adult	Flood	PC	2	good
FP	12-Dec-16	15:50:13	November	Caisson	CSL	0	1	32.69905	-117.23221	SW		P-K-7	Unknown	Unknown	Flood	PC	2	good
FP	12-Dec-16	15:52:49	November	Caisson	CSL	0	1	32.70280	-117.23254	SW		P-K-7	Unknown	Unknown	Flood	PC	2	good
FP	13-Dec-16	8:41:53	Sierra	Pre-	CSL	7	1	32.69386	-117.23644	SW			Mixed	Mixed	Ebb	CD	1	moderate
FP	13-Dec-16	9:30:26	Sierra	Pre-	CSL	0	1	32.69754	-117.23039	SW			Male	Adult	Ebb	CD	1	moderate
FP	13-Dec-16	9:56:05	Sierra	Caisson	CSL	0	1	32.69493	-117.23517	RF		P-H-11	Unknown	Adult	Ebb	CD	1	good
FP	13-Dec-16	11:21:11	Sierra	Caisson	CSL	0	1	32.69870	-117.23388	SW		P-H-7	Female	Adult	Ebb	CD	1	good
FP	13-Dec-16	11:26:00	Sierra	Caisson	CSL	0	1	32.69978	-117.23555	SW		P-H-7	Female	Adult	Ebb	CD	1	good
FP	13-Dec-16	12:28:55	Caisson1	Caisson	CSL	0	1	32.70190	-117.23654	SW		P-H-11	Male	Adult	Ebb	PC	3	moderate
FP	13-Dec-16	14:35:00	Sierra	I-PD	CSL	0	1	32.69924	-117.23417	PP		I-12C	Male	Adult	Ebb	CD	2	excellent
FP	13-Dec-16	15:28:08	Sierra	Pre-/Post-	CSL	0	1	32.69893	-117.23434	SW			Male	Adult	Flood	CD	2	excellent

Location	Date	Time	Station	Activity	Species	No. of Indiv		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1 ^o	2 ^o							
FP	14-Dec-16	7:18:20	Sierra	Pre-	CSL	4	0	32.69464	-117.23397	HO			Mixed	Mixed	Flood	PC	1	good
FP	14-Dec-16	7:22:28	Sierra	Caisson	CSL	0	1	32.69467	-117.23374	SW		P-H-10	Unknown	Unknown	Flood	PC	1	good
FP	14-Dec-16	7:28:44	Sierra	Caisson	CSL	0	1	32.69454	-117.23417	SW		P-H-10	Male	Adult	Flood	PC	1	good
FP	14-Dec-16	7:42:41	Sierra	Pre-/Post-	CSL	0	1	32.69518	-117.23503	ML			Male	Adult	Flood	PC	1	good
FP	14-Dec-16	7:47:23	Sierra	Pre-/Post-	CSL	2	0	32.69577	-117.23318	HO			Unknown	Unknown	Flood	PC	1	good
FP	14-Dec-16	7:52:46	November	Pre-/Post-	CSL	1	0	32.70636	-117.22875	HO			Male	Adult	Flood	HZ	1	moderate
FP	14-Dec-16	7:59:28	Sierra	Pre-/Post-	CSL	2	0	32.69464	-117.23397	HO			Mixed	Mixed	Flood	PC	1	good
FP	14-Dec-16	8:03:36	Sierra	Pre-/Post-	CSL	0	1	32.69867	-117.23391	SW			Female	Adult	Flood	PC	1	good
FP	14-Dec-16	8:05:39	Sierra	Pre-/Post-	CSL	0	5	32.69732	-117.23163	ML			Unknown	Unknown	Flood	PC	1	good
FP	14-Dec-16	8:39:23	Sierra	Caisson	CSL	0	1	32.69940	-117.23142	SW		P-H-6	Male	Adult	Ebb	PC	1	good
FP	14-Dec-16	8:54:58	Sierra	Caisson	CSL	1	0	32.69561	-117.23099	HO		P-H-6	Unknown	Unknown	Ebb	PC	1	good
FP	14-Dec-16	9:30:16	November	I-PD	CSL	0	1	32.70286	-117.23471	SW		I-11G	Male	Adult	Ebb	HZ	1	moderate
FP	14-Dec-16	9:46:52	Sierra	Pre-/Post-	CSL	0	1	32.69814	-117.23125	SW			Male	Adult	Ebb	PC	1	good
FP	14-Dec-16	9:49:38	Sierra	Pre-/Post-	CSL	0	4	32.69546	-117.23156	RF			Mixed	Unknown	Ebb	PC	1	good
FP	14-Dec-16	10:11:36	Sierra	Caisson	CSL	0	1	32.69604	-117.23589	SW		P-H-6	Unknown	Unknown	Ebb	PC	1	good
FP	14-Dec-16	10:17:07	Sierra	Pre-/Post-	CSL	0	1	32.70081	-117.23265	SW			Unknown	Adult	Ebb	PC	1	good
FP	14-Dec-16	11:44:02	Sierra	Pre-/Post-	CSL	0	1	32.69732	-117.23791	SW			Male	Adult	Ebb	PC	1	good
FP	14-Dec-16	11:53:17	Sierra	Pre-/Post-	CSL	0	1	32.69841	-117.23725	SW			Male	Adult	Ebb	PC	1	good
FP	14-Dec-16	13:12:42	Sierra	Pre-/Post-	CSL	1	0	32.69588	-117.23422	HO			Male	Adult	Ebb	PC	2	good
FP	14-Dec-16	14:38:53	Sierra	Pre-/Post-	CSL	0	1	32.69768	-117.23538	SW			Male	Adult	Ebb	O	2	good
FP	14-Dec-16	15:02:23	November	Pre-/Post-	CSL	0	1	32.70228	-117.23645	SW			Male	Adult	Ebb	PC	2	moderate
FP	14-Dec-16	15:19:20	Sierra	I-PD	CSL	0	1	32.70242	-117.23183	DV		I-11D	Unknown	Unknown	Ebb	PC	2	good
FP	15-Dec-16	7:29:35	Sierra	Caisson	CSL	1	0	32.69577	-117.23318	HO		P-K-6	Male	Adult	Flood	O	1	poor
FP	15-Dec-16	7:32:02	Sierra	Caisson	CSL	0	1	32.70063	-117.23042	SW		P-K-6	Male	Adult	Flood	O	1	poor
FP	15-Dec-16	7:40:40	November	Caisson	CSL	0	1	32.70207	-117.23533	SW		P-K-6	Male	Adult	Flood	CD	1	poor
FP	15-Dec-16	7:43:58	Sierra	Pre-/Post-	CSL	0	1	32.69849	-117.23628	SW			Male	Adult	Flood	O	1	poor
FP	15-Dec-16	8:15:07	Sierra	Caisson	CSL	1	0	32.69561	-117.23099	HO		P-K-6	Male	Adult	Flood	O	1	poor
FP	15-Dec-16	10:05:47	Sierra	Pre-/Post-	CSL	0	1	32.70002	-117.23463	SW			Unknown	Unknown	Ebb	O	1	poor
FP	15-Dec-16	10:08:29	Sierra	Pre-/Post-	CSL	0	1	32.70132	-117.23117	SW			Unknown	Unknown	Ebb	CD	1	moderate
FP	15-Dec-16	11:11:17	Sierra	Caisson	CSL	0	2	32.69586	-117.23371	ML		P-K-8	Unknown	Unknown	Ebb	CD	1	moderate
FP	15-Dec-16	12:06:57	Caisson2	Post-	CSL	0	2	32.70200	-117.23588	SW			Male	Adult	Ebb	CD	1	moderate
FP	15-Dec-16	14:18:43	Sierra	Caisson	CSL	0	1	32.69665	-117.23422	SW		P-K-9	Male	Adult	Ebb	O	3	moderate
FP	17-Dec-16	9:38:07	Caisson1	Pre-/Post-	CSL	0	1	32.70175	-117.23508	SW			Unknown	Adult	Flood	PC	1	excellent
FP	19-Dec-16	9:08:52	Caisson1	Caisson	CSL	1	0	32.69577	-117.23318	HO		P-H-4	Unknown	Adult	Flood	C	0	excellent
FP	19-Dec-16	11:36:30	Caisson1	Caisson	CSL	1	0	32.70246	-117.23649	HO		P-H-4	Male	Adult	Flood	C	0	excellent
FP	19-Dec-16	15:52:14	Caisson1	Pre-/Post-	CSL	0	1	32.70113	-117.23556	SW			Male	Adult	Ebb	C	0	excellent
FP	19-Dec-16	16:18:43	Caisson1	Caisson	PHS	0	1	32.70191	-117.23582	SW		P-H-5	Unknown	Adult	Ebb	C	2	excellent
FP	19-Dec-16	16:19:30	Caisson1	Caisson	CSL	1	4	32.70234	-117.23645	ML		P-H-5	Mixed	Adult	Ebb	C	3	excellent
FP	21-Dec-16	10:18:00	Caisson1	Pre-/Post-	CSL	1	0	32.70279	-117.23565	HO			Male	Subadult	Flood	CD	1	good
FP	27-Dec-16	7:44:43	Caisson1	Caisson	CSL	1	0	32.70636	-117.22875	HO		P-K-3	Unknown	Adult	Ebb	C	1	excellent
FP	27-Dec-16	7:45:19	Caisson1	Caisson	CSL	1	0	32.69577	-117.23318	HO		P-K-3	Unknown	Unknown	Ebb	C	1	excellent
FP	10-Jan-17	8:37:48	Caisson1	Caisson	PHS	0	1	32.70210	-117.23707	SW		P-H-11	Unknown	Adult	Ebb	PC	1	good
FP	10-Jan-17	9:25:25	Caisson1	Caisson	PHS	0	1	32.70123	-117.23050	SW		P-H-11	Unknown	Adult	Ebb	PC	1	good
FP	10-Jan-17	13:28:50	Caisson1	Caisson	UDOL	0	2	32.69467	-117.23223	SW		P-H-11	Unknown	Unknown	Ebb	PC	1	good
FP	10-Jan-17	13:51:00	Caisson1	Caisson	CSL	0	1	32.70111	-117.23663	SW		P-H-11	Male	Adult	Ebb	PC	1	good
FP	10-Jan-17	14:32:22	Caisson1	Jetting-R	CSL	0	3	32.70123	-117.23157	SW		P-H-11	Mixed	Mixed	Flood	PC	1	good
FP	10-Jan-17	15:05:32	Caisson1	Jetting-R	CSL	0	1	32.70260	-117.23491	ML		P-H-11	Male	Adult	Flood	PC	1	good

Location	Date	Time	Station	Activity	Species	No. of Indiv		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	10-Jan-17	15:15:45	Caisson1	Pre-/Post-	CSL	0	1	32.69849	-117.23397	SW			Male	Adult	Flood	PC	1	good
FP	11-Jan-17	9:32:24	Caisson1	Caisson	CSL	0	1	32.70052	-117.23108	LO		P-H-11	Male	Adult	Ebb	CD	3	moderate
FP	16-Jan-17	9:29:45	Caisson1	Pre-/Post-	CSL	0	1	32.69962	-117.23414	SW			Male	Adult	Flood	CD	2	moderate
FP	17-Jan-17	15:18:38	Caisson1	Caisson	CSL	1	0	32.70226	-117.23663	HO		P-H-6	Male	Adult	Ebb	C	2	good
FP	18-Jan-17	9:30:14	Caisson1	Caisson	CSL	1	0	32.69577	-117.23318	HO		P-H-6	Female	Adult	Flood	CD	2	moderate
FP	18-Jan-17	9:30:14	Caisson1	Caisson	CSL	1	0	32.70177	-117.22927	HO		P-H-6	Unknown	Juvenile	Flood	CD	2	moderate
FP	18-Jan-17	11:56:19	Caisson1	Pre-/Post-	CSL	0	1	32.69665	-117.23526	RF			Male	Adult	Flood	CD	2	moderate
FP	18-Jan-17	12:33:53	Caisson1	Pre-/Post-	CBD	0	1	32.70007	-117.23800	SW			Unknown	Adult	Flood	CD	2	moderate
FP	25-Jan-17	8:08:45	Caisson1	Caisson	CSL	1	0	32.70621	-117.22619	HO		P-K-5	Unknown	Adult	Ebb	C	1	good
FP	25-Jan-17	8:08:49	Caisson1	Caisson	CSL	3	0	32.69577	-117.23318	HO		P-K-5	Male	Adult	Ebb	C	1	good
FP	25-Jan-17	8:23:48	Caisson1	Caisson	CSL	0	1	32.70158	-117.22977	EX		P-K-5	Male	Adult	Ebb	C	1	good
FP	25-Jan-17	8:35:55	Caisson1	Caisson	CSL	0	3	32.69440	-117.23478	RF		P-K-5	Unknown	Unknown	Ebb	C	1	good
FP	25-Jan-17	8:43:27	Caisson1	Pre-/Post-	CSL	0	1	32.70047	-117.23583	SW			Male	Adult	Ebb	C	1	good
FP	25-Jan-17	9:25:20	Caisson1	Caisson	CSL	0	1	32.69572	-117.23337	EN		P-K-5	Unknown	Adult	Ebb	C	1	good
FP	25-Jan-17	10:34:57	Caisson1	Pre-/Post-	CSL	0	1	32.69854	-117.23076	ML			Unknown	Pup	Ebb	C	1	good
FP	25-Jan-17	11:16:58	Caisson1	Caisson	CSL	0	1	32.70101	-117.23488	SW		P-K-5	Male	Adult	Ebb	C	1	good
FP	26-Jan-17	8:11:36	Caisson1	Caisson	CSL	0	1	32.70126	-117.23270	SW		P-H-6	Male	Adult	Ebb	C	2	good
FP	26-Jan-17	13:35:04	Caisson1	Caisson	GST	0	1	32.70105	-117.23605	SW		P-K-3	Unknown	Unknown	Ebb	C	2	good
FP	27-Jan-17	9:59:31	Caisson1	Caisson	PHS	0	1	32.70001	-117.23634	SW		P-K-3	Unknown	Adult	Ebb	C	4	good
FP	28-Jan-17	12:18:07	Caisson1	Caisson	CSL	0	1	32.70213	-117.23630	SW		P-H-3	Unknown	Adult	Ebb	CD	1	excellent
FP	28-Jan-17	12:57:05	Caisson1	Caisson	CSL	0	1	32.69977	-117.23689	SW		P-H-3	Female	Adult	Ebb	CD	1	excellent
FP	28-Jan-17	13:08:00	Caisson1	Caisson	CSL	0	1	32.69963	-117.23703	SW		P-H-3	Unknown	Adult	Ebb	CD	1	excellent
FP	28-Jan-17	13:12:39	Caisson1	Caisson	CSL	0	1	32.70038	-117.23559	SW		P-H-3	Unknown	Juvenile	Ebb	CD	1	excellent
FP	30-Jan-17	10:08:31	Caisson1	Caisson	CSL	1	0	32.69577	-117.23318	HO		P-H-9	Unknown	Unknown	Flood	C	2	excellent
FP	30-Jan-17	10:08:31	Caisson1	Caisson	PHS	0	1	32.70030	-117.23531	ML		P-H-9	Unknown	Adult	Flood	C	2	excellent
FP	30-Jan-17	10:08:31	Caisson1	Caisson	PGW	0	1	32.68105	-117.22369	SW		P-H-9	Unknown	Unknown	Flood	C	2	excellent
FP	30-Jan-17	10:10:17	Caisson1	Caisson	CBD	0	1	32.69690	-117.23108	SW		P-H-9	Unknown	Adult	Ebb	C	2	excellent
FP	30-Jan-17	10:38:24	Caisson1	Caisson	CSL	0	2	32.69902	-117.23274	SW		P-H-9	Unknown	Juvenile	Ebb	C	2	excellent
FP	30-Jan-17	12:00:59	Caisson1	Caisson	PHS	0	1	32.70149	-117.23676	ML		P-K-7	Unknown	Adult	Ebb	C	2	excellent
FP	30-Jan-17	12:59:23	Caisson1	Caisson	PHS	0	1	32.70120	-117.23047	LO		P-K-7	Unknown	Unknown	Ebb	C	2	excellent
FP	30-Jan-17	13:02:58	Caisson1	Caisson	CSL	0	1	32.69854	-117.23378	SW		P-K-7	Unknown	Unknown	Ebb	C	2	excellent
FP	30-Jan-17	13:56:02	Caisson1	Pre-/Post-	CSL	1	0	32.70246	-117.23649	HO			Male	Adult	Ebb	C	2	excellent
FP	31-Jan-17	7:52:50	Caisson1	Caisson	CSL	2	0	32.70177	-117.22927	HO		P-K-11	Unknown	Unknown	Flood	C	0	excellent
FP	1-Feb-17	10:42:01	P-122	Caisson	CSL	1	0	32.69826	-117.23863	HO		P-K-9	Male	Adult	Flood	HZ	2	moderate
FP	1-Feb-17	11:07:18	BaitBarge	Caisson	CSL	8	0	32.69435	-117.23540	HO		P-K-9	Mixed	Adult	Flood	C	1	excellent
FP	1-Feb-17	11:07:18	BaitBarge	Caisson	CSL	0	1	32.70149	-117.23473	SW		P-K-9	Male	Adult	Flood	C	1	excellent
FP	1-Feb-17	11:17:17	MagSi	Pre-/Post-	CSL	1	0	32.67354	117.23030	HO			Unknown	Juvenile	Flood	F	2	poor
FP	1-Feb-17	11:22:10	BaitBarge	Pre-/Post-	CSL	0	3	32.69564	-117.23436	ML			Unknown	Unknown	Flood	C	1	excellent
FP	1-Feb-17	11:26:57	Sierra	V-PD	CSL	0	1	32.69976	-117.23631	SW		D5-PD(IPP)	Male	Adult	Flood	HZ	1	moderate
FP	1-Feb-17	13:56:19	MagSi	Pre-	CSL	1	0	32.66540	-117.22669	HO			Unknown	Unknown	Ebb	HZ	2	good
FP	1-Feb-17	14:05:57	BaitBarge	Pre-	CSL	0	1	32.69910	-117.23438	ML			Mixed	Adult	Ebb	C	1	excellent
FP	1-Feb-17	14:09:02	November	Pre-	CSL	0	1	32.70144	-117.23684	SW			Male	Adult	Ebb	C	0	moderate
FP	1-Feb-17	14:16:46	BaitBarge	Pre-/Post-	CSL	0	3	32.69440	-117.23376	DV			Unknown	Mixed	Ebb	C	1	excellent
FP	1-Feb-17	14:20:50	November	Pre-/Post-	CSL	0	1	32.70256	-117.23428	SW			Unknown	Juvenile	Ebb	C	0	moderate
FP	1-Feb-17	14:37:42	BaitBarge	Pre-/Post-	CSL	0	1	32.69416	-117.23427	ML			Male	Adult	Ebb	C	1	excellent
FP	1-Feb-17	14:50:19	November	Pre-/Post-	CSL	0	1	32.70159	-117.23679	SW			Male	Adult	Ebb	C	0	moderate

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	1-Feb-17	14:57:13	MagSi	Shutdown	CSL	0	1	32.67731	-117.23440	PP			Unknown	Subadult	Ebb	PC	2	good
FP	1-Feb-17	14:59:55	MagSi	Pre-/Post-	CSL	0	1	32.67821	-117.23193	SW			Unknown	Unknown	Ebb	PC	2	good
FP	1-Feb-17	15:04:35	MagSi	I-PD	PHS	0	1	32.68731	-117.23453	ML		D5-PD(IPP)	Unknown	Adult	Ebb	PC	2	good
FP	2-Feb-17	8:51:55	Sierra	Pre-	CSL	6	0	32.69435	-117.23540	HO			Unknown	Unknown	Flood	CD	1	good
FP	2-Feb-17	8:59:56	MagSi	Pre-	CSL	1	0	32.67354	117.23030	HO			Unknown	Juvenile	Flood	HZ	2	moderate
FP	2-Feb-17	9:00:12	Sierra	Pre-	CSL	1	0	32.69577	-117.23318	HO			Unknown	Unknown	Flood	CD	1	good
FP	2-Feb-17	9:02:34	Sierra	Pre-	CSL	0	1	32.69557	-117.23433	SW			Mixed	Adult	Flood	CD	1	good
FP	2-Feb-17	9:14:50	BaitBarge	Pre-	CSL	0	1	32.69465	-117.23411	ML			Male	Adult	Flood	C	1	excellent
FP	2-Feb-17	9:43:30	MagSi	Caisson	CSL	1	0	32.67381	-117.22762	HO		P-K-10	Unknown	Adult	Flood	HZ	2	moderate
FP	2-Feb-17	9:51:00	BaitBarge	Caisson	CSL	0	1	32.69469	-117.23483	ML		P-K-10	Male	Adult	Flood	C	1	excellent
FP	2-Feb-17	9:54:28	MagSi	Caisson	CSL	0	1	32.68734	-117.23163	SW		P-K-10	Unknown	Adult	Flood	HZ	2	moderate
FP	2-Feb-17	10:05:43	MagSi	Pre-/Post-	CSL	0	1	32.68697	-117.23310	ML			Unknown	Juvenile	Flood	HZ	2	moderate
FP	2-Feb-17	10:08:06	MagSi	Pre-/Post-	CSL	0	1	32.68718	-117.23291	SW			Unknown	Adult	Flood	HZ	2	moderate
FP	2-Feb-17	10:17:59	MagSi	Caisson	PHS	0	1	32.68711	-117.23265	SH		P-K-10	Unknown	Adult	Flood	HZ	2	moderate
FP	2-Feb-17	10:28:28	MagSi	Caisson	PHS	0	1	32.68582	-117.23263	SW		P-K-10	Unknown	Adult	Flood	HZ	2	moderate
FP	2-Feb-17	10:34:52	P-122	Caisson	PHS	0	1	32.69755	-117.23878	SW		P-K-10	Unknown	Unknown	Flood	PC	2	good
FP	2-Feb-17	10:42:54	MagSi	I-PD	CSL	0	1	32.68896	-117.23254	DV		D8-DB(IPP)	Unknown	Adult	Flood	HZ	2	moderate
FP	2-Feb-17	10:49:53	Sierra	I-PD	CSL	1	0	32.69577	-117.23318	HO		D8-DB(IPP)	Female	Adult	Flood	CD	1	good
FP	2-Feb-17	10:51:56	MagSi	I-PD	CSL	0	1	32.68629	-117.22936	SW		D8-DB(IPP)	Unknown	Adult	Flood	HZ	1	moderate
FP	2-Feb-17	11:02:38	MagSi	Pre-/Post-	CSL	0	1	32.68918	-117.23310	DV			Male	Adult	Flood	HZ	1	moderate
FP	2-Feb-17	11:11:38	P-122	I-PD	CSL	0	1	32.69654	-117.23650	SW		D8-DB(IPP)	Male	Adult	Flood	PC	2	good
FP	2-Feb-17	11:30:46	MagSi	Caisson	PHS	0	1	32.68542	-117.23338	ML		P-K-10	Unknown	Adult	Flood	HZ	1	moderate
FP	2-Feb-17	11:33:17	November	Caisson	CSL	0	1	32.70250	-117.23437	SW		P-K-10	Unknown	Juvenile	Flood	PC	0	good
FP	2-Feb-17	11:33:48	MagSi	Caisson	PHS	0	1	32.68557	-117.23279	SW		P-K-10	Unknown	Adult	Flood	HZ	1	moderate
FP	2-Feb-17	11:38:54	MagSi	Caisson	PHS	0	1	32.68897	-117.23195	ML		P-K-10	Unknown	Adult	Flood	HZ	1	moderate
FP	2-Feb-17	11:41:28	MagSi	Caisson	PHS	0	1	32.68456	-117.23138	ML		P-K-10	Unknown	Adult	Flood	HZ	1	moderate
FP	2-Feb-17	11:44:46	MagSi	Caisson	CSL	0	1	32.68673	-117.23296	SW		P-K-10	Female	Adult	Flood	HZ	1	moderate
FP	2-Feb-17	14:24:46	Caisson1	Caisson	CSL	1	0	32.70246	-117.23649	HO		P-H-9	Male	Adult	Ebb	O	2	good
FP	2-Feb-17	14:58:34	Caisson1	Caisson	CSL	0	1	32.70163	-117.23626	SW		P-H-9	Male	Adult	Ebb	O	2	good
FP	6-Feb-17	8:45:22	BaitBarge	Pre-	CSL	20	0	32.69504	-117.23537	HO			Mixed	Mixed	Ebb	LR	2	moderate
FP	6-Feb-17	8:46:18	MagSi	Pre-	CSL	1	0	32.67354	117.23030	HO			Unknown	Subadult	Ebb	LR	4	moderate
FP	6-Feb-17	8:47:11	BaitBarge	Pre-	CSL	0	2	32.69504	-117.23532	ML			Mixed	Mixed	Ebb	LR	2	moderate
FP	6-Feb-17	8:55:45	BaitBarge	Pre-	CSL	2	0	32.69639	-117.23331	HO			Female	Adult	Ebb	LR	2	moderate
FP	6-Feb-17	9:25:32	BaitBarge	Caisson	CSL	1	0	32.69370	-117.23600	HO		P-K-4	Male	Adult	Ebb	LR	2	moderate
FP	6-Feb-17	10:59:58	Caisson1	Caisson	PHS	0	1	32.70252	-117.23623	SW		P-K-4	Unknown	Adult	Ebb	CD	1	moderate
FP	6-Feb-17	11:11:28	P-122	Caisson	PHS	0	1	32.69850	-117.23847	SW		P-K-4	Unknown	Adult	Flood	CD	2	moderate
FP	6-Feb-17	11:48:22	BaitBarge	Pre-/Post-	CSL	0	1	32.69468	-117.23549	SW			Female	Adult	Flood	O	2	moderate
FP	6-Feb-17	12:12:34	MagSi	ISS-PD	CBD	0	2	32.69287	-117.23116	BR		D8-DB(IPP)	Unknown	Adult	Flood	LR	4	moderate
FP	6-Feb-17	12:15:01	BaitBarge	I-PD	CSL	0	1	32.69477	-117.23533	ML		D8-DB(IPP)	Male	Adult	Flood	O	3	moderate
FP	6-Feb-17	12:17:24	BaitBarge	I-PD	CSL	0	1	32.69631	-117.23304	SW		D8-DB(IPP)	Female	Adult	Flood	O	3	moderate

Location	Date	Time	Station	Activity	Species	No. of Indiv		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1 ^o	2 ^o							
FP	6-Feb-17	12:41:16	Sierra	Caisson	CSL	0	1	32.69940	-117.23600	SW		P-K-4	Male	Adult	Flood	O	4	moderate
FP	6-Feb-17	13:01:19	BaitBarge	Post-	CSL	2	0	32.69396	-117.23532	HO			Mixed	Mixed	Flood	O	3	moderate
FP	7-Feb-17	9:24:39	Caisson1	Pre-/Post-	CSL	0	1	32.70147	-117.23639	ML			Male	Adult	Ebb	CD	2	moderate
FP	7-Feb-17	9:56:53	Caisson1	Caisson	CSL	0	1	32.70240	-117.23593	SW		P-H-4	Male	Adult	Ebb	CD	2	moderate
FP	15-Feb-17	14:28:41	Clipper	Clipping	CSL	1	0	32.69799	-117.23846	HO		SEC16	Male	Adult	Flood	PC	4	good
FP	16-Feb-17	7:22:39	Clipper	Clipping	CSL	4	0	32.69435	-117.23540	HO		SEC01	Mixed	Mixed	Flood	C	1	moderate
FP	16-Feb-17	7:22:54	Clipper	Clipping	CSL	0	1	32.69524	-117.23491	RF		SEC01	Male	Adult	Flood	HZ	1	moderate
FP	16-Feb-17	8:19:58	Clipper	Pre-/Post-	CSL	0	1	32.69603	-117.23545	SW			Male	Adult	Flood	HZ	1	moderate
FP	16-Feb-17	9:22:03	Clipper	Pre-/Post-	CSL	0	1	32.69902	-117.23730	SW			Male	Adult	Flood	HZ	1	moderate
FP	16-Feb-17	9:28:55	Clipper	Clipping	CSL	0	1	32.69898	-117.23637	SW		SEC08	Male	Adult	Flood	C	1	moderate
FP	16-Feb-17	15:21:39	Clipper	Pre-/Post-	PHS	0	1	32.69939	-117.23816	SW			Unknown	Adult	Ebb	C	1	moderate
FP	18-Feb-17	9:10:00	MagSi	Pre-	CSL	0	1	32.68882	-117.23310	RF			Male	Adult	Ebb	CD	2	moderate
FP	18-Feb-17	9:12:44	MagSi	Pre-	CSL	3	0	32.67354	117.23030	HO			Mixed	Mixed	Ebb	CD	2	moderate
FP	18-Feb-17	9:28:48	BaitBarge	Pre-	CSL	2	0	32.69508	-117.23625	HO			Mixed	Adult	Ebb	CD	2	excellent
FP	18-Feb-17	9:28:59	BaitBarge	Pre-	CSL	1	0	32.69600	-117.23327	HO			Male	Adult	Ebb	CD	2	excellent
FP	18-Feb-17	9:29:06	BaitBarge	Pre-	CSL	14	0	32.69478	-117.23527	HO			Mixed	Mixed	Ebb	CD	2	excellent
FP	18-Feb-17	9:35:15	November	Pre-	CSL	0	1	32.70110	-117.23555	SW			Unknown	Unknown	Ebb	PC	2	good
FP	18-Feb-17	9:37:11	Sierra	Pre-	CSL	0	1	32.69923	-117.23466	SW			Unknown	Adult	Ebb	O	2	moderate
FP	18-Feb-17	9:38:52	BaitBarge	Pre-	CSL	0	1	32.69485	-117.23502	ML			Female	Adult	Ebb	CD	2	excellent
FP	18-Feb-17	9:46:30	BaitBarge	Pre-/Post-	CSL	0	1	32.69741	-117.23335	SW			Female	Adult	Ebb	CD	2	excellent
FP	18-Feb-17	9:52:45	BaitBarge	V-PD	CSL	0	3	32.69472	-117.23501	ML		D6-PD	Mixed	Mixed	Flood	CD	2	excellent
FP	18-Feb-17	10:00:26	November	Pre-/Post-	CSL	0	1	32.70104	-117.23039	SW			Female	Adult	Flood	PC	2	good
FP	18-Feb-17	10:07:25	BaitBarge	Pre-/Post-	CSL	0	1	32.69546	-117.23419	ML			Male	Adult	Flood	CD	2	excellent
FP	18-Feb-17	10:32:49	MagSi	I-PD	CSL	0	1	32.69203	-117.22994	PP		D6-PD	Male	Adult	Flood	CD	3	good
FP	18-Feb-17	10:42:17	BaitBarge	Pre-/Post-	CSL	0	2	32.69332	-117.23465	SW			Unknown	Adult	Flood	CD	2	excellent
FP	18-Feb-17	11:03:14	BaitBarge	Post-	CSL	0	1	32.69541	-117.23419	SW			Female	Adult	Flood	CD	2	excellent
FP	18-Feb-17	11:09:34	MagSi	Post-	CSL	0	1	32.68681	-117.23223	SF			Male	Adult	Flood	CD	3	good
FP	18-Feb-17	11:14:03	BaitBarge	Post-	CSL	0	1	32.69555	-117.23398	SW			Male	Adult	Flood	CD	2	excellent
FP	18-Feb-17	11:16:13	MagSi	Post-	CSL	0	1	32.68598	-117.23233	SW			Male	Adult	Flood	CD	3	good
FP	18-Feb-17	11:20:15	MagSi	Post-	CSL	0	2	32.68764	-117.23324	ML			Mixed	Adult	Flood	CD	3	good
FP	21-Feb-17	8:21:49	November	Clipping	CSL	0	1	32.70135	-117.23522	SW		SWC10	Female	Adult	Ebb	C	2	excellent
FP	21-Feb-17	8:22:30	BaitBarge	Clipping	CSL	0	3	32.69512	-117.23537	ML		SWC10	Male	Adult	Ebb	HZ	0	good
FP	21-Feb-17	8:24:18	BaitBarge	Pre-/Post-	CSL	13	0	32.69435	-117.23540	HO	FL		Mixed	Adult	Ebb	HZ	0	good
FP	21-Feb-17	8:27:13	BaitBarge	Pre-/Post-	CSL	10	0	32.69472	-117.23619	HO			Mixed	Adult	Ebb	HZ	0	good
FP	21-Feb-17	8:28:05	Sierra	Pre-/Post-	CSL	0	1	32.69928	-117.23616	SW			Unknown	Subadult	Ebb	C	1	good
FP	21-Feb-17	8:31:56	BaitBarge	Clipping	CSL	2	0	32.69561	-117.23099	HO		SWC09	Unknown	Adult	Ebb	HZ	0	good
FP	21-Feb-17	8:32:54	November	Pre-/Post-	CSL	0	1	32.70129	-117.23542	SW			Female	Adult	Ebb	C	2	excellent
FP	21-Feb-17	8:40:00	MagSi	Clipping	CSL	1	0	32.68246	-117.22904	HO		SWC08	Male	Adult	Ebb	PC	1	moderate
FP	21-Feb-17	8:40:01	MagSi	Clipping	CSL	1	0	32.68202	-117.23160	HO		SWC08	Male	Adult	Ebb	PC	1	moderate
FP	21-Feb-17	8:44:52	MagSi	Pre-/Post-	CSL	0	2	32.68878	-117.23362	ML			Female	Adult	Ebb	PC	1	moderate
FP	21-Feb-17	8:48:43	MagSi	Pre-/Post-	CSL	0	1	32.68604	-117.23230	SW			Female	Adult	Ebb	PC	1	moderate
FP	21-Feb-17	8:54:49	MagSi	Pre-/Post-	CSL	0	1	32.68688	-117.23261	ML			Unknown	Juvenile	Ebb	PC	1	moderate
FP	21-Feb-17	9:02:04	MagSi	Pre-/Post-	CSL	0	1	32.68553	-117.23117	SW			Male	Adult	Ebb	PC	1	moderate
FP	21-Feb-17	9:09:30	MagSi	Pre-/Post-	CSL	4	0	32.67354	117.23030	HO			Mixed	Mixed	Ebb	PC	1	moderate
FP	21-Feb-17	9:10:10	MagSi	Pre-/Post-	CSL	1	0	32.66505	-117.22912	HO			Male	Adult	Ebb	PC	1	moderate
FP	21-Feb-17	9:12:06	MagSi	Pre-/Post-	CSL	0	1	32.69119	-117.23208	ML			Female	Adult	Ebb	PC	1	moderate

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1 ^o	2 ^o							
FP	21-Feb-17	9:17:08	MagSi	Pre-/Post-	CSL	0	1	32.68892	-117.23049	ML			Male	Adult	Ebb	PC	1	moderate
FP	21-Feb-17	9:19:00	BaitBarge	V-PD	CSL	0	4	32.69512	-117.23523	ML		D5-PB	Male	Adult	Ebb	HZ	0	good
FP	21-Feb-17	9:36:01	MagSi	V-PD	CSL	0	1	32.68519	-117.22825	SW		D5-PB	Unknown	Adult	Ebb	PC	1	moderate
FP	21-Feb-17	9:37:49	MagSi	V-PD	CSL	0	1	32.68629	-117.23097	SW		D5-PB	Unknown	Adult	Ebb	PC	1	moderate
FP	21-Feb-17	9:42:11	MagSi	Pre-/Post-	CSL	0	1	32.69022	-117.23186	SW			Unknown	Adult	Ebb	PC	1	moderate
FP	21-Feb-17	9:49:23	BaitBarge	Pre-/Post-	CSL	0	1	32.69614	-117.23387	SW			Male	Adult	Ebb	HZ	0	good
FP	21-Feb-17	9:56:14	MagSi	Pre-/Post-	PHS	0	1	32.68674	-117.23265	ML			Unknown	Adult	Ebb	PC	1	moderate
FP	21-Feb-17	10:07:20	Command	Pre-/Post-	CSL	0	1	32.70118	-117.22992	ML			Female	Adult	Ebb	C	1	moderate
FP	21-Feb-17	10:10:10	Command	V-PD	CSL	0	1	32.70118	-117.22992	EN		D6-PD	Female	Adult	Ebb	C	1	moderate
FP	21-Feb-17	10:50:27	MagSi	Pre-/Post-	CSL	0	1	32.68668	-117.23047	SW			Male	Adult	Ebb	PC	1	moderate
FP	21-Feb-17	11:28:25	BaitBarge	Pre-/Post-	CSL	0	1	32.69307	-117.23469	SW			Female	Adult	Ebb	HZ	0	good
FP	21-Feb-17	11:34:30	November	Pre-/Post-	CSL	0	1	32.70135	-117.23522	SW			Female	Pup	Ebb	C	2	excellent
FP	21-Feb-17	11:39:21	November	I-PD	CSL	0	1	32.70165	-117.23664	ML		D6-PD	Female	Adult	Ebb	C	2	excellent
FP	21-Feb-17	12:07:17	BaitBarge	I-PD	CSL	0	1	32.69418	-117.23534	ML		D5-PB	Male	Adult	Ebb	HZ	0	good
FP	21-Feb-17	12:33:13	MagSi	Post-	PHS	0	1	32.68578	-117.23288	SW			Unknown	Adult	Ebb	PC	3	moderate
FP	21-Feb-17	14:21:53	BaitBarge	Pre-	CSL	0	1	32.69498	-117.23338	SW			Female	Adult	Flood	CD	2	good
FP	21-Feb-17	14:30:36	P-122	Pre-	PHS	0	1	32.69825	-117.23836	SW			Unknown	Adult	Flood	PC	3	good
FP	21-Feb-17	15:17:46	MagSi	Pre-	CSL	0	1	32.68539	-117.23301	SW			Female	Adult	Flood	PC	1	moderate
FP	21-Feb-17	15:20:50	MagSi	V-PD	CSL	0	1	32.68607	-117.23240	DV		D7-DB	Male	Adult	Flood	PC	1	moderate
FP	21-Feb-17	15:34:50	MagSi	Pre-/Post-	PHS	0	1	32.68558	-117.23262	LO			Unknown	Adult	Flood	PC	1	moderate
FP	21-Feb-17	15:40:25	BaitBarge	Pre-/Post-	CSL	0	1	32.69409	-117.23532	SW			Female	Adult	Flood	CD	2	good
FP	21-Feb-17	15:43:36	MagSi	Pre-/Post-	CSL	1	0	32.68246	-117.22904	HO			Male	Adult	Flood	PC	1	moderate
FP	21-Feb-17	15:46:07	BaitBarge	Pre-/Post-	CSL	0	1	32.69409	-117.23532	ML			Female	Adult	Flood	CD	2	good
FP	21-Feb-17	15:47:23	P-122	Pre-/Post-	PHS	0	1	32.69824	-117.23818	SW			Unknown	Adult	Flood	PC	3	excellent
FP	22-Feb-17	7:48:16	MagSi	Pre-	CSL	1	0	32.66540	-117.22669	HO			Unknown	Juvenile	Ebb	CD	3	moderate
FP	22-Feb-17	7:50:12	MagSi	Pre-	CSL	1	0	32.67354	-117.23030	HO			Unknown	Unknown	Ebb	CD	3	moderate
FP	22-Feb-17	7:55:59	BaitBarge	Pre-	CSL	13	0	32.69435	-117.23540	HO			Mixed	Mixed	Ebb	PC	2	moderate
FP	22-Feb-17	7:56:50	BaitBarge	Pre-	CSL	6	0	32.69472	-117.23619	HO			Mixed	Mixed	Ebb	PC	2	moderate
FP	22-Feb-17	8:08:24	BaitBarge	V-PD	CSL	0	1	32.69454	-117.23542	ML		D8-DA	Female	Adult	Ebb	PC	2	moderate
FP	22-Feb-17	8:24:05	BaitBarge	Pre-/Post-	CSL	1	0	32.69577	-117.23318	HO			Female	Adult	Ebb	PC	2	moderate
FP	22-Feb-17	8:24:57	BaitBarge	Pre-/Post-	CSL	1	0	32.69561	-117.23099	HO			Male	Adult	Ebb	PC	2	moderate
FP	22-Feb-17	8:29:33	November	Pre-/Post-	CSL	0	1	32.70120	-117.23551	SW			Male	Adult	Ebb	CD	3	good
FP	22-Feb-17	8:33:23	BaitBarge	V-PD	CSL	0	8	32.69454	-117.23536	EN	FL	D7-DA	Mixed	Mixed	Ebb	PC	2	moderate
FP	22-Feb-17	10:21:33	BaitBarge	I-PD	CSL	0	1	32.69454	-117.23542	SW		D8-DA	Female	Adult	Ebb	PC	2	moderate
FP	22-Feb-17	10:24:35	BaitBarge	I-PD	CSL	0	1	32.69568	-117.23568	EN		D8-DA	Male	Adult	Ebb	PC	2	moderate
FP	28-Feb-17	14:31:26	BaitBarge	Pre-	CSL	84	0	32.69435	-117.23540	HO			Mixed	Mixed	Ebb	PC	3	good
FP	28-Feb-17	14:35:37	MagSi	Pre-	CSL	1	0	32.67381	-117.22762	HO			Male	Adult	Ebb	PC	3	good
FP	28-Feb-17	14:36:46	MagSi	Pre-	CSL	2	0	32.66540	-117.22669	HO			Mixed	Mixed	Ebb	PC	3	good
FP	28-Feb-17	14:37:40	MagSi	Pre-	CSL	3	0	32.67354	-117.23030	HO			Mixed	Mixed	Ebb	PC	3	good
FP	28-Feb-17	15:15:14	MagSi	Pre-/Post-	PHS	0	1	32.68576	-117.23299	SW			Unknown	Adult	Ebb	PC	3	good
FP	28-Feb-17	15:17:46	MagSi	Pre-/Post-	CSL	0	1	32.68641	-117.23231	SW			Female	Adult	Ebb	PC	3	good
FP	28-Feb-17	15:22:00	November	Pre-/Post-	CSL	0	1	32.70148	-117.23607	SW			Male	Adult	Ebb	PC	1	good
FP	28-Feb-17	15:44:43	MagSi	Pre-/Post-	CBD	0	1	32.68110	-117.22881	SW			Unknown	Adult	Ebb	PC	3	good
FP	28-Feb-17	15:50:32	MagSi	Pre-/Post-	CSL	0	1	32.68697	-117.23281	SW			Female	Adult	Ebb	PC	3	good
FP	28-Feb-17	15:55:33	MagSi	Pre-/Post-	CSL	0	1	32.69022	-117.23434	SW			Female	Adult	Ebb	PC	3	good
FP	28-Feb-17	16:31:09	MagSi	Post-	CSL	0	1	32.68676	-117.23245	SW			Male	Adult	Flood	PC	2	good

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	1-Mar-17	7:31:16	BaitBarge	Pre-	CSL	28	3	32.69447	-117.23548	HO			Mixed	Mixed	Flood	C	1	excellent
FP	1-Mar-17	7:41:43	MagSi	Pre-	CSL	0	1	32.68757	-117.23365	SW			Male	Adult	Flood	HZ	2	good
FP	1-Mar-17	7:44:11	Sierra	Pre-	CSL	0	1	32.69550	-117.23462	EX			Female	Adult	Flood	C	1	good
FP	1-Mar-17	7:44:26	MagSi	Pre-	CSL	0	4	32.68802	-117.23138	SW			Mixed	Adult	Flood	HZ	2	moderate
FP	1-Mar-17	7:52:12	MagSi	Pre-	CSL	0	1	32.68282	-117.22967	SW			Male	Adult	Flood	HZ	2	moderate
FP	1-Mar-17	7:56:05	Sierra	Pre-	CSL	0	1	32.69971	-117.23458	SW			Unknown	Subadult	Flood	C	1	good
FP	1-Mar-17	7:59:18	MagSi	Pre-	CSL	0	1	32.68443	-117.22708	RF			Male	Adult	Flood	HZ	2	moderate
FP	1-Mar-17	8:05:12	MagSi	Pre-	CSL	0	1	32.68799	-117.22758	SW			Male	Adult	Flood	HZ	2	moderate
FP	1-Mar-17	8:16:55	November	Pre-	CSL	1	0	32.69561	-117.23099	HO			Unknown	Subadult	Flood	C	1	good
FP	1-Mar-17	8:18:36	BaitBarge	Pre-	CSL	0	1	32.69526	-117.23479	SW			Male	Adult	Flood	C	1	excellent
FP	1-Mar-17	8:31:39	MagSi	I-PD	CSL	0	3	32.68757	-117.23365	SW		D8-DB-B2	Mixed	Adult	Flood	HZ	2	moderate
FP	1-Mar-17	8:38:49	P-122	I-PD	CSL	0	1	32.69755	-117.23755	ML	AD	D8-DB-B2	Male	Adult	Flood	C	0	good
FP	1-Mar-17	8:41:46	MagSi	Post-	CSL	0	1	32.68664	-117.23276	SW			Female	Adult	Flood	HZ	2	moderate
FP	1-Mar-17	8:43:37	Sierra	Post-	CSL	0	1	32.69558	-117.23435	EX			Unknown	Subadult	Flood	C	1	good
FP	1-Mar-17	8:45:47	MagSi	Post-	CBD	0	3	32.68722	-117.23009	SW			Unknown	Adult	Flood	HZ	2	moderate
FP	1-Mar-17	8:45:55	BaitBarge	Post-	CSL	0	25	32.69447	-117.23548	EN	FL		Mixed	Mixed	Flood	C	1	excellent
FP	1-Mar-17	8:55:28	Sierra	Post-	CSL	0	1	32.70077	-117.22987	SW			Unknown	Subadult	Flood	C	1	good
FP	1-Mar-17	8:58:17	MagSi	Post-	CSL	0	1	32.68640	-117.23236	SW			Female	Adult	Flood	HZ	2	moderate
FP	1-Mar-17	9:05:33	MagSi	Post-	CSL	0	2	32.68352	-117.23036	SW			Unknown	Adult	Flood	HZ	2	moderate
FP	1-Mar-17	12:59:03	MagSi	Pre-/Post-	CSL	0	1	32.68675	-117.23160	SW			Male	Adult	Ebb	HZ	3	moderate
FP	1-Mar-17	13:00:32	BaitBarge	Pre-/Post-	CSL	39	1	32.69447	-117.23548	HO			Mixed	Mixed	Ebb	C	3	excellent
FP	1-Mar-17	13:13:18	MagSi	Pre-/Post-	CSL	0	2	32.68333	-117.23065	SW			Unknown	Adult	Ebb	HZ	3	moderate
FP	1-Mar-17	13:20:40	BaitBarge	V-PD	CSL	0	1	32.69500	-117.23573	EN		D8-DB-B1	Male	Adult	Ebb	C	3	excellent
FP	1-Mar-17	13:31:57	P-122	V-PD	CSL	0	1	32.69790	-117.23789	SW		D8-DB-B1	Male	Adult	Ebb	C	2	excellent
FP	1-Mar-17	14:13:55	P-122	Pre-/Post-	CSL	0	1	32.69689	-117.23785	SW			Male	Adult	Ebb	C	2	excellent
FP	1-Mar-17	14:28:29	MagSi	Post-	CSL	0	1	32.69182	-117.23073	SW			Male	Adult	Ebb	HZ	3	moderate
FP	6-Mar-17	8:48:11	MagSi	Pre-	CSL	1	0	32.68202	-117.23160	HO			Male	Adult	Flood	C	2	good
FP	6-Mar-17	8:49:01	BaitBarge	Pre-	CSL	8	0	32.69435	-117.23540	HO			Mixed	Mixed	Flood	C	3	excellent
FP	6-Mar-17	8:49:38	MagSi	Pre-	CSL	4	0	32.67354	117.23030	HO			Mixed	Unknown	Flood	C	2	good
FP	6-Mar-17	8:52:46	BaitBarge	Pre-	CSL	0	2	32.69430	-117.23551	ML			Female	Juvenile	Flood	C	3	excellent
FP	6-Mar-17	8:53:46	November	Pre-	CSL	1	0	32.70246	-117.23649	HO			Male	Subadult	Flood	C	2	good
FP	6-Mar-17	8:59:44	BaitBarge	Pre-	CSL	1	1	32.69540	-117.23302	ML			Unknown	Juvenile	Flood	C	3	excellent
FP	6-Mar-17	9:11:46	BaitBarge	Pre-	CSL	4	0	32.69435	-117.23540	HO			Mixed	Mixed	Flood	C	3	excellent
FP	6-Mar-17	9:12:59	MagSi	V-PD	CSL	0	1	32.68765	-117.23310	SW		D8-DB-B1	Male	Adult	Flood	C	2	good
FP	6-Mar-17	9:25:37	MagSi	Pre-/Post-	CSL	0	1	32.68610	-117.23184	SW			Male	Adult	Flood	C	2	good
FP	6-Mar-17	9:28:57	November	Pre-/Post-	CSL	1	0	32.70246	-117.23649	HO	FL		Female	Adult	Flood	C	2	good
FP	6-Mar-17	9:31:58	BaitBarge	Pre-/Post-	CSL	0	1	32.69490	-117.23482	SW			Female	Juvenile	Flood	C	3	excellent
FP	6-Mar-17	9:53:28	P-122	Pre-/Post-	PHS	0	1	32.69815	-117.23870	SW			Unknown	Adult	Flood	C	1	moderate
FP	6-Mar-17	9:56:19	BaitBarge	Pre-/Post-	CSL	0	1	32.69377	-117.23550	SW			Unknown	Juvenile	Flood	C	3	excellent
FP	6-Mar-17	10:00:30	P-122	Pre-/Post-	PHS	0	1	32.69809	-117.23883	ML			Unknown	Adult	Flood	C	1	moderate
FP	6-Mar-17	10:09:13	P-122	Pre-/Post-	CSL	0	1	32.69930	-117.23552	SW			Male	Adult	Flood	C	2	moderate
FP	6-Mar-17	10:11:46	P-122	Pre-/Post-	CSL	1	0	32.69826	-117.23863	HO			Male	Adult	Flood	C	2	moderate
FP	6-Mar-17	10:26:00	BaitBarge	Pre-/Post-	CSL	0	1	32.69368	-117.23539	ML			Unknown	Juvenile	Flood	C	3	excellent
FP	6-Mar-17	10:36:16	MagSi	Pre-/Post-	CSL	0	1	32.68807	-117.23273	SW			Male	Adult	Flood	C	2	good
FP	6-Mar-17	10:37:50	BaitBarge	Pre-/Post-	CSL	0	1	32.69517	-117.23488	SW			Female	Adult	Flood	C	3	excellent
FP	6-Mar-17	10:51:36	November	Pre-/Post-	CBD	0	2	32.70071	-117.23204	SW	AD		Unknown	Adult	Flood	C	2	good

Location	Date	Time	Station	Activity	Species	No. of Indiv		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1 ^o	2 ^o							
FP	6-Mar-17	11:00:19	MagSi	Pre-/Post-	CSL	0	1	32.68720	-117.23157	SW			Female	Adult	Flood	C	2	good
FP	6-Mar-17	11:00:51	BaitBarge	I-PD	CSL	0	1	32.69653	-117.23416	SW		D8-DB-B1	Unknown	Juvenile	Flood	C	3	excellent
FP	6-Mar-17	11:20:15	P-122	Post-	CSL	0	1	32.69942	-117.23816	SW			Male	Adult	Flood	C	3	moderate
FP	6-Mar-17	11:28:07	November	Post-	CSL	1	0	32.70246	-117.23649	HO			Female	Adult	Flood	C	2	good
FP	6-Mar-17	11:46:10	Clipper	Pre-/Post-	PHS	0	1	32.69811	-117.23747	ML			Unknown	Adult	Flood	C	2	excellent
FP	6-Mar-17	14:14:27	November	Pre-	CSL	3	0	32.70246	-117.23649	HO			Mixed	Adult	Flood	C	3	good
FP	6-Mar-17	14:28:33	BaitBarge	Pre-	CSL	40	0	32.69435	-117.23540	HO			Mixed	Mixed	Flood	C	4	excellent
FP	6-Mar-17	14:41:11	MagSi	V-PD	CBD	0	2	32.68282	-117.22967	SW		D7-DB-B2	Unknown	Adult	Flood	C	3	good
FP	6-Mar-17	15:03:40	MagSi	Pre-/Post-	CSL	0	1	32.68495	-117.23282	SW			Male	Adult	Flood	C	3	good
FP	6-Mar-17	15:19:42	BaitBarge	Pre-/Post-	CSL	0	1	32.69249	-117.23302	DV			Unknown	Unknown	Flood	C	5	excellent
FP	6-Mar-17	15:38:27	November	I-PD	CSL	0	1	32.70160	-117.23682	SW		D7-DB-B2	Unknown	Adult	Flood	C	3	excellent
FP	6-Mar-17	16:01:42	November	Post-	CSL	0	1	32.70072	-117.23461	SW			Unknown	Unknown	Flood	C	3	excellent
FP	6-Mar-17	16:08:16	MagSi	Post-	CSL	0	1	32.68645	-117.23205	SW			Male	Adult	Flood	C	3	good
FP	7-Mar-17	9:11:00	BaitBarge	Pre-	CSL	6	0	32.69435	-117.23540	HO			Mixed	Mixed	Ebb	C	1	excellent
FP	7-Mar-17	9:13:58	MagSi	Pre-	CSL	6	0	32.67354	-117.23030	HO			Mixed	Mixed	Ebb	HZ	1	moderate
FP	7-Mar-17	9:14:50	November	Pre-	CSL	1	0	32.70621	-117.22619	HO			Unknown	Unknown	Ebb	C	1	good
FP	7-Mar-17	9:15:12	MagSi	Pre-	CSL	2	0	32.66540	-117.22669	HO			Mixed	Adult	Ebb	HZ	1	moderate
FP	7-Mar-17	9:41:45	BaitBarge	Pre-	CSL	0	1	32.69529	-117.23404	PP			Unknown	Subadult	Ebb	C	1	excellent
FP	7-Mar-17	10:04:27	Sierra	Pre-	CSL	0	1	32.70036	-117.23567	SW			Female	Adult	Ebb	C	1	excellent
FP	7-Mar-17	10:05:59	MagSi	Pre-	CSL	1	0	32.68202	-117.23160	HO			Male	Adult	Ebb	HZ	1	moderate
FP	7-Mar-17	10:07:40	BaitBarge	Pre-/Post-	CSL	0	1	32.69491	-117.23532	EN			Male	Adult	Ebb	C	1	excellent
FP	7-Mar-17	10:10:48	BaitBarge	V-PD	CSL	0	1	32.69573	-117.23501	SW		D7-DB-B1	Male	Adult	Ebb	C	1	excellent
FP	7-Mar-17	10:11:23	MagSi	V-PD	CSL	0	1	32.68407	-117.23126	SW		D7-DB-B1	Male	Adult	Ebb	HZ	1	moderate
FP	7-Mar-17	10:13:02	Sierra	V-PD	CSL	0	1	32.69754	-117.23288	ML		D7-DB-B1	Male	Adult	Ebb	C	1	excellent
FP	7-Mar-17	10:32:23	MagSi	Pre-/Post-	PHS	2	0	32.67694	-117.23712	HO			Mixed	Mixed	Ebb	HZ	1	moderate
FP	7-Mar-17	10:34:46	MagSi	Pre-/Post-	PHS	1	0	32.67694	-117.23712	HO			Unknown	Adult	Ebb	HZ	1	moderate
FP	7-Mar-17	10:35:27	MagSi	Pre-/Post-	PHS	1	0	32.67752	-117.23793	HO			Unknown	Adult	Ebb	HZ	1	moderate
FP	7-Mar-17	10:40:11	MagSi	Pre-/Post-	PHS	1	0	32.67025	-117.23644	HO			Unknown	Adult	Ebb	HZ	1	moderate
FP	7-Mar-17	10:42:41	BaitBarge	I-PD	CSL	0	4	32.69492	-117.23540	EN		D7-DB-B1	Mixed	Mixed	Ebb	C	1	excellent
FP	7-Mar-17	10:47:41	MagSi	I-PD	PHS	0	1	32.68665	-117.23303	SW		D7-DB-B1	Unknown	Adult	Ebb	HZ	1	moderate
FP	7-Mar-17	11:13:55	MagSi	Post-	CSL	0	2	32.68594	-117.23155	SW			Mixed	Adult	Ebb	HZ	2	moderate
FP	7-Mar-17	11:16:07	MagSi	Post-	CSL	0	1	32.68536	-117.23009	SW			Male	Adult	Ebb	HZ	2	moderate
FP	7-Mar-17	14:21:24	BaitBarge	Pre-/Post-	CSL	2	0	32.69577	-117.23318	HO			Female	Adult	Flood	C	4	excellent
FP	7-Mar-17	14:22:25	BaitBarge	Clipping	CSL	11	0	32.69435	-117.23540	HO		SWF56	Mixed	Mixed	Flood	C	4	excellent
FP	7-Mar-17	14:30:47	November	Pre-	CSL	1	0	32.70246	-117.23649	HO			Female	Adult	Flood	PC	4	excellent
FP	7-Mar-17	14:34:32	MagSi	Pre-	CSL	3	0	32.66540	-117.22669	HO			Mixed	Unknown	Flood	HZ	4	moderate
FP	7-Mar-17	14:35:20	MagSi	Pre-	CSL	4	0	32.67354	-117.23030	HO			Mixed	Unknown	Flood	HZ	4	moderate
FP	7-Mar-17	14:37:33	MagSi	V-PD	PHS	1	0	32.67719	-117.23701	HO		D7-DA-B2	Unknown	Adult	Flood	HZ	4	moderate
FP	7-Mar-17	14:54:34	P-122	Pre-/Post-	CSL	0	1	32.69833	-117.23864	SW			Male	Adult	Flood	C	1	good
FP	7-Mar-17	14:54:41	November	Pre-/Post-	CSL	0	1	32.70200	-117.23624	SW			Unknown	Adult	Flood	PC	3	excellent
FP	7-Mar-17	15:01:55	Sierra	Pre-/Post-	CSL	0	1	32.69848	-117.23478	SW			Female	Adult	Flood	C	3	excellent
FP	7-Mar-17	15:18:19	MagSi	Pre-/Post-	CSL	0	1	32.68666	-117.23190	SW			Male	Adult	Flood	HZ	4	moderate
FP	7-Mar-17	15:51:29	MagSi	Pre-/Post-	CBD	0	1	32.68292	-117.22742	SW			Unknown	Adult	Flood	HZ	4	moderate
FP	8-Mar-17	8:47:15	P-122	Pre-	CSL	0	1	32.69782	-117.23805	SW			Male	Adult	Ebb	PC	1	good
FP	8-Mar-17	8:49:22	MagSi	Pre-	CBD	0	4	32.68644	-117.23243	SW			Unknown	Mixed	Ebb	HZ	1	good
FP	8-Mar-17	8:53:30	BaitBarge	Pre-	CSL	16	0	32.69435	-117.23540	HO			Mixed	Mixed	Ebb	C	1	good

Location	Date	Time	Station	Activity	Species	No. of Indiv		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	8-Mar-17	8:55:22	November	Pre-	CSL	0	1	32.70126	-117.23536	SW			Male	Adult	Ebb	PC	1	good
FP	8-Mar-17	9:00:10	MagSi	Pre-	PHS	2	0	32.67732	-117.23738	HO			Unknown	Adult	Ebb	HZ	1	good
FP	8-Mar-17	9:06:14	MagSi	Pre-	CSL	4	0	32.67354	-117.23030	HO			Mixed	Adult	Ebb	HZ	1	good
FP	8-Mar-17	9:07:27	MagSi	Pre-	CSL	2	0	32.65253	-117.22481	HO			Unknown	Unknown	Ebb	HZ	1	good
FP	8-Mar-17	9:08:18	MagSi	V-PD	CSL	1	0	32.66540	-117.22669	HO		D7-DA-B1	Unknown	Adult	Ebb	HZ	1	good
FP	8-Mar-17	9:09:20	MagSi	V-PD	CSL	1	0	32.67381	-117.22762	HO		D7-DA-B1	Male	Adult	Ebb	HZ	1	good
FP	8-Mar-17	9:11:28	MagSi	Pre-/Post-	CSL	0	1	32.68957	-117.23206	DV			Male	Adult	Ebb	HZ	1	good
FP	8-Mar-17	9:15:05	MagSi	Pre-/Post-	CSL	0	1	32.66827	-117.23124	LO			Male	Adult	Ebb	HZ	1	good
FP	8-Mar-17	9:17:08	BaitBarge	Pre-/Post-	CSL	0	1	32.69571	-117.23526	SW			Female	Adult	Ebb	C	1	good
FP	8-Mar-17	9:23:59	MagSi	Pre-/Post-	PHS	0	2	32.67493	-117.23669	SW			Mixed	Mixed	Ebb	HZ	1	good
FP	8-Mar-17	9:28:42	BaitBarge	Pre-/Post-	CSL	0	1	32.69558	-117.23309	SW			Male	Adult	Ebb	C	1	good
FP	8-Mar-17	9:34:44	BaitBarge	Pre-/Post-	CSL	0	1	32.69547	-117.23467	SW			Male	Adult	Ebb	C	1	good
FP	8-Mar-17	10:01:33	Sierra	Pre-/Post-	CSL	0	1	32.69903	-117.23601	SW			Female	Subadult	Ebb	PC	0	good
FP	8-Mar-17	10:04:04	MagSi	Shutdown	CSL	0	1	32.69114	-117.22830	SW			Male	Adult	Ebb	HZ	1	good
FP	8-Mar-17	10:14:09	BaitBarge	I-PD	CSL	0	2	32.69375	-117.23393	SW		D7-DA-B1	Female	Adult	Ebb	C	1	good
FP	8-Mar-17	10:18:04	MagSi	I-PD	CSL	0	1	32.68668	-117.23047	SW		D7-DA-B1	Male	Adult	Ebb	HZ	2	good
FP	8-Mar-17	10:51:04	MagSi	Post-	PHS	0	1	32.67706	-117.23750	SW			Unknown	Adult	Ebb	HZ	2	good
FP	9-Mar-17	14:18:50	BaitBarge	Pre-	CSL	29	0	32.69435	-117.23540	HO			Mixed	Mixed	Flood	HZ	2	good
FP	9-Mar-17	14:19:29	BaitBarge	Pre-	CSL	1	0	32.69561	-117.23099	HO			Female	Adult	Flood	HZ	2	good
FP	9-Mar-17	14:22:04	MagSi	Pre-	CSL	4	0	32.69577	-117.23318	HO			Mixed	Mixed	Flood	C	2	good
FP	9-Mar-17	14:24:37	November	Pre-	CSL	1	0	32.70246	-117.23649	HO			Male	Adult	Flood	C	3	good
FP	9-Mar-17	14:46:00	P-122	I-PD	CSL	0	1	32.69738	-117.23457	SW		D8-DA-B1	Male	Adult	Flood	C	2	good
FP	9-Mar-17	14:58:52	P-122	Post-	CSL	0	1	32.70002	-117.23239	SW			Male	Adult	Flood	C	2	good
FP	9-Mar-17	14:59:37	Sierra	Post-	PHS	0	1	32.69978	-117.23593	ML			Unknown	Adult	Flood	PC	2	good
FP	9-Mar-17	15:07:05	P-122	Post-	PHS	0	1	32.69828	-117.23789	SW			Unknown	Adult	Flood	C	2	good
FP	10-Mar-17	9:52:02	MagSi	Pre-	CSL	3	0	32.68202	-117.23160	HO			Unknown	Adult	Ebb	HZ	2	moderate
FP	10-Mar-17	9:54:11	MagSi	Pre-	CSL	7	0	32.67354	-117.23030	HO			Unknown	Mixed	Ebb	HZ	2	moderate
FP	10-Mar-17	9:55:37	MagSi	Pre-	CSL	4	0	32.68246	-117.22904	HO			Unknown	Mixed	Ebb	HZ	2	moderate
FP	10-Mar-17	10:06:47	BaitBarge	Pre-	CSL	20	0	32.69435	-117.23540	HO			Mixed	Mixed	Ebb	C	3	good
FP	10-Mar-17	10:07:14	MagSi	Pre-	CSL	6	0	32.66505	-117.22912	HO			Unknown	Unknown	Ebb	HZ	2	moderate
FP	10-Mar-17	10:08:44	MagSi	Pre-	CSL	0	1	32.68769	-117.22691	SW			Male	Adult	Ebb	HZ	2	moderate
FP	10-Mar-17	10:13:30	November	Pre-	CSL	0	1	32.70215	-117.23568	SW			Unknown	Adult	Ebb	PC	1	excellent
FP	10-Mar-17	10:15:23	MagSi	Pre-	CSL	1	0	32.69561	-117.23099	HO			Unknown	Unknown	Ebb	HZ	2	moderate
FP	10-Mar-17	10:20:08	MagSi	Pre-	PHS	0	1	32.68752	-117.23086	SW			Unknown	Adult	Ebb	HZ	2	moderate
FP	10-Mar-17	10:49:32	November	Pre-	CSL	0	1	32.70137	-117.23558	SH			Male	Adult	Ebb	PC	2	excellent
FP	10-Mar-17	11:28:58	November	Post-	CSL	0	1	32.70157	-117.23503	SW			Unknown	Juvenile	Ebb	PC	3	excellent
FP	10-Mar-17	11:29:32	BaitBarge	Post-	CSL	0	1	32.69493	-117.23540	ML			Male	Juvenile	Ebb	C	3	good
FP	10-Mar-17	11:49:25	BaitBarge	Pre-/Post-	CSL	0	1	32.69379	-117.23419	SW			Male	Adult	Ebb	C	3	good
FP	11-Mar-17	10:42:44	MagSi	Pre-	CSL	0	1	32.68362	-117.23254	SW			Male	Adult	Ebb	C	2	good
FP	11-Mar-17	10:43:20	MagSi	Pre-	CSL	3	0	32.68202	-117.23160	HO			Mixed	Mixed	Ebb	C	2	good
FP	11-Mar-17	10:45:25	BaitBarge	Pre-	CSL	25	0	32.69435	-117.23540	HO			Mixed	Mixed	Ebb	C	4	good
FP	11-Mar-17	11:15:24	BaitBarge	Pre-/Post-	CSL	1	0	32.69472	-117.23619	HO			Male	Adult	Ebb	C	4	good
FP	11-Mar-17	11:17:46	MagSi	Pre-/Post-	CSL	0	2	32.68711	-117.23265	SW			Unknown	Juvenile	Ebb	C	2	good
FP	11-Mar-17	11:21:21	November	Pre-/Post-	CSL	0	1	32.70118	-117.23539	SW			Unknown	Subadult	Ebb	PC	2	good
FP	11-Mar-17	11:22:02	MagSi	Pre-/Post-	CSL	0	1	32.68629	-117.23230	SW			Male	Adult	Ebb	C	2	good
FP	11-Mar-17	11:44:15	MagSi	I-PD	CSL	0	1	32.68629	-117.23230	SW		D8-DA-B2	Female	Adult	Ebb	C	2	good

Location	Date	Time	Station	Activity	Species	No. of Indiv		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	11-Mar-17	11:53:58	BaitBarge	I-PD	CSL	0	1	32.69470	-117.23529	ML		D8-DA-B2	Male	Subadult	Ebb	C	4	good
FP	11-Mar-17	12:03:38	BaitBarge	Post-	CSL	1	0	32.69577	-117.23318	HO			Male	Subadult	Ebb	C	4	good
FP	11-Mar-17	12:22:09	MagSi	Post-	CSL	0	1	32.68660	-117.23210	SW			Male	Adult	Ebb	C	2	good
FP	15-Mar-17	10:05:04	November	Pre-	CSL	1	0	32.70177	-117.22927	HO			Unknown	Subadult	Flood	PC	2	moderate
FP	15-Mar-17	10:05:12	P-122	Pre-	CSL	3	0	32.69823	-117.23856	HO			Male	Mixed	Flood	PC	2	good
FP	15-Mar-17	10:08:37	BaitBarge	Pre-	CSL	2	0	32.69561	-117.23099	HO			Unknown	Juvenile	Flood	C	2	good
FP	15-Mar-17	10:10:26	MagSi	Pre-	CSL	1	0	32.67354	117.23030	HO			Male	Adult	Flood	C	2	good
FP	15-Mar-17	10:11:19	MagSi	Pre-	CSL	6	0	32.68202	-117.23160	HO			Mixed	Adult	Flood	C	2	good
FP	15-Mar-17	10:13:17	Sierra	Pre-	CSL	0	1	32.69948	-117.23586	SW			Unknown	Juvenile	Flood	PC	2	moderate
FP	15-Mar-17	10:14:41	BaitBarge	Pre-	CSL	1	0	32.69577	-117.23318	HO			Unknown	Subadult	Flood	C	2	good
FP	15-Mar-17	10:17:35	BaitBarge	Pre-	CSL	12	0	32.69435	-117.23540	HO			Mixed	Mixed	Flood	C	2	good
FP	15-Mar-17	10:25:23	BaitBarge	Pre-	CSL	0	1	32.69430	-117.23462	SW			Male	Adult	Flood	C	2	good
FP	15-Mar-17	10:30:01	MagSi	Pre-	CSL	0	2	32.68433	-117.23177	SW			Male	Adult	Flood	C	2	good
FP	15-Mar-17	10:36:13	MagSi	Pre-	CSL	0	1	32.68752	-117.23242	ML			Male	Subadult	Flood	C	2	good
FP	15-Mar-17	11:25:03	Sierra	Pre-/Post-	CSL	0	1	32.69951	-117.23602	SW			Unknown	Subadult	Flood	PC	2	moderate
FP	15-Mar-17	11:36:11	MagSi	Pre-/Post-	CSL	0	1	32.68683	-117.23134	SW			Male	Adult	Ebb	C	2	good
FP	15-Mar-17	11:39:29	November	Pre-/Post-	CBD	0	2	32.70369	-117.23434	SW			Unknown	Adult	Ebb	PC	2	moderate
FP	15-Mar-17	11:44:39	P-122	Pre-/Post-	CSL	0	2	32.69823	-117.23856	EN			Male	Mixed	Ebb	PC	2	good
FP	15-Mar-17	11:45:33	MagSi	Pre-/Post-	CSL	0	1	32.68472	-117.23203	SW			Male	Adult	Ebb	C	2	good
FP	15-Mar-17	11:48:25	BaitBarge	Pre-/Post-	CSL	1	0	32.69472	-117.23619	HO			Male	Adult	Ebb	C	2	good
FP	15-Mar-17	11:51:44	November	Pre-/Post-	CSL	0	2	32.70489	-117.23255	SW			Male	Subadult	Ebb	PC	2	moderate
FP	15-Mar-17	12:08:54	P-122	Pre-/Post-	CSL	0	1	32.69721	-117.23806	SW			Male	Adult	Ebb	PC	2	good
FP	15-Mar-17	12:14:45	P-122	Pre-/Post-	CSL	0	1	32.69794	-117.23801	SW			Male	Subadult	Ebb	PC	2	good
FP	15-Mar-17	12:19:45	P-122	Pre-/Post-	CSL	0	1	32.69890	-117.23649	SW			Unknown	Juvenile	Ebb	PC	2	good
FP	15-Mar-17	12:31:51	BaitBarge	Pre-/Post-	CSL	0	1	32.69459	-117.23449	ML			Male	Adult	Ebb	C	3	good
FP	15-Mar-17	12:36:12	BaitBarge	I-PD	CSL	0	1	32.69610	-117.23353	SW		D6-PB-B2	Male	Adult	Ebb	C	4	good
FP	15-Mar-17	12:40:52	MagSi	Pre-/Post-	CSL	0	1	32.68842	-117.23219	ML			Female	Adult	Ebb	C	2	good
FP	15-Mar-17	12:52:40	BaitBarge	Pre-/Post-	CSL	0	1	32.69430	-117.23580	SW			Male	Adult	Ebb	C	4	good
FP	15-Mar-17	13:14:10	MagSi	Post-	CSL	0	1	32.68707	-117.23257	SF			Male	Adult	Ebb	C	2	good
FP	16-Mar-17	10:22:00	MagSi	Pre-	CSL	1	0	32.68202	-117.23160	HO			Male	Adult	Flood	HZ	2	moderate
FP	16-Mar-17	10:22:42	MagSi	Pre-	CSL	2	0	32.67354	117.23030	HO			Unknown	Adult	Flood	HZ	2	moderate
FP	16-Mar-17	10:23:18	MagSi	Pre-	CSL	3	0	32.66540	-117.22669	HO			Unknown	Unknown	Flood	HZ	2	moderate
FP	16-Mar-17	10:23:32	P-122	Pre-	CSL	1	4	32.69826	-117.23880	SW			Mixed	Adult	Flood	HZ	3	moderate
FP	16-Mar-17	10:29:54	BaitBarge	Pre-	CSL	15	0	32.69435	-117.23540	HO			Mixed	Mixed	Flood	C	4	moderate
FP	16-Mar-17	10:32:18	November	Pre-	CSL	0	1	32.70069	-117.23307	SW			Unknown	Juvenile	Flood	HZ	1	moderate
FP	16-Mar-17	10:33:37	BaitBarge	Pre-	CSL	2	0	32.69561	-117.23099	HO			Unknown	Mixed	Flood	C	4	moderate
FP	16-Mar-17	10:41:24	BaitBarge	Pre-	CSL	0	1	32.69484	-117.23520	EN			Unknown	Juvenile	Flood	C	4	moderate
FP	16-Mar-17	10:46:21	BaitBarge	V-PD	CSL	0	1	32.69468	-117.23523	EX		D5-PD-B2	N/A	Subadult	Flood	C	4	moderate
FP	16-Mar-17	10:51:06	BaitBarge	V-PD	CSL	0	2	32.69493	-117.23589	SW		D5-PD-B2	Mixed	Mixed	Flood	C	4	moderate
FP	16-Mar-17	10:55:21	BaitBarge	Pre-/Post-	CSL	0	1	32.69547	-117.23424	SW			N/A	Juvenile	Flood	C	4	moderate
FP	16-Mar-17	11:03:28	BaitBarge	Pre-/Post-	CSL	0	1	32.69428	-117.23511	SW			Unknown	Subadult	Flood	C	4	moderate
FP	16-Mar-17	11:05:10	P-122	Pre-/Post-	CSL	0	3	32.69787	-117.23858	ML			Mixed	Mixed	Flood	HZ	2	moderate
FP	16-Mar-17	11:07:06	November	Pre-/Post-	CSL	0	1	32.70281	-117.23381	SW			Unknown	Subadult	Flood	HZ	1	moderate
FP	16-Mar-17	11:17:14	BaitBarge	Pre-/Post-	CSL	0	1	32.69519	-117.23599	EX			Unknown	Subadult	Flood	C	4	moderate
FP	16-Mar-17	11:20:36	November	Pre-/Post-	CSL	0	1	32.70057	-117.23397	SW			Unknown	Unknown	Flood	HZ	1	moderate
FP	16-Mar-17	11:25:53	BaitBarge	Pre-/Post-	CSL	0	3	32.69422	-117.23498	ML			Mixed	Mixed	Flood	C	4	moderate

Location	Date	Time	Station	Activity	Species	No. of Indiv		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	16-Mar-17	11:30:08	P-122	Pre-/Post-	CSL	0	2	32.69790	-117.23789	SW			Mixed	Adult	Flood	HZ	2	moderate
FP	16-Mar-17	11:33:50	MagSi	I-PD	CSL	0	1	32.68685	-117.23264	SW		D5-PD-B2	Male	Adult	Flood	HZ	2	moderate
FP	16-Mar-17	11:34:29	November	I-PD	CSL	0	1	32.70140	-117.23671	SW		D5-PD-B2	Male	Subadult	Flood	HZ	1	moderate
FP	16-Mar-17	11:34:59	MagSi	I-PD	CSL	0	1	32.69164	-117.23421	PP		D5-PD-B2	Unknown	Juvenile	Flood	HZ	2	moderate
FP	16-Mar-17	11:41:56	MagSi	I-PD	CSL	0	1	32.68863	-117.23210	SW		D5-PD-B2	Unknown	Subadult	Flood	HZ	2	moderate
FP	16-Mar-17	11:42:57	BaitBarge	I-PD	CSL	0	1	32.69402	-117.23475	EX		D5-PD-B2	Male	Subadult	Flood	C	4	moderate
FP	16-Mar-17	11:49:22	BaitBarge	Pre-/Post-	CSL	4	0	32.69472	-117.23619	HO			Mixed	Mixed	Flood	C	4	moderate
FP	16-Mar-17	11:49:46	MagSi	Pre-/Post-	CSL	0	1	32.68626	-117.23246	SW			Unknown	Juvenile	Flood	HZ	2	moderate
FP	16-Mar-17	11:50:14	BaitBarge	Pre-/Post-	CSL	18	0	32.69435	-117.23540	HO			Mixed	Mixed	Flood	C	4	moderate
FP	16-Mar-17	11:55:34	MagSi	Pre-/Post-	CSL	0	1	32.68629	-117.23265	ML			Female	Adult	Flood	HZ	2	moderate
FP	16-Mar-17	12:14:08	BaitBarge	Pre-/Post-	CSL	0	1	32.69517	-117.23613	EN			Male	Adult	Flood	C	4	moderate
FP	16-Mar-17	12:15:48	November	Pre-/Post-	CBD	0	3	32.70231	-117.23467	SW			Mixed	Mixed	Flood	HZ	1	moderate
FP	16-Mar-17	12:25:22	November	Pre-/Post-	CSL	0	1	32.70185	-117.23600	SW			Unknown	Juvenile	Ebb	HZ	1	moderate
FP	16-Mar-17	14:10:34	P-122	Pre-/Post-	CSL	5	3	32.69826	-117.23863	HO			Mixed	Adult	Ebb	HZ	2	good
FP	16-Mar-17	14:10:50	P-122	Pre-/Post-	PHS	0	1	32.69788	-117.23873	ML			Unknown	Adult	Ebb	HZ	2	moderate
FP	16-Mar-17	14:22:30	BaitBarge	Pre-/Post-	CSL	29	0	32.69435	-117.23540	HO			Mixed	Mixed	Ebb	C	4	moderate
FP	16-Mar-17	14:25:48	BaitBarge	Pre-/Post-	CSL	0	2	32.69554	-117.23460	SW			Mixed	Mixed	Ebb	C	4	moderate
FP	16-Mar-17	14:30:31	P-122	Pre-/Post-	CSL	0	2	32.69729	-117.23639	SW			Male	Subadult	Ebb	HZ	2	moderate
FP	16-Mar-17	14:41:25	BaitBarge	Pre-/Post-	CSL	0	1	32.69408	-117.23599	EX			Male	Adult	Ebb	C	4	moderate
FP	16-Mar-17	14:42:30	Sierra	Pre-/Post-	CSL	0	1	32.69974	-117.23656	SW			Female	Subadult	Ebb	HZ	2	poor
FP	16-Mar-17	14:48:32	November	I-PD	CSL	0	2	32.70228	-117.23463	SW		D6-PD-B1	Male	Subadult	Ebb	PC	2	good
FP	16-Mar-17	15:00:38	BaitBarge	I-PD	CSL	0	1	32.69478	-117.23530	EN		D6-PD-B1	Male	Adult	Ebb	C	4	moderate
FP	16-Mar-17	15:04:50	BaitBarge	I-PD	CSL	0	2	32.69388	-117.23651	EX		D6-PD-B1	Male	Mixed	Ebb	C	4	moderate
FP	17-Mar-17	10:50:30	Clipper	Clipping	CSL	5	0	32.69826	-117.23863	HO		Pier56	Mixed	Adult	Flood	F	2	moderate
FP	17-Mar-17	11:17:02	Clipper	Pre-/Post-	CSL	0	1	32.69906	-117.23580	SW			Male	Adult	Flood	F	2	moderate
FP	17-Mar-17	11:20:57	BaitBarge	Pre-	CSL	3	0	32.69577	-117.23318	HO			Female	Adult	Flood	HZ	3	moderate
FP	17-Mar-17	11:22:01	BaitBarge	Pre-	CSL	2	0	32.69561	-117.23099	HO			Male	Adult	Flood	HZ	3	moderate
FP	17-Mar-17	11:23:12	MagSi	Pre-	CSL	2	0	32.67354	117.23030	HO			Mixed	Adult	Flood	HZ	2	moderate
FP	17-Mar-17	11:23:40	P-122	Pre-	CSL	9	0	32.69826	-117.23863	HO			Mixed	Mixed	Flood	C	3	moderate
FP	17-Mar-17	11:24:12	BaitBarge	Pre-	CSL	2	0	32.69472	-117.23619	HO			Unknown	Mixed	Flood	HZ	3	moderate
FP	17-Mar-17	11:26:31	BaitBarge	Pre-	CSL	26	0	32.69435	-117.23540	HO			Mixed	Mixed	Flood	HZ	3	moderate
FP	17-Mar-17	11:43:07	MagSi	Pre-	CSL	0	1	32.68673	-117.23296	DV			Unknown	Unknown	Flood	HZ	2	moderate
FP	17-Mar-17	12:06:41	P-122	Pre-/Post-	CSL	0	1	32.69802	-117.23838	EN			Female	Adult	Flood	CD	4	moderate
FP	17-Mar-17	12:07:07	MagSi	Pre-/Post-	CSL	0	2	32.68551	-117.23179	SW			Male	Adult	Flood	HZ	2	moderate
FP	17-Mar-17	12:08:32	BaitBarge	Pre-/Post-	CSL	0	1	32.69542	-117.23455	SW			Female	Adult	Flood	HZ	3	moderate
FP	17-Mar-17	12:26:01	P-122	I-PD	CSL	0	1	32.69565	-117.23796	SW		D5-PB-B2	Unknown	Adult	Flood	CD	4	moderate
FP	17-Mar-17	12:30:26	BaitBarge	I-PD	CSL	0	1	32.69426	-117.23527	SW		D5-PB-B2	Unknown	Unknown	Flood	HZ	3	moderate
FP	17-Mar-17	12:33:40	P-122	I-PD	CSL	0	1	32.69821	-117.23844	EN		D5-PB-B2	Male	Adult	Flood	CD	4	moderate
FP	17-Mar-17	12:40:56	BaitBarge	I-PD	CSL	0	1	32.69580	-117.23461	SW		D5-PB-B2	Unknown	Juvenile	Flood	HZ	3	moderate
FP	17-Mar-17	12:41:04	MagSi	I-PD	CSL	0	2	32.68312	-117.22663	SW		D5-PB-B2	Male	Adult	Flood	HZ	2	moderate
FP	17-Mar-17	14:51:42	P-122	Pre-	CSL	7	0	32.69826	-117.23863	HO			Mixed	Mixed	Ebb	CD	4	moderate
FP	17-Mar-17	14:52:30	BaitBarge	Pre-	CSL	2	0	32.69577	-117.23318	HO			Female	Adult	Ebb	HZ	3	moderate
FP	17-Mar-17	14:53:19	BaitBarge	Pre-	CSL	5	0	32.69472	-117.23619	HO			Mixed	Mixed	Ebb	HZ	3	moderate
FP	17-Mar-17	14:55:23	BaitBarge	Pre-	CSL	25	0	32.69435	-117.23540	HO			Mixed	Mixed	Ebb	HZ	3	moderate
FP	17-Mar-17	14:57:18	P-122	Pre-	CSL	0	1	32.69824	-117.23838	EN			Female	Adult	Ebb	CD	4	moderate
FP	17-Mar-17	15:58:21	BaitBarge	Pre-	CSL	0	1	32.69644	-117.23409	SW			Unknown	Juvenile	Ebb	HZ	3	moderate

Location	Date	Time	Station	Activity	Species	No. of Indiv		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	17-Mar-17	16:05:25	MagSi	Pre-	CSL	0	1	32.68606	-117.23207	SW			Female	Adult	Ebb	HZ	2	moderate
FP	17-Mar-17	16:33:40	MagSi	Pre-/Post-	CSL	0	2	32.68668	-117.23244	SW			Unknown	Subadult	Ebb	HZ	2	moderate
FP	17-Mar-17	16:47:45	MagSi	Pre-/Post-	CSL	0	1	32.68778	-117.23246	ML			Male	Adult	Ebb	HZ	2	moderate
FP	17-Mar-17	16:53:57	MagSi	I-PD	CSL	0	1	32.68809	-117.23291	SW		D5-PD-B1	Male	Adult	Ebb	HZ	2	moderate
FP	17-Mar-17	16:58:10	MagSi	I-PD	CSL	0	1	32.68668	-117.23283	SW		D5-PD-B1	Female	Adult	Ebb	HZ	2	moderate
FP	17-Mar-17	16:59:17	P-122	I-PD	CSL	0	1	32.69814	-117.23836	EX		D5-PD-B1	Male	Adult	Ebb	CD	4	moderate
FP	18-Mar-17	10:58:54	BaitBarge	Pre-	CSL	1	0	32.69577	-117.23318	HO			Male	Adult	Flood	F	2	poor
FP	18-Mar-17	10:59:22	MagSi	Pre-	CSL	1	0	32.68202	-117.23160	HO			Unknown	Unknown	Flood	CD	2	poor
FP	18-Mar-17	10:59:58	MagSi	Pre-	CSL	3	0	32.67354	-117.23030	HO			Unknown	Unknown	Flood	CD	2	poor
FP	18-Mar-17	11:01:36	BaitBarge	Pre-	CSL	0	1	32.69306	-117.23445	SW			Unknown	Juvenile	Flood	F	2	poor
FP	18-Mar-17	11:04:11	BaitBarge	Pre-	CSL	15	0	32.69472	-117.23619	HO			Mixed	Mixed	Flood	F	2	poor
FP	18-Mar-17	11:05:20	MagSi	Pre-	CSL	0	1	32.68585	-117.23249	SW			Male	Subadult	Flood	CD	2	poor
FP	18-Mar-17	11:06:43	BaitBarge	Pre-	CSL	33	0	32.69435	-117.23540	HO			Mixed	Mixed	Flood	F	2	poor
FP	18-Mar-17	11:07:51	P-122	Pre-	CSL	1	0	32.69826	-117.23863	HO			Male	Adult	Flood	CD	2	moderate
FP	18-Mar-17	11:07:56	BaitBarge	Pre-	CSL	0	1	32.69560	-117.23415	SW			Male	Adult	Flood	F	2	poor
FP	18-Mar-17	11:11:35	MagSi	Pre-	PHS	0	1	32.68673	-117.23273	SW			Unknown	Adult	Flood	CD	2	poor
FP	18-Mar-17	11:54:41	P-122	Pre-	CSL	0	1	32.69636	-117.23598	SW			Male	Adult	Flood	CD	2	moderate
FP	18-Mar-17	12:05:44	BaitBarge	Pre-	CSL	0	1	32.69410	-117.23362	SW			Unknown	Unknown	Flood	HZ	2	moderate
FP	18-Mar-17	12:24:27	November	Pre-/Post-	PHS	0	1	32.70139	-117.23765	ML			Unknown	Adult	Flood	PC	2	good
FP	18-Mar-17	12:24:27	November	Pre-/Post-	PHS	0	1	32.70095	-117.23651	ML			Unknown	Adult	Flood	PC	2	good
FP	18-Mar-17	13:15:01	P-122	Post-	PHS	0	1	32.69817	-117.23879	ML			Unknown	Adult	Flood	CD	2	moderate
FP	20-Mar-17	9:18:43	BaitBarge	Pre-	CSL	0	1	32.69754	-117.23242	SW			Unknown	Adult	Ebb	O	1	good
FP	20-Mar-17	9:19:27	Clipper	Pre-	CSL	1	0	32.69826	-117.23863	HO			Male	Adult	Ebb	CD	0	moderate
FP	20-Mar-17	9:20:33	BaitBarge	Pre-	CSL	0	1	32.69576	-117.23257	RF			Male	Adult	Ebb	O	1	good
FP	20-Mar-17	9:20:52	P-122	Pre-	CSL	1	0	32.69809	-117.23833	HO			Male	Adult	Ebb	O	1	moderate
FP	20-Mar-17	9:21:05	MagSi	Pre-	CSL	2	0	32.69577	-117.23318	HO			Female	Adult	Ebb	O	1	good
FP	20-Mar-17	9:22:06	MagSi	Pre-	CSL	3	0	32.66540	-117.22669	HO			Mixed	Mixed	Ebb	O	1	good
FP	20-Mar-17	9:23:24	MagSi	Pre-	CSL	4	0	32.67354	-117.23030	HO			Mixed	Mixed	Ebb	O	1	good
FP	20-Mar-17	9:23:43	BaitBarge	Pre-	CSL	1	0	32.69561	-117.23099	HO			Unknown	Adult	Ebb	O	1	good
FP	20-Mar-17	9:25:31	BaitBarge	Clipping	CSL	2	0	32.69472	-117.23619	HO		SWF55	Mixed	Mixed	Ebb	O	1	good
FP	20-Mar-17	9:26:06	BaitBarge	Pre-	CSL	25	6	32.69435	-117.23540	HO			Mixed	Mixed	Ebb	O	1	good
FP	20-Mar-17	9:26:38	MagSi	Pre-	PHS	3	0	32.67630	-117.23739	HO			Mixed	Adult	Ebb	O	1	good
FP	20-Mar-17	9:33:49	MagSi	Pre-	CSL	0	1	32.69125	-117.23259	DV			Unknown	Adult	Ebb	O	1	good
FP	20-Mar-17	9:39:15	BaitBarge	Pre-	CSL	0	1	32.69068	-117.23449	RF			Unknown	Unknown	Ebb	O	2	good
FP	20-Mar-17	9:45:01	MagSi	Pre-	CSL	0	1	32.68763	-117.23338	DV			Unknown	Juvenile	Ebb	O	1	good
FP	20-Mar-17	9:45:05	MagSi	Pre-	PHS	0	1	32.68787	-117.23310	SW			Unknown	Adult	Ebb	O	1	good
FP	20-Mar-17	10:01:03	MagSi	Pre-/Post-	CBD	0	3	32.69045	-117.22898	SW			Unknown	Adult	Ebb	O	1	good
FP	20-Mar-17	10:19:06	BaitBarge	Pre-/Post-	CSL	0	1	32.69513	-117.23482	SW			Male	Adult	Ebb	O	2	good
FP	20-Mar-17	10:22:09	P-122	Pre-/Post-	CSL	0	1	32.69782	-117.23736	SW			Male	Subadult	Ebb	O	1	moderate
FP	20-Mar-17	10:24:49	P-122	Pre-/Post-	CSL	0	1	32.69798	-117.23811	SW			Male	Adult	Ebb	O	1	good
FP	20-Mar-17	10:37:03	MagSi	Pre-/Post-	CSL	0	1	32.68744	-117.23020	SW			Male	Adult	Ebb	O	1	good
FP	20-Mar-17	11:18:52	November	Post-	CSL	0	1	32.70174	-117.23585	ML			Male	Adult	Flood	CD	2	good
FP	20-Mar-17	11:21:18	P-122	Post-	CSL	0	1	32.69769	-117.23656	SW			Male	Adult	Flood	O	2	good
FP	20-Mar-17	11:23:13	MagSi	Post-	CSL	0	1	32.68649	-117.23044	SW			Male	Adult	Flood	O	2	good
FP	20-Mar-17	11:37:06	MagSi	Post-	CSL	0	1	32.68536	-117.23233	SW			Male	Juvenile	Flood	O	2	good
FP	20-Mar-17	12:48:45	Clipper	Pre-/Post-	CSL	4	0	32.69826	-117.23863	HO			Mixed	Adult	Flood	PC	1	good

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	20-Mar-17	14:13:45	BaitBarge	Pre-	CSL	4	0	32.69472	-117.23619	HO			Unknown	Mixed	Flood	PC	2	excellent
FP	20-Mar-17	14:14:33	MagSi	Pre-	CSL	2	0	32.68202	-117.23160	HO			Female	Adult	Flood	PC	2	good
FP	20-Mar-17	14:15:25	BaitBarge	Pre-	CSL	17	0	32.69435	-117.23540	HO			Mixed	Mixed	Flood	PC	2	excellent
FP	20-Mar-17	14:19:17	November	Pre-	PHS	0	2	32.70116	-117.23682	ML			Unknown	Mixed	Flood	PC	2	good
FP	20-Mar-17	14:19:35	P-122	Pre-	CSL	1	0	32.69802	-117.23848	HO			Male	Adult	Flood	PC	2	excellent
FP	20-Mar-17	14:44:13	MagSi	Pre-	CSL	0	1	32.68214	-117.22611	SW			Male	Adult	Flood	PC	2	good
FP	20-Mar-17	14:47:28	MagSi	Pre-	CSL	0	1	32.68718	-117.23291	SW			Male	Adult	Flood	PC	2	good
FP	20-Mar-17	15:30:43	MagSi	Pre-/Post-	CSL	0	1	32.68622	-117.23214	DV			Male	Adult	Flood	PC	2	good
FP	20-Mar-17	15:36:57	MagSi	Pre-/Post-	CSL	0	1	32.68658	-117.23237	SW			Female	Adult	Flood	PC	2	good
FP	21-Mar-17	14:58:07	Clipper	Clipping	CSL	16	0	32.69472	-117.23619	HO		Pier54	Mixed	Mixed	Flood	PC	2	good
FP	21-Mar-17	14:58:07	Clipper	Clipping	CSL	5	0	32.69435	-117.23540	HO		Pier54	Mixed	Mixed	Flood	PC	2	good
FP	23-Mar-17	10:46:36	P-122	Pre-	CSL	3	0	32.69826	-117.23863	HO			Mixed	Adult	Ebb	PC	2	good
FP	23-Mar-17	10:46:37	MagSi	Pre-	CSL	2	0	32.68202	-117.23160	HO			Male	Adult	Ebb	CD	2	good
FP	23-Mar-17	10:48:10	MagSi	Pre-	CSL	2	0	32.67354	117.23030	HO			Unknown	Adult	Ebb	CD	2	good
FP	23-Mar-17	10:53:54	November	Pre-	PHS	0	2	32.70285	-117.23556	ML			Mixed	Mixed	Ebb	PC	2	good
FP	23-Mar-17	11:11:04	BaitBarge	Pre-	CSL	26	0	32.69435	-117.23540	HO			Mixed	Mixed	Ebb	C	3	good
FP	23-Mar-17	11:11:54	BaitBarge	Pre-	CSL	2	0	32.69577	-117.23318	HO			Mixed	Adult	Ebb	C	3	good
FP	23-Mar-17	11:12:54	BaitBarge	Pre-	CSL	4	0	32.69472	-117.23619	HO			Mixed	Mixed	Ebb	C	3	good
FP	23-Mar-17	11:25:25	BaitBarge	Pre-	CSL	0	1	32.69590	-117.23519	SW			Male	Subadult	Ebb	C	3	good
FP	23-Mar-17	11:33:26	BaitBarge	Pre-	CSL	0	1	32.69381	-117.23469	SW			Female	Adult	Ebb	C	3	good
FP	23-Mar-17	11:36:30	Sierra	Pre-	PHS	0	1	32.69951	-117.23683	SW			Unknown	Adult	Ebb	PC	3	good
FP	23-Mar-17	11:42:47	MagSi	Pre-	CSL	0	1	32.68698	-117.23142	SW			Unknown	Unknown	Ebb	CD	2	good
FP	23-Mar-17	12:01:27	MagSi	Pre-	PHS	0	2	32.68213	-117.23722	ML			Unknown	Unknown	Ebb	CD	2	good
FP	23-Mar-17	12:04:43	MagSi	Pre-	CSL	0	1	32.68688	-117.23052	SW			Unknown	Adult	Ebb	CD	2	good
FP	23-Mar-17	12:38:50	November	Pre-	CBD	0	2	32.70043	-117.22877	SW			Unknown	Mixed	Ebb	PC	3	good
FP	23-Mar-17	13:14:37	MagSi	Post-	CSL	0	1	32.68609	-117.23179	SW			Unknown	Adult	Ebb	CD	2	good
FP	23-Mar-17	13:15:47	P-122	Post-	PHS	0	3	32.69822	-117.23850	ML			Unknown	Mixed	Ebb	PC	2	good
FP	23-Mar-17	13:16:46	BaitBarge	Post-	CSL	0	1	32.69478	-117.23529	EX			Female	Adult	Ebb	C	3	good
FP	23-Mar-17	13:21:04	MagSi	Post-	PHS	0	1	32.68581	-117.23295	SW			Unknown	Adult	Ebb	CD	2	good
FP	23-Mar-17	15:00:00	P-122	Pre-	CSL	3	0	32.69826	-117.23863	HO	FL		Mixed	Adult	Flood	PC	2	good
FP	23-Mar-17	15:03:41	BaitBarge	Pre-	CSL	27	0	32.69435	-117.23540	HO			Mixed	Mixed	Flood	C	3	good
FP	23-Mar-17	15:06:33	Sierra	Pre-	CSL	0	1	32.69937	-117.23672	SW			Female	Adult	Flood	PC	2	good
FP	23-Mar-17	15:06:44	BaitBarge	Pre-	CSL	3	0	32.69472	-117.23619	HO			Mixed	Mixed	Flood	C	3	good
FP	23-Mar-17	15:30:21	November	Pre-/Post-	CSL	0	2	32.69885	-117.23117	SW			Unknown	Adult	Flood	C	2	good
FP	23-Mar-17	15:31:57	BaitBarge	Post-	CSL	0	1	32.69672	-117.23433	SW			Male	Adult	Flood	C	3	good
FP	23-Mar-17	15:40:56	P-122	Post-	CSL	0	1	32.69826	-117.23836	SW			Male	Adult	Flood	PC	2	good
FP	23-Mar-17	15:43:39	BaitBarge	Post-	CSL	0	1	32.69414	-117.23470	UF			Male	Adult	Flood	C	3	good
FP	23-Mar-17	15:57:51	Sierra	Post-	CSL	0	2	32.69808	-117.23563	SW			Male	Adult	Flood	PC	2	excellent
FP	24-Mar-17	10:39:55	Clipper	Clipping	CSL	18	0	32.69472	-117.23619	HO		Pier52	Mixed	Mixed	Ebb	C	1	moderate
FP	24-Mar-17	10:40:58	Clipper	Clipping	CSL	1	0	32.69435	-117.23540	HO		Pier52	Male	Adult	Ebb	C	1	moderate
FP	24-Mar-17	10:51:43	Clipper	Clipping	CSL	6	0	32.69826	-117.23863	HO		Pier52	Mixed	Mixed	Ebb	C	1	moderate
FP	24-Mar-17	10:55:10	Clipper	Clipping	CSL	0	1	32.69786	-117.23782	ML		Pier52	Female	Adult	Ebb	C	1	moderate
FP	24-Mar-17	11:00:43	Clipper	Clipping	CSL	0	1	32.69951	-117.23654	SW		Pier52	Male	Adult	Ebb	C	1	moderate
FP	24-Mar-17	11:29:23	Clipper	Clipping	CSL	2	0	32.69561	-117.23099	HO		Pier52	Mixed	Mixed	Ebb	C	1	moderate
FP	24-Mar-17	11:30:48	Clipper	Clipping	CSL	1	0	32.69577	-117.23318	HO		Pier52	Unknown	Unknown	Ebb	C	1	moderate
FP	24-Mar-17	11:33:08	Clipper	Clipping	CSL	0	1	32.69944	-117.23435	SW		Pier52	Male	Adult	Ebb	C	1	moderate

Location	Date	Time	Station	Activity	Species	No. of Indiv		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	24-Mar-17	11:37:10	Clipper	Clipping	CSL	0	1	32.69786	-117.23782	DV		Pier52	Male	Adult	Ebb	C	1	moderate
FP	27-Mar-17	10:09:07	Clipper	Pre-/Post-	PHS	0	2	32.69944	-117.23822	ML			Unknown	Mixed	Ebb	CD	2	moderate
FP	27-Mar-17	11:23:23	Clipper	Pre-/Post-	CSL	0	1	32.69837	-117.23763	SW			Male	Adult	Ebb	CD	2	moderate
FP	27-Mar-17	16:12:04	Clipper	Clipping	CSL	3	0	32.69826	-117.23863	HO		Pier53	Mixed	Mixed	Flood	CD	2	moderate
FP	27-Mar-17	16:12:04	Clipper	Clipping	PHS	1	0	32.69826	-117.23863	HO		Pier53	Unknown	Adult	Flood	CD	2	moderate
FP	27-Mar-17	18:03:48	Command	Jetting-R	CSL	1	0	32.69577	-117.23318	HO		O-8	Male	Adult	Flood	C	2	moderate
FP	27-Mar-17	18:05:26	Command	Jetting-R	CSL	3	0	32.69826	-117.23863	HO		O-8	Male	Mixed	Flood	C	2	moderate
FP	27-Mar-17	18:15:10	Command	Jetting-R	CSL	0	1	32.69825	-117.23590	SW		O-8	Male	Adult	Flood	C	2	moderate
FP	28-Mar-17	9:07:44	Clipper	Clipping	CSL	13	0	32.69472	-117.23619	HO		Pier51	Mixed	Mixed	Flood	HZ	1	moderate
FP	28-Mar-17	9:12:00	Clipper	Clipping	CSL	0	1	32.69653	-117.23718	DV		Pier51	Male	Adult	Flood	HZ	1	moderate
FP	28-Mar-17	9:40:42	Clipper	Pre-/Post-	CSL	0	1	32.69789	-117.23539	DV			Unknown	Unknown	Flood	HZ	2	moderate
FP	28-Mar-17	10:01:48	Clipper	Clipping	PHS	0	2	32.69653	-117.23770	ML		Pier51	Mixed	Mixed	Flood	HZ	1	moderate
FP	28-Mar-17	10:51:36	Clipper	Clipping	CSL	0	1	32.69672	-117.23644	RF		Pier51	Unknown	Unknown	Ebb	HZ	1	moderate
FP	28-Mar-17	10:52:36	Command	Clipping	CSL	0	1	32.69550	-117.23779	SW		Pier51	Unknown	Unknown	Ebb	HZ	2	moderate
FP	28-Mar-17	14:43:05	Command	Jetting-R	CSL	1	0	32.69826	-117.23863	HO		O-5	Male	Adult	Ebb	HZ	2	moderate
FP	28-Mar-17	15:17:26	Command	Jetting-R	CSL	2	0	32.69577	-117.23318	HO		O-4	Unknown	Adult	Ebb	HZ	2	moderate
FP	30-Mar-17	7:54:08	Command	Jetting-R	CSL	2	0	32.69577	-117.23318	HO		O-3	Unknown	Adult	Flood	PC	2	good
FP	30-Mar-17	8:05:15	Command	Jetting-R	CSL	0	4	32.69886	-117.23300	SW		O-3	Unknown	Mixed	Flood	F	2	poor
FP	30-Mar-17	8:28:14	Command	Pre-/Post-	CSL	0	1	32.70023	-117.23615	SW			Unknown	Subadult	Flood	F	2	bad
FP	30-Mar-17	8:30:10	Command	Pre-/Post-	CSL	0	1	32.70067	-117.23643	SW			Unknown	Juvenile	Flood	F	2	bad
FP	30-Mar-17	9:45:52	Command	Jetting-R	CSL	0	2	32.69933	-117.23695	SW		O-2	Male	Mixed	Flood	F	2	moderate
FP	30-Mar-17	11:22:22	Command	Pre-/Post-	CSL	0	1	32.69940	-117.23637	SW			Male	Adult	Flood	HZ	4	moderate
FP	31-Mar-17	10:48:05	Clipper	Clipping	CSL	24	0	32.69435	-117.23540	HO		Pier49	Mixed	Mixed	Flood	HZ	1	moderate
FP	31-Mar-17	12:39:00	Clipper	Clipping	PHS	0	2	32.69892	-117.23813	EN		Pier49	Unknown	Mixed	Flood	HZ	1	moderate
FP	3-Apr-17	10:18:10	Clipper	Pre-/Post-	CSL	25	0	32.69435	-117.23540	HO			Mixed	Mixed	Ebb	CD	3	moderate
FP	3-Apr-17	10:39:24	Clipper	Pre-/Post-	CSL	1	0	32.69561	-117.23099	HO			Unknown	Unknown	Flood	CD	3	moderate
FP	3-Apr-17	10:45:25	Clipper	Clipping	CSL	0	1	32.69576	-117.23861	SW		Pier50	Male	Subadult	Flood	CD	3	moderate
FP	3-Apr-17	13:06:00	Sierra	Pre-	CSL	2	0	32.69561	-117.23099	HO			Unknown	Adult	Flood	PC	1	excellent
FP	3-Apr-17	13:13:01	Sierra	Pre-	CSL	17	0	32.69435	-117.23540	HO			Mixed	Mixed	Flood	PC	1	excellent
FP	3-Apr-17	13:20:00	Sierra	Pre-	CBD	0	3	32.69737	-117.23798	SW			Unknown	Mixed	Flood	PC	1	excellent
FP	3-Apr-17	13:32:11	Sierra	Pre-	PHS	0	1	32.70040	-117.23550	SW			Unknown	Adult	Flood	PC	1	excellent
FP	3-Apr-17	13:38:44	P-122	Pre-	PHS	0	1	32.70019	-117.23794	ML			Unknown	Adult	Flood	PC	2	excellent
FP	3-Apr-17	13:42:59	P-122	Pre-	PHS	0	1	32.69844	-117.23869	SW			Unknown	Pup	Flood	PC	2	excellent
FP	3-Apr-17	13:50:02	Clipper	Pre-	CBD	0	3	32.69969	-117.23734	SW			Mixed	Mixed	Flood	CD	3	moderate
FP	3-Apr-17	13:51:00	Sierra	Pre-	CBD	0	3	32.69904	-117.23728	SW			Unknown	Mixed	Flood	PC	1	excellent
FP	3-Apr-17	13:52:09	P-122	Pre-	CBD	0	3	32.69806	-117.23831	SW			Unknown	Mixed	Flood	PC	2	excellent
FP	3-Apr-17	14:00:06	P-122	Pre-	CSL	0	1	32.69870	-117.23885	SW			Male	Adult	Flood	PC	2	excellent
FP	3-Apr-17	14:01:52	Sierra	Pre-	CSL	0	1	32.70018	-117.23544	SW			Female	Adult	Flood	PC	1	excellent
FP	3-Apr-17	14:26:59	Sierra	Pre-	PHS	0	1	32.70026	-117.23580	SW			Unknown	Adult	Flood	PC	1	excellent
FP	3-Apr-17	14:38:50	P-122	I-PD	PHS	0	1	32.69780	-117.23867	ML		O-1	Unknown	Adult	Flood	PC	2	excellent
FP	3-Apr-17	14:49:13	P-122	Post-	CSL	0	1	32.69870	-117.23783	SW			Male	Adult	Flood	PC	2	excellent
FP	3-Apr-17	14:53:28	Command	Post-	CSL	0	1	32.69924	-117.23467	SW			Female	Adult	Flood	CD	3	excellent
FP	3-Apr-17	15:07:54	Sierra	Post-	CSL	0	1	32.69924	-117.23509	SW			Unknown	Adult	Flood	PC	1	excellent
FP	4-Apr-17	7:25:46	Sierra	Pre-	CSL	1	0	32.69577	-117.23318	HO			Unknown	Unknown	Ebb	CD	1	good
FP	4-Apr-17	7:26:22	Sierra	Pre-	CSL	2	0	32.69561	-117.23099	HO			Unknown	Unknown	Ebb	CD	1	good
FP	4-Apr-17	7:30:22	Sierra	Pre-	CSL	15	4	32.69435	-117.23540	HO			Mixed	Mixed	Ebb	CD	1	good
FP	4-Apr-17	7:39:05	P-122	Pre-	CSL	0	1	32.69818	-117.23855	ML			Male	Adult	Ebb	CD	1	excellent

Location	Date	Time	Station	Activity	Species	No. of Indiv		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	4-Apr-17	7:45:25	P-122	Pre-	CSL	0	12	32.69731	-117.23129	SW			Mixed	Unknown	Ebb	CD	1	excellent
FP	4-Apr-17	7:46:40	Command	Pre-	CSL	0	1	32.70290	-117.23487	SW			Unknown	Unknown	Ebb	CD	2	good
FP	4-Apr-17	7:47:57	P-122	Pre-	CSL	0	1	32.69649	-117.23663	SW			Female	Adult	Ebb	CD	1	excellent
FP	4-Apr-17	7:53:54	Sierra	Pre-	CSL	0	1	32.69974	-117.23492	SW			Male	Subadult	Ebb	CD	1	good
FP	4-Apr-17	7:59:00	Sierra	Pre-	CSL	0	1	32.69670	-117.23407	SW			Male	Subadult	Ebb	CD	1	good
FP	4-Apr-17	8:08:51	Command	Pre-	CSL	0	1	32.69823	-117.23082	SW			Unknown	Unknown	Ebb	CD	2	good
FP	4-Apr-17	8:20:30	Sierra	Pre-/Post-	CSL	0	1	32.69991	-117.23514	SW			Unknown	Unknown	Ebb	CD	1	good
FP	4-Apr-17	8:25:50	Sierra	Pre-/Post-	CSL	0	4	32.69552	-117.23326	RF			Mixed	Unknown	Ebb	CD	1	good
FP	4-Apr-17	8:34:49	Sierra	Pre-/Post-	CSL	0	1	32.70081	-117.23509	SW			Male	Adult	Ebb	CD	1	good
FP	4-Apr-17	8:43:16	Sierra	Pre-/Post-	CSL	0	1	32.69899	-117.23580	SW			Unknown	Unknown	Ebb	HZ	1	excellent
FP	4-Apr-17	8:49:34	Sierra	Pre-/Post-	PHS	0	1	32.70187	-117.23452	SW			Unknown	Unknown	Ebb	HZ	1	excellent
FP	4-Apr-17	8:52:09	Sierra	Pre-/Post-	CSL	0	1	32.69945	-117.23303	SW			Male	Subadult	Ebb	HZ	1	excellent
FP	4-Apr-17	8:57:27	Sierra	Pre-/Post-	CSL	0	4	32.70274	-117.23211	RF			Mixed	Mixed	Ebb	HZ	1	excellent
FP	4-Apr-17	9:00:22	P-122	Pre-/Post-	CSL	0	1	32.69592	-117.23305	SW			Unknown	Adult	Ebb	CD	1	excellent
FP	4-Apr-17	9:03:42	Sierra	Pre-/Post-	CSL	0	1	32.69916	-117.23631	SW			Male	Adult	Ebb	C	1	excellent
FP	4-Apr-17	9:09:15	Sierra	Pre-/Post-	CSL	0	1	32.69955	-117.23141	SW			Male	Subadult	Ebb	C	1	excellent
FP	4-Apr-17	9:22:30	P-122	Pre-/Post-	CSL	0	4	32.69572	-117.23451	SW			Mixed	Mixed	Ebb	CD	1	excellent
FP	4-Apr-17	9:29:26	Sierra	Pre-/Post-	CSL	0	1	32.69924	-117.23571	SW			Male	Adult	Ebb	C	1	excellent
FP	4-Apr-17	9:56:11	P-122	Pre-/Post-	CSL	0	1	32.69853	-117.23797	ML			Female	Adult	Ebb	CD	1	excellent
FP	4-Apr-17	9:58:19	P-122	Pre-/Post-	CSL	0	1	32.69805	-117.23778	SW			Male	Adult	Ebb	CD	1	excellent
FP	4-Apr-17	10:00:15	Sierra	Pre-/Post-	CSL	0	1	32.70229	-117.23172	SW			Male	Adult	Ebb	C	1	excellent
FP	4-Apr-17	10:21:19	Command	I-PD	CSL	0	1	32.70115	-117.23543	SW		O-1	Unknown	Subadult	Ebb	C	3	good
FP	4-Apr-17	10:26:20	Sierra	Pre-/Post-	CSL	0	2	32.70248	-117.23220	SW			Unknown	Unknown	Ebb	C	1	excellent
FP	4-Apr-17	10:29:32	Sierra	Pre-/Post-	CSL	0	1	32.70110	-117.23313	SW			Male	Adult	Ebb	C	1	excellent
FP	4-Apr-17	10:30:42	Command	Pre-/Post-	CSL	0	1	32.69902	-117.23677	SW			Male	Adult	Ebb	C	3	good
FP	4-Apr-17	11:02:21	Sierra	Post-	CSL	0	1	32.69896	-117.23543	SW			Male	Subadult	Ebb	C	1	excellent
FP	5-Apr-17	8:34:54	Sierra	Pre-	CSL	0	3	32.69470	-117.23409	SW			Unknown	Adult	Ebb	C	2	moderate
FP	5-Apr-17	8:38:40	P-122	Pre-	CSL	12	3	32.69580	-117.23518	SW			Mixed	Mixed	Ebb	HZ	1	good
FP	5-Apr-17	8:50:55	Sierra	I-PD	CSL	0	1	32.70030	-117.23303	SW		O-2	Male	Adult	Ebb	C	2	moderate
FP	5-Apr-17	8:55:41	Sierra	Pre-/Post-	CSL	0	1	32.69850	-117.23402	SW			Male	Adult	Ebb	C	2	moderate
FP	5-Apr-17	8:57:31	P-122	Pre-/Post-	CSL	0	1	32.69580	-117.23518	EN			Unknown	Juvenile	Ebb	HZ	1	good
FP	5-Apr-17	9:04:18	P-122	Pre-/Post-	CSL	0	2	32.69580	-117.23518	EX			Male	Adult	Ebb	HZ	1	good
FP	5-Apr-17	9:06:22	Sierra	Pre-/Post-	CSL	0	1	32.69844	-117.23481	SW			Male	Adult	Ebb	C	2	moderate
FP	5-Apr-17	9:12:46	Sierra	Pre-/Post-	CSL	0	2	32.69698	-117.23400	ML			Unknown	Adult	Ebb	C	2	moderate
FP	5-Apr-17	9:40:18	P-122	Pre-/Post-	PHS	0	1	32.69930	-117.23845	SW			Unknown	Adult	Ebb	HZ	1	good
FP	5-Apr-17	9:47:38	P-122	Pre-/Post-	CSL	1	0	32.69561	-117.23099	HO			Unknown	Unknown	Ebb	HZ	1	good
FP	5-Apr-17	9:52:52	Command	Pre-/Post-	PHS	0	1	32.69901	-117.23535	SW			Unknown	Adult	Ebb	HZ	2	moderate
FP	5-Apr-17	10:15:40	P-122	Pre-/Post-	CSL	0	2	32.69486	-117.23543	EN			Unknown	Juvenile	Ebb	HZ	2	good
FP	5-Apr-17	10:34:27	Sierra	Post-	CSL	0	1	32.70005	-117.23406	SW			Male	Adult	Ebb	C	2	moderate
FP	5-Apr-17	10:40:48	P-122	Post-	CSL	0	2	32.69590	-117.23507	EN			Mixed	Mixed	Ebb	HZ	3	good
FP	5-Apr-17	10:48:38	P-122	Post-	CSL	1	0	32.69561	-117.23099	HO			Unknown	Unknown	Ebb	HZ	3	good
FP	5-Apr-17	11:24:20	Sierra	Post-	CSL	0	1	32.69974	-117.23555	SW			Female	Adult	Ebb	C	2	moderate
FP	5-Apr-17	11:25:29	Sierra	Post-	CSL	0	10	32.69564	-117.23418	SW			Unknown	Adult	Ebb	C	2	moderate
FP	5-Apr-17	11:30:35	Sierra	Post-	CSL	0	1	32.69630	-117.23378	ML			Male	Adult	Ebb	C	2	moderate
FP	5-Apr-17	11:33:12	Sierra	Post-	CSL	0	1	32.69748	-117.23458	SW			Male	Adult	Ebb	C	2	moderate
FP	5-Apr-17	12:55:01	P-122	Pre-	CSL	1	0	32.69826	-117.23863	HO			Male	Subadult	Flood	HZ	4	good

Location	Date	Time	Station	Activity	Species	No. of Indiv		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1 ^o	2 ^o							
FP	5-Apr-17	13:05:41	P-122	Pre-	PHS	0	1	32.69732	-117.23864	SW			Unknown	Adult	Flood	HZ	4	good
FP	5-Apr-17	13:14:05	P-122	Pre-/Post-	CSL	0	1	32.69580	-117.23518	EN			Unknown	Juvenile	Flood	HZ	4	good
FP	5-Apr-17	15:35:48	P-122	I-PD	PHS	0	1	32.69779	-117.23878	EN	FL	O-5	Unknown	Adult	Flood	HZ	1	excellent
FP	5-Apr-17	15:41:12	P-122	Pre-/Post-	CSL	0	1	32.69823	-117.23805	EN			Male	Subadult	Flood	HZ	1	excellent
FP	5-Apr-17	16:14:24	Command	Post-	CSL	0	1	32.69907	-117.23503	SW			Male	Adult	Flood	C	3	good
FP	5-Apr-17	16:14:26	Sierra	Post-	CSL	0	1	32.69787	-117.23485	SW			Male	Adult	Flood	C	2	moderate
FP	6-Apr-17	8:03:52	Clipper	Pre-/Post-	CSL	0	1	32.69849	-117.23450	SW			Male	Adult	Ebb	CD	2	moderate
FP	6-Apr-17	8:11:13	Clipper	Pre-/Post-	CSL	0	1	32.69987	-117.23756	SW			Male	Subadult	Ebb	CD	2	moderate
FP	6-Apr-17	13:17:51	Sierra	Pre-	CSL	2	0	32.69577	-117.23318	HO			Unknown	Mixed	Ebb	PC	2	good
FP	6-Apr-17	13:19:28	P-122	Pre-	PHS	0	1	32.69761	-117.23767	ML			Unknown	Adult	Ebb	PC	4	good
FP	6-Apr-17	13:19:42	Sierra	Pre-	CSL	1	0	32.69561	-117.23099	HO			Male	Adult	Ebb	PC	2	good
FP	6-Apr-17	13:22:23	P-122	Pre-	CSL	8	0	32.69472	-117.23619	HO			Mixed	Mixed	Ebb	PC	4	good
FP	6-Apr-17	13:22:44	Sierra	Pre-	CSL	1	0	32.70621	-117.22619	HO			Unknown	Unknown	Ebb	PC	2	good
FP	6-Apr-17	13:23:35	P-122	Pre-	CSL	12	0	32.69435	-117.23540	HO			Mixed	Mixed	Ebb	PC	4	good
FP	6-Apr-17	13:30:41	P-122	Pre-	CSL	1	0	32.69826	-117.23863	HO			Male	Adult	Flood	PC	3	good
FP	6-Apr-17	13:42:42	P-122	I-PD	CSL	0	1	32.69586	-117.23598	SW		O-4	Unknown	Unknown	Flood	PC	3	good
FP	6-Apr-17	14:28:46	P-122	Pre-/Post-	PHS	0	1	32.69758	-117.23856	ML			Unknown	Adult	Flood	PC	3	good
FP	6-Apr-17	14:48:58	P-122	I-PD	CSL	0	3	32.69735	-117.23584	SW		O-7	Mixed	Mixed	Flood	PC	2	good
FP	6-Apr-17	15:06:18	Sierra	I-PD	CSL	0	1	32.70099	-117.23326	PP		O-7	Unknown	Subadult	Flood	PC	2	good
FP	6-Apr-17	15:28:26	Command	Pre-/Post-	CSL	0	1	32.69884	-117.23595	SW			Female	Adult	Flood	PC	2	good
FP	6-Apr-17	15:55:55	P-122	Pre-/Post-	PHS	0	1	32.69838	-117.23883	EX			Unknown	Adult	Flood	PC	2	good
FP	6-Apr-17	16:10:16	P-122	I-PD	CSL	0	1	32.69856	-117.23873	PP		O-2	Female	Adult	Flood	PC	2	good
FP	6-Apr-17	16:28:40	Sierra	Post-	CSL	0	1	32.69910	-117.23529	DV			Unknown	Unknown	Flood	PC	3	good
FP	10-Apr-17	7:30:16	Clipper	Clipping	CSL	25	0	32.69435	-117.23540	HO		Pier46	Mixed	Mixed	Flood	HZ	2	good
FP	10-Apr-17	7:30:16	Clipper	Clipping	CSL	1	0	32.69826	-117.23863	HO		Pier46	Male	Adult	Flood	HZ	2	good
FP	10-Apr-17	7:30:16	Clipper	Clipping	PHS	0	1	32.69941	-117.23852	ML		Pier46	Unknown	Adult	Flood	HZ	2	good
FP	10-Apr-17	8:28:36	Clipper	Pre-/Post-	CSL	0	1	32.69983	-117.23736	SW			Male	Adult	Flood	HZ	2	good
FP	10-Apr-17	13:03:54	Clipper	Pre-/Post-	CSL	0	1	32.69847	-117.23011	SW			Unknown	Adult	Ebb	C	2	good
FP	11-Apr-17	10:33:17	Command	Pre-/Post-	CSL	0	2	32.69868	-117.23647	SW			Unknown	Subadult	Ebb	C	2	good
FP	11-Apr-17	11:43:09	Clipper	Pre-/Post-	PHS	0	1	32.69968	-117.23740	ML			Unknown	Adult	Ebb	PC	2	good
FP	11-Apr-17	12:56:41	Clipper	Pre-/Post-	CSL	0	1	32.69831	-117.23646	SW			Unknown	Adult	Ebb	PC	2	good
FP	11-Apr-17	13:08:45	Command	Jetting-R	CSL	8	0	32.69472	-117.23619	HO		I-2	Mixed	Mixed	Ebb	C	3	good
FP	11-Apr-17	13:08:45	Command	Jetting-R	CSL	10	0	32.69435	-117.23540	HO		I-2	Mixed	Mixed	Ebb	C	3	good
FP	11-Apr-17	13:08:45	Command	Jetting-R	CSL	3	0	32.69577	-117.23318	HO		I-2	Mixed	Mixed	Ebb	C	2	good
FP	11-Apr-17	13:18:21	Command	Jetting-R	PHS	1	0	32.69826	-117.23863	HO		I-2	Unknown	Adult	Ebb	C	2	good
FP	11-Apr-17	13:35:38	Command	Jetting-R	CSL	0	1	32.69887	-117.23870	EN	FL	I-2	Unknown	Unknown	Ebb	C	2	good
FP	11-Apr-17	13:42:50	Command	Jetting-R	PHS	0	2	32.69887	-117.23870	EX		I-2	Unknown	Adult	Ebb	C	2	good
FP	11-Apr-17	13:52:01	Command	Pre-/Post-	CSL	0	2	32.69942	-117.23717	SW			Male	Adult	Ebb	C	3	good
FP	11-Apr-17	13:56:59	Clipper	Pre-/Post-	CSL	0	1	32.69771	-117.23813	LO			Female	Adult	Ebb	PC	2	good
FP	11-Apr-17	14:03:59	Clipper	Pre-/Post-	CSL	0	4	32.69768	-117.23802	SW			Mixed	Adult	Ebb	PC	2	good
FP	11-Apr-17	15:04:36	Command	Pre-/Post-	CSL	0	1	32.69489	-117.23757	ML			Male	Pup	Ebb	C	3	good
FP	11-Apr-17	15:09:56	Command	Jetting-R	CSL	0	2	32.69934	-117.23504	ML		I-3	Female	Adult	Ebb	C	3	good
FP	11-Apr-17	15:15:04	Command	Jetting-R	CSL	0	1	32.70010	-117.23471	SW		I-3	Unknown	Unknown	Ebb	C	3	good
FP	11-Apr-17	15:23:27	Command	Pre-/Post-	CSL	0	1	32.69887	-117.23870	EX			Male	Adult	Ebb	C	3	good
FP	11-Apr-17	15:31:07	Clipper	Jetting-R	CSL	0	1	32.69916	-117.23696	SW		I-4	Male	Juvenile	Ebb	PC	2	good
FP	11-Apr-17	15:42:57	Command	Jetting-R	CSL	0	1	32.69953	-117.23538	SW		I-4	Female	Adult	Ebb	C	3	good

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	11-Apr-17	15:46:15	Clipper	Jetting-R	UPIN	0	1	32.69980	-117.23713	SW		I-4	Unknown	Unknown	Ebb	PC	2	good
FP	11-Apr-17	15:47:49	Command	Jetting-R	CSL	0	1	32.69622	-117.23729	SW		I-4	Female	Adult	Ebb	C	2	good
FP	11-Apr-17	16:15:38	Command	Pre-/Post-	PHS	0	1	32.69866	-117.23885	SW			Unknown	Adult	Flood	C	2	good
FP	12-Apr-17	7:33:56	Command	Jetting-R	CSL	1	0	32.69826	-117.23863	HO	FL	I-5	Female	Adult	Flood	HZ	1	moderate
FP	12-Apr-17	7:35:16	Command	Jetting-R	CSL	1	0	32.69577	-117.23318	HO		I-5	Unknown	Unknown	Flood	HZ	1	moderate
FP	12-Apr-17	7:36:13	Command	Jetting-R	CSL	2	0	32.69561	-117.23099	HO		I-5	Mixed	Adult	Flood	HZ	1	moderate
FP	12-Apr-17	7:38:17	Command	Jetting-R	CSL	2	0	32.70636	-117.22875	HO		I-5	Unknown	Adult	Flood	HZ	1	moderate
FP	12-Apr-17	7:39:57	Command	Jetting-R	CSL	10	0	32.69435	-117.23540	HO	FL	I-5	Mixed	Mixed	Flood	HZ	1	moderate
FP	12-Apr-17	7:57:02	Clipper	Pre-/Post-	PHS	0	1	32.69912	-117.23817	SW			Unknown	Adult	Flood	HZ	2	good
FP	12-Apr-17	8:34:09	Command	Pre-/Post-	CSL	0	1	32.69810	-117.23515	SW			Male	Adult	Flood	HZ	2	moderate
FP	12-Apr-17	8:57:19	Command	Pre-/Post-	CSL	0	1	32.69944	-117.23461	SW			Male	Subadult	Flood	HZ	2	moderate
FP	12-Apr-17	9:00:51	Command	Pre-/Post-	CSL	0	1	32.70116	-117.23345	SW			Male	Adult	Flood	HZ	2	moderate
FP	12-Apr-17	9:13:33	Command	Pre-/Post-	CSL	0	3	32.69801	-117.23707	SW			Male	Mixed	Flood	HZ	2	moderate
FP	12-Apr-17	13:38:15	Clipper	Pre-/Post-	PHS	1	0	32.69826	-117.23863	HO			Unknown	Adult	Ebb	C	2	good
FP	13-Apr-17	9:03:21	Clipper	Clipping	CSL	7	0	32.69826	-117.23863	HO		Pier42	Mixed	Mixed	Flood	CD	2	moderate
FP	13-Apr-17	9:03:26	Clipper	Clipping	PHS	2	0	32.69826	-117.23863	HO		Pier42	Unknown	Unknown	Flood	CD	2	moderate
FP	13-Apr-17	9:03:33	Clipper	Clipping	CSL	3	0	32.69577	-117.23318	HO		Pier42	Unknown	Unknown	Flood	CD	2	moderate
FP	13-Apr-17	9:03:36	Clipper	Clipping	CSL	25	0	32.69435	-117.23540	HO		Pier42	Mixed	Mixed	Flood	CD	2	moderate
FP	13-Apr-17	9:03:40	Clipper	Clipping	CSL	11	0	32.69472	-117.23619	HO		Pier42	Mixed	Mixed	Flood	CD	2	moderate
FP	13-Apr-17	9:07:02	Clipper	Pre-/Post-	CSL	2	0	32.69561	-117.23099	HO			Unknown	Unknown	Flood	CD	2	moderate
FP	13-Apr-17	10:22:24	P-122	Pre-	CSL	8	0	32.69826	-117.23863	HO			Mixed	Adult	Flood	PC	2	excellent
FP	13-Apr-17	10:28:49	P-122	Pre-	CSL	21	0	32.69435	-117.23540	HO			Mixed	Mixed	Flood	PC	2	excellent
FP	13-Apr-17	10:33:00	P-122	Pre-	CSL	3	0	32.69577	-117.23318	HO			Unknown	Mixed	Flood	PC	2	excellent
FP	13-Apr-17	10:33:03	Sierra	Pre-	CSL	1	0	32.69561	-117.23099	HO			Unknown	Adult	Flood	PC	2	good
FP	13-Apr-17	10:33:03	Sierra	Pre-	CSL	1	0	32.69561	-117.23099	HO			Unknown	Adult	Flood	PC	2	good
FP	13-Apr-17	10:58:17	P-122	Pre-	CSL	0	1	32.69861	-117.23764	SW			Unknown	Adult	Flood	PC	2	excellent
FP	13-Apr-17	12:56:15	Command	Clipping	CSL	0	1	32.69944	-117.23642	LO		Pier43	Female	Adult	Ebb	PC	2	excellent
FP	13-Apr-17	13:00:01	P-122	Pre-/Post-	PHS	1	0	32.69826	-117.23863	HO			Unknown	Adult	Ebb	PC	2	excellent
FP	13-Apr-17	13:01:20	Command	Pre-/Post-	CSL	0	1	32.69788	-117.23393	SW			Unknown	Juvenile	Ebb	PC	2	excellent
FP	13-Apr-17	14:46:27	P-122	Pre-/Post-	PHS	0	1	32.69772	-117.23878	DV			Unknown	Adult	Ebb	PC	2	excellent
FP	14-Apr-17	7:18:14	Sierra	Pre-	CSL	0	2	32.69885	-117.23314	SW			Unknown	Adult	Flood	PC	2	good
FP	14-Apr-17	7:19:14	Sierra	Pre-	CSL	3	0	32.69561	-117.23099	HO			Mixed	Mixed	Flood	PC	2	good
FP	14-Apr-17	7:24:12	Sierra	Pre-	CSL	0	1	32.69957	-117.23568	SW			Female	Adult	Flood	PC	2	good
FP	14-Apr-17	7:26:07	P-122	Pre-	CSL	0	1	32.69785	-117.23553	SW			Unknown	Adult	Flood	CD	2	good
FP	14-Apr-17	7:27:35	Sierra	Pre-	CSL	2	0	32.69577	-117.23318	HO			Unknown	Adult	Flood	PC	2	good
FP	14-Apr-17	7:29:44	P-122	Pre-	CSL	0	1	32.69832	-117.23777	SW			Male	Adult	Flood	CD	2	good
FP	14-Apr-17	7:29:46	Sierra	Pre-	CSL	0	1	32.69857	-117.23495	ML			Female	Adult	Flood	PC	2	good
FP	14-Apr-17	7:33:36	P-122	Shutdown	CSL	0	1	32.69825	-117.23832	EX	FL		Female	Adult	Flood	CD	2	good
FP	14-Apr-17	8:08:34	Sierra	Pre-/Post-	CSL	0	1	32.69786	-117.23389	SW			Male	Adult	Flood	PC	2	good
FP	14-Apr-17	8:36:55	Sierra	Pre-/Post-	CSL	1	0	32.70177	-117.22927	HO			N/A	Adult	Flood	PC	2	good
FP	14-Apr-17	8:48:46	Sierra	Pre-/Post-	CSL	0	1	32.69953	-117.23601	SW			Female	Adult	Flood	PC	2	good
FP	14-Apr-17	9:15:27	Sierra	Pre-/Post-	CSL	0	1	32.69575	-117.23340	ML			Unknown	Subadult	Flood	PC	2	good
FP	14-Apr-17	10:31:00	Clipper	Clipping	CSL	0	1	32.69899	-117.23453	SW		SWF39	Male	Adult	Flood	PC	2	good
FP	14-Apr-17	11:28:44	Sierra	Pre-/Post-	CSL	0	1	32.69926	-117.23702	SW			Male	Adult	Flood	PC	2	good
FP	14-Apr-17	12:03:24	P-122	I-PD	PHS	0	1	32.69809	-117.23838	ML		I-1	Unknown	Adult	Flood	C	2	good
FP	14-Apr-17	12:21:45	P-122	Post-	CSL	0	1	32.69947	-117.23777	SW			Male	Adult	Ebb	HZ	3	good

Location	Date	Time	Station	Activity	Species	No. of Indiv		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	17-Apr-17	11:39:16	Clipper	Clipping	CSL	13	0	32.69435	-117.23540	HO		Pier40	Mixed	Mixed	Flood	HZ	2	moderate
FP	17-Apr-17	13:30:11	Clipper	Pre-/Post-	CSL	0	1	32.69834	-117.23860	EX			Male	Adult	Flood	HZ	3	moderate
FP	17-Apr-17	13:37:56	Clipper	Pre-/Post-	PHS	0	1	32.69894	-117.23703	ML			Unknown	Adult	Flood	HZ	3	moderate
FP	17-Apr-17	13:49:10	Clipper	Pre-/Post-	PHS	0	1	32.69834	-117.23860	EX			Unknown	Adult	Flood	HZ	3	moderate
FP	17-Apr-17	14:13:08	Clipper	Pre-/Post-	CSL	3	0	32.69577	-117.23318	HO			Unknown	Unknown	Flood	HZ	3	moderate
FP	17-Apr-17	14:18:14	Clipper	Pre-/Post-	CSL	1	0	32.69561	-117.23099	HO			Unknown	Unknown	Flood	HZ	3	moderate
FP	18-Apr-17	13:58:11	Clipper	Clipping	CSL	21	0	32.69435	-117.23540	HO		Pier39	Mixed	Mixed	Flood	PC	3	moderate
FP	18-Apr-17	14:01:07	Clipper	Pre-/Post-	PHS	1	0	32.69826	-117.23863	HO			Unknown	Adult	Flood	PC	3	moderate
FP	18-Apr-17	14:05:29	Clipper	Pre-/Post-	CSL	3	0	32.69577	-117.23318	HO			Mixed	Mixed	Flood	PC	3	moderate
FP	19-Apr-17	9:17:48	Clipper	Clipping	CSL	1	0	32.69826	-117.23863	HO		Pier39	Male	Adult	Ebb	CD	1	good
FP	19-Apr-17	9:27:55	Clipper	Pre-/Post-	CBD	0	6	32.69798	-117.23228	SW			Unknown	Adult	Ebb	CD	1	good
FP	20-Apr-17	11:01:05	Clipper	Pre-/Post-	CSL	1	0	32.69826	-117.23863	HO			Female	Adult	Ebb	C	2	good
FP	20-Apr-17	11:45:23	Clipper	Pre-/Post-	CSL	0	1	32.69773	-117.23788	RF			Male	Adult	Ebb	C	2	good
FP	20-Apr-17	11:46:17	Clipper	Pre-/Post-	PHS	0	1	32.69841	-117.23751	ML			Unknown	Adult	Ebb	C	2	good
FP	21-Apr-17	8:49:29	Clipper	Pre-/Post-	PHS	0	1	32.69951	-117.23752	LO			Unknown	Adult	Ebb	HZ	2	good
FP	27-Apr-17	7:45:53	Clipper	Pre-/Post-	CSL	0	1	32.69843	-117.23716	SW			Male	Adult	Flood	CD	2	moderate
FP	1-May-17	8:07:19	Clipper	Clipping	CSL	1	0	32.69826	-117.23863	HO		Pier34	Male	Adult	Flood	HZ	0	moderate
FP	1-May-17	8:07:19	Clipper	Clipping	CSL	4	0	32.69472	-117.23619	HO		Pier34	Male	Adult	Flood	HZ	0	moderate
FP	1-May-17	8:07:19	Clipper	Clipping	CSL	9	0	32.69500	-117.23438	HO		Pier34	Mixed	Mixed	Flood	HZ	0	moderate
FP	1-May-17	8:07:19	Clipper	Clipping	PHS	1	0	32.69906	-117.23911	HO		Pier34	Unknown	Pup	Flood	HZ	0	moderate
FP	1-May-17	8:38:12	Clipper	Pre-/Post-	CSL	4	0	32.69577	-117.23318	HO			Mixed	Adult	Flood	HZ	2	moderate
FP	1-May-17	13:16:10	Clipper	Clipping	CSL	3	0	32.69561	-117.23099	HO		Pier34	Unknown	Unknown	Flood	C	2	moderate
FP	2-May-17	9:25:12	Clipper	Clipping	CSL	1	0	32.69826	-117.23863	HO		SWF32	Male	Adult	Flood	F	2	moderate
FP	2-May-17	13:00:30	Clipper	Clipping	PHS	1	0	32.69826	-117.23863	HO		Pier32	Unknown	Adult	Flood	C	2	good
FP	5-May-17	9:43:30	Clipper	Clipping	CSL	3	0	32.69826	-117.23863	HO		Pier31	Mixed	Adult	Ebb	O	2	moderate
FP	5-May-17	12:09:24	Clipper	Pre-/Post-	CSL	2	0	32.69826	-117.23863	HO			Male	Adult	Ebb	O	2	moderate
FP	5-May-17	12:17:55	Clipper	Clipping	CSL	0	2	32.69889	-117.23852	SW		Pier31	Unknown	Subadult	Ebb	O	2	moderate
FP	5-May-17	12:34:32	Clipper	Pre-/Post-	CSL	0	1	32.69802	-117.23696	SW			Male	Adult	Ebb	O	2	moderate
FP	8-May-17	9:23:32	Clipper	Clipping	CSL	5	0	32.69826	-117.23863	HO		Pier30	Male	Adult	Ebb	CD	2	excellent
FP	8-May-17	13:52:15	Clipper	Clipping	CSL	2	0	32.69826	-117.23863	HO		Pier29	Male	Adult	Ebb	PC	3	excellent
FP	8-May-17	13:52:15	Clipper	Clipping	PHS	1	0	32.69826	-117.23863	HO		Pier29	Unknown	Adult	Ebb	PC	3	excellent
FP	8-May-17	15:33:02	Clipper	Clipping	CSL	0	1	32.69877	-117.23730	SW		Pier28	Unknown	Adult	Ebb	PC	4	excellent
FP	9-May-17	7:43:27	Clipper	Clipping	CSL	14	0	32.69826	-117.23863	HO		SWF28	Mixed	Mixed	Ebb	LR	3	moderate
FP	9-May-17	10:17:43	Clipper	Clipping	CSL	0	1	32.69833	-117.23798	SW		Pier29	Male	Subadult	Ebb	O	3	moderate
FP	10-May-17	7:55:48	Clipper	Pre-/Post-	CSL	7	1	32.69833	-117.23879	HO			Male	Mixed	Ebb	CD	2	moderate
FP	10-May-17	7:56:20	Clipper	Pre-/Post-	PHS	0	2	32.69805	-117.23727	SW			Unknown	Unknown	Ebb	CD	2	moderate
FP	10-May-17	7:57:58	Clipper	Pre-/Post-	CSL	25	0	32.69472	-117.23619	HO			Mixed	Mixed	Ebb	CD	2	moderate
FP	10-May-17	7:59:41	Clipper	Pre-/Post-	CSL	25	2	32.69497	-117.23572	HO			Mixed	Mixed	Ebb	CD	2	moderate
FP	10-May-17	11:03:57	Clipper	Clipping	CSL	0	1	32.69829	-117.23715	RF			Male	Adult	Ebb	CD	2	moderate
FP	10-May-17	15:17:38	Clipper	Clipping	CSL	0	1	32.69853	-117.23694	SW		Pier26	Male	Adult	Ebb	LR	2	poor
FP	15-May-17	11:15:23	Clipper	Clipping	CSL (DD)	1	0	32.69830	-117.23855	O		Pier27	Unknown	Pup	Ebb	CD	3	good
FP	15-May-17	11:38:04	Clipper	Clipping	CSL	0	1	32.69860	-117.23778	SW		Pier27	Male	Adult	Ebb	CD	3	good
FP	15-May-17	15:09:05	Clipper	Clipping	CSL	9	0	32.69826	-117.23863	HO		SEF14	Mixed	Mixed	Ebb	CD	3	good
FP	16-May-17	10:27:43	Clipper	Clipping	CSL	5	0	32.69500	-117.23438	HO		Pier25	Unknown	Mixed	Ebb	PC	2	good
FP	16-May-17	15:45:00	Clipper	Clipping	CSL	0	2	32.69938	-117.23811	SW		SWF22	Unknown	Mixed	Ebb	PC	2	good
FP	17-May-17	8:14:45	Clipper	Pre-/Post-	CSL	0	1	32.69989	-117.22975	SW			Unknown	Unknown	Flood	PC	3	good
FP	17-May-17	12:58:57	Clipper	Clipping	CSL	3	0	32.69826	-117.23863	HO		Pier23	Male	Adult	Flood	PC	4	good
FP	18-May-17	9:45:19	Clipper	Clipping	CSL	1	0	32.69826	-117.23863	HO		Pier22	Male	Adult	Flood	PC	2	good

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	18-May-17	14:24:15	Clipper	Clipping	CSL	16	1	32.69840	-117.23906	HO		Pier23	Male	Mixed	Flood	PC	2	good
FP	18-May-17	15:12:21	Clipper	Pre-/Post-	CSL	0	1	32.69997	-117.23824	SW			Male	Adult	Flood	PC	2	good
FP	18-May-17	15:14:05	Clipper	Pre-/Post-	CSL	0	3	32.69755	-117.23768	SW			Unknown	Unknown	Flood	PC	2	good
FP	18-May-17	15:15:39	Clipper	Pre-/Post-	CSL	0	1	32.69672	-117.23537	SW			Unknown	Adult	Flood	PC	2	good
FP	18-May-17	15:26:24	Clipper	Pre-/Post-	PHS	1	0	32.69826	-117.23863	HO			Unknown	Adult	Flood	PC	2	good
FP	22-May-17	10:42:14	Clipper	Clipping	CSL	5	3	32.69804	-117.23838	HO		Pier21	Male	Mixed	Ebb	C	2	good
FP	22-May-17	12:52:30	Clipper	Clipping	CSL	0	1	32.69782	-117.23774	RF		Pier20	Male	Adult	Ebb	C	3	good
FP	7-Jun-17	11:44:33	Clipper	Pre-/Post-	CSL	13	0	32.69500	-117.23438	HO			Mixed	Mixed	Ebb	CD	2	moderate
FP	13-Jun-17	8:31:32	Clipper	Pre-	CSL	1	0	32.69826	-117.23863	HO			Male	Adult	Flood	C	1	good
FP	13-Jun-17	8:51:09	Clipper	Pre-	CSL	25	0	32.69472	-117.23619	HO			Mixed	Mixed	Flood	C	1	good
FP	13-Jun-17	8:52:56	Clipper	Clipping	CSL	3	0	32.69500	-117.23438	HO		SWF18	Mixed	Mixed	Flood	C	1	good
FP	13-Jun-17	8:58:22	Clipper	Pre-/Post-	CSL	0	1	32.69818	-117.23584	RF			Unknown	Unknown	Flood	C	1	good
FP	13-Jun-17	9:01:09	Clipper	Pre-/Post-	CSL	2	0	32.69577	-117.23318	HO			Mixed	Mixed	Flood	C	1	good
FP	13-Jun-17	9:09:37	Clipper	Pre-/Post-	CSL	0	3	32.69898	-117.23504	RF			Unknown	Unknown	Flood	C	1	good
FP	13-Jun-17	9:34:33	Clipper	Clipping	CSL	0	1	32.69895	-117.23586	RF		SWF15	Male	Adult	Flood	C	1	good
FP	13-Jun-17	9:51:29	Clipper	Pre-/Post-	CSL	0	1	32.69898	-117.23609	SW			Male	Adult	Flood	C	2	excellent
FP	13-Jun-17	11:45:58	Clipper	Post-	CSL	0	1	32.69907	-117.23431	SW			Unknown	Adult	Flood	C	3	excellent
FP	13-Jun-17	11:55:04	Clipper	Post-	CSL	0	1	32.69975	-117.23569	SW			Male	Adult	Flood	C	3	excellent
FP	19-Jun-17	8:55:30	Clipper	Pre-	CSL	3	0	32.69500	-117.23438	HO			Mixed	Mixed	Ebb	PC	1	moderate
FP	19-Jun-17	8:56:52	Clipper	Pre-	CSL	7	0	32.69472	-117.23619	HO			Mixed	Mixed	Ebb	PC	1	moderate
FP	19-Jun-17	12:03:02	Clipper	Post-	CSL	0	1	32.70000	-117.23706	LO			Male	Adult	Ebb	PC	2	moderate
FP	20-Jun-17	8:47:55	Clipper	Pre-	CSL	1	0	32.69500	-117.23438	HO			Male	Adult	Ebb	O	1	poor
FP	20-Jun-17	8:49:28	Clipper	Pre-	CSL	1	0	32.69472	-117.23619	HO			Male	Adult	Ebb	O	1	poor
FP	20-Jun-17	8:49:57	Clipper	Pre-	CSL	1	0	32.69826	-117.23863	HO			Male	Adult	Ebb	O	1	poor
FP	20-Jun-17	12:02:42	Clipper	Pre-	CSL	2	0	32.69577	-117.23318	HO			Mixed	Mixed	Ebb	PC	4	poor
FP	20-Jun-17	12:05:26	Clipper	Pre-	CSL	12	0	32.69472	-117.23619	HO			Mixed	Mixed	Ebb	PC	4	poor
FP	20-Jun-17	12:16:25	Clipper	Pre-	CSL	0	1	32.69728	-117.23652	SF			Male	Adult	Ebb	PC	4	poor
FP	20-Jun-17	12:18:44	Clipper	Pre-	CSL	0	1	32.69995	-117.23644	LO			Female	Adult	Ebb	PC	4	poor
FP	20-Jun-17	12:39:56	Clipper	Pre-	CSL	0	1	32.70003	-117.23655	DV			Female	Adult	Ebb	PC	4	poor
FP	20-Jun-17	13:54:10	Clipper	Post-	CLT	0	1	32.69974	-117.23729	O			Unknown	Adult	Ebb	PC	4	poor
FP	21-Jun-17	7:21:14	Clipper	Jetting-R	CSL	5	0	32.69500	-117.23438	HO		Pier20	Unknown	Unknown	Ebb	F	1	poor
FP	21-Jun-17	7:31:27	Clipper	Jetting-R	CSL	0	2	32.69572	-117.23320	EX		Pier19	Male	Adult	Ebb	F	1	poor
FP	21-Jun-17	7:44:19	Clipper	Jetting-R	CSL	0	1	32.69555	-117.23347	ML		Pier19	Male	Adult	Ebb	F	1	poor
FP	21-Jun-17	8:39:06	Clipper	Jetting-R	CSL	0	1	32.69584	-117.23302	RF		Pier21	Male	Adult	Ebb	F	1	poor
FP	21-Jun-17	8:58:40	Clipper	Jetting-R	CLT	0	2	32.70037	-117.23834	O		Pier21	Unknown	Adult	Ebb	F	1	poor
FP	21-Jun-17	9:20:19	Clipper	Pre-/Post-	CSL	0	1	32.69775	-117.23590	SW			Male	Adult	Ebb	F	1	poor
FP	21-Jun-17	10:01:49	Clipper	Jetting-R	CSL	2	0	32.69577	-117.23318	HO		Pier21	Female	Adult	Ebb	F	1	moderate
FP	21-Jun-17	11:11:47	Clipper	Jetting-R	CSL	0	1	32.69976	-117.23872	SW		Pier21	Male	Adult	Ebb	CD	2	good
FP	21-Jun-17	11:34:11	Clipper	Jetting-R	CSL	0	1	32.69802	-117.23694	SW		Pier21	Male	Adult	Ebb	CD	2	good
FP	21-Jun-17	11:49:09	Clipper	Post-	CSL	0	1	32.69955	-117.23806	SW			Male	Adult	Ebb	CD	2	good
FP	21-Jun-17	14:04:28	Clipper	Pre-	CSL	3	0	32.69577	-117.23318	HO			Unknown	Unknown	Ebb	PC	3	good
FP	21-Jun-17	14:05:16	Clipper	Pre-	CSL	5	0	32.69500	-117.23438	HO			Mixed	Adult	Ebb	PC	3	good
FP	21-Jun-17	14:05:53	Clipper	Pre-	CSL	4	0	32.69472	-117.23619	HO			Male	Adult	Ebb	PC	3	good
FP	21-Jun-17	14:07:48	Clipper	Pre-	CSL	1	0	32.69826	-117.23863	HO			Male	Adult	Ebb	PC	3	good
FP	21-Jun-17	15:42:08	Clipper	Post-	CSL	0	1	32.70000	-117.23554	SW			Male	Adult	Ebb	PC	3	good
FP	22-Jun-17	6:53:16	Clipper	Pre-	CSL	1	0	32.69577	-117.23318	HO			Unknown	Unknown	Flood	F	2	poor
FP	22-Jun-17	6:54:21	Clipper	Pre-	CSL	3	0	32.69472	-117.23619	HO			Unknown	Unknown	Flood	F	2	poor
FP	22-Jun-17	10:29:33	Clipper	Pre-/Post-	CSL	0	1	32.69981	-117.23742	SW			Male	Adult	Ebb	F	2	poor

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1 ^o	2 ^o							
FP	22-Jun-17	10:39:31	Clipper	Jetting-R	CLT	0	2	32.69927	-117.23947	O		Pier21	Unknown	Adult	Ebb	F	2	poor
FP	22-Jun-17	11:32:06	Clipper	Jetting-R	CSL	0	1	32.69365	-117.23717	SW		Pier21	Male	Adult	Ebb	CD	1	moderate
FP	22-Jun-17	11:36:30	Clipper	Jetting-R	CSL	0	1	32.69915	-117.23635	SW		Pier21	Male	Adult	Ebb	CD	1	moderate
FP	22-Jun-17	12:19:58	Clipper	Post-	CSL	0	1	32.69859	-117.23580	SW			Male	Adult	Ebb	CD	1	moderate
FP	22-Jun-17	13:06:40	Clipper	Pre-	CSL	3	0	32.69500	-117.23438	HO			Mixed	Adult	Ebb	PC	1	moderate
FP	22-Jun-17	13:07:10	Clipper	Pre-	CSL	4	0	32.69472	-117.23619	HO			Male	Adult	Ebb	PC	1	moderate
FP	22-Jun-17	15:27:23	Clipper	Post-	CSL	0	1	32.69939	-117.23677	SW			Male	Adult	Ebb	PC	2	good
FP	23-Jun-17	8:25:45	Clipper	Jetting-R	CSL	0	1	32.69683	-117.23630	SW		Pier15	Unknown	Unknown	Ebb	O	1	moderate
FP	23-Jun-17	11:32:49	Clipper	Pre-/Post-	CSL	0	1	32.69905	-117.23892	SW			Male	Adult	Ebb	O	2	moderate
FP	23-Jun-17	11:39:41	Clipper	Pre-/Post-	CSL	1	0	32.69826	-117.23863	HO			Male	Adult	Ebb	O	2	moderate
FP	23-Jun-17	11:41:19	Clipper	Pre-/Post-	CSL	2	0	32.69472	-117.23619	HO			Male	Adult	Ebb	O	2	moderate
FP	23-Jun-17	11:51:24	Clipper	Pre-/Post-	CSL	5	0	32.69500	-117.23438	HO			Mixed	Mixed	Ebb	O	2	moderate
FP	26-Jun-17	6:45:53	Clipper	Pre-	CSL	3	0	32.69472	-117.23619	HO			Male	Adult	Flood	PC	0	moderate
FP	26-Jun-17	6:47:24	Clipper	Pre-	CSL	2	0	32.69500	-117.23438	HO			Mixed	Adult	Flood	PC	0	moderate
FP	26-Jun-17	6:52:23	Clipper	Pre-	CSL	0	1	32.70170	-117.23689	RF			Unknown	Unknown	Flood	PC	0	moderate
FP	26-Jun-17	7:14:37	Clipper	Pre-	CSL	0	1	32.69915	-117.23837	RF			Male	Adult	Flood	PC	0	moderate
FP	26-Jun-17	7:39:46	Clipper	Pre-	CSL	0	2	32.69829	-117.23888	RF			Male	Adult	Flood	PC	0	moderate
FP	26-Jun-17	7:43:05	Clipper	Pre-	CSL	0	1	32.69900	-117.23717	SW			Male	Adult	Flood	PC	0	moderate
FP	26-Jun-17	10:47:56	Clipper	Pre-	CSL	5	0	32.69500	-117.23438	HO			Mixed	Mixed	Flood	F	3	poor
FP	26-Jun-17	10:50:08	Clipper	Pre-	CSL	0	1	32.69932	-117.23820	JH			Unknown	Adult	Flood	F	3	poor
FP	26-Jun-17	11:34:01	Clipper	Pre-	CSL	0	1	32.69877	-117.23875	RF			Unknown	Unknown	Ebb	F	3	poor
FP	26-Jun-17	12:33:33	Clipper	Pre-/Post-	CSL	0	1	32.69723	-117.23931	RF			Unknown	Unknown	Ebb	F	3	poor
FP	26-Jun-17	12:54:49	Clipper	Pre-/Post-	CSL	0	1	32.70064	-117.23690	SW			Male	Adult	Ebb	HZ	2	moderate
FP	27-Jun-17	7:21:22	Clipper	Pre-/Post-	CSL	2	0	32.69500	-117.23438	HO			Mixed	Mixed	Flood	C	1	good
FP	27-Jun-17	9:29:40	Clipper	Post-	CSL	4	0	32.69472	-117.23619	HO			Mixed	Mixed	Flood	C	1	good
FP	28-Jun-17	14:23:12	Clipper	Post-	CSL	0	1	32.69738	-117.23756	SW			Unknown	Unknown	Flood	C	2	good
FP	30-Jun-17	9:51:10	Clipper	Pre-	CSL	4	0	32.69500	-117.23438	HO			Unknown	Mixed	Flood	CD	1	moderate
FP	3-Jul-17	7:24:37	Clipper	Jetting-R	CSL	0	1	32.69985	-117.23737	SW		Pier08	Unknown	Unknown	Ebb	O	1	good
FP	3-Jul-17	7:39:11	Clipper	Jetting-R	CSL	0	1	32.69918	-117.23669	RF		Pier08	Male	Adult	Ebb	O	1	good
FP	3-Jul-17	8:04:13	Clipper	Jetting-R	CSL	0	1	32.70227	-117.23673	RF			Male	Adult	Ebb	C	1	good
FP	3-Jul-17	8:09:56	Clipper	Jetting-R	CSL	0	1	32.70006	-117.23692	SW			Unknown	Unknown	Ebb	C	1	good
FP	3-Jul-17	10:07:59	Clipper	Pre-/Post-	CSL	0	1	32.70049	-117.23443	SW			Male	Adult	Ebb	C	2	good
FP	3-Jul-17	10:10:10	Clipper	Pre-/Post-	CSL	1	0	32.69472	-117.23619	HO			Unknown	Juvenile	Ebb	C	2	good
FP	5-Jul-17		Clipper	N/A	No Obs.	0	0								PC	2	good	
FP	7-Jul-17	7:22:26	Clipper	Pre-/Post-	CSL	0	1	32.70179	-117.23680	SW			Male	Adult	Ebb	PC	0	excellent
FP	7-Jul-17	7:25:51	Clipper	Pre-/Post-	CSL	4	0	32.69500	-117.23438	HO			Mixed	Mixed	Ebb	PC	0	excellent
FP	7-Jul-17	7:26:27	Clipper	Pre-/Post-	CSL	0	1	32.69909	-117.23431	SW			Unknown	Unknown	Ebb	PC	0	excellent
FP	7-Jul-17	7:58:39	Clipper	Pre-/Post-	CSL	0	1	32.69966	-117.23546	SW			Male	Adult	Ebb	PC	1	excellent
FP	7-Jul-17	8:08:10	Clipper	Pre-/Post-	PHS	0	1	32.69939	-117.23754	SW			Unknown	Adult	Ebb	PC	1	excellent
FP	7-Jul-17	12:38:32	Clipper	Pre-/Post-	CSL	0	1	32.69939	-117.23662	SW			Male	Subadult	Ebb	C	2	excellent
FP	7-Jul-17	12:57:30	Clipper	Pre-/Post-	CSL	0	1	32.70000	-117.23616	SW			Male	Subadult	Ebb	C	2	excellent
FP	10-Jul-17	13:06:38	Clipper	Pre-	CSL	2	0	32.69826	-117.23863	HO			Mixed	Mixed	Ebb	PC	2	moderate
FP	10-Jul-17	13:09:59	Clipper	Pre-	CSL	8	0	32.69472	-117.23619	HO			Mixed	Mixed	Ebb	PC	2	moderate
FP	10-Jul-17	13:11:17	Clipper	Pre-	CSL	2	0	32.69500	-117.23438	HO			Male	Adult	Ebb	PC	2	moderate
FP	10-Jul-17	13:18:09	Clipper	Pre-	CSL	0	1	32.69826	-117.23753	PP			Unknown	Unknown	Ebb	PC	2	moderate
FP	10-Jul-17	13:35:53	Clipper	Pre-	CSL	0	1	32.70177	-117.23652	RF			Female	Adult	Ebb	PC	2	moderate
FP	10-Jul-17	13:39:37	Clipper	Pre-	CSL	0	1	32.69982	-117.23721	DV			Unknown	Unknown	Ebb	PC	2	moderate
FP	10-Jul-17	14:57:19	Clipper	Pre-/Post-	CSL	0	1	32.69834	-117.23854	RF			Unknown	Unknown	Ebb	PC	2	moderate

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	10-Jul-17	15:00:57	Clipper	Pre-/Post-	CSL	0	1	32.69944	-117.23854	SW			Unknown	Unknown	Ebb	PC	2	moderate
FP	12-Jul-17	12:23:57	Clipper	Pre-	CSL	17	0	32.69500	-117.23438	HO			Mixed	Mixed	Ebb	PC	3	moderate
FP	12-Jul-17	12:24:27	Clipper	Pre-	CSL	3	0	32.69472	-117.23619	HO			Mixed	Mixed	Ebb	PC	3	moderate
FP	12-Jul-17	16:19:09	Clipper	Post-	CSL	3	0	32.69826	-117.23863	HO			Male	Adult	Ebb	PC	2	moderate
FP	12-Jul-17	16:20:00	Clipper	Post-	PHS	1	0	32.69826	-117.23863	HO			Unknown	Adult	Ebb	PC	2	moderate
FP	13-Jul-17	7:38:33	Clipper	Pre-	CSL	3	0	32.69500	-117.23438	HO			Unknown	Unknown	Ebb	CD	1	moderate
FP	13-Jul-17	7:38:58	Clipper	Pre-	CSL	2	0	32.69472	-117.23619	HO			Unknown	Unknown	Ebb	CD	1	moderate
FP	13-Jul-17	7:39:20	Clipper	Pre-	CSL	0	1	32.69997	-117.23707	SW			Female	Adult	Ebb	CD	1	moderate
FP	13-Jul-17	8:30:56	Clipper	Pre-	CSL	0	1	32.69864	-117.23735	SW			Male	Adult	Ebb	CD	1	moderate
FP	13-Jul-17	8:47:02	Clipper	Pre-/Post-	CSL	0	1	32.69861	-117.23328	SW			Male	Adult	Ebb	PC	1	moderate
FP	14-Jul-17	8:55:04	Clipper	Pre-	CSL	0	2	32.69500	-117.23600	ML			Unknown	Adult	Flood	CD	1	moderate
FP	14-Jul-17	8:56:19	Clipper	Pre-	CSL	8	0	32.69472	-117.23619	HO	FL		Mixed	Mixed	Flood	CD	1	moderate
FP	14-Jul-17	9:35:53	Clipper	Pre-	CSL	0	1	32.69873	-117.23780	SW			Male	Adult	Flood	CD	1	moderate
FP	14-Jul-17	9:36:38	Clipper	Pre-	CSL	0	1	32.69822	-117.23802	SW			Female	Adult	Flood	CD	1	moderate
FP	14-Jul-17	9:37:42	Clipper	Pre-	CSL	0	1	32.69901	-117.23739	SW			Male	Adult	Flood	CD	1	moderate
FP	14-Jul-17	9:57:39	Clipper	Pre-	CSL	0	1	32.69511	-117.23545	SW			Female	Adult	Flood	CD	1	moderate
FP	14-Jul-17	10:30:52	Clipper	Pre-	CSL	0	1	32.69958	-117.23868	SW			Male	Adult	Flood	CD	1	moderate
FP	14-Jul-17	12:58:16	Clipper	Clipping	CSL	0	2	32.69504	-117.23578	ML		Pier02	Male	Adult	Flood	C	2	moderate
FP	17-Jul-17	6:47:41	Clipper	Pre-	CSL	2	0	32.69826	-117.23863	HO			Male	Adult	Flood	O	0	moderate
FP	17-Jul-17	6:54:22	Clipper	Pre-	CSL	6	0	32.69500	-117.23438	HO			Mixed	Mixed	Flood	O	0	moderate
FP	17-Jul-17	7:23:59	Clipper	Pre-	CSL	0	1	32.70228	-117.23653	RF			Unknown	Unknown	Flood	O	1	moderate
FP	17-Jul-17	8:40:49	Clipper	Pre-/Post-	CSL	2	0	32.70246	-117.23649	HO			Male	Adult	Flood	O	1	moderate
FP	17-Jul-17	8:57:04	Clipper	Pre-/Post-	CSL	0	1	32.69944	-117.23740	DV			Male	Adult	Flood	O	1	moderate
FP	17-Jul-17	9:11:09	Clipper	Pre-/Post-	CSL	0	1	32.69892	-117.23666	SW			Male	Adult	Flood	O	1	moderate
FP	17-Jul-17	9:22:54	Clipper	Pre-/Post-	CSL	0	1	32.70117	-117.23685	SW			Female	Adult	Flood	O	1	moderate
FP	17-Jul-17	10:55:22	Clipper	Jetting-R	CSL	0	1	32.70153	-117.23685	SW		Pier01	Female	Adult	Flood	O	1	moderate
FP	17-Jul-17	11:53:29	Clipper	Jetting-R	CSL	0	1	32.70162	-117.23685	SW		Pier01	Male	Adult	Flood	O	1	moderate
FP	17-Jul-17	12:06:12	Clipper	Jetting-R	CSL	0	2	32.70228	-117.23653	SW		Pier01	Female	Adult	Flood	O	1	moderate
FP	17-Jul-17	13:15:55	Clipper	Pre-	CSL	5	0	32.69472	-117.23619	HO			Mixed	Adult	Flood	PC	3	moderate
FP	17-Jul-17	13:18:48	Clipper	Pre-	CSL	2	0	32.69826	-117.23863	HO			Male	Adult	Flood	PC	3	moderate
FP	17-Jul-17	13:50:54	Clipper	Jetting-R	CSL	0	1	32.70206	-117.23657	RF		Pier01	Female	Adult	Flood	PC	3	moderate
FP	3-Aug-17	6:51:52	Clipper	Pre-	CSL	25	1	32.69815	-117.23876	ML			Mixed	Mixed	Flood	F	1	bad
FP	3-Aug-17	7:08:59	Clipper	Pre-	CSL	0	1	32.69991	-117.23753	SW			Male	Adult	Flood	F	1	bad
FP	3-Aug-17	8:01:31	Clipper	Jetting-R	CSL	0	2	32.69975	-117.23702	SW		Pier12	Male	Adult	Ebb	F	2	bad
FP	3-Aug-17	9:49:02	Clipper	Pre-/Post-	CSL	0	1	32.70001	-117.23743	SW			Mixed	Adult	Ebb	F	2	bad
FP	3-Aug-17	10:08:47	Clipper	Jetting-R	CSL	0	1	32.69870	-117.23874	SW		Pier12	Male	Adult	Ebb	F	2	poor
FP	3-Aug-17	10:14:18	Clipper	Jetting-R	CSL	0	2	32.69533	-117.23483	PP		Pier12	Male	Adult	Ebb	CD	2	poor
FP	3-Aug-17	10:15:52	Clipper	Jetting-R	CSL	0	1	32.69508	-117.23591	ML		Pier12	Male	Adult	Ebb	CD	2	poor
FP	3-Aug-17	10:19:04	Clipper	Jetting-R	CSL	0	1	32.69874	-117.23737	ML		Pier12	Male	Subadult	Ebb	CD	2	poor
FP	3-Aug-17	10:24:02	Clipper	Jetting-R	CSL	0	1	32.69615	-117.23658	SW		Pier12	Male	Adult	Ebb	CD	2	poor
FP	3-Aug-17	10:29:14	Clipper	Jetting-R	CSL	0	1	32.69502	-117.23646	SW		Pier12	Unknown	Adult	Ebb	CD	2	poor
FP	3-Aug-17	10:49:31	Clipper	Pre-/Post-	CSL	0	1	32.70002	-117.23785	DV			Unknown	Adult	Ebb	CD	2	poor
FP	3-Aug-17	11:04:47	Clipper	Pre-/Post-	CLT	0	1	32.69954	-117.23683	UF			Unknown	Adult	Ebb	CD	2	poor
FP	3-Aug-17	11:05:34	Clipper	Pre-/Post-	CLT	0	1	32.70027	-117.23691	UF			Unknown	Adult	Ebb	CD	2	poor
FP	3-Aug-17	11:07:10	Clipper	Pre-/Post-	CLT	0	2	32.70040	-117.23698	O			Unknown	Adult	Ebb	CD	2	poor
FP	3-Aug-17	11:23:33	Clipper	Jetting-R	CSL	0	1	32.69711	-117.23807	ML		Pier12	Unknown	Adult	Ebb	CD	2	poor
FP	3-Aug-17	11:53:18	Clipper	Jetting-R	CSL	0	4	32.69714	-117.23821	RF		Pier12	Unknown	Adult	Ebb	PC	2	moderate
FP	3-Aug-17	12:01:04	Clipper	Pre-/Post-	CSL	0	1	32.69927	-117.23866	SW			Male	Adult	Ebb	PC	2	moderate

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	3-Aug-17	12:02:10	Clipper	Pre-/Post-	CSL	0	1	32.69936	-117.23724	SW			Female	Adult	Ebb	PC	2	moderate
FP	3-Aug-17	12:23:04	Clipper	Pre-/Post-	CSL	0	1	32.69966	-117.23735	SW			Male	Subadult	Ebb	PC	2	moderate
FP	3-Aug-17	13:08:03	Clipper	Pre-	CSL	0	2	32.69843	-117.23744	SW			Male	Adult	Ebb	PC	2	moderate
FP	3-Aug-17	13:21:21	Clipper	Jetting-R	CSL	0	1	32.69924	-117.23870	EX		Pier12	Male	Adult	Ebb	PC	2	moderate
FP	3-Aug-17	13:23:34	Clipper	Jetting-R	CSL	0	1	32.70030	-117.23707	SW		Pier12	Unknown	Adult	Ebb	PC	2	moderate
FP	3-Aug-17	13:38:32	Clipper	Jetting-R	CSL	0	1	32.69984	-117.23742	SW		Pier12	Male	Adult	Ebb	PC	2	moderate
FP	3-Aug-17	13:41:01	Clipper	Jetting-R	CSL	0	1	32.69821	-117.23886	SW		Pier12	Male	Adult	Ebb	PC	2	moderate
FP	3-Aug-17	13:43:48	Clipper	Jetting-R	CSL	0	1	32.69904	-117.23839	SW		Pier12	Male	Adult	Ebb	PC	2	moderate
FP	3-Aug-17	13:53:53	Clipper	Jetting-R	CSL	0	1	32.69873	-117.23629	SW		Pier12	Male	Subadult	Ebb	PC	2	moderate
FP	3-Aug-17	13:56:55	Clipper	Jetting-R	CSL	0	1	32.69953	-117.23702	SW		Pier12	Male	Adult	Ebb	PC	2	moderate
FP	3-Aug-17	14:09:10	Clipper	Post-	CSL	0	2	32.69909	-117.23730	SW			Male	Adult	Ebb	PC	2	moderate
FP	3-Aug-17	14:12:42	Clipper	Post-	CSL	0	1	32.69976	-117.23716	SW			Male	Adult	Ebb	PC	2	moderate
FP	4-Aug-17	10:46:43	Clipper	Pre-	CSL	21	1	32.69846	-117.23894	ML			Mixed	Mixed	Ebb	PC	2	good
FP	4-Aug-17	10:46:50	Clipper	Pre-	CSL	6	0	32.69472	-117.23619	HO			Unknown	Unknown	Ebb	PC	2	good
FP	4-Aug-17	10:46:52	Clipper	Pre-	CSL	5	0	32.69500	-117.23438	HO			Unknown	Unknown	Ebb	PC	2	good
FP	4-Aug-17	11:10:30	Clipper	Jetting-R	CSL	0	1	32.69830	-117.23876	ML		Pier11	Male	Adult	Ebb	PC	2	good
FP	4-Aug-17	11:23:54	Clipper	Jetting-R	CSL	0	1	32.69899	-117.23734	SW		Pier11	Female	Adult	Ebb	PC	2	good
FP	4-Aug-17	11:24:54	Clipper	Jetting-R	CSL	0	2	32.69881	-117.23737	SW		Pier11	Male	Adult	Ebb	PC	2	good
FP	4-Aug-17	11:33:32	Clipper	Jetting-R	CSL	0	3	32.69825	-117.23849	EN		Pier11	Mixed	Mixed	Ebb	PC	2	good
FP	4-Aug-17	11:39:58	Clipper	Jetting-R	CSL	0	1	32.69859	-117.23668	RF		Pier11	Male	Adult	Ebb	PC	2	good
FP	4-Aug-17	12:06:37	Clipper	Jetting-R	CSL	0	1	32.69697	-117.23851	ML		Pier12	Male	Subadult	Ebb	PC	2	good
FP	4-Aug-17	12:24:51	Clipper	Jetting-R	CSL	0	1	32.69770	-117.23761	RF		Pier12	Female	Adult	Ebb	PC	2	good
FP	4-Aug-17	12:37:42	Clipper	Jetting-R	UDOL	0	5	32.69019	-117.23011	SW		Pier12	Unknown	Unknown	Ebb	PC	2	good
FP	4-Aug-17	12:50:31	Clipper	Jetting-R	CSL	0	2	32.69833	-117.23873	ML		Pier12	Male	Adult	Ebb	PC	2	good
FP	4-Aug-17	13:16:01	Clipper	Post-	CSL	0	1	32.69823	-117.23749	SW			Female	Adult	Ebb	PC	3	good
FP	4-Aug-17	13:17:27	Clipper	Post-	CSL	0	1	32.69937	-117.23737	PP			Female	Adult	Ebb	PC	3	good
FP	7-Aug-17	7:52:14	Clipper	Pre-	CSL	30	30	32.69838	-117.23877	ML			Mixed	Mixed	Ebb	CD	2	poor
FP	7-Aug-17	7:55:38	Clipper	Pre-	CSL	7	0	32.69500	-117.23438	HO			Unknown	Adult	Ebb	CD	2	poor
FP	7-Aug-17	8:02:14	Clipper	Pre-	CSL	0	2	32.69639	-117.23664	SW			Mixed	Mixed	Ebb	CD	2	poor
FP	7-Aug-17	8:12:06	Clipper	Pre-	CSL	0	1	32.70008	-117.23826	SW			Male	Adult	Ebb	CD	2	poor
FP	7-Aug-17	8:16:37	Clipper	Pre-	CSL	0	1	32.70077	-117.23706	ML			Male	Adult	Ebb	CD	2	poor
FP	7-Aug-17	9:11:51	Clipper	Pre-	CSL	30	10	32.69843	-117.23886	ML			Mixed	Mixed	Ebb	CD	2	moderate
FP	7-Aug-17	9:13:17	Clipper	Pre-	CSL	20	5	32.69594	-117.23659	ML			Mixed	Mixed	Ebb	CD	2	moderate
FP	7-Aug-17	9:14:03	Clipper	Pre-	CSL	5	0	32.69500	-117.23438	HO			Mixed	Mixed	Ebb	CD	2	moderate
FP	7-Aug-17	9:44:28	Clipper	Pre-	CSL	0	1	32.69977	-117.23699	SW			Mixed	Subadult	Ebb	CD	2	moderate
FP	7-Aug-17	9:45:52	Clipper	Jetting-R	CSL	0	1	32.69889	-117.23738	SW		Pier13	Male	Subadult	Ebb	CD	2	moderate
FP	7-Aug-17	9:45:54	Clipper	Jetting-R	CSL	0	1	32.70065	-117.23641	SF		Pier13	Male	Adult	Ebb	CD	2	moderate
FP	7-Aug-17	10:07:05	Clipper	Pre-/Post-	CSL	0	1	32.69775	-117.23734	SW			Female	Adult	Ebb	PC	2	moderate
FP	7-Aug-17	10:24:17	Clipper	Jetting-R	CSL	0	1	32.70029	-117.23811	ML		Pier12	Male	Adult	Ebb	PC	2	moderate
FP	7-Aug-17	10:26:33	Clipper	Jetting-R	CSL	0	1	32.69854	-117.23895	ML		Pier12	Male	Adult	Ebb	PC	2	moderate
FP	7-Aug-17	10:32:09	Clipper	Jetting-R	CSL	0	2	32.69820	-117.23830	EN		Pier12	Male	Subadult	Ebb	PC	2	moderate
FP	7-Aug-17	10:36:48	Clipper	Jetting-R	CSL	0	8	32.69521	-117.23540	EN	FL	Pier12	Mixed	Mixed	Ebb	PC	2	moderate
FP	7-Aug-17	10:43:33	Clipper	Jetting-R	CSL	0	1	32.70037	-117.23759	SW		Pier12	Male	Adult	Ebb	PC	2	moderate
FP	7-Aug-17	10:46:43	Clipper	Jetting-R	CSL	0	3	32.69564	-117.23554	PP		Pier12	Unknown	Unknown	Ebb	PC	2	moderate
FP	7-Aug-17	10:56:01	Clipper	Jetting-R	CSL	0	1	32.69778	-117.23762	LO		Pier12	Male	Adult	Ebb	PC	2	moderate
FP	7-Aug-17	11:00:12	Clipper	Jetting-R	CSL	0	1	32.69775	-117.23734	LO		Pier12	Male	Adult	Ebb	PC	2	moderate
FP	7-Aug-17	11:00:32	Clipper	Jetting-R	CSL	0	2	32.69733	-117.23771	SW		Pier12	Male	Adult	Ebb	PC	2	moderate
FP	7-Aug-17	11:03:17	Clipper	Jetting-R	CSL	0	1	32.69977	-117.23706	SW		Pier12	Male	Adult	Ebb	PC	2	moderate

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	7-Aug-17	11:10:59	Clipper	Jetting-R	CSL	0	2	32.69514	-117.23573	ML		Pier12	Mixed	Mixed	Ebb	PC	2	moderate
FP	7-Aug-17	11:13:16	Clipper	Jetting-R	CSL	0	2	32.69847	-117.23875	ML		Pier12	Male	Adult	Ebb	PC	2	moderate
FP	7-Aug-17	11:19:49	Clipper	Jetting-R	CSL	0	1	32.69978	-117.23720	SW		Pier12	Male	Adult	Ebb	PC	2	moderate
FP	7-Aug-17	11:28:57	Clipper	Jetting-R	CSL	0	2	32.69917	-117.23651	O		Pier12	Male	Subadult	Ebb	PC	2	moderate
FP	7-Aug-17	11:39:36	Clipper	Jetting-R	CSL	0	1	32.69739	-117.23609	SF		Pier12	Female	Adult	Ebb	PC	2	moderate
FP	7-Aug-17	11:47:54	Clipper	Jetting-R	CSL	0	1	32.69459	-117.23646	SW		Pier12	Unknown	Unknown	Ebb	PC	2	moderate
FP	7-Aug-17	11:51:12	Clipper	Jetting-R	CSL	0	1	32.69870	-117.23651	SW		Pier12	Male	Subadult	Ebb	PC	2	moderate
FP	7-Aug-17	12:15:43	Clipper	Jetting-R	CSL	0	1	32.69839	-117.23876	SW		Pier12	Male	Adult	Ebb	PC	2	moderate
FP	7-Aug-17	12:25:05	Clipper	Jetting-R	CSL	0	1	32.69889	-117.23738	RF		Pier12	Unknown	Unknown	Ebb	PC	2	moderate
FP	7-Aug-17	12:35:33	Clipper	Pre-/Post-	CSL	0	2	32.69783	-117.23623	O			Male	Subadult	Ebb	PC	2	moderate
FP	7-Aug-17	12:36:54	Clipper	Pre-/Post-	CSL	0	1	32.69939	-117.23752	SW			Male	Adult	Ebb	PC	2	moderate
FP	7-Aug-17	12:39:57	Clipper	Pre-/Post-	CSL	0	1	32.69909	-117.23706	ML			Male	Adult	Ebb	PC	2	moderate
FP	7-Aug-17	12:50:05	Clipper	Pre-/Post-	CSL	0	1	32.69887	-117.23706	SW	AD		Female	Adult	Ebb	PC	2	moderate
FP	7-Aug-17	12:54:35	Clipper	Jetting-R	CSL	0	10	32.69830	-117.23853	ML		Pier12	Mixed	Mixed	Ebb	PC	3	moderate
FP	7-Aug-17	13:01:32	Clipper	Jetting-R	CSL	0	1	32.69939	-117.23752	SW		Pier12	Mixed	Subadult	Ebb	PC	3	moderate
FP	7-Aug-17	13:02:05	Clipper	Jetting-R	CSL	0	2	32.69896	-117.23770	SW		Pier12	Female	Adult	Ebb	PC	3	moderate
FP	7-Aug-17	13:09:36	Clipper	Jetting-R	CSL	0	8	32.69773	-117.23823	EN	FL	Pier12	Mixed	Mixed	Ebb	PC	3	moderate
FP	7-Aug-17	13:15:37	Clipper	Jetting-R	CSL	0	1	32.70111	-117.23727	ML		Pier12	Male	Adult	Ebb	PC	3	moderate
FP	7-Aug-17	13:16:23	Clipper	Jetting-R	CSL	0	1	32.69875	-117.23779	SW		Pier12	Male	Adult	Ebb	PC	4	moderate
FP	7-Aug-17	13:33:46	Clipper	Post-	CSL	0	1	32.69911	-117.23734	SW			Male	Adult	Ebb	PC	3	moderate
FP	7-Aug-17	13:45:24	Clipper	Post-	CSL	0	1	32.70033	-117.23785	SW			Male	Adult	Ebb	PC	3	moderate
FP	9-Aug-17	13:16:19	Clipper	Pre-	CSL	47	0	32.69826	-117.23863	HO			Mixed	Mixed	Ebb	C	2	good
FP	9-Aug-17	13:20:28	Clipper	Pre-	CSL	0	5	32.69829	-117.23774	SW			Mixed	Mixed	Ebb	C	2	good
FP	9-Aug-17	13:29:55	Clipper	Pre-	CSL	0	4	32.69818	-117.23726	EX			Mixed	Mixed	Ebb	C	2	good
FP	9-Aug-17	13:44:40	Clipper	Post-	CSL	0	1	32.69927	-117.23729	SW			Male	Adult	Ebb	C	2	good
FP	9-Aug-17	13:46:48	Clipper	Post-	CSL	0	1	32.70016	-117.23696	SW			Male	Adult	Ebb	C	2	good
FP	9-Aug-17	13:51:07	Clipper	Post-	CLT	0	3	32.69925	-117.23701	O			Unknown	Adults	Ebb	C	2	good
FP	9-Aug-17	13:57:56	Clipper	Post-	CSL	0	1	32.70002	-117.23661	SW			Male	Adult	Ebb	C	2	good
FP	9-Aug-17	14:06:22	Clipper	Post-	CSL	0	5	32.69820	-117.23751	ML			Mixed	Mixed	Ebb	C	3	good
FP	9-Aug-17	14:15:02	Clipper	Post-	CSL	0	5	32.69804	-117.23728	EX			Mixed	Mixed	Ebb	C	3	good
FP	11-Aug-17	11:05:18	Clipper	Pre-	CSL	0	2	32.69765	-117.23755	SW			Unknown	Adult	Flood	PC	1	good
FP	11-Aug-17	11:12:13	Clipper	Pre-	CSL	0	1	32.69934	-117.23720	ML			Male	Adult	Flood	PC	1	good
FP	11-Aug-17	11:15:36	Clipper	Pre-	CSL	0	2	32.69783	-117.23752	O			Male	Adult	Flood	PC	1	good
FP	11-Aug-17	11:17:19	Clipper	Pre-	CSL	0	2	32.69795	-117.23806	EN			Female	Adult	Flood	PC	1	good
FP	11-Aug-17	11:18:32	Clipper	Pre-	CSL	0	1	32.69768	-117.23755	SW			Male	Adult	Flood	PC	1	good
FP	11-Aug-17	11:30:42	Clipper	Pre-	CSL	0	5	32.69813	-117.23892	ML			Mixed	Mixed	Flood	PC	1	good
FP	11-Aug-17	11:36:34	Clipper	Clipping	CSL	20	5	32.69859	-117.23885	ML		TFS03	Mixed	Mixed	Ebb	PC	1	good
FP	11-Aug-17	12:04:39	Clipper	Pre-/Post-	CSL	0	2	32.69852	-117.23892	SW			Male	Adult	Ebb	PC	1	good
FP	11-Aug-17	12:24:33	Clipper	Clipping	CSL	0	2	32.69856	-117.23888	ML		TFS04	Male	Adult	Ebb	PC	1	good
FP	11-Aug-17	12:31:50	Clipper	Pre-/Post-	CSL	0	2	32.69870	-117.23874	SW			Male	Adult	Ebb	PC	1	good
FP	11-Aug-17	12:57:07	Clipper	Pre-/Post-	CSL	0	6	32.69917	-117.23747	SW			Mixed	Mixed	Ebb	PC	1	good
FP	11-Aug-17	13:30:36	Clipper	Post-	CSL	0	1	32.69707	-117.23477	SW			Female	Adult	Ebb	PC	1	good
FP	11-Aug-17	13:35:52	Clipper	Post-	CSL	0	1	32.70060	-117.23802	SW			Male	Adult	Ebb	PC	1	good
FP	14-Aug-17	8:00:05	Clipper	Pre-	CSL	45	10	32.69825	-117.23877	ML			Mixed	Mixed	Flood	CD	2	good
FP	14-Aug-17	8:04:13	Clipper	Pre-	CSL	0	6	32.69677	-117.23553	ML			Male	Adult	Flood	CD	1	good
FP	14-Aug-17	8:11:29	Clipper	Pre-	CSL	0	1	32.69615	-117.23810	SW			Male	Adult	Flood	CD	1	good
FP	14-Aug-17	8:20:39	Clipper	Pre-	CSL	0	1	32.69904	-117.23749	SW			Male	Adult	Flood	CD	1	good
FP	14-Aug-17	8:24:15	Clipper	Clipping	CSL	0	15	32.69825	-117.23877	ML		TFS06	Mixed	Mixed	Flood	CD	1	good

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	14-Aug-17	8:31:10	Clipper	Pre-/Post-	CSL	0	2	32.69653	-117.23717	SW			Male	Adult	Flood	CD	1	good
FP	14-Aug-17	8:46:38	Clipper	Clipping	CSL	0	1	32.70067	-117.23670	SW		TFS07	Male	Adult	Flood	CD	1	good
FP	14-Aug-17	9:12:27	Clipper	Pre-/Post-	CSL	0	1	32.69877	-117.23795	SW			Male	Adult	Flood	CD	1	good
FP	14-Aug-17	9:16:01	Clipper	Pre-/Post-	CSL	0	1	32.69997	-117.23296	SW			Male	Adult	Flood	CD	1	good
FP	14-Aug-17	9:32:33	Clipper	Clipping	CSL	0	1	32.69944	-117.23881	ML		TFS09	Male	Adult	Flood	CD	1	good
FP	14-Aug-17	9:34:40	Clipper	Clipping	CSL	0	3	32.69525	-117.23606	RF		TFS09	Male	Adult	Flood	CD	1	good
FP	14-Aug-17	10:00:37	Clipper	Pre-	CSL	0	4	32.69942	-117.23717	SW			Mixed	Mixed	Flood	CD	1	good
FP	14-Aug-17	10:07:17	Clipper	Pre-	CSL	0	1	32.70031	-117.23790	SW			Female	Adult	Flood	CD	1	good
FP	14-Aug-17	10:09:40	Clipper	Pre-	CSL	0	1	32.70080	-117.23688	SW			Male	Adult	Flood	CD	1	good
FP	14-Aug-17	10:10:46	Clipper	Pre-	CSL	0	2	32.70052	-117.23664	SW			Male	Adult	Flood	CD	1	good
FP	14-Aug-17	10:30:24	Clipper	Pre-	CSL	0	1	32.70026	-117.23648	SW			Male	Adult	Flood	CD	1	good
FP	14-Aug-17	10:34:17	Clipper	Pre-	CSL	0	4	32.69615	-117.23624	SW			Mixed	Adult	Flood	CD	1	good
FP	14-Aug-17	10:41:46	Clipper	Pre-	CSL	0	1	32.70065	-117.23780	SW			Male	Adult	Flood	PC	1	good
FP	14-Aug-17	10:57:56	Clipper	Pre-	CSL	0	1	32.69902	-117.23862	SW			Male	Adult	Flood	C	1	good
FP	14-Aug-17	11:00:37	Clipper	Pre-	CSL	0	1	32.69902	-117.23727	SW			Male	Adult	Flood	C	1	good
FP	14-Aug-17	11:03:14	Clipper	Pre-	CSL	0	2	32.70020	-117.23736	SW			Mixed	Adult	Flood	C	1	good
FP	14-Aug-17	11:06:54	Clipper	Pre-	CSL	0	1	32.69814	-117.23835	SW			Male	Subadult	Flood	C	2	good
FP	14-Aug-17	11:26:08	Clipper	Pre-/Post-	CSL	0	1	32.69998	-117.23741	SW			Unknown	Adult	Flood	C	2	good
FP	14-Aug-17	12:00:00	Clipper	Clipping	CSL	0	1	32.69830	-117.23727	SW		TFS14	Female	Adult	Flood	C	2	good
FP	14-Aug-17	12:00:44	Clipper	Clipping	CSL	0	2	32.69852	-117.23818	SW		TFS14	Male	Adult	Flood	C	2	good
FP	14-Aug-17	12:10:25	Clipper	Pre-/Post-	CSL	0	1	32.69788	-117.23453	SW			Male	Adult	Flood	C	2	good
FP	14-Aug-17	12:11:17	Clipper	Pre-/Post-	CSL	0	1	32.69869	-117.23594	SW			Female	Adult	Flood	C	2	good
FP	14-Aug-17	12:20:20	Clipper	Clipping	CSL	0	1	32.70034	-117.23827	SW		TFS15	Male	Adult	Flood	C	2	good
FP	14-Aug-17	12:42:25	Clipper	Post-	CSL	0	2	32.69746	-117.23864	EN			Mixed	Adult	Flood	C	2	good
FP	14-Aug-17	12:47:56	Clipper	Post-	CSL	0	1	32.70027	-117.23824	SW			Male	Adult	Flood	C	2	good
FP	15-Aug-17	8:14:57	Clipper	Pre-	CSL	0	40	32.69800	-117.23867	SW			Mixed	Mixed	Flood	O	1	moderate
FP	15-Aug-17	8:16:50	Clipper	Pre-	CSL	15	0	32.69826	-117.23863	HO			Mixed	Mixed	Flood	O	1	moderate
FP	15-Aug-17	8:22:10	Clipper	Pre-	CSL	12	0	32.69500	-117.23438	HO			Mixed	Mixed	Flood	O	1	moderate
FP	15-Aug-17	8:22:56	Clipper	Pre-	CSL	6	0	32.69472	-117.23619	HO			Mixed	Mixed	Flood	O	1	moderate
FP	15-Aug-17	8:23:52	Clipper	Pre-	CSL	0	1	32.69850	-117.23748	DV			Unknown	Adult	Flood	O	1	moderate
FP	15-Aug-17	8:27:26	Clipper	Pre-	CSL	0	1	32.70061	-117.23698	SW			Female	Adult	Flood	O	1	moderate
FP	15-Aug-17	8:31:33	Clipper	Pre-	CSL	0	1	32.69942	-117.23776	SW			Female	Adult	Flood	O	1	moderate
FP	15-Aug-17	8:35:11	Clipper	Pre-	CSL	0	1	32.70008	-117.23748	DV			Unknown	Unknown	Flood	O	1	moderate
FP	15-Aug-17	8:36:01	Clipper	Pre-	CSL	0	1	32.70049	-117.23748	LO			Female	Adult	Flood	O	1	moderate
FP	15-Aug-17	8:40:21	Clipper	Pre-/Post-	CSL	0	1	32.70053	-117.23781	SW			Male	Adult	Flood	O	1	moderate
FP	15-Aug-17	8:42:21	Clipper	Pre-/Post-	CSL	0	1	32.69896	-117.23729	LO			Male	Adult	Flood	O	1	moderate
FP	15-Aug-17	8:46:40	Clipper	Pre-/Post-	CSL	0	1	32.69714	-117.23748	DV			Unknown	Adult	Flood	O	1	moderate
FP	15-Aug-17	9:11:22	Clipper	Pre-/Post-	CSL	0	1	32.70102	-117.23778	DV			Unknown	Adult	Flood	O	1	moderate
FP	15-Aug-17	9:52:13	Clipper	Pre-/Post-	CSL	0	2	32.69942	-117.23720	SW			Mixed	Adult	Flood	O	2	moderate
FP	15-Aug-17	9:55:17	Clipper	Pre-/Post-	CSL	0	3	32.69805	-117.23748	RF			Mixed	Adult	Flood	O	2	moderate
FP	15-Aug-17	9:59:54	Clipper	Pre-/Post-	CSL	0	1	32.69916	-117.23781	SW			Male	Adult	Flood	O	2	moderate
FP	15-Aug-17	10:01:02	Clipper	Pre-/Post-	CSL	0	1	32.70017	-117.23788	LO			Male	Adult	Flood	O	2	moderate
FP	15-Aug-17	10:12:52	Clipper	Pre-/Post-	CSL	0	1	32.69948	-117.23803	SW			Female	Adult	Flood	O	2	moderate
FP	15-Aug-17	10:23:17	Clipper	Pre-/Post-	CSL	0	1	32.69965	-117.23795	LO			Male	Adult	Flood	O	2	moderate
FP	16-Aug-17	6:38:14	Clipper	Pre-	CSL	85	0	32.69826	-117.23863	HO			Mixed	Mixed	Flood	O	0	moderate
FP	16-Aug-17	6:38:52	Clipper	Pre-	CSL	0	15	32.69939	-117.23898	SW			Mixed	Mixed	Flood	O	0	moderate
FP	16-Aug-17	6:40:01	Clipper	Pre-	CSL	10	0	32.69500	-117.23438	HO			Mixed	Mixed	Flood	O	0	moderate
FP	16-Aug-17	6:41:21	Clipper	Pre-	CSL	3	0	32.69472	-117.23619	HO			Mixed	Mixed	Flood	O	0	moderate

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	16-Aug-17	6:44:48	Clipper	Pre-	CSL	0	2	32.69813	-117.23799	SW			Male	Adult	Flood	O	0	moderate
FP	16-Aug-17	6:46:03	Clipper	Pre-	CSL	0	1	32.70065	-117.23822	SW			Female	Adult	Flood	O	0	moderate
FP	16-Aug-17	6:50:20	Clipper	Pre-	CSL	0	1	32.70096	-117.23807	SW			Male	Adult	Flood	O	0	moderate
FP	16-Aug-17	7:00:11	Clipper	Pre-/Post-	CSL	0	1	32.70017	-117.23813	RF			Male	Adult	Flood	O	0	moderate
FP	16-Aug-17	7:28:43	Clipper	Pre-/Post-	CSL	0	1	32.69956	-117.23854	SW			Female	Adult	Flood	O	0	moderate
FP	16-Aug-17	8:11:41	Clipper	Pre-/Post-	CSL	0	1	32.70006	-117.23852	LO			Male	Adult	Flood	O	0	moderate
FP	16-Aug-17	8:12:59	Clipper	Pre-/Post-	CSL	0	1	32.69956	-117.23854	SW			Male	Adult	Flood	O	0	moderate
FP	16-Aug-17	8:28:13	Clipper	Pre-/Post-	CSL	0	1	32.69999	-117.23836	LO			Male	Adult	Flood	O	0	moderate
FP	16-Aug-17	8:34:49	Clipper	Pre-/Post-	CSL	0	1	32.70055	-117.23840	LO			Female	Adult	Flood	O	0	moderate
FP	16-Aug-17	8:35:57	Clipper	Pre-/Post-	CSL	0	1	32.70097	-117.23796	DV			Female	Adult	Flood	O	0	moderate
FP	16-Aug-17	9:04:09	Clipper	Pre-/Post-	CSL	0	1	32.69948	-117.23714	DV			Female	Adult	Flood	PC	0	moderate
FP	16-Aug-17	9:11:16	Clipper	Pre-/Post-	CSL	0	1	32.70070	-117.23677	SW			Female	Adult	Flood	PC	0	moderate
FP	16-Aug-17	9:16:18	Clipper	Pre-/Post-	CSL	3	0	32.69577	-117.23318	HO			Mixed	Mixed	Flood	PC	0	moderate
FP	16-Aug-17	9:48:23	Clipper	Pre-/Post-	CSL	0	1	32.69927	-117.23665	SW			Male	Adult	Flood	PC	0	moderate
FP	16-Aug-17	10:55:30	Clipper	Pre-/Post-	CSL	0	1	32.70070	-117.23710	SW			Male	Adult	Flood	C	2	moderate
FP	16-Aug-17	11:05:46	Clipper	Post-	CSL	0	1	32.70095	-117.23795	SW			Male	Adult	Flood	C	2	moderate
FP	17-Aug-17	6:53:12	Clipper	Pre-	CSL	80	0	32.69826	-117.23863	HO			Mixed	Mixed	Ebb	CD	1	good
FP	17-Aug-17	7:03:03	Clipper	Pre-	CSL	0	2	32.70039	-117.23780	SW			Male	Adult	Ebb	CD	1	good
FP	17-Aug-17	7:09:33	Clipper	Pre-	CSL	1	0	32.69826	-117.23863	HO			Male	Adult	Ebb	CD	1	good
FP	17-Aug-17	7:27:47	Clipper	Clipping	CSL	0	1	32.69810	-117.23593	SW		TFS29	Unknown	Adult	Ebb	CD	1	good
FP	17-Aug-17	7:37:40	Clipper	Pre-/Post-	CSL	0	1	32.69904	-117.23761	SW			Male	Adult	Ebb	CD	1	good
FP	17-Aug-17	7:54:20	Clipper	Pre-/Post-	CSL	0	1	32.69772	-117.23715	ML			Male	Adult	Ebb	CD	1	good
FP	17-Aug-17	8:02:30	Clipper	Pre-/Post-	CSL	0	1	32.69973	-117.23688	SW			Female	Adult	Ebb	CD	1	good
FP	17-Aug-17	8:21:06	Clipper	Pre-/Post-	CSL	0	1	32.69877	-117.23609	SW			Unknown	Juvenile	Ebb	CD	1	good
FP	17-Aug-17	8:24:09	Clipper	Pre-/Post-	CSL	1	0	32.69826	-117.23863	HO			Female	Adult	Ebb	CD	1	good
FP	17-Aug-17	8:37:19	Clipper	Pre-/Post-	CSL	0	3	32.69927	-117.23887	ML			Unknown	Unknown	Ebb	CD	1	good
FP	17-Aug-17	8:51:42	Clipper	Pre-/Post-	CSL	0	1	32.69769	-117.23747	SW			Male	Adult	Ebb	CD	1	good
FP	17-Aug-17	9:38:06	Clipper	Pre-/Post-	CSL	0	1	32.69903	-117.23780	SW			Male	Adult	Ebb	CD	1	good
FP	17-Aug-17	9:41:59	Clipper	Pre-/Post-	CSL	0	1	32.69751	-117.23504	JH			Unknown	Adult	Ebb	CD	1	good
FP	17-Aug-17	9:50:14	Clipper	Pre-/Post-	CSL	0	1	32.69973	-117.23827	SW			Male	Adult	Ebb	CD	1	good
FP	17-Aug-17	9:56:36	Clipper	Pre-/Post-	CSL	0	2	32.69927	-117.23887	JH			Unknown	Unknown	Ebb	CD	1	good
FP	17-Aug-17	10:08:02	Clipper	Post-	CSL	0	1	32.70060	-117.23764	SW			Male	Adult	Ebb	CD	1	good
FP	17-Aug-17	10:20:08	Clipper	Post-	CSL	0	1	32.69956	-117.23725	LO			Male	Adult	Ebb	CD	1	good
FP	17-Aug-17	10:28:00	Clipper	Post-	CSL	100	0	32.69826	-117.23863	HO			Mixed	Mixed	Ebb	CD	1	good
HDA	22-Aug-17	7:30:58	Command	Pre-	CSL	0	1	32.72373	-117.21569	SW			Unknown	Adult	Ebb	CD	1	moderate
HDA	22-Aug-17	7:39:59	Command	Pre-	CSL	0	1	32.72353	-117.21590	DV			Male	Adult	Ebb	CD	1	moderate
HDA	22-Aug-17	7:41:23	Command	Pre-	CSL	0	1	32.72235	-117.21510	DV			Male	Adult	Ebb	CD	1	moderate
HDA	22-Aug-17	8:01:17	Command	Jetting-R	CSL	0	1	32.72363	-117.21658	SW		548 (Sign-S)	Female	Adult	Ebb	CD	1	moderate
HDA	22-Aug-17	9:13:42	Command	Pre-/Post-	CSL	0	1	32.71991	-117.21700	RF			Unknown	Adult	Ebb	CD	1	moderate
HDA	22-Aug-17	9:56:27	Command	Pre-/Post-	CSL	0	1	32.72086	-117.21714	DV			Unknown	Adult	Ebb	CD	1	moderate
HDA	22-Aug-17	10:15:26	Clipper	Pre-/Post-	CSL	1	0	32.71505	-117.21856	HO			Female	Adult	Ebb	CD	1	moderate
HDA	22-Aug-17	11:28:11	Clipper	Jetting-R	CSL	1	0	32.71313	-117.21728	HO		548 (B-32)	Unknown	Unknown	Ebb	C	1	moderate
HDA	23-Aug-17	9:03:01	Command	Pre-/Post-	CSL	0	1	32.72078	-117.21583	RF			Unknown	Adult	Ebb	O	1	moderate
HDA	23-Aug-17	9:04:35	Command	Pre-/Post-	CSL	0	1	32.72218	-117.21561	SW			Female	Adult	Ebb	O	1	moderate
HDA	23-Aug-17	9:13:37	Command	Pre-/Post-	CSL	0	1	32.72131	-117.21533	SW			Female	Adult	Ebb	O	1	moderate
HDA	23-Aug-17	9:17:04	Command	Pre-/Post-	CSL	0	2	32.72263	-117.21397	SW			Female	Adult	Ebb	O	1	moderate

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
HDA	23-Aug-17	11:26:24	Command	Jetting-R	CSL	0	1	32.72144	-117.21616	DV		548 (B-26.5)	Unknown	Adult	Ebb	O	1	moderate
HDA	23-Aug-17	11:45:35	Clipper	Post-	CSL	1	0	32.71505	-117.21856	HO			Unknown	Unknown	Ebb	O	1	moderate
HDA	24-Aug-17	9:51:07	Command	Post-	CSL	0	1	32.72485	-117.21410	SF			Male	Subadult	Ebb	CD	1	moderate
HDA	24-Aug-17	10:38:46	Command	Pre-	CSL	0	1	32.72394	-117.21399	SW			Female	Adult	Ebb	CD	1	moderate
HDA	24-Aug-17	11:44:16	Command	Jetting-R	CSL	0	1	32.72359	-117.21425	SW		548 (B-14)	Male	Adult	Ebb	CD	1	moderate
HDA	24-Aug-17	12:14:47	Command	Pre-/Post-	CSL	0	1	32.72402	-117.21528	SW			Male	Subadult	Ebb	CD	1	moderate
HDA	25-Aug-17		Command	N/A	No Obs.	0	0								O	2	moderate	
HDA	31-Aug-17	9:10:53	Command	Pre-	CLT	0	1	32.72477	-117.21607	SF			Unknown	Adult	Ebb	HZ	1	moderate
HDA	31-Aug-17	10:04:53	Command	Jetting-R	CSL	1	0	32.71505	-117.21856	HO		548 (B-11)	Unknown	Unknown	Ebb	HZ	1	moderate
HDA	31-Aug-17	10:37:24	Command	Shutdown	CSL	0	1	32.72499	-117.21561	SW		548 (B-10)	Male	Adult	Ebb	HZ	1	moderate
HDA	31-Aug-17	11:28:05	Command	Jetting-R	CLT	0	3	32.72307	-117.21545	SF		548 (B-8)	Unknown	Adult	Ebb	HZ	1	moderate
HDA	31-Aug-17	11:35:56	Command	Jetting-R	CLT	0	2	32.72383	-117.21439	SF		548 (B-8)	Unknown	Adult	Ebb	HZ	1	moderate
HDA	31-Aug-17	15:15:10	Command	Post-	CSL	0	1	32.72531	-117.21431	SW			Unknown	Juvenile	Ebb	HZ	1	moderate
HDA	1-Sep-17	9:13:26	Command	Pre-/Post-	CSL	0	1	32.72531	-117.21375	SW			Male	Subadult	Ebb	C	1	good
HDA	1-Sep-17	11:51:56	Command	Pre-/Post-	CSL	0	1	32.72531	-117.21375	DV			Unknown	Unknown	Ebb	C	1	good
HDA	1-Sep-17	12:35:01	Command	Pre-/Post-	CSL	0	1	32.72429	-117.21419	SW			Unknown	Unknown	Ebb	C	2	good
HDA	1-Sep-17	13:57:52	Command	Pre-/Post-	CSL	0	1	32.72531	-117.21370	ML			Male	Subadult	Ebb	C	2	good
HDA	5-Sep-17		Command	N/A	No Obs.	0	0								PC	2	moderate	
HDA	6-Sep-17		Command	N/A	No Obs.	0	0								PC	2	good	
HDA	6-Sep-17		Command	N/A	No Obs.	0	0								PC	1	good	
HDA	7-Sep-17	10:04:03	Command	Pre-/Post-	CBD	0	3	32.72302	-117.21489	SW			Unknown	Adult	Ebb	C	2	moderate
HDA	8-Sep-17	10:21:35	Command	Jetting-R	CSL	0	1	32.72424	-117.21399	SW		619 (B-5)	Male	Subadult	Ebb	PC	2	moderate
HDA	8-Sep-17	11:21:20	Command	Pre-/Post-	CLT	0	2	32.72335	-117.21370	O			Unknown	Adult	Ebb	PC	1	moderate
HDA	11-Sep-17	9:16:34	Command	Pre-/Post-	GST	0	1	32.72717	-117.21469	SW			Unknown	Adult	Flood	C	1	good
HDA	11-Sep-17	10:18:52	Command	Pre-/Post-	CLT	0	2	32.72359	-117.21467	O			Unknown	Adult	Flood	C	2	good
HDA	11-Sep-17	11:20:12	Command	Post-	CLT	0	2	32.72409	-117.21532	O			Unknown	Adult	Flood	C	2	good
FP	12-Sep-17	8:57:52	Clipper	Pre-	CSL	64	0	32.69826	-117.23863	HO			Mixed	Mixed	Flood	PC	2	moderate
FP	12-Sep-17	8:58:20	Clipper	Pre-	CSL	0	15	32.69827	-117.23851	SW			Mixed	Mixed	Flood	PC	2	moderate
FP	12-Sep-17	9:12:43	Clipper	Pre-	CSL	0	1	32.69681	-117.23729	RF			Mixed	Mixed	Flood	PC	2	moderate
FP	12-Sep-17	9:14:26	Clipper	Pre-	CSL	10	0	32.69500	-117.23438	HO			Mixed	Mixed	Flood	PC	2	moderate
FP	12-Sep-17	9:14:56	Clipper	Pre-	CSL	8	0	32.69472	-117.23619	HO			Mixed	Mixed	Flood	PC	2	moderate
FP	12-Sep-17	9:17:16	Clipper	Pre-	CSL	2	0	32.69577	-117.23318	HO			Mixed	N/A	Flood	PC	2	moderate
FP	12-Sep-17	9:17:49	Clipper	Pre-	CBD	0	4	32.69520	-117.23322	ML			Unknown	Adult	Flood	PC	2	moderate
FP	12-Sep-17	9:28:15	Clipper	Pre-	CSL	0	1	32.69808	-117.23662	SW			Unknown	Unknown	Flood	PC	2	moderate
FP	12-Sep-17	9:30:07	Clipper	Pre-	CBD	0	4	32.69859	-117.23775	SW			Unknown	Unknown	Flood	PC	2	moderate
FP	12-Sep-17	9:35:10	Clipper	Pre-	CSL	0	1	32.69922	-117.23775	SW			Female	Adult	Flood	PC	2	moderate
FP	12-Sep-17	9:44:27	Clipper	Pre-	CBD	0	4	32.69998	-117.23144	ML			Unknown	Adult	Flood	PC	2	moderate
FP	12-Sep-17	9:51:32	Clipper	Pre-	CSL	0	1	32.69747	-117.23668	DV			Unknown	Adult	Flood	PC	2	moderate
FP	12-Sep-17	9:53:59	Clipper	Pre-	CBD	0	4	32.69311	-117.23285	SW				Adult	Flood	PC	2	moderate
FP	12-Sep-17	9:57:03	Clipper	Pre-	CSL	0	11	32.69930	-117.23765	DV			Unknown	Unknown	Flood	PC	2	moderate
FP	12-Sep-17	9:58:24	Clipper	Pre-	CSL	0	1	32.69726	-117.23738	SW			Male	Adult	Flood	PC	2	moderate
FP	12-Sep-17	10:05:43	Clipper	Pre-	CSL	1	0	32.69561	-117.23099	HO			Unknown	Adult	Flood	PC	2	moderate
FP	12-Sep-17	10:08:51	Clipper	Pre-	CSL	0	40	32.69830	-117.23862	EN			Mixed	Mixed	Flood	PC	2	moderate
FP	12-Sep-17	10:13:54	Clipper	Pre-	CSL	0	1	32.69927	-117.23700	SW			Male	Adult	Flood	PC	2	moderate
FP	12-Sep-17	10:15:24	Clipper	Pre-	CSL	0	1	32.69817	-117.23803	SW			Male	Adult	Flood	PC	2	moderate
FP	12-Sep-17	10:18:15	Clipper	Pre-	CSL	0	1	32.69932	-117.23510	SW			Female	Adult	Flood	PC	2	moderate
FP	12-Sep-17	10:28:21	Clipper	Pre-	CSL	0	1	32.69958	-117.23778	SW			Male	Adult	Flood	PC	2	moderate

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
HDA	12-Sep-17	10:46:05	Command	Pre-/Post-	CLT	0	2	32.72551	-117.21516	O			Unknown	Adult	Flood	PC	3	excellent
FP	12-Sep-17	10:54:08	Clipper	Pre-/Post-	CSL	0	1	32.69773	-117.23734	ML			Female	Adult	Flood	PC	3	moderate
FP	12-Sep-17	10:58:25	Clipper	Pre-/Post-	CSL	0	1	32.69912	-117.23750	SW			Female	Adult	Flood	PC	3	moderate
FP	12-Sep-17	11:37:00	Clipper	Pre-/Post-	CSL	0	1	32.69557	-117.23432	SW			Unknown	Unknown	Flood	PC	3	moderate
FP	12-Sep-17	12:02:05	Clipper	Pre-/Post-	CSL	0	1	32.69967	-117.23497	SW			Male	Juvenile	Flood	PC	3	moderate
FP	12-Sep-17	12:04:52	Clipper	Pre-/Post-	CSL	0	1	32.69948	-117.23786	SW			Male	Adult	Flood	PC	3	moderate
FP	12-Sep-17	12:08:25	Clipper	Pre-/Post-	CSL	0	20	32.69827	-117.23851	EN	FL		Mixed	Mixed	Flood	PC	3	moderate
FP	12-Sep-17	12:13:24	Clipper	Pre-/Post-	CLT	0	1	32.69878	-117.23764	O			Unknown	Adult	Flood	PC	3	moderate
FP	12-Sep-17	12:22:35	Clipper	Pre-/Post-	CSL	0	1	32.69740	-117.23685	SW			Male	Adult	Flood	PC	4	moderate
FP	12-Sep-17	12:25:41	Clipper	Pre-/Post-	CSL	0	2	32.69816	-117.23749	ML			Mixed	Mixed	Flood	PC	4	moderate
FP	12-Sep-17	12:38:37	Clipper	Pre-/Post-	CSL	0	1	32.69904	-117.23764	LO			Male	Adult	Flood	PC	4	moderate
FP	12-Sep-17	12:41:08	Clipper	Pre-/Post-	CSL	0	1	32.69958	-117.23781	DV			Male	Adult	Flood	PC	4	moderate
FP	12-Sep-17	12:58:33	Clipper	Torch	CSL	0	1	32.69825	-117.23249	SW		SWC01	Male	Adult	Flood	PC	4	moderate
HDA	12-Sep-17	13:01:48	Command	Pre-/Post-	CLT	0	3	32.72551	-117.21516	O			Unknown	Adult	Flood	PC	1	good
FP	12-Sep-17	13:03:34	Clipper	Torch	CSL	0	10	32.69840	-117.23850	EN		SWC01	Mixed	Mixed	Flood	PC	4	moderate
FP	12-Sep-17	13:06:01	Clipper	Torch	CSL	0	2	32.69885	-117.23798	ML		SWC01	Male	Adult	Flood	PC	4	moderate
FP	12-Sep-17	13:12:08	Clipper	Pre-/Post-	CSL	0	1	32.69938	-117.23706	SW			Male	Adult	Flood	PC	4	moderate
FP	12-Sep-17	13:16:01	Clipper	Pre-/Post-	CSL	0	1	32.69916	-117.23815	SW			Male	Adult	Flood	PC	4	moderate
FP	12-Sep-17	13:18:31	Clipper	Pre-/Post-	CSL	0	1	32.69788	-117.23611	DV			Male	Adult	Flood	PC	4	moderate
FP	12-Sep-17	13:28:33	Clipper	Pre-/Post-	CLT	0	1	32.70074	-117.23702	UF			Unknown	Adult	Flood	PC	4	moderate
FP	12-Sep-17	13:30:13	Clipper	Pre-/Post-	CSL	0	1	32.70074	-117.23702	SW			Male	Adult	Flood	PC	4	moderate
FP	12-Sep-17	13:31:51	Clipper	Clipping	CSL	0	1	32.69943	-117.23748	SW		SWC01	Male	Adult	Flood	PC	4	moderate
FP	12-Sep-17	13:37:54	Clipper	Clipping	CSL	0	1	32.69819	-117.23738	SW		SWC01	Male	Adult	Flood	PC	4	moderate
FP	12-Sep-17	13:41:01	Clipper	Pre-/Post-	CSL	0	1	32.69856	-117.23832	SW			Male	Adult	Flood	PC	4	moderate
FP	12-Sep-17	13:44:06	Clipper	Clipping	CSL	0	1	32.69943	-117.23748	SW		SWC01	Male	Adult	Flood	PC	4	moderate
FP	12-Sep-17	13:53:28	Clipper	Pre-/Post-	CSL	0	1	32.69921	-117.23769	SW			Male	Adult	Flood	PC	4	moderate
FP	12-Sep-17	13:59:47	Clipper	Pre-/Post-	CSL	0	1	32.69912	-117.23762	SW			Male	Adult	Flood	PC	4	moderate
FP	12-Sep-17	14:07:44	Clipper	Pre-/Post-	CSL	0	1	32.70084	-117.23794	SW			Male	Adult	Flood	PC	4	moderate
FP	12-Sep-17	14:11:47	Clipper	Clipping	CSL	0	1	32.69936	-117.23840	SW		SWC01	Male	Adult	Flood	PC	4	moderate
FP	12-Sep-17	14:16:53	Clipper	Clipping	CLT	0	2	32.70082	-117.23738	O		SWC01	Unknown	Adult	Flood	PC	4	moderate
FP	12-Sep-17	14:17:48	Clipper	Clipping	CSL	0	1	32.70013	-117.23740	SW		SWC01	Male	Adult	Flood	PC	4	moderate
FP	12-Sep-17	14:22:22	Clipper	Post-	CSL	0	1	32.69936	-117.23737	SW			Male	Adult	Flood	PC	4	moderate
FP	12-Sep-17	14:29:45	Clipper	Post-	CSL	0	3	32.69634	-117.23803	ML			Mixed	Adult	Flood	PC	4	moderate
FP	12-Sep-17	14:31:02	Clipper	Post-	CSL	0	1	32.69909	-117.23754	DV			Male	Adult	Flood	PC	4	moderate
FP	12-Sep-17	14:35:39	Clipper	Post-	CSL	0	1	32.69941	-117.23744	SW			Female	Adult	Flood	PC	4	moderate
FP	12-Sep-17	14:37:35	Clipper	Post-	CSL	0	1	32.70032	-117.23720	SW			Unknown	Adult	Flood	PC	4	moderate
FP	12-Sep-17	14:39:21	Clipper	Post-	CSL	0	1	32.69932	-117.23802	DV			Male	Juvenile	Flood	PC	4	moderate
FP	13-Sep-17	7:18:00	Clipper	Pre-	CSL	40	0	32.69826	-117.23863	HO			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	7:23:00	Clipper	Pre-	CSL	0	3	32.69755	-117.23625	SW			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	7:28:00	Clipper	Pre-	CSL	0	2	32.69680	-117.23313	SW			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	7:29:00	Clipper	Pre-	CSL	0	3	32.69808	-117.23558	SW			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	7:30:00	Clipper	Pre-	CSL	10	0	32.69500	-117.23438	HO			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	7:31:00	Clipper	Pre-	CSL	5	0	32.69472	-117.23619	HO			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	7:32:00	Clipper	Pre-	CSL	0	1	32.69742	-117.23685	SW			Unknown	Juvenile	Flood	O	1	good
FP	13-Sep-17	7:33:00	Clipper	Pre-	CSL	0	2	32.69836	-117.23858	SW			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	7:38:00	Clipper	Pre-	CSL	0	1	32.69888	-117.23852	SW			Male	Adult	Flood	O	1	good
FP	13-Sep-17	7:39:00	Clipper	Pre-	CSL	0	1	32.69808	-117.23708	SW			Male	Subadult	Flood	O	1	good
FP	13-Sep-17	7:41:00	Clipper	Pre-	CSL	0	5	32.69808	-117.23829	EN			Mixed	Mixed	Flood	O	1	good

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	13-Sep-17	7:44:00	Clipper	Pre-	CSL	0	2	32.69559	-117.23432	SW			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	7:47:00	Clipper	Clipping	CSL	0	1	32.69947	-117.23798	SW		SWC08	Male	Adult	Flood	O	1	good
FP	13-Sep-17	7:56:00	Clipper	Pre-/Post-	CSL	0	1	32.69924	-117.23738	RF			Male	Adult	Flood	O	1	good
FP	13-Sep-17	7:58:00	Clipper	Pre-/Post-	CSL	0	2	32.69636	-117.23803	RF			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	8:00:00	Clipper	Pre-/Post-	CSL	0	2	32.69859	-117.23884	SW			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	8:02:00	Clipper	Pre-/Post-	CSL	0	2	32.69825	-117.23569	EN			Male	Adult	Flood	O	1	good
FP	13-Sep-17	8:06:00	Clipper	Pre-/Post-	CSL	0	3	32.69615	-117.23366	SW			Mixed	Juvenile	Flood	O	1	good
FP	13-Sep-17	8:08:00	Clipper	Pre-/Post-	CSL	0	3	32.69867	-117.23748	SW			Male	Adult	Flood	O	1	good
FP	13-Sep-17	8:11:00	Clipper	Clipping	CSL	0	3	32.69825	-117.23855	SW		SWC11	Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	8:13:00	Clipper	Clipping	CSL	0	3	32.69881	-117.23788	SW		SWC11	Male	Adult	Flood	O	1	good
FP	13-Sep-17	8:17:00	Clipper	Clipping	CSL	0	2	32.69681	-117.23798	EN		SWC11	Mixed	Juvenile	Flood	O	1	good
FP	13-Sep-17	8:24:00	Clipper	Clipping	CSL	0	1	32.69914	-117.23828	SW		SWC11	Male	Adult	Flood	O	1	good
FP	13-Sep-17	8:28:00	Clipper	Clipping	CSL	0	4	32.70075	-117.23280	SW		SWC11	Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	8:29:00	Clipper	Clipping	CSL	0	2	32.69814	-117.23833	SW		SWC11	Male	Adult	Flood	O	1	good
FP	13-Sep-17	8:37:00	Clipper	Pre-/Post-	CSL	0	1	32.69828	-117.23722	SW			Male	Subadult	Flood	O	1	good
FP	13-Sep-17	8:38:00	Clipper	Pre-/Post-	CSL	0	3	32.69708	-117.23795	EN			Mixed	Juvenile	Flood	O	1	good
FP	13-Sep-17	8:40:00	Clipper	Pre-/Post-	CSL	0	1	32.69909	-117.23765	EN	FL		Male	Adult	Flood	O	1	good
FP	13-Sep-17	8:54:00	Clipper	Clipping	CSL	0	3	32.69572	-117.23519	SW		SWC13	Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	8:57:00	Clipper	Clipping	CSL	0	1	32.69795	-117.23683	SW		SWC13	Male	Adult	Flood	O	1	good
FP	13-Sep-17	8:59:00	Clipper	Clipping	CSL	0	3	32.69708	-117.23795	SW		SWC13	Mixed	Juvenile	Flood	O	1	good
FP	13-Sep-17	9:06:00	Clipper	Clipping	CSL	0	3	32.69832	-117.23559	EN		SWC14	Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	9:12:00	Clipper	Pre-/Post-	CSL	0	2	32.69906	-117.23882	SW			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	9:13:00	Clipper	Pre-/Post-	CSL	0	2	32.69906	-117.23882	SW			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	9:14:00	Clipper	Pre-/Post-	CLT	0	3	32.69885	-117.23784	SF			Mixed	Adult	Flood	O	1	good
HDA	13-Sep-17	9:18:45	Command	Pre-/Post-	CSL	0	1	32.72264	-117.21343	ML			Female	Adult	Flood	O	2	moderate
FP	13-Sep-17	9:19:00	Clipper	Pre-/Post-	CSL	0	6	32.69772	-117.23800	EN	FL		Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	9:23:00	Clipper	Pre-/Post-	CSL	0	2	32.69693	-117.23684	SW			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	9:26:00	Clipper	Pre-/Post-	CSL	20	20	32.69816	-117.23836	EN	FL		Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	9:34:00	Clipper	Pre-/Post-	CSL	0	5	32.69817	-117.23848	SW			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	9:37:00	Clipper	Pre-/Post-	CLT	0	20	32.69993	-117.23747	O			Mixed	Adult	Flood	O	1	good
FP	13-Sep-17	9:56:00	Clipper	Pre-/Post-	CSL	0	5	32.69816	-117.23836	EN			Mixed	Mixed	Flood	O	1	good
HDA	13-Sep-17	10:06:47	Command	Pre-/Post-	CSL	0	1	32.72595	-117.21412	SW			Male	Adult	Flood	O	2	moderate
FP	13-Sep-17	10:15:00	Clipper	Pre-/Post-	CSL	0	5	32.69554	-117.23484	EN			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	10:16:00	Clipper	Pre-/Post-	CSL	0	2	32.69906	-117.23882	EN			Male	Adult	Flood	O	1	good
FP	13-Sep-17	10:31:00	Clipper	Pre-/Post-	CSL	0	8	32.69877	-117.23816	SW			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	10:32:00	Clipper	Pre-/Post-	CSL	5	0	32.69826	-117.23863	HO			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	10:41:00	Clipper	Pre-/Post-	CSL	0	4	32.69530	-117.23519	RF			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	10:50:00	Clipper	Pre-/Post-	CSL	0	6	32.70015	-117.23740	SW			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	10:51:00	Clipper	Pre-/Post-	CSL	0	5	32.69851	-117.23671	EN	FL		Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	10:53:00	Clipper	Pre-/Post-	CSL	0	20	32.69851	-117.23671	EN	FL		Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	11:03:00	Clipper	Pre-/Post-	CLT	0	1	32.70037	-117.23659	O			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	11:08:00	Clipper	Pre-/Post-	CSL	0	3	32.69770	-117.23379	RF			Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	11:17:00	Clipper	Clipping	CSL	0	1	32.69836	-117.23466	SW		Pier59	Male	Adult	Flood	O	1	good
HDA	13-Sep-17	11:20:30	Command	Pre-/Post-	CLT	0	1	32.72644	-117.21504	O			Unknown	Adult	Flood	O	2	moderate
FP	13-Sep-17	11:29:00	Clipper	Pre-/Post-	CSL	0	2	32.69851	-117.23671	EN	FL		Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	11:40:00	Clipper	Pre-/Post-	CSL	0	20	32.69816	-117.23836	EN	FL		Mixed	Mixed	Flood	O	1	good
FP	13-Sep-17	11:57:00	Clipper	Pre-/Post-	CSL	0	1	32.69909	-117.23765	SW			Male	Adult	Flood	O	1	good
FP	13-Sep-17	12:03:00	Clipper	Pre-/Post-	CSL	0	2	32.69772	-117.23747	RF			Mixed	Mixed	Flood	O	3	good

Location	Date	Time	Station	Activity	Species	No. of Indiv		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	13-Sep-17	12:04:00	Clipper	Pre-/Post-	CSL	0	8	32.69851	-117.23671	EN	FL		Mixed	Mixed	Flood	O	3	good
FP	13-Sep-17	12:15:00	Clipper	Pre-/Post-	CSL	0	4	32.69850	-117.23665	PP			Mixed	Mixed	Flood	O	3	good
FP	13-Sep-17	12:26:00	Clipper	Clipping	CSL	0	5	32.69859	-117.23678	SW		Pier59	Mixed	Mixed	Flood	O	3	good
FP	13-Sep-17	13:05:00	Clipper	Pre-/Post-	CSL	0	3	32.69906	-117.23882	SW			Mixed	Mixed	Flood	O	3	good
FP	13-Sep-17	13:07:00	Clipper	Pre-/Post-	CSL	0	3	32.69795	-117.23683	SW			Unknown	Juvenile	Flood	O	3	good
FP	13-Sep-17	13:21:00	Clipper	Clipping	CSL	0	3	32.69832	-117.23610	SW		Pier59	Mixed	Mixed	Flood	O	3	good
FP	13-Sep-17	13:36:00	Clipper	Pre-/Post-	CSL	0	2	32.69727	-117.23672	RF			Mixed	Mixed	Flood	O	3	good
FP	13-Sep-17	13:38:00	Clipper	Pre-/Post-	CSL	0	1	32.69909	-117.23765	SW			Male	Adult	Flood	O	3	good
FP	13-Sep-17	13:49:00	Clipper	Clipping	CSL	0	2	32.69853	-117.23671	SW		Pier59	Mixed	Mixed	Flood	O	2	good
FP	13-Sep-17	14:05:00	Clipper	Post-	CSL	0	5	32.69830	-117.23582	SW			Mixed	Mixed	Flood	O	2	good
HDA	13-Sep-17	14:07:01	Command	Post-	CLT	0	1	32.72661	-117.21569	SF			Unknown	Adult	Flood	O	2	moderate
HDA	14-Sep-17		Command	N/A	No Obs.	0	0								C	1	moderate	
FP	14-Sep-17	6:56:44	Clipper	Pre-	CSL	0	1	32.69904	-117.23823	RF			Male	Adult	Flood	PC	0	moderate
FP	14-Sep-17	6:58:58	Clipper	Pre-	CSL	0	1	32.69921	-117.23772	SW			Male	Adult	Flood	PC	0	moderate
FP	14-Sep-17	6:59:50	Clipper	Pre-	CSL	0	20	32.69832	-117.23849	ML			Mixed	Mixed	Flood	PC	0	moderate
FP	14-Sep-17	7:02:32	Clipper	Pre-	CSL	40	0	32.69826	-117.23863	HO			Mixed	Mixed	Flood	PC	0	moderate
FP	14-Sep-17	7:03:22	Clipper	Pre-	CSL	0	1	32.69905	-117.23777	SW			Female	Adult	Flood	PC	0	moderate
FP	14-Sep-17	7:06:41	Clipper	Pre-	CSL	0	3	32.69974	-117.23783	RF			Mixed	Adult	Flood	PC	0	moderate
FP	14-Sep-17	7:08:03	Clipper	Pre-	CSL	0	1	32.69967	-117.23733	SW			Male	Adult	Flood	PC	0	moderate
FP	14-Sep-17	7:10:06	Clipper	Pre-	CSL	10	0	32.69500	-117.23438	HO			Mixed	Mixed	Flood	PC	0	moderate
FP	14-Sep-17	7:10:42	Clipper	Pre-	CSL	1	0	32.69472	-117.23619	HO			Male	Adult	Flood	PC	0	moderate
FP	14-Sep-17	7:13:11	Clipper	Pre-	CSL	4	0	32.69577	-117.23318	HO			Mixed	Mixed	Flood	PC	0	moderate
FP	14-Sep-17	7:13:47	Clipper	Pre-	CSL	0	5	32.69717	-117.23442	ML			Mixed	Mixed	Flood	PC	0	moderate
FP	14-Sep-17	7:16:14	Clipper	Pre-	CSL	1	0	32.69561	-117.23099	HO			Unknown	Adult	Flood	PC	0	moderate
FP	14-Sep-17	7:17:09	Clipper	Pre-	CSL	0	1	32.69773	-117.23319	PP			Female	Adult	Flood	PC	0	moderate
FP	14-Sep-17	7:18:46	Clipper	Pre-	CSL	0	1	32.69923	-117.23747	SW			Male	Adult	Flood	PC	0	moderate
FP	14-Sep-17	7:26:03	Clipper	Pre-	CSL	0	1	32.69810	-117.23791	SW			Female	Adult	Flood	PC	0	moderate
FP	14-Sep-17	7:28:03	Clipper	Pre-	CSL	0	2	32.69885	-117.23825	ML			Male	Adult	Flood	PC	0	moderate
FP	14-Sep-17	7:30:31	Clipper	Pre-	CSL	0	1	32.69916	-117.23760	EX	FL		Male	Adult	Flood	PC	0	moderate
FP	14-Sep-17	7:35:37	Clipper	Pre-	CSL	0	1	32.69930	-117.23766	SW			Female	Adult	Flood	PC	0	moderate
HDA	14-Sep-17	7:40:55	Command	Pre-	CLT	0	1	32.72511	-117.21573	O			Unknown	Adult	Flood	CD	1	moderate
FP	14-Sep-17	7:47:04	Clipper	Pre-	CSL	0	1	32.69965	-117.23727	SW			Male	Adult	Flood	PC	0	moderate
FP	14-Sep-17	7:55:47	Clipper	Pre-	CSL	0	1	32.69683	-117.23655	RF			Male	Adult	Flood	PC	0	moderate
FP	14-Sep-17	7:57:28	Clipper	Pre-	CSL	0	1	32.69917	-117.23802	SW			Male	Adult	Flood	PC	0	moderate
FP	14-Sep-17	7:58:29	Clipper	Pre-	CSL	0	1	32.69784	-117.23715	SW			Female	Adult	Flood	PC	0	moderate
FP	14-Sep-17	8:04:55	Clipper	Pre-	CSL	0	1	32.69947	-117.23819	SW			Unknown	Adult	Flood	PC	0	moderate
HDA	14-Sep-17	8:05:10	Command	Pre-	CLT	0	3	32.72426	-117.21610	SF			Unknown	Adult	Flood	CD	1	moderate
FP	14-Sep-17	8:06:28	Clipper	Pre-	CSL	0	1	32.69819	-117.23693	SW			Female	Adult	Flood	PC	0	moderate
FP	14-Sep-17	8:09:35	Clipper	Pre-	CSL	0	1	32.69848	-117.23680	SW			Female	Adult	Flood	PC	0	moderate
FP	14-Sep-17	8:16:45	Clipper	Pre-	CSL	0	1	32.69945	-117.23742	SW			Male	Adult	Flood	PC	0	moderate
FP	14-Sep-17	8:20:39	Clipper	Pre-	CSL	0	1	32.69932	-117.23494	SW			Unknown	Juvenile	Flood	PC	0	moderate
FP	14-Sep-17	8:48:46	Clipper	Pre-	CSL	0	1	32.69801	-117.23692	SW			Male	Adult	Flood	PC	1	moderate
FP	14-Sep-17	8:53:44	Clipper	Pre-	CSL	0	1	32.69880	-117.23745	SW			Male	Adult	Flood	PC	1	moderate
FP	14-Sep-17	8:58:12	Clipper	Pre-	CSL	0	1	32.69932	-117.23767	SW			Female	Adult	Flood	PC	1	moderate
FP	14-Sep-17	9:02:43	Clipper	Clipping	CSL	0	1	32.70019	-117.23740	SW		Pier58	Male	Adult	Flood	PC	1	moderate
FP	14-Sep-17	9:04:46	Clipper	Pre-/Post-	CSL	0	1	32.69943	-117.23756	SW			Male	Adult	Flood	PC	1	moderate
FP	14-Sep-17	9:14:13	Clipper	Pre-/Post-	CSL	0	3	32.69973	-117.23772	PP			Mixed	Mixed	Flood	PC	1	moderate
FP	14-Sep-17	9:20:19	Clipper	Pre-/Post-	CSL	0	1	32.69983	-117.23799	SW			Unknown	Juvenile	Flood	PC	1	moderate

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1 ^o	2 ^o							
FP	14-Sep-17	9:27:28	Clipper	Pre-/Post-	CSL	0	1	32.70021	-117.23793	SW			Male	Adult	Flood	PC	1	moderate
FP	14-Sep-17	9:29:41	Clipper	Pre-/Post-	CSL	0	4	32.69830	-117.23753	SW			Mixed	Mixed	Flood	PC	1	moderate
FP	14-Sep-17	9:31:00	Clipper	Pre-/Post-	CSL	0	3	32.69896	-117.23697	SW			Mixed	Adult	Flood	PC	1	moderate
FP	14-Sep-17	9:35:01	Clipper	Pre-/Post-	CSL	0	4	32.69806	-117.23541	PP			Mixed	Mixed	Flood	PC	1	moderate
FP	14-Sep-17	9:36:57	Clipper	Pre-/Post-	CSL	0	1	32.69905	-117.23586	RF			Unknown	Adult	Flood	PC	1	moderate
FP	14-Sep-17	9:38:58	Clipper	Pre-/Post-	CSL	0	1	32.69896	-117.23726	SW			Female	Adult	Flood	PC	1	moderate
FP	14-Sep-17	9:54:52	Clipper	Pre-/Post-	CSL	0	1	32.70051	-117.23626	SW			Male	Adult	Flood	PC	1	moderate
FP	14-Sep-17	9:56:43	Clipper	Pre-/Post-	CSL	0	1	32.69986	-117.23717	SW			Female	Adult	Flood	PC	2	moderate
FP	14-Sep-17	10:15:24	Clipper	Pre-/Post-	CSL	0	3	32.69830	-117.23753	SW			Mixed	Mixed	Flood	PC	2	moderate
FP	14-Sep-17	10:17:49	Clipper	Pre-/Post-	CSL	0	1	32.69988	-117.23703	RF			Male	Adult	Flood	PC	2	moderate
FP	14-Sep-17	10:19:02	Clipper	Pre-/Post-	CSL	0	1	32.69926	-117.23771	LO			Female	Adult	Flood	PC	2	moderate
FP	14-Sep-17	10:33:07	Clipper	Pre-/Post-	CSL	0	1	32.69815	-117.23875	SW			Male	Adult	Flood	PC	2	moderate
FP	14-Sep-17	10:35:59	Clipper	Pre-/Post-	CSL	0	1	32.69928	-117.23768	LO			Female	Adult	Flood	PC	2	moderate
FP	14-Sep-17	10:36:56	Clipper	Pre-/Post-	CSL	0	1	32.69987	-117.23743	ML			Female	Adult	Flood	PC	2	moderate
FP	14-Sep-17	10:38:11	Clipper	Pre-/Post-	CSL	0	1	32.69856	-117.23351	RF			Unknown	Adult	Flood	PC	2	moderate
FP	14-Sep-17	10:40:16	Clipper	Pre-/Post-	CSL	0	1	32.70008	-117.23791	SW			Female	Adult	Flood	PC	2	moderate
FP	14-Sep-17	10:46:35	Clipper	Pre-/Post-	CSL	0	1	32.69964	-117.23763	LO			Male	Adult	Flood	PC	2	moderate
FP	14-Sep-17	10:56:55	Clipper	Pre-/Post-	CSL	0	1	32.69944	-117.23786	ML			Female	Adult	Flood	PC	2	moderate
FP	14-Sep-17	11:00:15	Clipper	Clipping	CSL	0	1	32.69919	-117.23745	SW		Pier57	Female	Adult	Flood	PC	2	moderate
FP	14-Sep-17	11:01:40	Clipper	Pre-/Post-	CSL	0	1	32.69937	-117.23768	LO			Female	Adult	Flood	PC	2	moderate
FP	14-Sep-17	11:08:01	Clipper	Pre-/Post-	CSL	0	1	32.69986	-117.23717	SW			Male	Adult	Flood	PC	2	moderate
FP	14-Sep-17	11:14:49	Clipper	Pre-/Post-	CSL	0	3	32.69987	-117.23779	ML			Mixed	Mixed	Flood	PC	2	moderate
FP	14-Sep-17	11:24:33	Clipper	Pre-/Post-	CSL	0	1	32.69926	-117.23765	SW			Female	Adult	Flood	PC	2	moderate
FP	14-Sep-17	11:38:45	Clipper	Pre-/Post-	CSL	0	1	32.69957	-117.23869	SW			Male	Adult	Flood	PC	2	moderate
FP	14-Sep-17	11:42:20	Clipper	Pre-/Post-	CSL	0	2	32.69881	-117.23788	ML			Mixed	Mixed	Flood	PC	2	moderate
FP	14-Sep-17	12:17:47	Clipper	Pre-/Post-	CSL	0	1	32.69829	-117.23587	SW			Male	Adult	Flood	PC	2	moderate
FP	14-Sep-17	12:30:58	Clipper	Pre-/Post-	CSL	0	1	32.69830	-117.23791	SW			Female	Adult	Flood	PC	2	moderate
FP	14-Sep-17	12:31:40	Clipper	Pre-/Post-	CSL	0	1	32.69841	-117.23719	SW			Male	Adult	Flood	PC	2	moderate
FP	14-Sep-17	12:32:58	Clipper	Pre-/Post-	CSL	0	1	32.69696	-117.23726	PP			Unknown	Adult	Flood	PC	2	moderate
FP	14-Sep-17	12:35:01	Clipper	Pre-/Post-	CSL	0	1	32.70049	-117.23665	SW			Male	Adult	Flood	PC	2	moderate
FP	14-Sep-17	12:43:07	Clipper	Pre-/Post-	CSL	0	1	32.69977	-117.23704	SW			Male	Adult	Flood	PC	2	moderate
FP	14-Sep-17	12:49:27	Clipper	Pre-/Post-	CSL	0	1	32.69763	-117.23740	SW			Male	Adult	Flood	PC	2	moderate
FP	14-Sep-17	12:51:38	Clipper	Pre-/Post-	CSL	0	2	32.69857	-117.23571	SW			Mixed	Mixed	Flood	PC	2	moderate
HDA	14-Sep-17	12:54:18	Command	Pre-/Post-	CLT	0	1	32.72583	-117.21567	O			Unknown	Adult	Flood	C	2	moderate
FP	14-Sep-17	13:05:25	Clipper	Pre-/Post-	CSL	0	1	32.69913	-117.23730	SW			Male	Adult	Flood	PC	2	moderate
FP	14-Sep-17	13:07:30	Clipper	Torch	CSL	0	1	32.69894	-117.23786	SW		Pier55	Male	Adult	Flood	PC	2	moderate
FP	14-Sep-17	13:25:24	Clipper	Pre-/Post-	CSL	0	1	32.69946	-117.23766	SW			Male	Adult	Flood	PC	2	moderate
FP	14-Sep-17	13:28:23	Clipper	Pre-/Post-	CSL	0	1	32.69924	-117.23763	SW			Male	Adult	Flood	PC	2	moderate
FP	14-Sep-17	13:30:19	Clipper	Pre-/Post-	CSL	0	1	32.69919	-117.23761	PP			Male	Adult	Flood	PC	2	moderate
FP	14-Sep-17	13:31:42	Clipper	Pre-/Post-	CSL	0	1	32.69930	-117.23743	SW			Female	Adult	Flood	PC	2	moderate
FP	14-Sep-17	13:40:34	Clipper	Torch	CSL	0	1	32.69972	-117.23761	SW			Male	Adult	Flood	PC	2	moderate
FP	14-Sep-17	13:47:30	Clipper	Post-	CSL	0	1	32.69971	-117.23721	SF			Female	Adult	Flood	PC	2	moderate
FP	14-Sep-17	13:55:33	Clipper	Post-	CSL	0	1	32.69923	-117.23769	LO			Male	Adult	Flood	PC	2	moderate
HDA	14-Sep-17	14:51:57	Command	Pre-/Post-	CLT	0	1	32.72577	-117.21603	O			Unknown	Adult	Flood	C	2	moderate
HDA	14-Sep-17	15:13:58	Command	Pre-/Post-	CLT	0	1	32.72256	-117.21683	O			Unknown	Adult	Flood	C	2	moderate
HDA	14-Sep-17	15:55:35	Command	Pre-/Post-	CLT	0	3	32.72414	-117.21556	SF			Unknown	Adult	Flood	C	2	moderate
HDA	15-Sep-17		Sierra-HDA	N/A	No Obs.	0	0								CD	1	moderate	
FP	15-Sep-17	8:52:38	Clipper	Pre-	CSL	70	6	32.69846	-117.23906	HO			Mixed	Mixed	Ebb	CD	2	moderate

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	15-Sep-17	8:53:52	Clipper	Pre-	CSL	3	0	32.69577	-117.23318	HO			Unknown	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	8:55:02	Clipper	Pre-	CSL	2	0	32.69561	-117.23099	HO			Unknown	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	8:57:30	Clipper	Pre-	CSL	1	0	32.69472	-117.23619	HO			Male	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	8:57:54	Clipper	Pre-	CSL	9	0	32.69500	-117.23438	HO			Mixed	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	9:01:23	Clipper	Pre-	CSL	0	1	32.69780	-117.23763	SW			Male	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	9:04:23	Clipper	Pre-	CSL	0	1	32.69735	-117.23393	SW			Male	Subadult	Ebb	CD	2	moderate
FP	15-Sep-17	9:05:29	Clipper	Pre-	CSL	0	1	32.69823	-117.23632	SW			Mixed	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	9:07:24	Clipper	Pre-	CSL	0	1	32.69649	-117.23819	SW			Female	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	9:54:50	Clipper	Clipping	CSL	0	1	32.69795	-117.23643	SW		Pier54	Male	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	10:02:37	Clipper	Pre-/Post-	CSL	0	2	32.69822	-117.23856	ML			Mixed	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	10:06:59	Clipper	Pre-/Post-	CSL	0	1	32.69847	-117.23832	SW			Male	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	10:15:14	Clipper	Pre-/Post-	CSL	0	1	32.69758	-117.23763	SW			Female	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	10:18:00	Clipper	Pre-/Post-	CSL	0	1	32.69904	-117.23684	SW			Male	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	10:23:51	Clipper	Clipping	CSL	0	3	32.69791	-117.23789	EN		Pier53	Male	Subadult	Ebb	CD	2	moderate
FP	15-Sep-17	10:29:30	Clipper	Pre-/Post-	CSL	0	1	32.69703	-117.23672	SW			Male	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	10:30:40	Clipper	Pre-/Post-	CSL	0	2	32.69738	-117.23726	SW			Female	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	10:36:06	Clipper	Pre-/Post-	CSL	0	1	32.69849	-117.23777	SW			Female	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	10:40:41	Clipper	Pre-/Post-	CSL	0	1	32.69533	-117.23599	SW			Male	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	11:01:17	Clipper	Pre-/Post-	CSL	0	2	32.69827	-117.23782	SW			Male	Subadult	Ebb	CD	2	moderate
FP	15-Sep-17	11:01:25	Clipper	Pre-/Post-	CSL	0	2	32.69895	-117.23670	SW			Male	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	11:04:51	Clipper	Pre-/Post-	CSL	0	1	32.69810	-117.23835	EX			Male	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	11:07:32	Clipper	Pre-/Post-	CSL	0	1	32.69749	-117.23746	SW			Mixed	Subadult	Ebb	CD	2	moderate
FP	15-Sep-17	11:15:56	Clipper	Pre-/Post-	CSL	0	1	32.69649	-117.23819	SW			Male	Subadult	Ebb	CD	2	moderate
FP	15-Sep-17	11:17:15	Clipper	Pre-/Post-	CSL	0	2	32.69876	-117.23893	ML			Mixed	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	11:19:40	Clipper	Pre-/Post-	CSL	0	1	32.69746	-117.23690	SW			Male	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	11:25:27	Clipper	Pre-/Post-	CSL	0	1	32.69826	-117.23754	SW			Female	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	11:31:20	Clipper	Pre-/Post-	CSL	0	1	32.69780	-117.23821	SW			Male	Adult	Ebb	CD	3	moderate
FP	15-Sep-17	11:44:43	Clipper	Pre-/Post-	CSL	0	2	32.69928	-117.23711	ML			Male	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	11:51:36	Clipper	Pre-/Post-	CSL	0	1	32.69961	-117.23763	SW			Male	Adult	Ebb	CD	3	moderate
FP	15-Sep-17	11:53:50	Clipper	Clipping	CSL	0	7	32.69822	-117.23856	ML		SWF52	Male	Subadult	Ebb	CD	2	moderate
FP	15-Sep-17	12:05:12	Clipper	Clipping	CSL	0	1	32.69858	-117.23845	ML		SWF52	Male	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	12:14:08	Clipper	Pre-/Post-	CSL	0	2	32.69857	-117.23723	ML			Male	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	12:30:32	Clipper	Pre-/Post-	CSL	0	2	32.70052	-117.23763	SW			Male	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	12:36:37	Clipper	Pre-/Post-	CSL	0	1	32.69798	-117.23683	SW			Female	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	12:38:04	Clipper	Pre-/Post-	CSL	0	2	32.69959	-117.23745	SW			Mixed	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	12:46:42	Clipper	Post-	CSL	0	1	32.69885	-117.23553	SW			Male	Subadult	Ebb	CD	2	moderate
FP	15-Sep-17	12:51:07	Clipper	Post-	CSL	0	2	32.69827	-117.23782	SW			Mixed	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	12:59:21	Clipper	Post-	CSL	0	2	32.70006	-117.23763	SW			Male	Adult	Ebb	CD	2	moderate
FP	15-Sep-17	13:10:25	Clipper	Post-	CSL	0	2	32.69960	-117.23702	ML			Male	Adult	Ebb	CD	2	moderate
FP	18-Sep-17	11:30:59	Clipper	Pre-	CSL	30	0	32.69826	-117.23863	HO			Mixed	Mixed	Ebb	O	2	moderate
FP	18-Sep-17	11:32:02	Clipper	Pre-	CSL	0	15	32.69832	-117.23854	SW			Mixed	Mixed	Ebb	O	2	moderate
FP	18-Sep-17	11:33:29	Clipper	Pre-	CSL	15	0	32.69472	-117.23619	HO			Mixed	Mixed	Ebb	O	2	moderate
FP	18-Sep-17	11:35:05	Clipper	Pre-	CSL	7	0	32.69500	-117.23438	HO			Mixed	Mixed	Ebb	O	2	moderate
FP	18-Sep-17	11:36:01	Clipper	Pre-	CSL	4	0	32.69577	-117.23318	HO			Mixed	Mixed	Ebb	O	2	moderate
FP	18-Sep-17	11:37:46	Clipper	Pre-	CSL	2	0	32.70177	-117.22927	HO			Mixed	Mixed	Ebb	O	2	moderate
FP	18-Sep-17	11:47:35	Clipper	Pre-	CSL	0	1	32.69842	-117.23844	SW			Male	Adult	Ebb	O	2	moderate
FP	18-Sep-17	11:51:42	Clipper	Pre-	CSL	0	2	32.70084	-117.23772	SW			Mixed	Adult	Ebb	O	2	moderate
FP	18-Sep-17	11:54:15	Clipper	Pre-	CSL	0	1	32.69989	-117.23744	SW			Male	Adult	Ebb	O	2	moderate

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1 ^o	2 ^o							
FP	18-Sep-17	11:56:57	Clipper	Pre-	CSL	0	1	32.69750	-117.23756	RF			Male	Adult	Ebb	O	2	moderate
FP	18-Sep-17	11:57:48	Clipper	Pre-	CSL	0	4	32.69864	-117.23770	SW			Female	Adult	Ebb	O	2	moderate
FP	18-Sep-17	12:00:15	Clipper	Pre-	CSL	0	1	32.70021	-117.23706	SW			Male	Adult	Ebb	O	2	moderate
FP	18-Sep-17	12:01:04	Clipper	Pre-	CSL	0	1	32.70021	-117.23695	SW			Female	Adult	Ebb	O	2	moderate
FP	18-Sep-17	12:02:15	Clipper	Pre-	CSL	0	1	32.69879	-117.23807	SW			Female	Adult	Ebb	O	2	moderate
FP	18-Sep-17	12:04:08	Clipper	Pre-	CSL	0	1	32.69848	-117.23854	ML			Female	Adult	Ebb	O	2	moderate
FP	18-Sep-17	12:05:51	Clipper	Pre-	CSL	0	2	32.69879	-117.23830	SW			Female	Adult	Ebb	O	2	moderate
FP	18-Sep-17	12:09:35	Clipper	Pre-	CSL	0	1	32.69970	-117.23783	SW			Female	Adult	Ebb	O	2	moderate
FP	18-Sep-17	12:12:05	Clipper	Pre-	CSL	0	13	32.69827	-117.23859	EN	FL		Mixed	Mixed	Ebb	O	2	moderate
FP	18-Sep-17	12:15:01	Clipper	Pre-/Post-	CSL	0	1	32.70033	-117.23712	SW			Male	Adult	Ebb	O	2	moderate
FP	18-Sep-17	12:16:25	Clipper	Pre-/Post-	CSL	0	2	32.69887	-117.23645	SW			Female	Adult	Ebb	O	2	moderate
FP	18-Sep-17	12:21:24	Clipper	Pre-/Post-	CSL	0	1	32.70011	-117.23773	SW			Male	Adult	Ebb	O	2	moderate
FP	18-Sep-17	12:33:50	Clipper	Pre-/Post-	CSL	0	1	32.69886	-117.23747	LO			Male	Adult	Ebb	O	2	moderate
FP	18-Sep-17	12:35:06	Clipper	Pre-/Post-	CSL	0	1	32.69878	-117.23745	SW			Male	Juvenile	Ebb	O	2	moderate
FP	18-Sep-17	12:40:08	Clipper	Pre-/Post-	CSL	0	1	32.69936	-117.23756	LO			Male	Adult	Ebb	O	2	moderate
FP	18-Sep-17	12:41:24	Clipper	Pre-/Post-	CSL	0	2	32.69931	-117.23729	ML			Mixed	Adult	Ebb	O	2	moderate
FP	18-Sep-17	12:47:18	Clipper	Pre-/Post-	CSL	0	1	32.69937	-117.23756	LO			Female	Adult	Ebb	O	2	moderate
FP	18-Sep-17	12:48:50	Clipper	Pre-/Post-	CSL	0	2	32.69873	-117.23768	ML			Mixed	Adult	Ebb	O	2	moderate
FP	18-Sep-17	12:51:08	Clipper	Pre-/Post-	CSL	0	1	32.69958	-117.23750	LO			Male	Juvenile	Ebb	O	2	moderate
FP	18-Sep-17	12:56:43	Clipper	Pre-/Post-	CSL	0	1	32.70011	-117.23773	SW			Male	Adult	Ebb	O	2	moderate
FP	18-Sep-17	12:57:47	Clipper	Pre-/Post-	CSL	0	2	32.69931	-117.23639	SW			Male	Juvenile	Ebb	O	2	moderate
FP	18-Sep-17	12:59:53	Clipper	Pre-/Post-	CSL	0	1	32.69876	-117.23780	DV			Unknown	Adult	Ebb	O	2	moderate
FP	18-Sep-17	13:05:08	Clipper	Pre-/Post-	CSL	0	1	32.70017	-117.23756	SW			Male	Adult	Ebb	O	2	moderate
FP	18-Sep-17	13:11:46	Clipper	Pre-/Post-	CSL	0	1	32.69887	-117.23719	SW			Male	Adult	Ebb	O	2	moderate
FP	18-Sep-17	13:14:07	Clipper	Pre-/Post-	CSL	0	1	32.69896	-117.23805	DV			Female	Adult	Ebb	O	2	moderate
FP	18-Sep-17	13:15:12	Clipper	Pre-/Post-	CSL	0	1	32.69864	-117.23742	SW			Male	Adult	Ebb	O	2	moderate
FP	18-Sep-17	13:16:09	Clipper	Pre-/Post-	CSL	0	2	32.69919	-117.23772	ML			Male	Adult	Ebb	O	2	moderate
FP	18-Sep-17	13:23:59	Clipper	Pre-/Post-	CSL	0	1	32.69935	-117.23753	LO			Male	Adult	Ebb	O	2	moderate
FP	18-Sep-17	13:28:20	Clipper	Pre-/Post-	CSL	0	2	32.69974	-117.23774	RF			Male	Adult	Ebb	O	2	moderate
FP	18-Sep-17	13:30:39	Clipper	Pre-/Post-	CSL	0	1	32.69933	-117.23751	LO			Male	Adult	Ebb	O	2	moderate
FP	18-Sep-17	13:37:53	Clipper	Clipping	CSL	0	1	32.69940	-117.23693	SW		Pier51	Mixed	Adult	Ebb	O	2	moderate
FP	18-Sep-17	13:39:45	Clipper	Post-	CSL	0	1	32.69885	-117.23606	SW			Unknown	Adult	Ebb	O	2	moderate
FP	18-Sep-17	13:40:39	Clipper	Post-	CSL	0	1	32.70016	-117.23793	SW			Male	Adult	Ebb	O	2	moderate
FP	18-Sep-17	13:42:27	Clipper	Post-	CSL	0	1	32.69932	-117.23755	LO			Female	Adult	Ebb	O	2	moderate
FP	18-Sep-17	13:46:32	Clipper	Post-	CSL	0	3	32.69931	-117.23660	ML			Mixed	Adult	Ebb	O	2	moderate
FP	18-Sep-17	13:48:05	Clipper	Post-	CSL	0	1	32.69913	-117.23793	SW			Male	Adult	Ebb	O	2	moderate
FP	18-Sep-17	13:48:20	Clipper	Post-	CSL	0	1	32.69932	-117.23756	SW			Male	Adult	Ebb	O	2	moderate
FP	18-Sep-17	13:50:41	Clipper	Post-	CSL	0	1	32.69948	-117.23763	SW			Male	Adult	Ebb	O	2	moderate
FP	18-Sep-17	13:58:52	Clipper	Post-	CSL	0	1	32.69873	-117.23768	SW			Female	Adult	Ebb	O	2	moderate
FP	18-Sep-17	14:07:34	Clipper	Post-	CSL	0	1	32.69974	-117.23738	PP			Male	Adult	Ebb	O	2	moderate
FP	19-Sep-17	7:44:20	Clipper	Pre-	CSL	30	0	32.69826	-117.23863	HO			Mixed	Mixed	Ebb	O	1	moderate
FP	19-Sep-17	7:46:22	Clipper	Pre-	CSL	0	10	32.69813	-117.23800	ML			Mixed	Mixed	Ebb	O	1	moderate
FP	19-Sep-17	7:48:47	Clipper	Pre-	CSL	10	0	32.69472	-117.23619	HO			Mixed	Mixed	Ebb	O	1	moderate
FP	19-Sep-17	7:49:39	Clipper	Pre-	CSL	2	0	32.69577	-117.23318	HO			Mixed	Mixed	Ebb	O	1	moderate
FP	19-Sep-17	7:51:26	Clipper	Pre-	CSL	1	0	32.69561	-117.23099	HO			Male	Adult	Ebb	O	1	moderate
FP	19-Sep-17	7:52:44	Clipper	Pre-	CSL	0	1	32.69971	-117.23757	SW			Male	Adult	Ebb	O	1	moderate
FP	19-Sep-17	8:11:49	Clipper	Pre-	CSL	0	1	32.69970	-117.23727	SW			Male	Adult	Ebb	O	1	moderate
FP	19-Sep-17	8:13:12	Clipper	Pre-	CSL	0	1	32.69954	-117.23738	SW			Male	Adult	Ebb	O	1	moderate

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	19-Sep-17	8:33:52	Clipper	Pre-	CSL	0	2	32.69755	-117.23742	SW			Male	Adult	Ebb	O	1	moderate
FP	19-Sep-17	8:35:53	Clipper	Pre-	CSL	0	6	32.69490	-117.23394	RF			Mixed	Mixed	Ebb	O	1	moderate
FP	19-Sep-17	8:37:33	Clipper	Pre-	CSL	0	2	32.69994	-117.23761	ML			Male	Adult	Ebb	O	1	moderate
FP	19-Sep-17	8:40:18	Clipper	Pre-	CSL	0	1	32.69951	-117.23750	LO			Male	Adult	Ebb	O	1	moderate
FP	19-Sep-17	8:43:19	Clipper	Pre-	CSL	0	2	32.69664	-117.23761	SW			Mixed	Adult	Ebb	O	1	moderate
FP	19-Sep-17	8:44:00	Clipper	Pre-	CSL	0	1	32.69896	-117.23734	SW			Male	Adult	Ebb	O	1	moderate
FP	19-Sep-17	8:48:19	Clipper	Pre-	CSL	0	1	32.69801	-117.23789	SW			Male	Adult	Ebb	O	1	moderate
FP	19-Sep-17	8:49:10	Clipper	Pre-	CSL	0	1	32.69908	-117.23767	SW			Female	Adult	Ebb	O	1	moderate
FP	19-Sep-17	8:50:59	Clipper	Pre-	CSL	0	1	32.70003	-117.23768	SW			Male	Adult	Ebb	O	1	moderate
FP	19-Sep-17	8:55:25	Clipper	Pre-	CSL	0	1	32.69867	-117.23761	SW			Female	Adult	Ebb	O	1	moderate
FP	19-Sep-17	9:02:51	Clipper	Pre-	CSL	0	2	32.69717	-117.23830	SW			Male	Adult	Ebb	O	1	moderate
FP	19-Sep-17	9:19:51	Clipper	Pre-/Post-	CSL	0	1	32.69854	-117.23647	SW			Unknown	Adult	Ebb	PC	2	moderate
FP	19-Sep-17	9:22:12	Clipper	Pre-/Post-	CSL	0	1	32.70025	-117.23770	SW			Male	Adult	Ebb	PC	2	moderate
FP	19-Sep-17	9:23:01	Clipper	Pre-/Post-	CSL	0	1	32.70058	-117.23708	SW			Male	Adult	Ebb	PC	2	moderate
FP	19-Sep-17	9:27:25	Clipper	Pre-/Post-	CSL	0	1	32.70061	-117.23748	SW			Male	Adult	Ebb	PC	2	moderate
FP	19-Sep-17	9:29:23	Clipper	Pre-/Post-	CSL	0	1	32.69937	-117.23761	LO			Male	Adult	Ebb	PC	2	moderate
FP	19-Sep-17	9:36:54	Clipper	Pre-/Post-	CSL	0	1	32.69938	-117.23757	LO			Male	Adult	Ebb	PC	2	moderate
FP	19-Sep-17	9:38:40	Clipper	Pre-/Post-	CSL	0	1	32.69980	-117.23761	RF			Male	Adult	Ebb	PC	2	moderate
FP	19-Sep-17	9:42:32	Clipper	Pre-/Post-	CSL	0	1	32.69804	-117.23720	SW			Male	Adult	Ebb	PC	2	moderate
FP	19-Sep-17	9:49:44	Clipper	Pre-/Post-	CSL	0	1	32.69877	-117.23679	SW			Female	Adult	Ebb	PC	2	moderate
FP	19-Sep-17	11:07:38	Clipper	Pre-/Post-	CSL	0	1	32.69855	-117.23744	SW			Male	Adult	Ebb	PC	2	moderate
FP	19-Sep-17	11:10:15	Clipper	Pre-/Post-	CSL	0	1	32.69954	-117.23843	SW			Male	Adult	Ebb	PC	2	moderate
FP	19-Sep-17	11:23:10	Clipper	Pre-/Post-	CSL	0	2	32.70113	-117.23724	RF			Male	Adult	Ebb	PC	2	moderate
FP	19-Sep-17	11:24:42	Clipper	Pre-/Post-	CSL	0	1	32.70091	-117.23729	SW			Male	Adult	Ebb	PC	2	moderate
FP	19-Sep-17	11:30:14	Clipper	Pre-/Post-	CSL	0	1	32.69992	-117.23779	SW			Male	Adult	Ebb	PC	2	moderate
FP	19-Sep-17	11:36:51	Clipper	Pre-/Post-	CSL	0	15	32.69820	-117.23824	EN	FL		Mixed	Mixed	Ebb	PC	2	moderate
FP	19-Sep-17	12:05:58	Clipper	Pre-/Post-	CSL	0	1	32.69900	-117.23795	ML			Female	Adult	Ebb	PC	2	moderate
FP	19-Sep-17	12:10:32	Clipper	Pre-/Post-	CSL	0	1	32.69923	-117.23801	SW			Female	Adult	Ebb	PC	2	moderate
FP	19-Sep-17	12:11:21	Clipper	Pre-/Post-	CSL	0	1	32.69908	-117.23816	ML			Female	Adult	Ebb	PC	2	moderate
FP	19-Sep-17	12:12:55	Clipper	Pre-/Post-	CSL	0	1	32.69939	-117.23755	LO			Male	Juvenile	Ebb	PC	2	moderate
FP	19-Sep-17	12:14:28	Clipper	Pre-/Post-	CSL	0	1	32.69939	-117.23755	EX	FL		Male	Juvenile	Ebb	PC	4	moderate
HDA	19-Sep-17	12:29:16	Command	Pre-/Post-	CSL	0	2	32.72497	-117.21442	SF			Mixed	Adult	Ebb	CD	3	moderate
FP	19-Sep-17	12:33:02	Clipper	Pre-/Post-	CSL	0	2	32.69668	-117.23705	RF			Female	Adult	Ebb	PC	4	moderate
FP	19-Sep-17	12:34:49	Clipper	Pre-/Post-	CSL	0	1	32.70025	-117.23752	SW			Male	Adult	Ebb	PC	4	moderate
FP	19-Sep-17	12:43:51	Clipper	Pre-/Post-	CSL	0	1	32.69970	-117.23737	SW			Female	Adult	Ebb	PC	4	moderate
FP	19-Sep-17	12:45:07	Clipper	Pre-/Post-	CSL	0	1	32.69950	-117.23741	SW			Female	Adult	Ebb	PC	4	moderate
FP	19-Sep-17	13:01:25	Clipper	Pre-/Post-	CSL	3	0	32.70246	-117.23649	HO			Mixed	Mixed	Ebb	PC	4	moderate
FP	19-Sep-17	13:14:09	Clipper	Pre-/Post-	CSL	0	1	32.69819	-117.23597	SW			Male	Adult	Ebb	PC	4	moderate
FP	19-Sep-17	13:15:05	Clipper	Pre-/Post-	CSL	0	1	32.69994	-117.23761	SW			Male	Adult	Ebb	PC	4	moderate
FP	19-Sep-17	13:16:40	Clipper	Pre-/Post-	CSL	0	1	32.69978	-117.23779	SW			Female	Adult	Ebb	PC	4	moderate
FP	19-Sep-17	13:31:04	Clipper	Post-	CSL	0	1	32.69962	-117.23758	LO			Male	Adult	Ebb	PC	4	moderate
FP	19-Sep-17	13:34:08	Clipper	Post-	CSL	0	1	32.69912	-117.23836	SW			Male	Adult	Ebb	PC	4	moderate
FP	19-Sep-17	13:37:01	Clipper	Post-	CSL	0	1	32.69908	-117.23755	LO			Female	Adult	Ebb	PC	4	moderate
FP	19-Sep-17	13:39:34	Clipper	Post-	CSL	0	1	32.69940	-117.23758	SW			Male	Adult	Ebb	PC	4	moderate
FP	19-Sep-17	13:41:00	Clipper	Post-	CSL	0	1	32.70046	-117.23738	SW			Male	Adult	Ebb	PC	4	moderate
FP	19-Sep-17	13:53:53	Clipper	Pre-	CSL	0	1	32.69979	-117.23700	SW			Female	Adult	Ebb	PC	4	moderate
HDA	19-Sep-17	14:41:05	Sierra-HDA	I-PD	CSL	0	1	32.72524	-117.21455	SW		607N (D-9)	Unknown	Subadult	Ebb	PC	2	moderate

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
HDA	19-Sep-17	16:40:33	Command	Post-	CSL	0	2	32.72540	-117.21395	ML			Male	Subadult	Ebb	CD	3	moderate
HDA	20-Sep-17		Command	N/A	No Obs.	0	0									CD	3	moderate
HDA	20-Sep-17		Command	N/A	No Obs.	0	0									PC	4	moderate
FP	20-Sep-17	7:29:18	Clipper	Pre-	CSL	55	0	32.69826	-117.23863	HO			Mixed	Mixed	Ebb	PC	3	moderate
FP	20-Sep-17	7:30:23	Clipper	Pre-	CSL	0	10	32.69793	-117.23823	ML			Mixed	Mixed	Ebb	PC	3	moderate
FP	20-Sep-17	7:31:50	Clipper	Pre-	CSL	7	0	32.69500	-117.23438	HO			Mixed	Mixed	Ebb	PC	3	moderate
FP	20-Sep-17	7:32:40	Clipper	Pre-	CSL	1	0	32.69577	-117.23318	HO			Male	Adult	Ebb	PC	3	moderate
FP	20-Sep-17	7:45:27	Clipper	Pre-	CSL	0	1	32.69620	-117.23550	DV			Unknown	Adult	Ebb	PC	3	moderate
FP	20-Sep-17	9:05:34	Clipper	Pre-/Post-	CSL	0	1	32.70022	-117.23836	SW			Male	Adult	Ebb	PC	3	good
FP	20-Sep-17	9:07:55	Clipper	Pre-/Post-	CSL	0	1	32.69973	-117.23633	SW			Male	Adult	Ebb	PC	3	good
FP	20-Sep-17	9:12:22	Clipper	Pre-/Post-	CSL	0	1	32.69938	-117.23772	SW			Male	Adult	Ebb	PC	3	good
FP	20-Sep-17	9:28:13	Clipper	Pre-/Post-	CSL	1	0	32.69561	-117.23099	HO			Male	Adult	Ebb	PC	3	good
FP	20-Sep-17	10:09:40	Clipper	Pre-/Post-	CSL	2	0	32.69472	-117.23619	HO			Male	Adult	Ebb	PC	3	good
FP	20-Sep-17	10:28:17	Clipper	Pre-/Post-	CSL	0	2	32.69851	-117.23718	SW			Male	Adult	Ebb	PC	3	good
FP	20-Sep-17	11:06:04	Clipper	Pre-/Post-	CSL	0	1	32.69869	-117.23790	SW			Female	Adult	Ebb	PC	3	good
FP	20-Sep-17	11:07:41	Clipper	Pre-/Post-	CSL	0	1	32.70051	-117.23843	RF			Male	Subadult	Ebb	PC	3	good
FP	20-Sep-17	11:45:43	Clipper	Pre-/Post-	CSL	0	2	32.69899	-117.23832	SW	AD		Male	Adult	Ebb	PC	3	good
FP	20-Sep-17	11:51:56	Clipper	Pre-/Post-	CSL	0	1	32.69861	-117.23756	ML			Mixed	Adult	Ebb	PC	3	good
FP	20-Sep-17	12:07:46	Clipper	Pre-/Post-	CSL	0	1	32.69883	-117.23661	SW			Male	Adult	Ebb	PC	3	good
FP	20-Sep-17	12:14:20	Clipper	Pre-/Post-	CSL	0	1	32.69930	-117.23759	SW			Male	Subadult	Ebb	PC	3	good
FP	20-Sep-17	12:15:29	Clipper	Pre-/Post-	CSL	0	1	32.69959	-117.23807	RF			Male	Adult	Ebb	PC	3	good
FP	20-Sep-17	12:19:35	Clipper	Pre-/Post-	CSL	0	1	32.69872	-117.23729	RF			Male	Adult	Ebb	PC	3	good
FP	20-Sep-17	12:26:55	Clipper	Pre-/Post-	CSL	0	1	32.70061	-117.23708	SW			Male	Adult	Ebb	PC	3	good
FP	20-Sep-17	12:28:41	Clipper	Pre-/Post-	CSL	0	1	32.69925	-117.23710	SW			Female	Adult	Ebb	PC	3	good
FP	20-Sep-17	12:31:45	Clipper	Clipping	CSL	0	1	32.69913	-117.23632	SW		Pier45	Male	Adult	Ebb	PC	3	good
FP	20-Sep-17	12:33:31	Clipper	Pre-/Post-	CSL	0	1	32.70018	-117.23726	SW			Male	Adult	Ebb	PC	3	good
FP	20-Sep-17	12:36:00	Clipper	Pre-/Post-	CSL	0	1	32.69860	-117.23661	SW			Female	Adult	Ebb	PC	3	good
FP	20-Sep-17	12:41:16	Clipper	Pre-/Post-	CSL	0	1	32.69950	-117.23738	LO			Female	Adult	Ebb	PC	3	good
FP	20-Sep-17	12:42:26	Clipper	Pre-/Post-	CSL	0	1	32.69941	-117.23816	DV			Male	Subadult	Ebb	PC	3	good
FP	20-Sep-17	12:46:11	Clipper	Pre-/Post-	CSL	0	1	32.69869	-117.23688	SW			Female	Adult	Ebb	PC	3	good
FP	20-Sep-17	12:50:51	Clipper	Torch	CSL	0	1	32.69815	-117.23683	ML		Pier45	Female	Adult	Ebb	PC	3	good
FP	20-Sep-17	13:14:50	Clipper	Pre-/Post-	CSL	0	1	32.69968	-117.23797	SW			Male	Adult	Ebb	PC	3	good
FP	20-Sep-17	13:21:55	Clipper	Pre-/Post-	CSL	0	2	32.69956	-117.23809	SW			Male	Adult	Ebb	PC	3	good
FP	20-Sep-17	13:28:51	Clipper	Pre-/Post-	CSL	0	2	32.69924	-117.23759	ML			Male	Adult	Ebb	PC	3	good
FP	20-Sep-17	13:44:53	Clipper	Post-	CSL	0	1	32.70020	-117.23849	SW			Female	Adult	Ebb	PC	3	good
FP	20-Sep-17	13:45:51	Clipper	Post-	CSL	0	1	32.69928	-117.23759	LO			Male	Adult	Ebb	PC	3	good
HDA	20-Sep-17	13:49:29	Sierra-HDA	Post-	CLT	0	2	32.72440	-117.21393	O			Unknown	Adult	Ebb	CD	4	good
FP	20-Sep-17	14:02:23	Clipper	Post-	CSL	0	1	32.69925	-117.23710	SW			Male	Adult	Ebb	PC	3	good
FP	20-Sep-17	14:04:43	Clipper	Post-	CSL	0	1	32.69921	-117.23803	SW			Female	Adult	Ebb	PC	3	good
HDA	21-Sep-17		Command	N/A	No Obs.	0	0											
FP	21-Sep-17	7:14:51	Clipper	Pre-	CSL	50	2	32.69827	-117.23877	HO			Mixed	Mixed	Ebb	CD	2	moderate
HDA	21-Sep-17	7:56:36	Command	Jetting-I	CSL	0	1	32.72595	-117.21413	SF		607N (E-9)	Male	Adult	Ebb	CD	2	moderate
HDA	21-Sep-17	8:09:30	Sierra-HDA	Pre-/Post-	CSL	0	1	32.72317	-117.21557	SW			Male	Adult	Ebb	CD	2	moderate
FP	21-Sep-17	8:22:45	Clipper	Pre-/Post-	CSL	0	1	32.69900	-117.23735	ML			Male	Adult	Ebb	CD	2	moderate
HDA	21-Sep-17	8:25:09	Command	Pre-/Post-	CSL	0	1	32.72536	-117.21390	SF			Male	Subadult	Ebb	CD	3	moderate
HDA	21-Sep-17	8:48:25	Sierra-HDA	Pre-/Post-	CSL	0	1	32.72563	-117.21420	RF			Male	Adult	Ebb	CD	2	moderate
FP	21-Sep-17	10:16:56	Clipper	Pre-/Post-	CSL	0	1	32.69872	-117.23680	ML			Male	Adult	Ebb	CD	2	moderate
FP	21-Sep-17	11:29:04	Clipper	Pre-/Post-	CSL	0	1	32.69927	-117.23708	SW			Male	Adult	Ebb	CD	2	moderate

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
HDA	21-Sep-17	11:38:27	Command	I-PD	CSL	0	1	32.72628	-117.21379	ML		607N (F-9)	Mixed	Adult	Ebb	CD	1	moderate
FP	21-Sep-17	11:45:34	Clipper	Post-	CSL	0	2	32.69963	-117.23735	SW			Mixed	Adult	Ebb	CD	3	moderate
FP	21-Sep-17	12:07:32	Clipper	Post-	CSL	0	1	32.69971	-117.23749	SW			Male	Adult	Ebb	CD	3	moderate
FP	21-Sep-17	12:58:50	Clipper	Pre-	CSL	0	1	32.69932	-117.23735	SW			Female	Adult	Ebb	CD	3	moderate
FP	21-Sep-17	13:28:40	Clipper	Pre-	CSL	0	1	32.69927	-117.23735	LO			Male	Adult	Ebb	CD	3	moderate
FP	21-Sep-17	13:40:51	Clipper	Pre-/Post-	CSL	0	1	32.69949	-117.23742	SW			Male	Adult	Ebb	CD	3	moderate
HDA	22-Sep-17		Command	N/A	No Obs.	0	0								PC	2	moderate	
FP	22-Sep-17	7:19:54	Clipper	Pre-	CSL	54	0	32.69826	-117.23863	HO			Mixed	Mixed	Ebb	PC	2	good
HDA	22-Sep-17	7:42:20	Sierra-HDA	Pre-	CSL	0	1	32.72284	-117.21672	SW			Male	Adult	Ebb	CD	2	good
FP	22-Sep-17	7:58:59	Clipper	Pre-	CSL	0	6	32.69900	-117.23692	SW			Mixed	Mixed	Ebb	PC	3	excellent
FP	22-Sep-17	8:01:09	Clipper	Pre-	CSL	0	1	32.69965	-117.23746	SW			Male	Adult	Ebb	PC	3	excellent
FP	22-Sep-17	8:53:54	Clipper	Pre-	CSL	0	6	32.69729	-117.23743	SW			Mixed	Mixed	Ebb	PC	3	good
FP	22-Sep-17	9:42:20	Clipper	Pre-/Post-	CSL	0	1	32.69744	-117.23537	SW			Male	Adult	Ebb	PC	3	good
FP	22-Sep-17	10:08:01	Clipper	Pre-/Post-	CSL	0	1	32.69996	-117.23662	SW			Male	Adult	Ebb	PC	3	good
FP	22-Sep-17	10:40:34	Clipper	Pre-/Post-	CSL	1	0	32.69577	-117.23318	HO			Unknown	Juvenile	Ebb	PC	3	good
FP	22-Sep-17	10:41:23	Clipper	Pre-/Post-	CSL	2	0	32.69561	-117.23099	HO			Unknown	Juvenile	Ebb	PC	3	good
FP	22-Sep-17	10:43:38	Clipper	Pre-/Post-	CSL	10	0	32.69472	-117.23619	HO			Mixed	Mixed	Ebb	PC	3	good
FP	22-Sep-17	10:43:38	Clipper	Pre-/Post-	CSL	30	0	32.69500	-117.23438	HO			Mixed	Mixed	Ebb	PC	3	good
HDA	22-Sep-17	10:46:55	Command	Pre-/Post-	CSL	0	1	32.72552	-117.21483	SW			Male	Adult	Ebb	PC	2	moderate
FP	22-Sep-17	11:24:27	Clipper	Pre-/Post-	CSL	0	2	32.69930	-117.23738	SW			Mixed	Adult	Ebb	PC	3	excellent
FP	22-Sep-17	11:40:13	Clipper	Clipping	CSL	20	0	32.69826	-117.23863	HO		Pier41	Mixed	N/A	Ebb	PC	3	excellent
FP	22-Sep-17	12:02:59	Clipper	Pre-/Post-	CSL	0	1	32.69929	-117.23743	SW			Female	Adult	Ebb	PC	3	excellent
FP	22-Sep-17	12:13:57	Clipper	Pre-/Post-	CSL	0	1	32.69952	-117.23700	SW			Male	Adult	Ebb	PC	3	excellent
FP	22-Sep-17	13:51:16	Clipper	Post-	CSL	0	2	32.69999	-117.23775	SW			Mixed	Adult	Ebb	PC	3	excellent
HDA	25-Sep-17		Command	N/A	No Obs.	0	0								C	0	excellent	
HDA	25-Sep-17		Command	N/A	No Obs.	0	0								C	3	excellent	
FP	25-Sep-17	7:45:16	Clipper	Pre-	CSL	30	0	32.69826	-117.23863	HO			Mixed	Mixed	Flood	PC	0	good
FP	25-Sep-17	7:45:58	Clipper	Pre-	CSL	0	6	32.69848	-117.23850	ML			Mixed	Mixed	Flood	PC	0	good
FP	25-Sep-17	7:48:19	Clipper	Pre-	CSL	7	0	32.69500	-117.23438	HO			Mixed	Mixed	Flood	PC	0	good
FP	25-Sep-17	7:49:23	Clipper	Pre-	CSL	25	0	32.69472	-117.23619	HO			Mixed	Mixed	Flood	PC	0	good
FP	25-Sep-17	7:50:12	Clipper	Pre-	CSL	1	0	32.69577	-117.23318	HO			Male	Adult	Flood	PC	0	good
FP	25-Sep-17	7:51:19	Clipper	Pre-	CSL	2	0	32.70246	-117.23649	HO			Mixed	Mixed	Flood	PC	0	good
FP	25-Sep-17	8:12:09	Clipper	Pre-	CSL	0	1	32.69983	-117.23683	SW			Male	Subadult	Flood	PC	0	good
FP	25-Sep-17	8:18:21	Clipper	Pre-	CSL	0	1	32.69870	-117.23571	SW			Male	Adult	Flood	PC	0	good
FP	25-Sep-17	8:26:13	Clipper	Pre-	CSL	0	1	32.69905	-117.23815	RF			Unknown	Adult	Flood	PC	0	good
HDA	25-Sep-17	8:42:38	Command	Pre-	CSL	0	1	32.72550	-117.21415	SF			Male	Adult	Flood	C	0	excellent
HDA	25-Sep-17	9:04:27	Command	Pre-/Post-	CSL	0	1	32.71856	-117.21875	SW			Female	Adult	Flood	C	1	excellent
FP	25-Sep-17	9:14:54	Clipper	Pre-/Post-	CSL	0	1	32.69907	-117.23760	LO			Male	Adult	Flood	PC	0	good
FP	25-Sep-17	9:23:10	Clipper	Pre-/Post-	CSL	0	1	32.69943	-117.23646	SW			Male	Adult	Flood	PC	0	good
FP	25-Sep-17	9:29:17	Clipper	Pre-/Post-	CSL	0	1	32.69950	-117.23588	RF			Unknown	Adult	Flood	PC	0	good
FP	25-Sep-17	9:30:25	Clipper	Pre-/Post-	CSL	0	1	32.69793	-117.23746	SW			Male	Subadult	Flood	PC	0	good
FP	25-Sep-17	9:30:57	Clipper	Pre-/Post-	CSL	0	1	32.69749	-117.23723	SW			Male	Adult	Flood	PC	0	good
FP	25-Sep-17	9:43:41	Clipper	Pre-/Post-	CSL	0	1	32.69923	-117.23768	SW			Female	Adult	Flood	PC	0	good
FP	25-Sep-17	9:45:25	Clipper	Pre-/Post-	CSL	0	1	32.70043	-117.23815	DV			Female	Adult	Flood	PC	0	good
FP	25-Sep-17	9:49:28	Clipper	Pre-/Post-	CSL	0	1	32.70105	-117.23746	SW			Male	Adult	Flood	PC	0	good
FP	25-Sep-17	9:53:07	Clipper	Pre-/Post-	CSL	0	1	32.69889	-117.23783	SW			Male	Adult	Flood	PC	0	good
FP	25-Sep-17	10:11:31	Clipper	Pre-/Post-	CSL	0	2	32.69818	-117.23714	RF			Male	Adult	Flood	PC	0	good
FP	25-Sep-17	10:15:21	Clipper	Pre-/Post-	CSL	0	4	32.69761	-117.23837	RF			Mixed	Mixed	Flood	PC	0	good

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	25-Sep-17	10:30:05	Clipper	Pre-/Post-	CSL	0	1	32.70041	-117.23691	SW			Male	Adult	Flood	PC	0	good
FP	25-Sep-17	10:39:13	Clipper	Pre-/Post-	CSL	0	1	32.69918	-117.23700	SW			Female	Adult	Flood	PC	0	good
FP	25-Sep-17	10:41:14	Clipper	Pre-/Post-	CSL	0	1	32.70003	-117.23787	SW			Male	Subadult	Flood	PC	0	good
FP	25-Sep-17	10:55:24	Clipper	Pre-/Post-	CSL	0	2	32.69734	-117.23746	ML			Mixed	Adult	Flood	PC	1	good
FP	25-Sep-17	11:12:22	Clipper	Pre-/Post-	CSL	0	1	32.69901	-117.23644	SW			Male	Adult	Flood	PC	1	good
FP	25-Sep-17	11:19:28	Clipper	Pre-/Post-	CSL	1	0	32.69561	-117.23099	HO			Male	Adult	Flood	PC	1	good
FP	25-Sep-17	11:31:14	Clipper	Pre-/Post-	CSL	0	1	32.69935	-117.23773	DV			Unknown	Adult	Flood	PC	2	good
FP	25-Sep-17	11:46:37	Clipper	Pre-/Post-	CSL	0	1	32.69991	-117.23740	PP	AD		Female	Adult	Flood	PC	2	good
FP	25-Sep-17	12:01:46	Clipper	Pre-/Post-	CSL	0	1	32.70114	-117.23702	SW			Male	Adult	Flood	PC	2	good
HDA	25-Sep-17	12:02:57	Sierra-HDA	Pre-/Post-	CSL	0	1	32.72250	-117.21632	SW			Male	Adult	Flood	C	1	good
FP	25-Sep-17	13:02:39	Clipper	Pre-/Post-	CSL	0	1	32.69961	-117.23751	EX	FL		Male	Adult	Flood	PC	2	good
FP	25-Sep-17	13:35:15	Clipper	Post-	CSL	0	1	32.69957	-117.23763	LO			Male	Subadult	Flood	PC	2	good
FP	25-Sep-17	13:36:47	Clipper	Post-	CSL	0	1	32.69951	-117.23821	SW			Male	Subadult	Flood	PC	2	good
FP	25-Sep-17	13:43:08	Clipper	Post-	CSL	0	2	32.69840	-117.23718	SW			Mixed	Mixed	Flood	PC	3	good
HDA	26-Sep-17		Command	N/A	No Obs.	0	0									C	1	moderate
HDA	26-Sep-17		Command	N/A	No Obs.	0	0									C	1	moderate
HDA	26-Sep-17		Command	N/A	No Obs.	0	0									C	1	moderate
HDA	26-Sep-17	7:29:27	Command	Pre-/Post-	CBD	0	1	32.72446	-117.21435	SW			Unknown	Adult	Flood	HZ	0	moderate
FP	26-Sep-17	7:47:56	Clipper	Pre-	CSL	30	0	32.69826	-117.23863	HO			Mixed	Mixed	Flood	PC	0	moderate
FP	26-Sep-17	7:48:34	Clipper	Pre-	CSL	0	3	32.69825	-117.23799	ML			Mixed	Mixed	Flood	PC	0	moderate
FP	26-Sep-17	7:50:47	Clipper	Pre-	CSL	4	0	32.69500	-117.23438	HO			Mixed	Mixed	Flood	PC	0	moderate
FP	26-Sep-17	7:51:34	Clipper	Pre-	CSL	12	0	32.69472	-117.23619	HO			Mixed	Mixed	Flood	PC	0	moderate
FP	26-Sep-17	7:52:29	Clipper	Pre-	CSL	2	0	32.69577	-117.23318	HO			Male	Adult	Flood	PC	0	moderate
FP	26-Sep-17	7:53:02	Clipper	Pre-	CSL	3	0	32.69561	-117.23099	HO			Mixed	Mixed	Flood	PC	0	moderate
FP	26-Sep-17	7:56:17	Clipper	Pre-	CSL	0	1	32.70077	-117.23680	SW			Female	Adult	Flood	PC	0	moderate
HDA	26-Sep-17	7:58:37	Command	Pre-	UPIN	0	1	32.72363	-117.21377	SW			Unknown	Unknown	Flood	HZ	0	moderate
FP	26-Sep-17	7:59:01	Clipper	Pre-	CSL	0	1	32.69809	-117.23596	RF			Unknown	Adult	Flood	PC	0	moderate
FP	26-Sep-17	8:00:02	Clipper	Pre-	CSL	0	1	32.69879	-117.23617	SW			Female	Adult	Flood	PC	0	good
FP	26-Sep-17	8:09:38	Clipper	Pre-	CSL	0	1	32.69838	-117.23648	SW			Male	Subadult	Flood	PC	0	good
FP	26-Sep-17	8:11:39	Clipper	Pre-	CBD	0	1	32.69845	-117.23583	SW			Unknown	Adult	Flood	PC	0	good
FP	26-Sep-17	8:17:43	Clipper	Pre-	CSL	0	1	32.70033	-117.23658	RF			Male	Subadult	Flood	PC	0	good
FP	26-Sep-17	8:23:35	Clipper	Pre-	CSL	0	1	32.69966	-117.23490	DV			Unknown	Juvenile	Flood	PC	0	good
FP	26-Sep-17	8:27:39	Clipper	Pre-	CSL	0	1	32.69975	-117.23703	SW			Male	Adult	Flood	PC	0	good
FP	26-Sep-17	8:31:45	Clipper	Pre-	CSL	0	1	32.69832	-117.23675	SW			Male	Adult	Flood	PC	0	good
HDA	26-Sep-17	9:07:41	Command	Pre-	CBD	0	1	32.72510	-117.21425	SW			Unknown	Adult	Flood	C	1	moderate
FP	26-Sep-17	9:08:15	Clipper	Pre-	CSL	0	1	32.69880	-117.23644	RF			Male	Adult	Flood	PC	0	good
FP	26-Sep-17	9:32:27	Clipper	Clipping	CSL	0	1	32.69983	-117.23587	DV		Pier36	Male	Subadult	Flood	PC	0	good
FP	26-Sep-17	9:39:09	Clipper	Pre-/Post-	CSL	0	1	32.69886	-117.23686	RF			Male	Adult	Flood	PC	0	good
FP	26-Sep-17	9:40:32	Clipper	Pre-/Post-	CSL	0	3	32.69802	-117.23613	RF			Unknown	Adult	Flood	PC	0	good
FP	26-Sep-17	9:52:27	Clipper	Pre-/Post-	CSL	0	1	32.69935	-117.23682	SW			Male	Adult	Flood	PC	0	good
FP	26-Sep-17	9:53:27	Clipper	Pre-/Post-	CSL	0	1	32.69931	-117.23737	SW			Male	Adult	Flood	PC	0	good
FP	26-Sep-17	9:59:50	Clipper	Pre-/Post-	CSL	0	2	32.69853	-117.23472	ML			Mixed	Mixed	Flood	PC	0	good
FP	26-Sep-17	10:04:52	Clipper	Pre-/Post-	CSL	0	1	32.69848	-117.23703	SW			Male	Subadult	Flood	PC	0	good
FP	26-Sep-17	10:26:20	Clipper	Pre-/Post-	CSL	0	1	32.69938	-117.23730	LO			Male	Subadult	Flood	PC	0	good
FP	26-Sep-17	10:37:27	Clipper	Pre-/Post-	CSL	0	1	32.69966	-117.23623	SW			Male	Adult	Flood	PC	2	good
FP	26-Sep-17	11:10:49	Clipper	Pre-/Post-	CSL	0	1	32.70019	-117.23692	SW			Female	Adult	Flood	PC	2	good
FP	26-Sep-17	11:15:16	Clipper	Torch	CSL	0	1	32.70106	-117.23659	RF		Pier34	Unknown	Adult	Flood	PC	2	good
FP	26-Sep-17	12:23:01	Clipper	Pre-/Post-	CSL	0	1	32.69830	-117.23703	SW			Male	Adult	Flood	PC	2	good

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	26-Sep-17	12:26:20	Clipper	Pre-/Post-	CSL	0	1	32.70072	-117.23657	RF			Male	Adult	Flood	PC	2	good
FP	26-Sep-17	12:47:05	Clipper	Pre-/Post-	CSL	0	1	32.70013	-117.23671	DV			Male	Adult	Ebb	PC	2	good
FP	26-Sep-17	12:48:30	Clipper	Pre-/Post-	CSL	0	1	32.69986	-117.23566	DV			Unknown	Adult	Ebb	PC	2	good
FP	26-Sep-17	12:51:07	Clipper	Pre-/Post-	CSL	0	1	32.69966	-117.23543	SW			Male	Adult	Ebb	PC	3	good
FP	26-Sep-17	12:57:08	Clipper	Pre-/Post-	CSL	0	2	32.69743	-117.23749	SW			Male	Subadult	Ebb	PC	3	good
FP	26-Sep-17	13:08:25	Clipper	Pre-/Post-	CSL	0	1	32.70029	-117.23660	SW			Male	Adult	Ebb	PC	3	good
FP	26-Sep-17	13:14:41	Clipper	Pre-/Post-	CSL	0	1	32.70007	-117.23726	SW			Male	Subadult	Ebb	PC	3	good
FP	26-Sep-17	13:15:29	Clipper	Pre-/Post-	CSL	0	1	32.70033	-117.23717	SW			Male	Subadult	Ebb	PC	3	good
FP	26-Sep-17	13:18:34	Clipper	Pre-/Post-	CSL	0	1	32.69958	-117.23756	SW			Male	Subadult	Ebb	PC	3	good
FP	26-Sep-17	13:21:04	Clipper	Pre-/Post-	CSL	0	1	32.69907	-117.23743	SW			Male	Adult	Ebb	PC	3	good
FP	26-Sep-17	13:26:51	Clipper	Pre-/Post-	CSL	0	1	32.69898	-117.23703	RF			Male	Adult	Ebb	PC	3	good
FP	26-Sep-17	13:29:52	Clipper	Pre-/Post-	CSL	0	1	32.69893	-117.23805	SW			Male	Adult	Ebb	PC	3	good
FP	26-Sep-17	13:36:58	Clipper	Pre-/Post-	CSL	0	1	32.69966	-117.23580	SW			Male	Adult	Ebb	PC	3	good
FP	26-Sep-17	13:40:31	Clipper	Pre-/Post-	CSL	0	1	32.69953	-117.23619	RF			Male	Adult	Ebb	PC	3	good
FP	26-Sep-17	13:41:32	Clipper	Pre-/Post-	CSL	0	1	32.70034	-117.23732	SW			Male	Adult	Ebb	PC	3	good
FP	26-Sep-17	13:45:11	Clipper	Pre-/Post-	CSL	0	1	32.70018	-117.23686	SW			Male	Adult	Ebb	PC	3	good
FP	26-Sep-17	13:45:23	Clipper	Pre-/Post-	CSL	0	1	32.70010	-117.23717	SW			Male	Adult	Ebb	PC	3	good
FP	26-Sep-17	13:48:45	Clipper	Pre-/Post-	CSL	0	1	32.69978	-117.23711	LO			Male	Subadult	Ebb	PC	3	good
FP	26-Sep-17	13:49:48	Clipper	Pre-/Post-	CSL	0	1	32.70009	-117.23721	SW			Male	Adult	Ebb	PC	3	good
FP	26-Sep-17	14:13:34	Clipper	Post-	CSL	0	2	32.69954	-117.23624	RF			Mixed	Adult	Ebb	PC	3	good
FP	26-Sep-17	14:16:59	Clipper	Post-	CSL	0	1	32.70037	-117.23751	SW			Male	Adult	Ebb	PC	3	good
FP	26-Sep-17	14:19:36	Clipper	Post-	CSL	0	1	32.70071	-117.23670	RF			Male	Adult	Ebb	PC	3	good
FP	26-Sep-17	14:26:52	Clipper	Post-	CSL	4	0	32.70246	-117.23649	HO			Mixed	Adult	Ebb	PC	3	good
FP	26-Sep-17	14:32:29	Clipper	Post-	CSL	0	1	32.70009	-117.23721	SW			Male	Adult	Ebb	PC	3	good
FP	26-Sep-17	14:42:25	Clipper	Post-	CSL	0	1	32.70025	-117.23743	SW			Male	Adult	Ebb	PC	3	good
HDA	27-Sep-17		Command	N/A	No Obs.	0	0									C	1	moderate
HDA	27-Sep-17		Command	N/A	No Obs.	0	0									C	2	moderate
HDA	27-Sep-17		Command	N/A	No Obs.	0	0									C	1	moderate
FP	27-Sep-17	7:04:54	Clipper	Pre-	CSL	15	0	32.69826	-117.23863	HO			Mixed	Mixed	Ebb	PC	0	moderate
FP	27-Sep-17	7:08:35	Clipper	Pre-	CSL	0	3	32.69818	-117.23838	ML			Mixed	Mixed	Ebb	PC	0	moderate
FP	27-Sep-17	7:09:51	Clipper	Pre-	CSL	6	0	32.69500	-117.23438	HO			Mixed	Adult	Ebb	PC	0	moderate
FP	27-Sep-17	7:10:49	Clipper	Pre-	CSL	9	0	32.69472	-117.23619	HO			Mixed	Mixed	Flood	PC	0	moderate
FP	27-Sep-17	7:11:57	Clipper	Pre-	CSL	2	0	32.69577	-117.23318	HO			Unknown	Juvenile	Flood	PC	0	moderate
FP	27-Sep-17	7:14:54	Clipper	Pre-	CSL	0	1	32.69861	-117.23670	RF			Unknown	Adult	Flood	PC	0	moderate
FP	27-Sep-17	7:57:19	Clipper	Pre-/Post-	CSL	0	1	32.69955	-117.23686	SW			Male	Adult	Flood	PC	0	moderate
FP	27-Sep-17	8:07:36	Clipper	Pre-/Post-	CSL	1	0	32.70246	-117.23649	HO			Male	Adult	Flood	PC	0	moderate
FP	27-Sep-17	8:17:46	Clipper	Pre-/Post-	CSL	0	1	32.69782	-117.23369	RF			Unknown	Adult	Flood	PC	0	moderate
FP	27-Sep-17	8:35:39	Clipper	Post-	CSL	0	1	32.69963	-117.23622	RF			Male	Subadult	Flood	PC	0	moderate
FP	27-Sep-17	8:42:22	Clipper	Post-	CSL	0	1	32.69739	-117.23475	ML			Male	Subadult	Flood	PC	0	moderate
FP	27-Sep-17	9:40:51	Clipper	Pre-/Post-	CSL	0	1	32.69890	-117.23841	SW			Male	Adult	Flood	PC	1	moderate
HDA	27-Sep-17	10:41:23	Sierra-HDA	Pre-/Post-	CLT	0	1	32.72246	-117.21684	SF			Unknown	N/A	Flood	C	2	good
FP	27-Sep-17	11:11:29	Clipper	Pre-/Post-	CSL	0	1	32.70006	-117.23710	SW			Male	Adult	Flood	PC	2	moderate
FP	27-Sep-17	11:25:31	Clipper	Pre-/Post-	CSL	0	1	32.69896	-117.23753	SW			Mixed	Adult	Flood	PC	2	moderate
FP	27-Sep-17	11:30:17	Clipper	Pre-/Post-	CSL	0	1	32.69951	-117.23779	SW			Male	Subadult	Flood	PC	2	moderate
HDA	27-Sep-17	11:40:18	Sierra-HDA	Pre-/Post-	CSL	0	1	32.72250	-117.21618	SW			Male	Adult	Flood	C	3	good
FP	27-Sep-17	11:40:33	Clipper	Pre-/Post-	CSL	0	1	32.69986	-117.23681	SW			Male	Subadult	Flood	PC	2	moderate
FP	27-Sep-17	11:48:18	Clipper	Post-	CSL	0	1	32.69912	-117.23717	SW			Male	Adult	Flood	PC	2	moderate
FP	27-Sep-17	11:53:25	Clipper	Post-	CSL	2	0	32.69561	-117.23099	HO			Mixed	Mixed	Flood	PC	2	moderate

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	27-Sep-17	11:54:01	Clipper	Post-	CSL	0	1	32.69963	-117.23627	SW			Male	Adult	Flood	PC	2	moderate
FP	27-Sep-17	12:11:23	Clipper	Post-	CSL	0	1	32.70041	-117.23686	SW			Male	Adult	Flood	PC	2	moderate
FP	28-Sep-17	7:16:45	Clipper	Pre-	CSL	25	0	32.69826	-117.23863	HO			Mixed	Mixed	Flood	C	1	moderate
FP	28-Sep-17	7:21:57	Clipper	Pre-	CSL	0	1	32.69908	-117.23832	SW			Male	Adult	Flood	C	1	moderate
FP	28-Sep-17	7:25:58	Clipper	Pre-	CSL	0	1	32.69902	-117.23809	SW			Male	Adult	Flood	C	1	moderate
FP	28-Sep-17	7:48:26	Clipper	Pre-	CSL	0	1	32.69833	-117.23853	EX			Male	Adult	Flood	C	1	moderate
FP	28-Sep-17	7:49:39	Clipper	Pre-	CSL	0	1	32.69782	-117.23775	ML			Unknown	Adult	Flood	C	1	moderate
FP	28-Sep-17	7:54:45	Clipper	Pre-	CSL	5	0	32.69826	-117.23863	HO			Mixed	Mixed	Flood	C	1	moderate
FP	28-Sep-17	9:21:58	Clipper	Pre-/Post-	CSL	0	1	32.69797	-117.23734	SW			Male	Adult	Flood	C	1	moderate
FP	28-Sep-17	9:31:53	Clipper	Pre-/Post-	CSL	0	3	32.69800	-117.23771	ML			Mixed	Adult	Flood	C	1	moderate
FP	28-Sep-17	10:17:38	Clipper	Pre-/Post-	CSL	0	1	32.69666	-117.23425	RF			Unknown	Adult	Flood	C	1	moderate
FP	28-Sep-17	10:26:45	Clipper	Pre-/Post-	CSL	0	1	32.69871	-117.23712	RF			Male	Adult	Flood	C	1	moderate
FP	28-Sep-17	10:29:46	Clipper	Pre-/Post-	CSL	0	3	32.69666	-117.23669	ML			Unknown	Unknown	Flood	C	1	moderate
FP	28-Sep-17	12:17:27	Clipper	Pre-/Post-	CSL	0	1	32.69844	-117.23706	SW			Male	Adult	Flood	C	2	good
FP	28-Sep-17	12:29:24	Clipper	Pre-/Post-	CSL	0	1	32.69907	-117.23782	ML			Female	Adult	Flood	C	2	good
FP	28-Sep-17	12:31:04	Clipper	Pre-/Post-	CSL	0	1	32.69926	-117.23660	SW			Unknown	Unknown	Flood	C	2	good
FP	28-Sep-17	13:28:15	Clipper	Post-	CSL	0	1	32.69961	-117.23751	SW			Male	Adult	Flood	C	2	good
FP	28-Sep-17	13:34:36	Clipper	Post-	CSL	0	1	32.69996	-117.23697	DV			Unknown	Unknown	Flood	C	2	good
FP	28-Sep-17	13:56:20	Clipper	Post-	CSL	0	1	32.69992	-117.23720	DV			Male	Adult	Flood	C	2	good
FP	28-Sep-17	14:00:25	Clipper	Post-	CSL	42	0	32.69826	-117.23863	HO			Mixed	Mixed	Flood	C	2	good
FP	29-Sep-17	7:38:05	Clipper	Pre-	CSL	9	0	32.69826	-117.23863	HO			Mixed	Mixed	Flood	F	1	bad
FP	29-Sep-17	8:18:06	Clipper	Pre-	CSL	0	1	32.69922	-117.23780	SW			Female	Adult	Flood	F	1	bad
FP	29-Sep-17	8:28:55	Clipper	Pre-	CLT	0	2	32.69947	-117.23834	O			Unknown	Adult	Flood	F	1	bad
FP	29-Sep-17	8:32:05	Clipper	Pre-	CSL	0	2	32.69800	-117.23771	EN			Mixed	Mixed	Flood	F	1	bad
FP	29-Sep-17	10:06:00	Clipper	Pre-/Post-	CSL	0	1	32.69844	-117.23706	SW			Male	Adult	Flood	HZ	1	moderate
FP	29-Sep-17	10:08:07	Clipper	Pre-/Post-	CSL	0	2	32.69609	-117.23531	RF			Mixed	Mixed	Flood	HZ	1	moderate
FP	29-Sep-17	10:11:17	Clipper	Pre-/Post-	CSL	5	0	32.69500	-117.23438	HO			Mixed	Mixed	Flood	HZ	1	moderate
FP	29-Sep-17	10:14:24	Clipper	Pre-/Post-	CSL	0	2	32.69668	-117.23656	SW			Mixed	Mixed	Flood	HZ	1	moderate
FP	29-Sep-17	10:31:07	Clipper	Pre-/Post-	PHS	0	1	32.69908	-117.23643	SW			Unknown	Adult	Flood	HZ	1	moderate
FP	29-Sep-17	11:17:06	Clipper	Pre-/Post-	CSL	0	1	32.69860	-117.23814	SW			Male	Adult	Flood	PC	2	good
FP	29-Sep-17	11:47:14	Clipper	Pre-/Post-	CLT	0	1	32.70173	-117.23627	O			Unknown	Adult	Flood	PC	2	good
FP	29-Sep-17	12:10:32	Clipper	Pre-/Post-	CSL	4	0	32.69472	-117.23619	HO			Mixed	Mixed	Flood	PC	1	excellent
FP	29-Sep-17	12:29:21	Clipper	Pre-/Post-	CSL	0	5	32.69821	-117.23627	SW			Mixed	Mixed	Flood	PC	1	excellent
FP	29-Sep-17	12:45:18	Clipper	Pre-/Post-	CSL	0	7	32.69666	-117.23425	PP			Mixed	Mixed	Flood	PC	1	excellent
FP	29-Sep-17	12:58:36	Clipper	Pre-/Post-	CSL	0	1	32.69586	-117.23467	SW			Mixed	Mixed	Flood	PC	1	excellent
FP	29-Sep-17	13:45:17	Clipper	Clipping	CSL	0	1	32.69860	-117.23814	SW		Pier29	Male	Adult	Flood	PC	1	excellent
FP	29-Sep-17	14:18:00	Clipper	Post-	CSL	15	0	32.69826	-117.23863	HO			Mixed	Mixed	Flood	PC	1	excellent
FP	2-Oct-17	8:19:53	Clipper	Pre-	CSL	5	0	32.69826	-117.23863	HO			Mixed	Mixed	Ebb	PC	3	good
FP	2-Oct-17	8:22:43	Clipper	Pre-	CSL	0	2	32.69810	-117.23836	ML			Mixed	Adult	Ebb	PC	2	good
FP	2-Oct-17	8:25:13	Clipper	Pre-	CSL	17	0	32.69500	-117.23438	HO			Mixed	Mixed	Ebb	PC	2	good
FP	2-Oct-17	8:26:12	Clipper	Pre-	CSL	15	0	32.69472	-117.23619	HO			Mixed	Mixed	Ebb	PC	2	good
FP	2-Oct-17	8:32:51	Clipper	Pre-	CSL	0	1	32.70083	-117.23705	RF			Male	Adult	Ebb	PC	2	good
FP	2-Oct-17	8:35:47	Clipper	Pre-	CSL	0	1	32.69953	-117.23739	LO			Male	Subadult	Ebb	PC	2	good
FP	2-Oct-17	8:44:07	Clipper	Pre-	CSL	0	1	32.70002	-117.23763	SW			Male	Adult	Ebb	PC	2	good
FP	2-Oct-17	8:53:34	Clipper	Pre-	CSL	0	1	32.69950	-117.23736	LO			Male	Subadult	Ebb	PC	2	good
FP	2-Oct-17	9:17:41	Clipper	Pre-	CSL	0	1	32.69703	-117.23388	RF			Unknown	Adult	Ebb	PC	2	good
FP	2-Oct-17	10:02:27	Clipper	Pre-/Post-	CSL	0	4	32.69608	-117.23564	RF			Mixed	Mixed	Ebb	PC	2	good
FP	2-Oct-17	10:14:26	Clipper	Pre-/Post-	CSL	0	1	32.69991	-117.23605	SW			Male	Adult	Ebb	PC	2	good

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	2-Oct-17	10:30:31	Clipper	Pre-/Post-	CSL	7	0	32.70246	-117.23649	HO			Mixed	Mixed	Ebb	PC	2	good
FP	2-Oct-17	10:57:45	Clipper	Pre-/Post-	CSL	0	1	32.69979	-117.23736	ML			Male	Subadult	Ebb	PC	2	good
FP	2-Oct-17	11:05:45	Clipper	Pre-/Post-	CSL	0	1	32.69997	-117.23725	LO			Male	Subadult	Ebb	PC	2	good
FP	2-Oct-17	11:40:06	Clipper	Post-	CSL	0	1	32.69986	-117.23760	SW			Female	Subadult	Ebb	PC	2	good
FP	2-Oct-17	11:41:42	Clipper	Post-	CSL	0	1	32.70089	-117.23686	SW			Male	Adult	Ebb	PC	2	good
FP	2-Oct-17	11:52:16	Clipper	Post-	CSL	0	1	32.69927	-117.23755	SW			Male	Adult	Ebb	PC	2	good
FP	2-Oct-17	12:00:38	Clipper	Post-	CSL	0	1	32.69940	-117.23750	DV			Male	Subadult	Ebb	PC	2	good
FP	2-Oct-17	12:02:31	Clipper	Post-	CSL	0	1	32.69956	-117.23777	SW			Male	Adult	Ebb	PC	2	good
FP	2-Oct-17	12:03:15	Clipper	Post-	CSL	0	1	32.69982	-117.23746	SW			Male	Adult	Ebb	PC	3	good
FP	2-Oct-17	12:27:56	Clipper	Pre-	CSL	0	1	32.70070	-117.23703	SW			Male	Adult	Ebb	PC	3	good
FP	2-Oct-17	12:28:17	Clipper	Pre-	CSL	0	1	32.70068	-117.23695	SW			Female	Adult	Ebb	PC	2	good
FP	2-Oct-17	12:37:55	Clipper	Pre-	CSL	0	1	32.70059	-117.23721	SW			Male	Adult	Ebb	PC	2	good
FP	2-Oct-17	12:45:03	Clipper	Pre-/Post-	CSL	0	1	32.69873	-117.23648	DV			Unknown	Adult	Ebb	PC	2	good
FP	2-Oct-17	13:02:43	Clipper	Pre-/Post-	CSL	0	1	32.70003	-117.23649	SW			Male	Adult	Flood	PC	2	good
FP	2-Oct-17	13:03:53	Clipper	Pre-/Post-	CSL	0	1	32.70061	-117.23690	SW			Male	Adult	Flood	PC	2	good
FP	2-Oct-17	13:17:08	Clipper	Post-	CSL	0	1	32.69991	-117.23760	SW			Male	Subadult	Flood	PC	2	good
FP	2-Oct-17	13:26:36	Clipper	Post-	CSL	0	2	32.69991	-117.23771	RF			Mixed	Adult	Flood	PC	2	good
FP	2-Oct-17	13:27:16	Clipper	Post-	CSL	0	1	32.69953	-117.23781	RF			Female	Adult	Flood	PC	2	good
FP	2-Oct-17	13:33:40	Clipper	Post-	CSL	0	1	32.70026	-117.23679	SW			Male	Adult	Flood	PC	2	good
FP	3-Oct-17	7:39:45	Clipper	Pre-	CSL	5	0	32.69826	-117.23863	HO			Mixed	Mixed	Ebb	PC	0	good
FP	3-Oct-17	7:41:05	Clipper	Pre-	CSL	0	3	32.69849	-117.23836	ML			Mixed	Mixed	Ebb	PC	0	good
FP	3-Oct-17	7:42:04	Clipper	Pre-	CSL	5	0	32.69500	-117.23438	HO			Mixed	Mixed	Ebb	PC	0	good
FP	3-Oct-17	7:42:56	Clipper	Pre-	CSL	15	0	32.69472	-117.23619	HO			Mixed	Mixed	Ebb	PC	0	good
FP	3-Oct-17	7:43:51	Clipper	Pre-	CSL	0	4	32.69626	-117.23408	ML			Mixed	Mixed	Ebb	PC	0	good
FP	3-Oct-17	7:48:30	Clipper	Pre-	CSL	0	1	32.69706	-117.23305	RF			Male	Adult	Ebb	PC	1	good
FP	3-Oct-17	9:01:52	Clipper	Pre-/Post-	CSL	2	0	32.69577	-117.23318	HO			Mixed	Adult	Ebb	PC	1	good
FP	3-Oct-17	9:19:39	Clipper	Pre-/Post-	CSL	0	2	32.69566	-117.23420	RF			Male	Adult	Ebb	PC	1	good
FP	3-Oct-17	9:29:54	Clipper	Pre-/Post-	CSL	0	1	32.70017	-117.23701	DV			Unknown	Adult	Ebb	PC	1	good
FP	3-Oct-17	9:54:53	Clipper	Pre-/Post-	CSL	0	2	32.69980	-117.23598	PP			Male	Adult	Ebb	PC	1	good
FP	3-Oct-17	9:55:31	Clipper	Pre-/Post-	CSL	0	1	32.69928	-117.23645	SW			Female	Adult	Ebb	PC	1	good
FP	3-Oct-17	9:56:51	Clipper	Pre-/Post-	CSL	0	1	32.69881	-117.23738	ML			Male	Subadult	Ebb	PC	1	good
FP	3-Oct-17	10:04:27	Clipper	Pre-/Post-	CSL	0	4	32.69881	-117.23738	PP			Mixed	Mixed	Ebb	PC	1	good
FP	3-Oct-17	10:11:33	Clipper	Pre-/Post-	CSL	0	1	32.69948	-117.23784	SW			Male	Adult	Ebb	PC	1	good
FP	3-Oct-17	10:21:00	Clipper	Pre-/Post-	CSL	0	1	32.70167	-117.23641	RF			Male	Adult	Ebb	PC	1	good
FP	3-Oct-17	10:48:57	Clipper	Clipping	CSL	0	1	32.69979	-117.23593	SW		Pier23	Male	Subadult	Ebb	PC	1	good
FP	3-Oct-17	11:08:29	Clipper	Post-	CSL	12	0	32.70246	-117.23649	HO			Mixed	Mixed	Ebb	PC	1	good
FP	3-Oct-17	11:11:26	Clipper	Post-	CSL	0	1	32.69924	-117.23816	RF			Male	Subadult	Ebb	PC	1	good
FP	3-Oct-17	11:13:44	Clipper	Post-	CSL	0	1	32.69974	-117.23789	SW			Male	Subadult	Ebb	PC	1	good
FP	3-Oct-17	11:16:26	Clipper	Post-	CSL	0	1	32.69945	-117.23671	SW			Male	Subadult	Ebb	PC	1	good
FP	3-Oct-17	12:26:34	Clipper	Pre-/Post-	CSL	0	1	32.70004	-117.23714	LO			Male	Adult	Ebb	PC	3	good
FP	3-Oct-17	12:44:17	Clipper	Pre-/Post-	CSL	0	1	32.69958	-117.23451	DV			Male	Adult	Ebb	PC	3	good
FP	3-Oct-17	12:51:22	Clipper	Pre-/Post-	CSL	0	1	32.70074	-117.23706	SW			Male	Subadult	Ebb	PC	3	good
FP	3-Oct-17	13:01:04	Clipper	Pre-/Post-	CSL	0	1	32.70068	-117.23699	SW			Male	Subadult	Ebb	PC	3	good
FP	3-Oct-17	13:01:47	Clipper	Pre-/Post-	CSL	0	1	32.70042	-117.23714	SW			Male	Subadult	Ebb	PC	3	good
FP	3-Oct-17	13:08:39	Clipper	Torch	CSL	0	1	32.70045	-117.23754	SW		Pier23	Male	Adult	Ebb	PC	3	good
FP	3-Oct-17	13:16:13	Clipper	Post-	CSL	0	1	32.69587	-117.23488	PP			Male	Subadult	Ebb	PC	3	good
FP	3-Oct-17	13:32:38	Clipper	Post-	CSL	0	1	32.69972	-117.23794	SW			Male	Adult	Flood	PC	3	good
FP	3-Oct-17	13:41:16	Clipper	Post-	CSL	0	1	32.69961	-117.23714	PP			Male	Subadult	Flood	PC	3	good

Location	Date	Time	Station	Activity	Species	No. of Individ		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1 ^o	2 ^o							
FP	4-Oct-17	7:26:45	Clipper	Pre-	CSL	14	0	32.69500	-117.23438	HO			Mixed	Mixed	Ebb	PC	1	good
FP	4-Oct-17	7:28:59	Clipper	Pre-	CSL	20	0	32.69472	-117.23619	HO			Mixed	Mixed	Ebb	PC	1	good
FP	4-Oct-17	7:30:26	Clipper	Pre-	CSL	0	1	32.69648	-117.23644	SW			Female	Adult	Ebb	PC	1	good
FP	4-Oct-17	7:31:12	Clipper	Pre-	CSL	3	0	32.69577	-117.23318	HO			Mixed	Mixed	Ebb	PC	1	good
FP	4-Oct-17	7:34:50	Clipper	Pre-	CSL	0	1	32.70083	-117.23693	ML			Male	Adult	Ebb	PC	1	good
FP	4-Oct-17	7:36:55	Clipper	Pre-	CSL	0	1	32.70023	-117.23733	LO			Male	Adult	Ebb	PC	1	good
FP	4-Oct-17	7:40:43	Clipper	Pre-	CSL	0	1	32.70011	-117.23711	LO			Male	Adult	Ebb	PC	0	good
FP	4-Oct-17	8:48:56	Clipper	Pre-/Post-	CSL	0	1	32.69873	-117.23677	SW			Unknown	Juvenile	Ebb	PC	0	good
FP	4-Oct-17	9:07:11	Clipper	Pre-/Post-	CSL	0	1	32.69957	-117.23403	DV			Male	Adult	Ebb	PC	0	good
FP	4-Oct-17	9:14:07	Clipper	Pre-/Post-	CSL	0	1	32.69966	-117.23771	SW			Female	Adult	Ebb	PC	0	good
FP	4-Oct-17	9:22:18	Clipper	Pre-/Post-	CSL	0	1	32.69789	-117.23571	PP			Unknown	Juvenile	Ebb	PC	1	good
FP	4-Oct-17	11:16:44	Clipper	Chain saw	CSL	0	6	32.70168	-117.23628	RF		Pier21	Mixed	Mixed	Ebb	PC	2	good
FP	4-Oct-17	11:28:56	Clipper	Chain saw	CSL	0	1	32.69936	-117.23579	SW		Pier21	Male	Adult	Ebb	PC	3	good
FP	4-Oct-17	11:56:28	Clipper	Torch	CSL	0	1	32.70024	-117.23653	SW		Pier21	Male	Adult	Ebb	PC	3	good
FP	4-Oct-17	12:45:24	Clipper	Pre-/Post-	CSL	0	1	32.70063	-117.23678	SW			Male	Subadult	Ebb	PC	3	good
FP	4-Oct-17	12:59:41	Clipper	Pre-/Post-	CSL	0	1	32.70049	-117.23709	LO			Male	Adult	Ebb	PC	3	good
FP	4-Oct-17	13:02:48	Clipper	Pre-/Post-	CSL	0	1	32.69936	-117.23579	SW			Male	Adult	Ebb	PC	3	good
FP	4-Oct-17	13:23:37	Clipper	Post-	CSL	0	1	32.69778	-117.23718	DV			Male	Adult	Ebb	PC	3	good
FP	5-Oct-17	7:14:07	Clipper	Pre-	CSL	0	1	32.69979	-117.23727	SW			Male	Adult	Flood	HZ	0	good
FP	5-Oct-17	7:16:56	Clipper	Pre-	CSL	3	0	32.69826	-117.23863	HO			Male	Adult	Flood	HZ	0	good
FP	5-Oct-17	7:19:17	Clipper	Pre-	CSL	0	1	32.69831	-117.23543	RF			Male	Adult	Flood	HZ	0	good
FP	5-Oct-17	7:20:44	Clipper	Pre-	CSL	3	0	32.69500	-117.23438	HO			Mixed	Mixed	Flood	HZ	0	good
FP	5-Oct-17	7:21:21	Clipper	Pre-	CSL	5	0	32.69472	-117.23619	HO			Mixed	Mixed	Flood	HZ	0	good
FP	5-Oct-17	7:22:57	Clipper	Pre-	CSL	0	1	32.69828	-117.23825	SW			Male	Adult	Flood	HZ	0	good
FP	5-Oct-17	7:27:43	Clipper	Pre-	CSL	0	4	32.69762	-117.23648	SW			Mixed	Mixed	Flood	HZ	0	good
FP	5-Oct-17	7:44:55	Clipper	Chain saw	CSL	0	3	32.69930	-117.23653	SW		Pier19	Mixed	Mixed	Flood	HZ	0	good
FP	5-Oct-17	7:53:29	Clipper	Chain saw	CSL	0	2	32.69861	-117.23635	SW		Pier19	Male	Adult	Flood	HZ	0	good
FP	5-Oct-17	8:07:11	Clipper	Chain saw	CSL	0	1	32.69889	-117.23778	SW		Pier19	Male	Adult	Flood	HZ	0	good
FP	5-Oct-17	8:24:40	Clipper	Chain saw	CSL	0	7	32.69633	-117.23408	RF		Pier19	Mixed	Mixed	Flood	HZ	0	good
FP	5-Oct-17	8:37:33	Clipper	Chain saw	CSL	0	1	32.69890	-117.23792	SW		Pier19	Male	Adult	Ebb	C	0	good
FP	5-Oct-17	9:06:54	Clipper	Chain saw	CSL	0	1	32.70133	-117.23688	RF		Pier19	Male	Adult	Ebb	C	0	good
FP	5-Oct-17	9:15:00	Clipper	Chain saw	CSL	0	8	32.69620	-117.23432	PP		Pier19	Mixed	Mixed	Ebb	C	0	good
FP	5-Oct-17	9:46:41	Clipper	Pre-/Post-	CSL	0	2	32.69887	-117.23726	ML			Unknown	Juvenile	Ebb	C	0	good
FP	5-Oct-17	10:02:26	Clipper	Pre-/Post-	CSL	0	1	32.69969	-117.23680	SW			Male	Adult	Ebb	C	0	good
FP	5-Oct-17	10:49:03	Clipper	Pre-/Post-	CSL	0	3	32.69992	-117.23766	SW			Mixed	Juvenile	Ebb	C	0	good
FP	5-Oct-17	10:51:19	Clipper	Pre-/Post-	CSL	0	1	32.69824	-117.23814	RF			Male	Adult	Ebb	C	1	good
FP	5-Oct-17	11:25:51	Clipper	Pre-/Post-	CSL	0	2	32.69978	-117.23758	SW			Male	Subadult	Ebb	C	1	good
FP	5-Oct-17	12:02:16	Clipper	Pre-/Post-	CSL	0	1	32.69991	-117.23720	SW			Male	Adult	Ebb	C	1	good
FP	5-Oct-17	12:20:35	Clipper	Pre-/Post-	CSL	0	2	32.69959	-117.23721	ML			Male	Adult	Ebb	C	2	good
FP	5-Oct-17	12:42:50	Clipper	Pre-/Post-	CSL	0	1	32.69852	-117.23798	ML			Unknown	Juvenile	Ebb	C	2	good
FP	5-Oct-17	12:54:11	Clipper	Chain saw	CSL	0	6	32.69670	-117.23395	PP		Pier17	Mixed	Mixed	Ebb	C	2	good
FP	5-Oct-17	12:58:57	Clipper	Chain saw	CSL	0	2	32.69955	-117.23741	SW		Pier17	Male	Adult	Ebb	C	2	excellent
FP	5-Oct-17	13:15:23	Clipper	Chain saw	CSL	0	1	32.69946	-117.23796	SW		Pier17	Male	Adult	Ebb	C	2	good
FP	5-Oct-17	13:49:19	Clipper	Chain saw	CSL	0	2	32.69973	-117.23721	SW		Pier17	Mixed	Mixed	Ebb	C	2	good
FP	5-Oct-17	14:40:00	Clipper	Post-	CSL	0	3	32.70013	-117.23756	SW			Mixed	Mixed	Ebb	C	2	good
FP	6-Oct-17	7:12:45	Clipper	Pre-	CSL	36	0	32.69826	-117.23863	HO			Mixed	Mixed	Flood	C	0	excellent
FP	6-Oct-17	7:18:54	Clipper	Pre-	CSL	5	0	32.69500	-117.23438	HO			Mixed	Mixed	Flood	C	0	excellent
FP	6-Oct-17	7:19:35	Clipper	Pre-	CSL	5	0	32.69472	-117.23619	HO			Mixed	Mixed	Flood	C	0	excellent

Location	Date	Time	Station	Activity	Species	No. of Indiv		Animal Location		Behavior		Pile Number	Sex	Age	Tide	Sky Cover	BSS	Visibility
						HO	Water	Lat	Long	1°	2°							
FP	6-Oct-17	7:21:20	Clipper	Pre-	CSL	0	2	32.69594	-117.23489	SW			Male	Adult	Flood	C	0	excellent
FP	6-Oct-17	7:37:32	Clipper	Clipping	CSL	0	2	32.69785	-117.23779	SW		Pier17	Mixed	Mixed	Flood	C	0	excellent
FP	6-Oct-17	7:42:26	Clipper	Pre-/Post-	CSL	0	1	32.69992	-117.23766	RF			Male	Adult	Flood	C	0	excellent
FP	6-Oct-17	7:44:31	Clipper	Pre-/Post-	CSL	0	1	32.69963	-117.23692	SW			Male	Adult	Flood	C	0	excellent
FP	6-Oct-17	8:09:11	Clipper	Pre-/Post-	CSL	0	1	32.69664	-117.23860	PP			Unknown	Juvenile	Flood	C	0	excellent
FP	6-Oct-17	8:33:00	Clipper	Clipping	CSL	0	4	32.69719	-117.23774	SW		Pier16	Mixed	Mixed	Flood	C	0	excellent
FP	6-Oct-17	9:21:39	Clipper	Pre-/Post-	CSL	0	1	32.69811	-117.23690	RF			Male	Adult	Ebb	C	0	excellent
FP	6-Oct-17	9:38:06	Clipper	Pre-/Post-	CSL	0	1	32.69959	-117.23711	SW			Male	Subadult	Ebb	C	0	excellent
FP	6-Oct-17	9:39:27	Clipper	Pre-/Post-	CSL	0	2	32.69563	-117.23389	PP			Unknown	Juvenile	Ebb	C	0	excellent
FP	6-Oct-17	11:42:37	Clipper	Pre-/Post-	CSL	0	1	32.69970	-117.23771	SW			Female	Adult	Ebb	C	1	excellent
FP	6-Oct-17	12:00:39	Clipper	Pre-/Post-	CSL	0	1	32.69976	-117.23742	SW			Male	Adult	Ebb	C	1	excellent
FP	6-Oct-17	14:03:10	Clipper	Post-	CSL	0	1	32.69990	-117.23760	SW			Male	Adult	Ebb	C	1	excellent

**Appendix C1: Acoustic Reporting Metrics for Demolition and Pile
Driving
(8 October 2016 to 8 October 2017)**

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A. NBPL Fuel Pier

Date	Pile Number	Distance (m [ft])	dB rms				
			Mean	Max	Min	Median (L ₅₀)	90th Percentile (L ₉₀)
Wire Saw							
84-inch Caisson (One Cutter)							
14-Dec-16	P-H-10	10 (33)	136.1	140.9	128.4	136.7	139.9
13-Dec-16	P-H-11	10 (33)	141.4	146.5	134.4	141.5	143.4
14-Dec-16	P-K-6	20 (66)	140.8	144.5	136.0	141.0	142.9
14-Dec-16	P-H-6	40 (131)	134.8	140.1	130.2	134.9	136.4
15-Dec-16	P-K-9	60 (197)	137.1	140.6	134.1	137.2	138.9
13-Dec-16	P-H-11	85 (279)	136.0	139.5	133.8	135.7	138.1
15-Dec-16	P-K-9	110 (361)	135.3	136.6	133.6	135.4	135.9
19-Dec-16	P-K-5	200 (656)	129.2	139.1	122.8	127.6	135.1
19-Dec-16	P-K-5	283 (928)	130.3	137.0	126.4	130.4	133.9
13-Dec-16	P-H-7	430 (1,411)	142.4	145.5	136.4	143.0	144.4
84-inch Caisson (Two Cutters)							
13-Dec-16	P-H-11	10 (33)	146.5	149.0	144.8	146.5	147.5
14-Dec-16	P-H-10	10 (33)	151.0	155.6	138.6	151.0	154.0
13-Dec-16	P-H-11	85 (279)	135.3	138.2	131.6	135.3	137.4
15-Dec-16	P-K-9	110 (361)	135.3	142.4	132.7	135.2	136.7
13-Dec-16	P-H-11	165 (541)	133.0	146.8	128.1	132.1	142.6
19-Dec-16	P-K-5	250 (820)	130.1	133.2	127.1	130.0	131.8
19-Dec-16	P-K-5	500 (1,640)	137.9	140.9	130.9	138.2	139.8
19-Dec-16	P-K-5	750 (2,461)	135.0	141.0	131.7	135.0	136.4
Chainsaw							
16-inch Piles							
4-Oct-17	P21-FB	10 (33)	140.9	149.8	128.5	142.3	N/A
4-Oct-17	P21-FB	20 (66)	132.3	137.7	128.5	132.4	N/A
11-Oct-17	P13-FB	40 (131)	127.9	132.9	125.1	127.9	N/A
11-Oct-17	P13-FB	35 (115)	128.5	133.6	125.7	128.2	N/A
11-Oct-17	P13-FB	54 (177)	128.1	133.9	124.4	128.3	N/A
11-Oct-17	P13-FB	70 (230)	126.0	130.3	123.3	126.9	N/A
Pile Clipping							
16-inch Square Concrete Piles							
12-Jul-17	P03-C	10 (33)	145.9	147.3	142.6	146.5	147.3
12-Jul-17	P03-D	10 (33)	143.9	146.5	141.7	142.9	146.3
3-Jul-17	P10-AB	30 (98)	137.4	143.8	131.9	136.5	142.6
3-Jul-17	P11-AB	100 (328)	133.1	138.5	126.7	132.9	136.7
17-Apr-17	P40-C	150 (492)	128.3	128.8	127.6	128.3	128.7
3-Jul-17	P08-AB	155 (509)	142.7	144.1	141.0	142.5	144.1
3-Jul-17	P09-AB	155 (509)	139.1	142.2	131.7	140.7	142.0
17-Apr-17	P40-E	200 (656)	131.3	133.2	130.0	130.9	133.0
17-Apr-17	P41-B	200 (656)	131.0	132.0	130.3	131.0	131.9
17-Apr-17	P41-D	200 (656)	131.8	132.7	131.1	131.7	132.4

Date	Pile Number	Distance (m [ft])	dB rms				
			Mean	Max	Min	Median (L ₅₀)	90th Percentile (L ₉₀)
17-Apr-17	P41-E	200 (656)	134.3	138.0	130.6	134.6	137.5
3-Jul-17	P08-AP	215 (705)	129.0	130.0	127.8	128.9	130.0
13-Jul-17	P03-AB	320 (1,050)	125.6	129.9	123.3	124.6	129.8
13-Jul-17	P03-AP	320 (1,050)	130.2	131.8	128.6	130.0	131.7
18-inch Square Concrete Piles							
19-Sep-16	NWF01	10 (33)	137.8	150.5	130.9	133.2	149.2
19-Sep-16	NWF05	10 (33)	140.0	154.3	127.9	141.7	150.1
19-Sep-16	NWF03	10 (33)	138.2	146.4	132.3	135.4	145.6
19-Sep-16	NWF08	92 (302)	136.8	139.6	134.5	136.7	138.5
19-Sep-16	NWF10	169 (554)	135.8	139.3	131.7	136.5	139.0
19-Sep-16	NWF12	175 (574)	128.6	142.8	120.5	127.3	140.4
13-Jul-17	TFS02	187 (614)	128.1	131.8	125.2	128.2	130.4
9-Aug-17	TFS11	206 (676)	134.6	141.3	131.1	132.9	141.2
14-Aug-17	TFS08	223 (732)	126.1	126.7	125.3	126.1	126.6
14-Aug-17	TFS09	224 (735)	135.1	137.3	132.3	135.2	136.5
14-Aug-17	TFS10	226 (741)	135.8	137.8	134.0	135.6	137.8
14-Aug-17	SWF01	238 (781)	125.4	127.9	124.6	125.1	125.9
14-Aug-17	TFS12	253 (830)	131.4	135.0	128.4	131.2	133.0
14-Aug-17	TFS06	280 (919)	123.9	126.6	122.3	123.5	125.7
14-Aug-17	TFS13	297 (974)	129.3	130.9	128.3	129.1	130.3
14-Aug-17	TFS14	335 (1,099)	126.6	132.3	124.3	126.5	129.2
14-Aug-17	TFS14	335 (1,099)	127.1	127.6	126.7	127.1	127.5
14-Aug-17	TFS15	370 (1,214)	128.8	131.9	126.6	127.8	131.0
14-Aug-17	TFS15	370 (1,214)	124.3	125.0	123.7	124.2	124.8
24-inch Square Concrete Piles							
12-Oct-16	NEB12	10 (33)	143.5	165.3	128.0	140.3	165.3
13-Oct-16	NEB01	10 (33)	144.6	159.9	130.9	141.4	157.3
13-Oct-16	NEB02	10 (33)	139.5	163.8	129.5	134.2	158.1
13-Oct-16	NEB03	10 (33)	138.0	156.1	129.9	133.8	151.7
High-pressure Water Jet							
24X30 Piles (Spud Jet)							
27-Mar-17	O-8	10 (33)	153.3	156.5	145.1	155.4	156.30
28-Mar-17	O-4	10 (33)	155.1	159.9	148.5	156.1	157.26
28-Mar-17	O-5	10 (33)	153.0	159.0	146.2	154.0	157.35
28-Mar-17	O-6	10 (33)	152.7	158.4	146.3	153.2	156.73
28-Mar-17	O-7	10 (33)	152.6	157.2	145.9	153.0	156.45
24X30 Piles (Internal Jet)							
28-Mar-17	O-4	10 (33)	133.0	137.1	130.4	132.0	136.50
28-Mar-17	O-5	10 (33)	149.8	153.2	142.7	150.1	152.72
28-Mar-17	O-6	10 (33)	145.0	146.9	141.3	145.9	146.70
28-Mar-17	O-7	10 (33)	141.5	143.4	139.4	141.4	142.76
28-Mar-17	O-8	10 (33)	138.5	140.7	133.2	138.9	139.84

B. NBPL HDA

Date	Pile Number	Distance (m [ft])	dB rms				
			Mean	Max	Min	Median (L ₅₀)	90th Percentile (L ₉₀)
High-pressure Water Jet							
16-inch Pile Removal							
22-Aug-17	548-B30	10 (33)	147.3	155.1	125.5	148.9	N/A
22-Aug-17	548-B31	10 (33)	154.2	157.6	142.8	154.5	N/A
22-Aug-17	548-B32	10 (33)	152.4	157.2	131.9	152.7	N/A
23-Aug-17	548-B34	94 (308)	130.4	142.5	119.4	129.9	N/A
25-Sep-17	619-B1	149 (489)	127.6	136.9	119.6	126.4	N/A
23-Aug-17	548-B33	151 (495)	127.3	135.6	121.2	126.4	N/A
25-Sep-17	619-B2	160 (525)	128.2	137.3	120.9	127.2	N/A
23-Aug-17	548-B29	240 (787)	128.2	137.9	125.5	127.5	N/A
16-inch Pile Installation							
13-Sep-17	607N-A9	10 (33)	123.7	130.5	119.1	123.0	N/A
21-Sep-17	548-M9	10 (33)	129.9	137.7	124.3	129.6	N/A
22-Sep-17	548-A10	10 (33)	128.5	131.9	124.6	128.1	131.1
22-Sep-17	548-H10	19 (62)	124.5	131.5	120.7	123.7	131.0
22-Sep-17	548-A10	175 (574)	127.3	131.3	124.5	127.2	N/A
22-Sep-17	548-C10	196 (643)	126.1	128.6	123.3	126.1	128.0
22-Sep-17	548-D10	206 (676)	126.9	130.0	122.9	126.5	N/A
21-Sep-17	607N-E9	328 (1,076)	130.4	134.0	124.8	130.4	N/A
21-Sep-17	607N-F9	328 (1,076)	128.6	132.7	125.1	128.5	N/A

Date ¹	Pile Number	Distance (m [ft])	Strike Count	90% RMS Pressure (dB re 1 µPa)			SEL (dB re µPa ² /sec)			Peak Pressure (dB re 1 µPa)		
				Mean	Max	Min	Mean	Max	Min	Mean	Max	Min
16-inch Impact Pile Driving												
27-Sep-17	548-D10	10 (33)		151.9	170.0	131.5	142.9	157.5	125.6	165.8	167.1	182.0
27-Sep-17	548-K10	10 (33)		147.9	179.8	138.3	138.4	163.6	116.5	163.2	160.4	187.5
27-Sep-17	548-L10	10 (33)		149.7	179.6	135.7	139.9	162.4	119.7	164.3	160.4	188.4
27-Sep-17	548-M10	10 (33)		154.2	177.2	150.5	143.0	161.5	117.0	169.1	163.7	187.7
27-Sep-17	548-M9	10 (33)		173.6	173.6	173.6	159.9	159.9	159.9	185.2	185.2	185.2
20-Sep-17	607N-B9	10 (33)		150.8	181.3	143.0	142.6	164.4	131.7	161.3	153.5	189.8
25-Sep-17	548-B10	73 (240)		137.4	160.2	130.8	128.3	142.5	113.9	155.1	153.7	169.4
25-Sep-17	548-A10	83 (272)		131.6	150.1	122.3	124.7	137.6	116.8	151.4	149.5	173.3
25-Sep-17	548-A9	83 (272)		138.1	151.0	122.6	129.9	138.4	116.6	155.7	155.9	162.5
21-Sep-17	607N-E9	328 (1,076)		134.2	143.6	125.3	127.0	133.3	119.7	149.8	148.6	157.2
21-Sep-17	607N-F9	338 (1,109)		133.3	154.1	129.1	126.2	141.3	115.8	151.0	148.3	163.5
19-Sep-17	607N-A9	353 (1,158)		131.0	142.2	120.2	125.0	135.5	114.4	149.9	148.7	160.1
19-Sep-17	607N-C9	374 (1,227)		129.6	135.3	120.6	123.5	129.3	115.0	146.9	146.9	153.7

Notes:¹The impact hammer setting was at Level 1 for all reported values, except for data from 19-Sep-2017, which was at Level 4.

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**Appendix D1¹: Project-Related Shutdowns or Delays Due to Marine Mammals
(8 October 2016 to 7 October 2017)**

¹ This is an update to Appendix G from NAVFAC SW (2017).

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Date	Project Location	Species Information		Shutdown Information			Delay?	Shutdown?	Notes
		Species	No. of Individuals	Start Time	End Time	Total Time			
27-Oct-2016	NBPL Fuel Pier	California sea lion	1	13:55:19	13:57:21	0:02:02	X		California sea lion approached ZOI from South in-between hammer blows. Went under new pier just outside of the shutdown ZOI. Could not verify if it was outside ZOI after it went under the pier. Observed near saltwater dock at 1357. Green flag raised and PD resumed.
01-Feb-2017	NBPL Fuel Pier	California sea lion	1	14:53:58	14:58:51	0:04:53	X		Male California sea lion sighted by November, passed to P-122. P-122 was unsure of location because it dove, called shutdown to be conservative. Confirmed as outside of ZOI by P-122 and Sierra.
28-Feb-2017	NBPL Fuel Pier	California sea lion	1	15:26:30	15:27:40	0:01:10	X		Adult male California sea lion approached from north. Last observed 20 m (66 ft) from pile during pre/post. Delay called when it dove at 20 m (66 ft) from pile. Last observed approximately 100 m (328 ft) south of crane barge.
06-Mar-2017	NBPL Fuel Pier	Coastal bottlenose dolphin	2	10:52:01	10:56:58	0:04:57	X		2 Coastal bottlenose dolphins swam into ZOI from north during a pre/post. Delayed construction from 1052 until 1057 after they had changed heading 180 degrees to head back north.
08-Mar-2017	NBPL Fuel Pier	California sea lion	1	10:02:13	10:04:55	0:02:42	X		Delay during pre/post. Subadult female California sea lion first observed by Command. Entered the ZOI from south, heading north. Observed at 1004 by Sierra as it left the ZOI heading north.
10-Mar-2017	NBPL Fuel Pier	California sea lion	1	11:31:12	11:35:23	0:04:11	X		Juvenile California sea lion heading south along outside of docked ship during pre-con. Crew just about to start driving. First observed by November, then Sierra, then Command. Kept swimming towards Bait Barges. Green flag at 11:35

Date	Project Location	Species Information		Shutdown Information			Delay?	Shutdown?	Notes
		Species	No. of Individuals	Start Time	End Time	Total Time			
16-Mar-2017	NBPL Fuel Pier	California sea lion	2	14:33:20	14:36:17	0:02:57	X		2 California sea lions, first observed by P-122 heading north, then by Sierra in-between old pier and new pier. Shutdown called by P-122. Went under the trestle and was observed by November heading north. Dove under P-160c and was not observed again. Confirmed as outside of the ZOI.
16-Mar-2017	NBPL Fuel Pier	California sea lion	1	14:44:03	14:45:46	0:01:43		X	Subadult female California sea lion heading south. First observed by Sierra in-between old pier and new pier to the south of the trestle. Shutdown called by Sierra. Was likely inside the 150m shutdown ZOI during ISS, but not observed until it was app 70-80 m (230-262 ft) from the pile in-between impact soft start hits. Continued south, and was observed by Command approximately 120 m (394 ft) from the pile. Called clear of the 150 m (492 ft) shutdown ZOI by P-122. It then went to the bait barge but was lost in the animals at the bait barge. Notes from MMOs indicate that there were no observable behavioral changes during the observations.
16-Mar-2017	NBPL Fuel Pier	California sea lion	2	14:50:32	14:54:10	0:03:38		X	2 California sea lions heading south app 100 m (328 ft) east of pier. First observed by November, then Sierra. Shutdown called by Command as the animals entered to shutdown ZOI from the north. Animals continued south and were last observed heading towards the bait barge.

Date	Project Location	Species Information		Shutdown Information			Delay?	Shutdown?	Notes
		Species	No. of Individuals	Start Time	End Time	Total Time			
18-Mar-2017	NBPL Fuel Pier	Harbor seal	2	12:27:10	12:47:01	0:19:51	X		2 Harbor seals initially called out by November passing under the trestle traveling South. 1 of the 2 Harbor seal observed by Sierra app 5 m (16 ft) from east side of the old pier, about halfway down the pier, during pre-/post. The individual dove at 1232 and not observed again. 2nd PHS not seen inside the shutdown ZOI. Waited 15 min to 1247 before giving PD green flag. Crew ready to drive at approximately 1245.
14-Apr-2017	NBPL Fuel Pier	California sea lion	1	7:30:40	7:46:40	0:16:00	X		Male California sea lion called by P-122 MMO as it entered the shutdown ZOI from the west. Last observed at 0731 as it dove under the barge towards the piles from the west. Did not see it surface outside of ZOI...Waited full 15 until 0746 to give green flag.
Subtotal (October 2016 to May 2017)			15				9	2	
03-Aug-2017	NBPL Fuel Pier	California sea lion	1	13:44:47	13:49:07	0:04:20		X	1 male California sea lion first observed approximately 200 m to south heading straight for barge. It surfaced approximately 50 m from the barge still heading straight for it. The crew was alerted for possible shutdown. Only saw it's hind flippers as it surfaced approximately 12-13 m from the pile in line with the old pier. A shutdown was called at that point. It wasn't next seen approximately 200 m away on north side of the trestle and the green flag given.

Date	Project Location	Species Information		Shutdown Information			Delay?	Shutdown?	Notes
		Species	No. of Individuals	Start Time	End Time	Total Time			
24-Aug-2017	NBPL HDA	California sea lion	1	11:49:01	11:50:11	0:01:10		X	1 male California sea lion was first observed to the east of the barge swimming to the north. It then turned and approached the barge from the north. It dove at the northern end of the barge (app 40 m from the pile) and the crew stopped the pump because we could not see where it was after it dove. The California sea lion was then observed app 75 m to the east of the barge heading towards the fuel dock. It was last observed heading under the fuel dock.
24-Aug-2017	NBPL HDA	California sea lion	1	11:54:11	11:55:23	0:01:12		X	The same male California sea lion that caused the shutdown at 11:49 was seen again to the northeast of the barge approaching the barge. It dove again at the northern end of the barge, and the crew turned off the pump used to remove piles via jetting. It was then observed approximately 75 m to the south of the barge heading into the Bay.
31-Aug-2017	NBPL HDA	California sea lion	1	10:35:24	10:41:11	0:05:47		X	1 male California sea lion was first observed swimming straight towards the crane barge. It then dove under barge...As soon as it dove under the barge, a shutdown of pile jetting was called. It was then observed approximately 150 meters to the south outside of zone.
14-Sep-2017	NBPL Fuel Pier	California sea lion	2	10:59:18	11:00:14	0:00:56		X	1 female California sea lion surfaced approximately 20 m from the diver. A shutdown was called because it was heading straight for the diver. The individual was only in the ZOI for a few seconds before it was observed outside of the shutdown ZOI.

Date	Project Location	Species Information		Shutdown Information			Delay?	Shutdown?	Notes
		Species	No. of Individuals	Start Time	End Time	Total Time			
15-Sep-2017	NBPL Fuel Pier	California sea lion	2	12:38:06	12:39:23	0:01:17	X		2 California sea lions approached from east. They were not seen until they rounded the crane barge on the east side. The crew was setting the clipper in place. An all stop was called until the California sea lion left the 10 m ZOI. No active pile clipping was occurring while it was in the ZOI.
18-Sep-2017	NBPL Fuel Pier	California sea lion	1	12:40:47	12:41:23	0:00:36	X		1 male California sea lion approached from the west and surfaced inside the 10 m zone. No active pile clipping was occurring while it was in the ZOI.
02-Oct-2017	NBPL Fuel Pier	California sea lion	1	13:04:42	13:05:17	0:00:35	X		1 California sea lion initially observed 85 m to the north, then got to within 10 m from pile about to be clipped. It then DV under the crane barge and surfaced on the south side at 13:05:17. Clearance was given to start cutting.
Subtotal (April to October 2017)			10			00:15:53	3	5	
TOTAL			25			01:19:57	12	7	

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