

Annual Post-Monitoring Report 2024



Richmond-San Rafael Bridge Painting Project Interstate 580

Caltrans District 4
Contra Costa County
04-3G474

March 2024





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**Annual Post-Monitoring Report
2024
Richmond-San Rafael Bridge Painting Project
Interstate 580**

Caltrans District 4
Contra Costa County
Interstate 580
CC 580 (Post Mile 6.1/7.8) MRN 580 (Post Mile 0.0/2.6)
04-3G474

STATE OF CALIFORNIA
Department of Transportation

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Abbreviated Terms

API	Allied Painting Inc.
Caltrans	California Department of Transportation
I-	Interstate
IHA	Incidental Harassment Authorization
MMP	Monitoring and Mitigation Plan
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
PCA	Project Construction Area
PM	post mile
Project	I-580 Richmond-San Rafael Bridge Painting Project
PSO	protected species observer
SEFI	San Francisco Estuary Institute

Annual Post-Monitoring Report

Interstate 580 Richmond-San Rafael Bridge Painting Project
04-3G474

Reporting Period: **October 5, 2023 – February 23, 2024**

Prepared to satisfy the Marine Mammal Protection Act (MMPA) Incidental Harassment Authorization (IHA) issued by the National Marine Fisheries Service (NMFS) on July 31st, 2023.

Introduction

This report provides a technical summary of the 2023 – 2024 harbor seal (*Phoca vitulina*) monitoring season for the California Department of Transportation (Caltrans) Richmond-San Rafael Bridge Painting Project (Project) on Interstate (I-) 580 from post miles (PM) 6.1 to 7.8 and from PM 0.0 to 2.6 in Contra Costa and Marin counties, California, respectively.

A schedule and description of construction activities in 2023 and 2024 are provided in this section. A summary of the biological surveys and monitoring performed are provided in the section titled *Harbor Seal Surveys and Monitoring*. Behavioral responses of marine mammal species to Project activities are described in the *Harbor Seal Responses to Construction* section. Zero take of marine mammal species occurred during the Project.

Project Description

A Marine Mammal Monitoring and Mitigation Plan (MMP) was developed, according to the MMPA requirements, for the issuance of the IHA for construction activities during Phase II of the Project. The goal of the Project was to paint and repair the road deck and expansion joints on the lower deck to maintain and preserve the integrity of the Richmond-San Rafael Bridge from adverse impacts of general operation and the marine environment. The Richmond-San Rafael Bridge is 5.5 miles in length and connects the City of Richmond in Contra Costa County to the City of San Rafael in Marin County, California. Restoration work on the bridge included replacing degraded steel bridge components, removing the traveler rail system, repairing damaged concrete, and replacing expansion joints of the lower deck. Painting of the bridge structure required the removal of all existing paint through sand blasting and rotary sanding. An enclosed scaffold system was constructed to ensure complete containment of paint and construction debris. Barges were used for staging personnel, equipment, and materials.

Project activities were conducted between Piers 48 and 78, an approximately 1.2-mile section of the bridge. Construction was performed by Allied Painting Inc. (API). Work was performed six days a week with one day shift and two nights shifts each 24-hour period. This report covers work performed between Piers 52 and 57, the 400-foot

harassment zone of the harbor seal colony at Castro Rocks, as issued by the IHA and described in the MMP.

Construction consisted of:

- Installing scaffolding below lower deck
- Installing containment
- Sand blasting
- Painting first and second prime coats
- Caulking
- Painting finish coat
- Setting plates and tapers
- Installing demo shield
- Removing containment and scaffolding

Project Location

The Project area consists of the existing roadway, existing bridge location, adjacent waters of the San Francisco Bay, a small portion of shoreline and landscaped areas on the east end of the bridge, and the industrial complex of the Chevron Richmond Refinery (Figure 1). Much of the Project area is located over the waters of the San Francisco Bay on the Richmond-San Rafael Bridge, while the east end includes a small portion of shoreline and landscaped areas, and the industrial complex of the Chevron Richmond Refinery.

The Project Construction Area (PCA) is the area where construction activities associated with the Project occurred. The current phase of the Project, Phase II, includes work on and between Piers 48 and 78. The PCA includes the existing bridge structure and all other areas that would be used for the Phase II staging, materials storage, access, painting, and restoration. The estimated area of the PCA is 88.29 acres. The biological study area, approximately 803.97 acres, includes the PCA, the length of the bridge between Piers 45 and 78, and adjacent sensitive habitats.

There are three known biologically sensitive resources located in the biological study area (Figure 2): eelgrass (*Zostera marina* L.) beds, the Castro Rocks, and a known double-crested cormorant (*Phalacrocorax auratus*) breeding colony on the Richmond-San Rafael Bridge superstructure. Approximately 40.21 acres of mapped eelgrass is located at the east end of the biological study area (San Francisco Estuary Institute [SEFI] Aquatic Science Center 2019). The Castro Rocks, a rock outcrop, is a known haul-out site for harbor seals. The double-crested cormorant breeding colony is mainly between Piers 51 and 56. Other birds protected by the Migratory Bird Treaty Act that have been documented nesting on the bridge include western gull (*Larus occidentalis*), peregrine falcon (*Falco peregrinus*), and common raven (*Corvus corax*).

Figure 1. I-580 Richmond-San Rafael Bridge Maintenance: Project Location

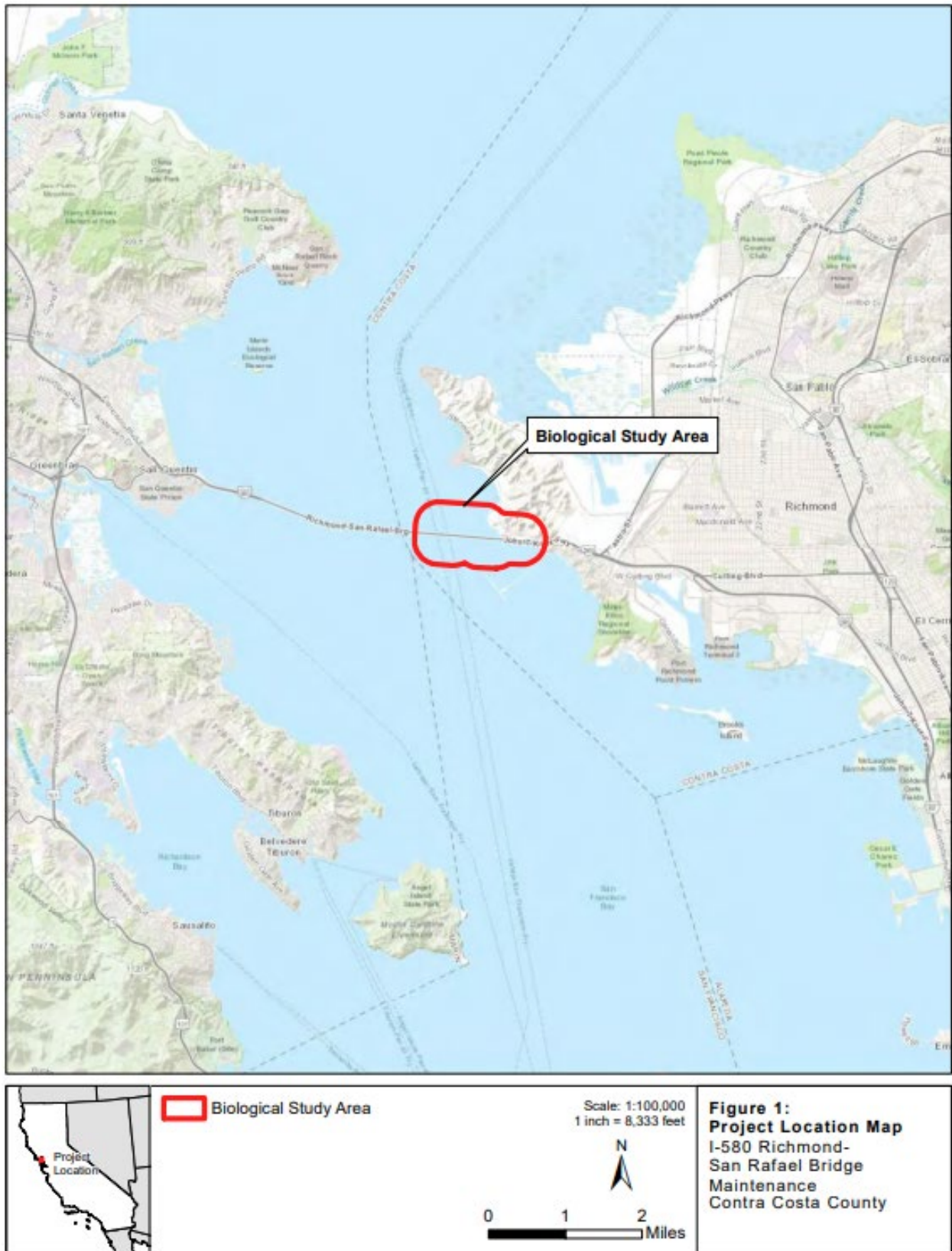
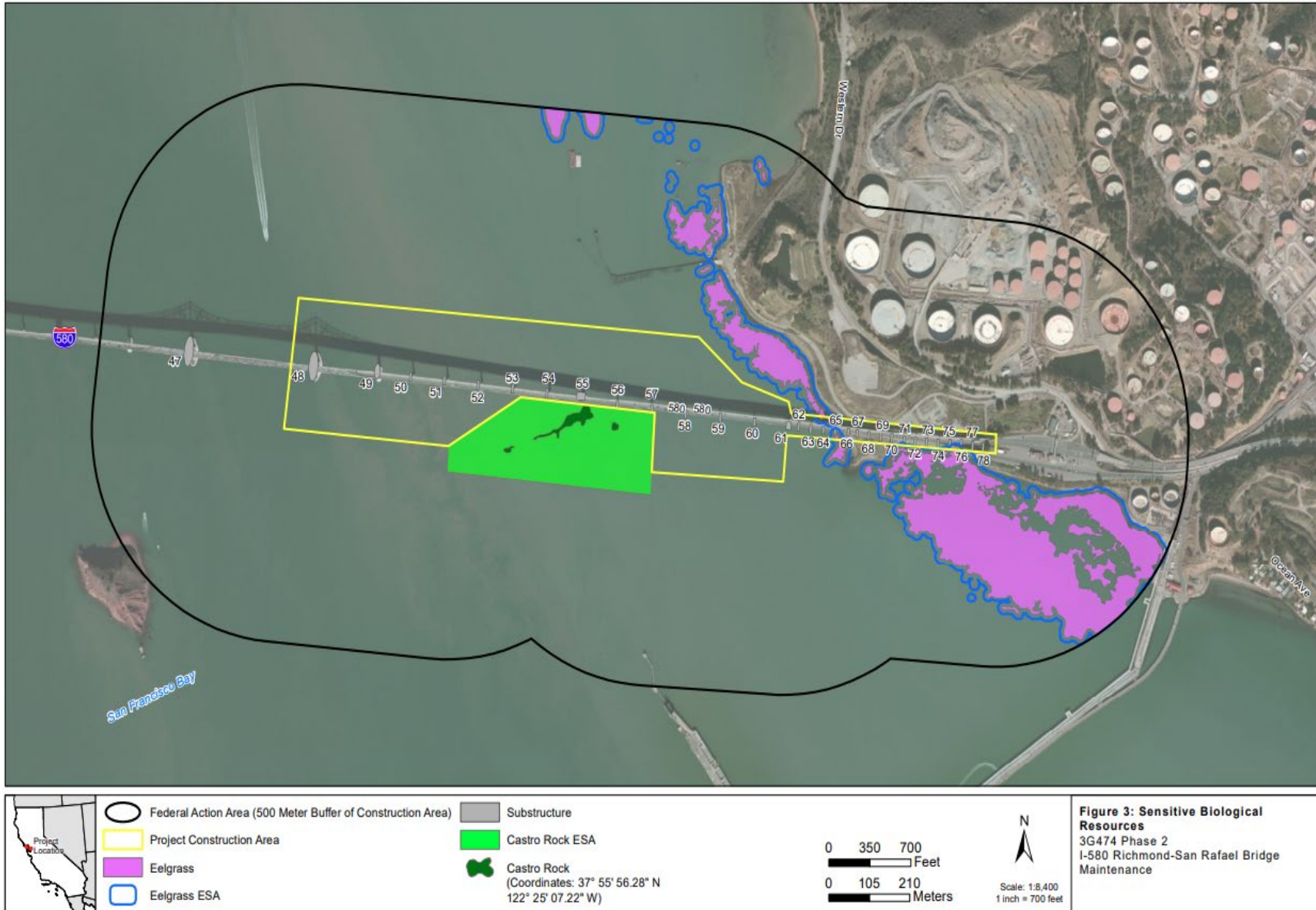


Figure 2. I-580 Richmond-San Rafael Bridge Maintenance: Biological Study Area and Sensitive Biological Resources



Compliance with Project Permits and Authorizations

This Report was prepared to satisfy conditions of the following resource agency permits and authorizations:

1. United States Department of Commerce National Oceanic and Atmospheric Administration (NOAA) NMFS IHA Requirement 6 dated July 31, 2023 (Table 1).

Table 1. Project Permit Conditions.

Document	Measure												
NOAA IHA Reporting Requirement 6	<p>The holder of this Authorization is required to:</p> <p>(a) Submit a draft report on all monitoring conducted under the IHA within ninety calendar days of the completion of marine mammal monitoring. A final report shall be prepared and submitted within thirty days following resolution of comments on the draft report from NMFS. This report must contain the informational elements described in the Monitoring Plan, at minimum, and shall also include: (i) observation position and start and end times of observations (ii) Weather conditions (sunny/cloudy, wind speed, fog, visibility), temperature, tide level, current, and sea state (iii) Species counts(including with or without pup, and, if possible, sex and age classes of any observed marine mammal species (iv) Identifying marks or color (scars, red pelage, etc.) (v) Position relative to Richmond-San Rafael Bridge (distance and direction) (vi) Movement (direction and relative speed) (vii) Behavior (logging (resting at the surface), swimming, spyhopping (raising above the water surface to view the area), foraging, etc.) (viii) Duration of sighting or times of multiple sightings of the same individual (ix) Details of any marine mammal behavioral disturbances, including information regarding the activity (e.g. disturbance from the containment system installation and removal or construction related disturbance within or outside the containment system), the type of behavioral response to the disturbance (flushing or head posturing), and the rate of disturbance on Castro Rocks. Disturbance events must be categorized according to the 3-point scale as shown below.</p> <table border="1"> <thead> <tr> <th>Level</th> <th>Type of Response</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>Level 1</td> <td>Alert</td> <td>Seal head orientation or brief movement in response to disturbance which may include turning head towards the disturbance, craning head and neck while holding the body rigid in a u-shaped position, changing from a lying to a sitting position, or brief movement of less than twice the animal's body length</td> </tr> <tr> <td>Level 2 (recorded as take event)</td> <td>Movement</td> <td>Movements in response to the source of disturbance, ranging from short withdrawals at least twice the animal's body length to longer retreats over the beach, or if already moving a change of direction of greater than 90 degrees.</td> </tr> <tr> <td>Level 3 (recorded as take event)</td> <td>Flush</td> <td>All retreats (flushes) to the water.</td> </tr> </tbody> </table> <p>Notes: ¹ Only observations of disturbance Levels 2 and 3 will be recorded as take events to authorized species.</p>	Level	Type of Response	Definition	Level 1	Alert	Seal head orientation or brief movement in response to disturbance which may include turning head towards the disturbance, craning head and neck while holding the body rigid in a u-shaped position, changing from a lying to a sitting position, or brief movement of less than twice the animal's body length	Level 2 (recorded as take event)	Movement	Movements in response to the source of disturbance, ranging from short withdrawals at least twice the animal's body length to longer retreats over the beach, or if already moving a change of direction of greater than 90 degrees.	Level 3 (recorded as take event)	Flush	All retreats (flushes) to the water.
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Reporting Period

Four pre-construction surveys of the seal colony on Castro Rocks occurred on October 2, October 3, October 4, and October 20, 2023. Additionally, data from eight separate surveys of the seal colony between April 2023 and July 2023 were also reviewed, totaling 12 pre-construction surveys. Monitoring activities during the installation of scaffolding and containment between Piers 52 and 57 (19 days total) included October 6 and 7 and from October 25 to November 17, 2023. The break between October 7 to 25 was because API was working outside the harassment zone during that time. No monitoring of Project activities was required while containment was up, as specified in the IHA. Monitoring during the removal of scaffolding and containment took place across 10 days between January 30 and February 23, 2024. Breaks between monitoring shifts were due to inclement weather canceling work or API working outside the harassment zone.

Harbor Seal Surveys and Monitoring

Survey methods and observations of seals and other marine mammals are discussed below. Tables of survey and monitoring results (Table 2) and photos (Table 3) are located at the end of this section.

Survey Methods and Conditions

Surveys and monitoring of seals on Castro Rocks were conducted in pairs by approved primary and secondary protected species observers (PSOs). Castro Rocks is located to the south side of the Richmond-San Rafael Bridge and can be seen from the right-most lane. The closest outcropping of Castro Rocks where harbor seals are known to haul-out is located approximately 70 feet from Pier 55, and the farthest outcropping is located approximately 475 feet from Pier 52.

API staged their vehicles and worked from within scheduled lane closures. Due to the high traffic volumes (200,000 vehicles per day) and the commercial importance of the Richmond-San Rafael Bridge, lane closures were limited to specific times of the day and could only occupy one of the three lanes at any given time. When the right lane was closed, PSOs would monitor seals from the right lane closure, which offered the best view of the rocks. From the right lane, PSOs faced south looking down on the hauled-out and swimming seals. Monitoring would begin at approximately 0730 hours and end when API finished their day shift, usually around 1300 hours. Castro Rocks is not visible from the left lane, so when API worked from the closed left lane, PSOs would be escorted by boat to the cap of Pier 49. From there, about 370 feet from the western end of Castro Rocks, PSOs faced east to observe the seals through binoculars and a spotting scope (Table 3: Photo 2). Due to exposure and isolation on the pier, monitoring was limited to about two hours and scheduled when the tide was lowest during API's day shift to maximize the number of hauled-out seals. Though PSOs were able to see the seals, the location on Pier 49's cap restricted visibility of construction activities on the north side of the bridge, visibility of seals on the east side of Castro Rocks, and the

ability to identify any specific construction-related activity that may have solicited a disturbance response by the seals.

While monitoring, PSOs recorded the total number of hauled-out and swimming seals every thirty minutes on data sheets, in addition to any disturbance behaviors observed. They also documented any red pelage, shark bites, seal behaviors, and other marine mammal species observed.

Weather conditions during surveys and monitoring remained clear with sunny to overcast skies. Some days experienced small amounts of rain or fog which did not obscure the view of Castro Rocks and the seal colony. The only weather condition that temporarily obscured the colony was glare from the sun on the water. Temperatures during monitoring ranged from 40 to 91 degrees Fahrenheit, and wind speeds ranged from 3 to 15 miles per hour. Tide levels during monitoring ranged greatly with as low as 0.44 feet to as high as 6.58 feet. When the tide was above 5 feet, most of the rocks were submerged and the seals did not haul-out. Bay waters remained relatively calm throughout monitoring. When waves were rougher during atmospheric rivers, construction activities and seal monitoring were cancelled.

Approved Protected Species Observers

- Primary Monitors:
 - Phelps Hawley
 - Elizabeth Janz
 - Erin Lacour
 - Mark McCaustland
 - Kenneth Norbert
 - Michael Voeltz

- Secondary Monitors:
 - Rob Aramayo
 - Tonja Chi
 - Samuel Daley
 - Emily Matthews
 - Jason Minton
 - Margaret Rousser
 - Vanessa Seawright
 - Luna Souchard
 - Jeff Steinman
 - Maria Tolymbek
 - Carol Wiegel

Baseline Surveys

The average number of seals counted during the eight April through July surveys in 2023 was 119 seals, with a high count of 153 seals seen on Castro Rocks on May 12 and 26. These eight surveys coincided with the birthing, nursing, and weaning months of harbor seals in the San Francisco Bay Area, and had an average low tide of 0.07 feet.

The four surveys conducted the week before construction had an average of 30 seals, with the highest count of 55 seals on October 20, and an average low tide of 2.72 feet. The lower number of seals seen in the October surveys is likely due to the dispersal of seals at the end of their breeding and molting cycles (August through October) and due to the height of the tide during the available daytime lane closures when surveys were possible. Surveys were limited to when right lane closures were scheduled because the right lane has the best view of the Castro Rocks seal colony, as opposed to taking a boat to the cap of Pier 49.

Monitoring Installation of Containment and Scaffolding

Installation of the of the containment system between Piers 49 and 53 began on October 5, 2023, and only the segment that was in the harassment zone, Piers 52 to 53, was monitored (between 390 and 490 feet from the nearest haul-out on Castro Rocks). Scaffolding and containment installation within the rest of the harassment zone, Piers 53 to 57, resumed on October 23. Monitoring did not resume until October 25 due to the start date changing last minute without notifying the PSOs in time. Monitoring continued until scaffolding and containment installation was complete on November 17.

During scaffolding and containment installation, PSOs observed a daily high count of harbor seals ranging from 3 to 84 adult seals. No pups were seen, as monitoring took place outside the pupping season. The number of seals observed coincided with the tide during the shift, with more seals hauled-out during low tides. Seals with red pelage were also observed, with a high of 10 red individuals on a single day. No shark bites were seen on any seals.

During construction monitoring, the seals were seen basking on the rocks, bottling, skyhopping, logging, swimming, and flapping their fore- and hind-flippers at cormorants perched on the rocks or at other seals. Seals in the water were seen swimming at slow, meandering speeds often swimming to and from the rocks and looking for places to haul-out. While the containment tarp was being unfurled and attached to the lower bridge deck, seals in the water took notice of the activity but did not appear disturbed and resumed logging (Table 3: Photo 4). There were no seals hauled-out at the time the tarp was unfurled due to the high tide covering the rocks. Three seals did exhibit Level 3 flushes in response to a kayaker approaching the rocks on November 4, 2023, at 12:22, and 41 seals also flushed into the water in response to a loud alarm sounding from the nearby Chevron refinery on November 8 at 13:30. No disturbance behaviors were seen

in response to Project activities, however. No individual seal was tracked across multiple days.

Harbor porpoises (*Phocoena phocoena*) were seen during scaffolding and containment installation. They were spotted near Pier 49 around midday outside of the harassment zone on October 6, 7, 25, and November 2, 6, and 7, 2023. One California sea lion (*Zalophus californianus*) was also seen swimming west past Pier 49, outside the harassment zone, on November 2 around 10:45.

Monitoring Removal of Containment and Scaffolding

Removal of the containment system between Piers 53 and 57 was scheduled to begin on January 30, 2024; however, when the PSOs arrived onsite, the containment tarp had already been taken down the previous Saturday without PSOs present. Monitoring continued through February 25. Due to a series of atmospheric rivers, a few monitoring shifts that required a boat escort were cancelled due to weather and small craft advisories, even though API continued dismantling the scaffolding. Removal of scaffolding and containment between Piers 52 and 53 took place on February 23; however, PSOs were not notified of this work in time to monitor. There were no other occurrences of work without PSOs present during construction.

During scaffolding and containment removal, PSOs observed a daily high count of harbor seals ranging from 4 to 220 adult seals. One pup was born while PSOs were monitoring on February 13, almost a month before the start of the pupping season in the San Francisco Bay Area (March 1 through May 31) (NOAA Fisheries 2022) and died within one hour of birth. The pup death was unrelated to Project activities, and more details can be found in the report sent to NOAA and NMFS contacts specified in the IHA on February 15, 2024 (Chan 2024). The total number of seals seen from day to day coincided with how low or high the tide was during the shift. Seals with red pelage were also observed, with a high of 13 red individuals on a single day. No shark bites were seen on any seals. No individual seal was tracked across multiple days.

During construction monitoring, the seals were seen basking on the rocks, bottling, logging, skyhopping, and swimming. Seals in the water were seen swimming at slow, meandering speeds often swimming to and from the rocks and looking for places to haul-out. A few seals were seen swimming at fast speeds, causing long ripples in the water. These seals were usually swimming around the rocks, and sudden increase in speed did not appear in response to activities on the Richmond-San Rafael Bridge. In response to three kayakers approaching Castro Rocks to take photos of the seals on February 13, 2024, 42 hauled-out seals flushed into the water (Table 3: Photo 7). No disturbance behaviors were seen in response to Project activities.

Harbor porpoises were also seen outside the harassment zone in the shipping channel from the boat on the way to Pier 49 on February 9, 2024, at approximately 10:45.

Table 2. Results from pre-construction surveys and construction monitoring.

	Avg. Low Tide (ft)	Avg. No. Seals	Highest Daily Seal Count	Lowest Daily Seal Count	Highest Daily Red Seal Count
Breeding and Weaning Season (April 14 – July 7, 2023)	0.09	144	153	125	34
Pre-construction surveys (October 2 – 4, and October 20, 2023,	2.72	39	55	21	5
Monitoring Containment Installation (October 25 – November 17, 2023)	2.97	21	84	3	10
Monitoring Containment Removal (January 30 – February 15, 2024)	1.74	78	220	4	13

Note. Seal counts include pups during the breeding and weaning season. Low tide is the lowest tide closest to the time of the survey or monitoring period.

Table 3. Photos of harbor seals, PSOs, and Project activities.


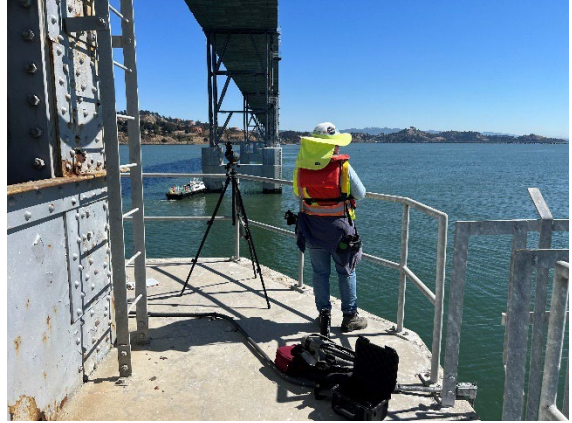
	
<p>Photo 1: Harbor seals basking on Castro Rocks during pre-construction survey, looking down from right-lane (10/02/2023)</p>	<p>Photo 2: PSO monitoring harbor seals from Pier 49 cap during containment installation (10/06/2023)</p>



Photo 3: Scaffolding and containment between Piers 51 and 52, barge stationed during sandblasting (10/31/2023)



Photo 4: API attaching tarp at Pier 55 (11/11/2023)

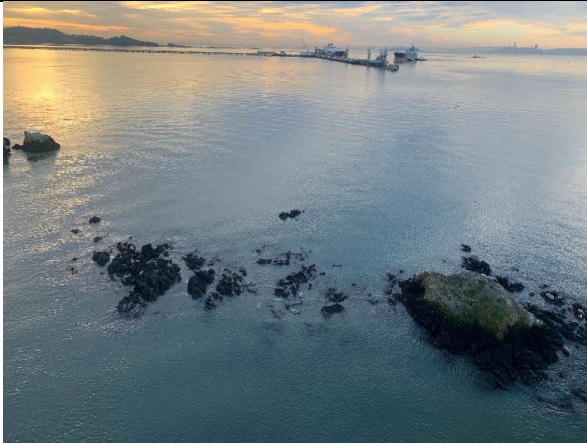


Photo 5: Harbor seals basking on Castro Rocks when scaffolding removal began (01/30/2024)

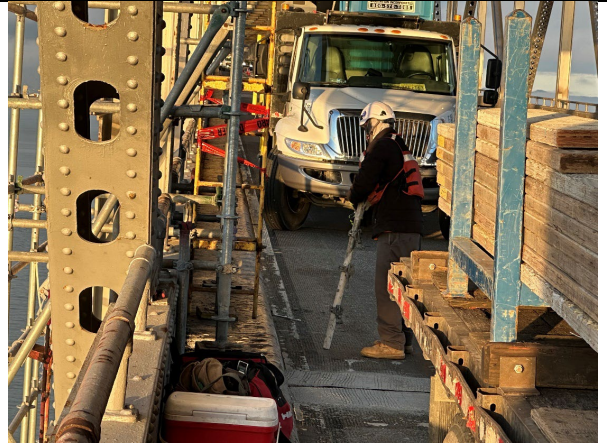


Photo 6: API removing scaffolding (02/06/2024)



Photo 7: Flushed seals (circles), kayaker taking photos (rectangle), hauled-out seals (arrow) (02/13/2024)



Photo 8: Seals hauled-out during construction activities (01/30/2024)

Harbor Seal Responses to Construction

No behavioral disturbances, as defined by the scale listed in the IHA, were observed while PSOs were on site. Level 3 flushes into water did occur from outside sources, such as kayakers, but not from the Project and construction activities. While API was setting up and taking down the scaffolding, the PSOs could not hear any noise from the construction that superseded the traffic noise from the bridge, and the seals did not spend any noticeable time looking up at the bridge. When seals took notice of the containment tarps unfurling and being attached to the bridge deck, they were already in the water and immediately resumed bottling as well as continually submerging and resurfacing. On the few days PSOs were not onsite to monitor seal behavior due to communication failures or weather restrictions, it is possible disturbance behaviors took place resulting from Project activities. Given no take was observed while PSOs were onsite, any potential unwitnessed take would have been minimal and would not have exceeded the 9,000 incidents of take issued by the IHA.

IHA Renewal

The IHA issued on July 31, 2023, was valid from August 1, 2023, through March 30, 2024. On February 7, 2024, Caltrans submitted a renewal letter to NOAA to renew the IHA for an additional year (Coghlan 2024). This renewal letter was submitted because Project activities were expected to extend past the March 30 expiration date. The renewal was approved by NOAA on March 26, 2024 (Cockrell 2024). API is currently working on painting, concrete repair, and scaffolding removal between Piers 59 and 60, outside the harassment zone. All remaining work will occur on the bridge deck and outside the harassment zone.

References

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- Cockrell, Craig, personal communication. March 26, 2024. Signed Renewal for the Richmond-San Rafael Bridge Project. NOAA. [Two Pages].
- Coghlan, Denis, personal communication. February 7th, 2024. Submitting IHA Renewal Letter to NOAA. Caltrans. [Two Pages].
- NOAA Fisheries. 2022. Harbor Seals Pupping Timeframes Along the West Coast. West Coast Regional Office. Accessed March 1st, 2024. Available online at: <https://www.fisheries.noaa.gov/resource/map/harbor-seals-pupping-timeframes-along-west-coast>
- San Francisco Estuary Institute (SFEI) Aquatic Science Center. 2019. "Eelgrass Survey GIS Data version 1.0" compiled by NMFS. Available online at: sfei.org/data/eelgrass-survey-gis-data#sthash.MVWMXtR9.xscoznRq.dpbs

Table 4-1: NOAA Fisheries Levels of Pinniped Behavioral Disturbance

Level	Type of Response	Definition
Level 1	Alert	Seal head orientation or brief movement in response to disturbance which may include turning head towards the disturbance, craning head and neck while holding the body rigid in a u-shaped position, changing from a lying to a sitting position, or brief movement of less than twice the animal's body length
Level 2 (recorded as take event)	Movement	Movements in response to the source of disturbance, ranging from short withdrawals at least twice the animal's body length to longer retreats over the beach, or if already moving a change of direction of greater than 90 degrees.
Level 3 (recorded as take event)	Flush	All retreats (flushes) to the water.

Notes:

¹ Only observations of disturbance Levels 2 and 3 will be recorded as take events to authorized species.

² Levels are based on the issued IHA for the Richmond-San Rafael Bridge (NOAA 2023a).

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RICHMOND-SAN RAFAEL BRIDGE HARBOR SEAL DISTURBANCE SURVEY

Date: 10/26 ___ Year 2023 ___ Location: CASTRO ROCKS Observers: Maria Tolymbek, Michael Voeltz ___

Lowest Tide During Survey: 3.98 Time of Lowest Tide During Survey: 13:30

Time	Disturbance Source *	Number Of Source	Sub-Site**	Seal Behavior (level) ***	No. Before Disturbance (Total Seals) & Time of Last Count	No. Adult/ Immature Seals Remain On site	No. pups Remain On site	Total No. Seals Flush Into Water	Seals Rehaul (Y/N) Time	Comments (details of disturbance source, seal reactions)
12:15	Construction	1	49	NR	4	4		0	NA	Count, ongoing construction
12:35	Construction	1	49	NR	5	5		0	NA	Count, ongoing construction
12:55	Construction	1	49	NR	6	6		0	NA	Count, ongoing construction
13:15	Construction	1	49	NR	7	7		0	NA	Count, ongoing construction
13:35	Construction	1	49	NR	12	12		0	NA	Count, ongoing construction

***DISTURBANCE SOURCE:** construction, motorboat, non-motor boat, vehicle, fisherman, human, researcher, bird, other. Add details to **Comments**.

****SUBSITES:** Piers 54 & 55

*****SEAL BEHAVIOR** (see back for definitions): NR=no response; 1=head alert; 2=movement; 3=flush into water. (Record Strongest Reaction)

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RICHMOND-SAN RAFAEL BRIDGE HARBOR SEAL DISTURBANCE SURVEY

Date: 10/27 ___ Year 2023 ___ Location: CASTRO ROCKS Observers: Vanessa Seawright, Phelps Hawley

Lowest Tide During Survey: 3.80 Time of Lowest Tide During Survey: 08:00

Time	Disturbance Source *	Number Of Source	Sub-Site**	Seal Behavior (level) ***	No. Before Disturbance (Total Seals) & Time of Last Count	No. Adult/ Immature Seals Remain On site	No. pups Remain On site	Total No. Seals Flush Into Water	Seals Rehaul (Y/N) Time	Comments (details of disturbance source, seal reactions)
08:00	Construction	1	54/55	NR	4	4		0	NA	Count, ongoing construction
08:20	Construction	1	54/55	NR	3	3		0	NA	Count, ongoing construction
08:40	Construction	1	54/55	NR	4	4		0	NA	Count, ongoing construction
09:00	Construction	1	54/55	NR	2	2		0	NA	Count, ongoing construction
09:20	Construction	1	54/55	NR	1	1		0	NA	Count, ongoing construction
09:40	Construction	1	54/55	NR	1	1		0	NA	Count, ongoing construction
10:00	Construction	1	54/55	NR	1	1		0	NA	Count, ongoing construction
10:20	Construction	1	54/55	NR	1	1		0	NA	Count, ongoing construction
10:40	Construction	1	54/55	NR	0	0		0	NA	Count, ongoing construction
11:00	Construction	1	54/55	NR	0	0		0	NA	Count, ongoing construction
11:20	Construction	1	54/55	NR	1	1		0	NA	Count, ongoing construction
11:40	Construction	1	54/55	NR	1	1		0	NA	Count, ongoing construction
12:00	Construction	1	54/55	NR	0	0		0	NA	Count, ongoing construction
12:20	Construction	1	54/55	NR	1	1		0	NA	Count, ongoing construction

12:40	Construction	1	54/55	NR	1	1		0	NA	Count, ongoing construction
13:00	Construction	1	54/55	NR	2	2		0	NA	Count, ongoing construction

***DISTURBANCE SOURCE:** construction, motorboat, non-motor boat, vehicle, fisherman, human, researcher, bird, other. Add details to **Comments**.

****SUBSITES:** Piers 54 & 55

*****SEAL BEHAVIOR (see back for definitions):** NR=no response; 1=head alert; 2=movement; 3=flush into water. (Record Strongest Reaction)

Revised October 2023

Table 4-1: NOAA Fisheries Levels of Pinniped Behavioral Disturbance

Level	Type of Response	Definition
Level 1	Alert	Seal head orientation or brief movement in response to disturbance which may include turning head towards the disturbance, craning head and neck while holding the body rigid in a u-shaped position, changing from a lying to a sitting position, or brief movement of less than twice the animal's body length
Level 2 (recorded as take event)	Movement	Movements in response to the source of disturbance, ranging from short withdrawals at least twice the animal's body length to longer retreats over the beach, or if already moving a change of direction of greater than 90 degrees.
Level 3 (recorded as take event)	Flush	All retreats (flushes) to the water.

Notes:

¹ Only observations of disturbance Levels 2 and 3 will be recorded as take events to authorized species.

² Levels are based on the issued IHA for the Richmond-San Rafael Bridge (NOAA 2023a).

RICHMOND-SAN RAFAEL BRIDGE HARBOR SEAL DISTURBANCE SURVEY

Date: 10/28 Year 2023 Location: CASTRO ROCKS Observers: Erin Lacour, Margaret Rousser

Lowest Tide During Survey: 2.5 ft Time of Lowest Tide During Survey: 08:00

Time	Disturbance Source *	Number Of Source	Sub-Site**	Seal Behavior (level) ***	No. Before Disturbance (Total Seals) & Time of Last Count	No. Adult/ Immature Seals Remain On site	No. pups Remain On site	Total No. Seals Flush Into Water	Seals Rehaul (Y/N) Time	Comments (details of disturbance source, seal reactions)
8:14	Construction	1	55	NR	12	12	0	0	NA	Count, ongoing construction
8:45	Construction	1	55	NR	9	9	0	0	NA	Count, ongoing construction
9:15	Construction	1	55	NR	6	6	0	0	NA	Count, ongoing construction
9:45	Construction	1	55	NR	6	6	0	0	NA	Count, ongoing construction
10:15	Construction	1	55	NR	5	5	0	0	NA	Count, ongoing construction
10:45	Construction	1	55	NR	4	4	0	0	NA	Count, ongoing construction, only one hauled out
11:15	Construction	1	55	NR	3	3	0	0	NA	Count, ongoing construction, tide above rocks, none hauled out
11:45	Construction	1	55	NR	4	4	0	0	NA	Count, ongoing construction
12:15	Construction	1	55	NR	4	4	0	0	NA	Count, ongoing construction

***DISTURBANCE SOURCE:** construction, motorboat, non-motor boat, vehicle, fisherman, human, researcher, bird, other. Add details to **Comments**.

****SUBSITES:** Piers 54 & 55

*****SEAL BEHAVIOR** (see back for definitions): NR=no response; 1=head alert; 2=movement; 3=flush into water. (Record Strongest Reaction)

Revised October 2023

Table 4-1: NOAA Fisheries Levels of Pinniped Behavioral Disturbance

Level	Type of Response	Definition
Level 1	Alert	Seal head orientation or brief movement in response to disturbance which may include turning head towards the disturbance, craning head and neck while holding the body rigid in a u-shaped position, changing from a lying to a sitting position, or brief movement of less than twice the animal's body length
Level 2 (recorded as take event)	Movement	Movements in response to the source of disturbance, ranging from short withdrawals at least twice the animal's body length to longer retreats over the beach, or if already moving a change of direction of greater than 90 degrees.
Level 3 (recorded as take event)	Flush	All retreats (flushes) to the water.

Notes:

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² Levels are based on the issued IHA for the Richmond-San Rafael Bridge (NOAA 2023a).

RICHMOND-SAN RAFAEL BRIDGE HARBOR SEAL DISTURBANCE SURVEY

Date: 10/30 ____ Year 2023 ____ Location: CASTRO ROCKS ____ Observers: Emily Matthews, Mark McCaustland ____

Lowest Tide During Survey: 4 ft ____ Time of Lowest Tide During Survey: 0900 hours ____

Time	Disturbance Source *	Number Of Source	Sub-Site**	Seal Behavior (level) ***	No. Before Disturbance (Total Seals) & Time of Last Count	No. Adult/ Immature Seals Remain On site	No. pups Remain On site	Total No. Seals Flush Into Water	Seals Rehaul (Y/N) Time	Comments (details of disturbance source, seal reactions)
0900	Construction	1	49	NR	1	1	0	1	0	Count, ongoing construction, seal left rock slowly
0920	Construction	1	49	NR	3	3	0	0	0	No flushing, in water bottling
0940	Construction	1	49	NR	3	3	0	0	0	No flushing, in water bottling
1000	Construction	1	49	NR	2	2	0	0	0	No flushing, in water bottling
1020	Construction	1	49	NR	1	1	0	0	0	No flushing, in water bottling
1040	Construction	1	49	NR	0	0	0	0	0	No flushing, in water bottling
1100	Construction	1	49	NR	2	2	0	0	0	No flushing, in water bottling

***DISTURBANCE SOURCE:** construction, motorboat, non-motor boat, vehicle, fisherman, human, researcher, bird, other. Add details to **Comments**.

****SUBSITES:** Piers 54 & 55

*****SEAL BEHAVIOR** (see back for definitions): NR=no response; 1=head alert; 2=movement; 3=flush into water. (Record Strongest Reaction)

Table 4-1: NOAA Fisheries Levels of Pinniped Behavioral Disturbance

Level	Type of Response	Definition
Level 1	Alert	Seal head orientation or brief movement in response to disturbance which may include turning head towards the disturbance, craning head and neck while holding the body rigid in a u-shaped position, changing from a lying to a sitting position, or brief movement of less than twice the animal's body length
Level 2 (recorded as take event)	Movement	Movements in response to the source of disturbance, ranging from short withdrawals at least twice the animal's body length to longer retreats over the beach, or if already moving a change of direction of greater than 90 degrees.
Level 3 (recorded as take event)	Flush	All retreats (flushes) to the water.

Notes:

¹ Only observations of disturbance Levels 2 and 3 will be recorded as take events to authorized species.

² Levels are based on the issued IHA for the Richmond-San Rafael Bridge (NOAA 2023a).

***DISTURBANCE SOURCE:** construction, motorboat, non-motor boat, vehicle, fisherman, human, researcher, bird, other. Add details to **Comments**.

****SUBSITES:** Piers 54 & 55

*****SEAL BEHAVIOR** (see back for definitions): NR=no response; 1=head alert; 2=movement; 3=flush into water. (Record Strongest Reaction)

Revised October 2023

Table 4-1: NOAA Fisheries Levels of Pinniped Behavioral Disturbance

Level	Type of Response	Definition
Level 1	Alert	Seal head orientation or brief movement in response to disturbance which may include turning head towards the disturbance, craning head and neck while holding the body rigid in a u-shaped position, changing from a lying to a sitting position, or brief movement of less than twice the animal's body length
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Revised October 2023

Table 4-1: NOAA Fisheries Levels of Pinniped Behavioral Disturbance

Level	Type of Response	Definition
Level 1	Alert	Seal head orientation or brief movement in response to disturbance which may include turning head towards the disturbance, craning head and neck while holding the body rigid in a u-shaped position, changing from a lying to a sitting position, or brief movement of less than twice the animal's body length
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Level 3 (recorded as take event)	Flush	All retreats (flushes) to the water.

Notes:

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- ² Levels are based on the issued IHA for the Richmond-San Rafael Bridge (NOAA 2023a).

RICHMOND-SAN RAFAEL BRIDGE HARBOR SEAL DISTURBANCE SURVEY

Date: 11/04/2023 Year _____ Location: CASTRO ROCKS Observers: Elizabeth Janz & Margaret Rousser

Time	Disturbance Source *	Number Of Source	Sub-Site**	Seal Behavior (level) ***	No. Before Disturbance (Total Seals) & Time of Last Count	No. Seals Reacted to Disturbance	No. Seals Remain on Site After Disturbance	Total No. Seals Flush Into Water	Seals Rehaul (Y/N) Time	Comments (details of disturbance source, seal reactions)
0805	Na			NR	6	0	6	N/a		All seals in water, 5 in A group 1 separate
0837	NA			NR	4	N/A	4	N/A		All seals in water
0907	NA			2	4		4			All seals in water, 3 in a cluster (In water summersaults)
0937	NA			2	4		4			Bottling, swimming
1007	NA			1	5		5			1 hauled out, others in water
1037	NA			1	7		7			1 hauled out, 1 partially hauled out, others in water
1107	NA			1	11		11			4 hauled out, 7 in the water
1137	NA			1	15		15			10 hauled out, 5 in the water
1207	NA			NR	17		17			14 hauled out, 3 in water
1222	Kayaker	1		3	12 hauled out	3	10 remained hauled out	2	N	
1227	NA			NR	8					8 remaining

***DISTURBANCE SOURCE:** construction, motorboat, non-motor boat, vehicle, fisherman, human, researcher, bird, other. Add details to **Comments**.

****SUBSITES:** Piers 54, 55, or Pier 49 (if boat day).

*****SEAL BEHAVIOR** (see back for definitions): NR=no response; 1=head alert; 2=movement; 3=flush into water. (Record Strongest Reaction)

Table 4-1: NOAA Fisheries Levels of Pinniped Behavioral Disturbance

Level	Type of Response	Definition
Level 1	Alert	Seal head orientation or brief movement in response to disturbance which may include turning head towards the disturbance, craning head and neck while holding the body rigid in a u-shaped position, changing from a lying to a sitting position, or brief movement of less than twice the animal's body length
Level 2 (recorded as take event)	Movement	Movements in response to the source of disturbance, ranging from short withdrawals at least twice the animal's body length to longer retreats over the beach, or if already moving a change of direction of greater than 90 degrees.
Level 3 (recorded as take event)	Flush	All retreats (flushes) to the water.

Notes:

- ¹ Only observations of disturbance Levels 2 and 3 will be recorded as take events to authorized species.
- ² Levels are based on the issued IHA for the Richmond-San Rafael Bridge (NOAA 2023a).

***DISTURBANCE SOURCE:** construction, motorboat, non-motor boat, vehicle, fisherman, human, researcher, bird, other. Add details to **Comments**.

****SUBSITES:** Piers 54 & 55

*****SEAL BEHAVIOR** (see back for definitions): NR=no response; 1=head alert; 2=movement; 3=flush into water. (Record Strongest Reaction)

Revised October 2023

Table 4-1: NOAA Fisheries Levels of Pinniped Behavioral Disturbance

Level	Type of Response	Definition
Level 1	Alert	Seal head orientation or brief movement in response to disturbance which may include turning head towards the disturbance, craning head and neck while holding the body rigid in a u-shaped position, changing from a lying to a sitting position, or brief movement of less than twice the animal's body length
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Notes:

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² Levels are based on the issued IHA for the Richmond-San Rafael Bridge (NOAA 2023a).

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***DISTURBANCE SOURCE:** construction, motorboat, non-motor boat, vehicle, fisherman, human, researcher, bird, other. Add details to **Comments**.

****SUBSITES:** Piers 54 & 55

*****SEAL BEHAVIOR** (see back for definitions): NR=no response; 1=head alert; 2=movement; 3=flush into water. (Record Strongest Reaction)

Revised October 2023

Table 4-1: NOAA Fisheries Levels of Pinniped Behavioral Disturbance

Level	Type of Response	Definition
Level 1	Alert	Seal head orientation or brief movement in response to disturbance which may include turning head towards the disturbance, craning head and neck while holding the body rigid in a u-shaped position, changing from a lying to a sitting position, or brief movement of less than twice the animal's body length
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Notes:

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RICHMOND-SAN RAFAEL BRIDGE HARBOR SEAL DISTURBANCE SURVEY

Date: 11/9 Year 23 Location: CASTRO ROCKS Observers: Elizabeth and Vanessa

Lowest Tide During Survey: 13:30 Time of Lowest Tide During Survey: 2.1'

Time	Disturbance Source *	Number Of Source	Sub-Site**	Seal Behavior (level) ***	No. Before Disturbance (Total Seals) & Time of Last Count	No. Adult/Immature Seals Remain On site	No. pups Remain On site	Total No. Seals Flush Into Water	Seals Rehauled (Y/N) Time	Comments (details of disturbance source, seal reactions)
8:00	Construction	1	54/55	NR	2	2	0	0	NA	count ongoing, construction
8:20	Construction	1	54/55	NR	2	2	0	0	NA	count ongoing, construction
8:40	Construction	1	54/55	NR	2	2	0	0	NA	count ongoing, construction
9:00	Construction	1	54/55	NR	3	3	0	0	NA	count ongoing, construction
9:20	Construction	1	54/55	NR	2	2	0	0	NA	count ongoing, construction
9:40	Construction	1	54/55	NR	2	2	0	0	NA	count ongoing, construction
10:00	Construction	1	54/55	NR	3	3	0	0	NA	count ongoing, construction
10:20	Construction	1	54/55	NR	5	5	0	0	NA	count ongoing, construction
10:40	Construction	1	54/55	NR	3	3	0	0	NA	count ongoing, construction
11:00	Construction	1	54/55	NR	2	2	0	0	NA	count ongoing, construction
11:20	Construction	1	54/55	NR	2	2	0	0	NA	count ongoing, construction
11:40	Construction	1	54/55	NR	7	7	0	0	NA	count ongoing, construction
12:00	Construction	1	54/55	NR	15	15	0	0	NA	count ongoing, construction
12:20	Construction	1	54/55	NR	31	31	0	0	NA	count ongoing, construction
12:40	Construction	1	54/55	NR	45	45	0	0	NA	count ongoing, construction

*DISTURBANCE SOURCE: construction, motorboat, non-motor boat, vehicle, fisherman, human, researcher, bird, other. Add details to Comments.

**SUBSITES: Piers 54 & 55

***SEAL BEHAVIOR (see back for definitions): NR=no response; 1=head alert; 2=movement; 3=flush into water. (Record Strongest Reaction)

13:00 construction 1 54/55 NR 64 64 0 0 NA count ongoing, construction
 13:20 construction 1 54/55 NR

Revised October 2023

Table 4-1: NOAA Fisheries Levels of Pinniped Behavioral Disturbance

Level	Type of Response	Definition
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8:00 → 5.5'
 9:12 → 5.7'

13:30 → 2.1'

RICHMOND-SAN RAFAEL BRIDGE HARBOR SEAL DISTURBANCE SURVEY

Date: 11/11/2023 Year _____ Location: CASTRO ROCKS Observers: Elizabeth Janz & Margaret Rousser

Time	Disturbance Source *	Number Of Source	Sub-Site**	Seal Behavior (level) ***	No. Before Disturbance (Total Seals) & Time of Last Count	No. Seals Reacted to Disturbance	No. Seals Remain on Site After Disturbance	Total No. Seals Flush Into Water	Seals Rehaul (Y/N) Time	Comments (details of disturbance source, seal reactions)
0800	N/A	N/A	54/55	NR	0	0	0	N/A		no seals observed in water or hauled out
0830	N/A	N/A	54/55	NR	2	0	2	N/A		All seals observed Logging in water
0900	N/A	N/A	54/55	NR	3	0	3	N/A		All seals observed logging in the water
0916	Setting up tarp on pier 55	1	55	3	2	2	0	N/A	0919, 0922	2 logging seals went underwater when tarp was Unfurled Being attached to scaffolding, both resurfaced intermittently similar to before disturbance.
0930	N/A	N/A	54/55	NR	1	0	1	N/A		In water
1000	N/A	N/A	54/55	NR	3	0	3	N/A		In Water
1030	N/A	N/A	54/55	NR	1	0	1	N/A		In water
1100	N/A	N/A	54/55	NR	1	0	1	N/A		In water
1130	N/A	N/A	54/55	NR	2	0	2	N/A		In Water
1200	N/A	N/A	54/55	NR	4	0	4	N/A		In water
1230	N/A	N/A	54/55	NR	7	0	7	N/A		In water
1300	N/A	N/A	54/55	NR	19	0	19	N/A		2 hauled, 2 partially hauled, 15 in water
1315	N/A	N/A	54/55	NR	19	0	19	N/A		4 hauled 5 partial, 10 in water

***DISTURBANCE SOURCE**: construction, motorboat, non-motor boat, vehicle, fisherman, human, researcher, bird, other. Add qqqdetails to **Comments**.

****SUBSITES**: Piers 54, 55, or Pier 49 (if boat day).

*****SEAL BEHAVIOR** (see back for definitions): NR=no response; 1=head alert; 2=movement; 3=flush into water. (Record Strongest Reaction)

Table 4-1: NOAA Fisheries Levels of Pinniped Behavioral Disturbance

Level	Type of Response	Definition
Level 1	Alert	Seal head orientation or brief movement in response to disturbance which may include turning head towards the disturbance, craning head and neck while holding the body rigid in a u-shaped position, changing from a lying to a sitting position, or brief movement of less than twice the animal's body length
Level 2 (recorded as take event)	Movement	Movements in response to the source of disturbance, ranging from short withdrawals at least twice the animal's body length to longer retreats over the beach, or if already moving a change of direction of greater than 90 degrees.
Level 3 (recorded as take event)	Flush	All retreats (flushes) to the water.

Notes:

¹ Only observations of disturbance Levels 2 and 3 will be recorded as take events to authorized species.

² Levels are based on the issued IHA for the Richmond-San Rafael Bridge (NOAA 2023a).

RICHMOND-SAN RAFAEL BRIDGE HARBOR SEAL DISTURBANCE SURVEY

Date: 11/15/2023 Year _____ Location: CASTRO ROCKS Observers: Elizabeth Janz & Kenneth Norberg

Time	Disturbance Source *	Number Of Source	Sub-Site**	Seal Behavior (level) ***	No. Before Disturbance (Total Seals) & Time of Last Count	No. Seals Reacted to Disturbance	No. Seals Remain on Site After Disturbance	Total No. Seals Flush Into Water	Seals Rehaul (Y/N) Time	Comments (details of disturbance source, seal reactions)
0800	Na	-	54/55	NR	2	N/A	2	N/a		All seals in water
0830	NA	-	54/55	NR	2	N/A	2	N/A		All seals in water
0900	NA	-	54/55	NR	2	N/A	2	N/A		All seals in water
0930	NA	-	54/55	NR	1	N/A	1	N/A		All seals in water
1000	NA	-	54/55	NR	2	N/A	2	N/A		All seals in water
1030	NA	-	54/55	NR	2	N/A	2	N/A		All seals in water
1100	NA	-	54/55	NR	1	N/A	1	N/A		All seals in water
1130	NA	-	54/55	NR	1	N/A	1	N/A		All seals in water
1200	NA	-	54/55	NR	2	N/A	2	N/A		All seals in water
1230	NA	-	54/55	NR	4	N/A	4	N/A		All seals in water
1259	NA	-	54/55	NR	4	N/A	4	N/A		All seals in water

***DISTURBANCE SOURCE:** construction, motorboat, non-motor boat, vehicle, fisherman, human, researcher, bird, other. Add details to **Comments**.

****SUBSITES:** Piers 54, 55, or Pier 49 (if boat day).

*****SEAL BEHAVIOR** (see back for definitions): NR=no response; 1=head alert; 2=movement; 3=flush into water. (Record Strongest Reaction)

Table 4-1: NOAA Fisheries Levels of Pinniped Behavioral Disturbance

Level	Type of Response	Definition
Level 1	Alert	Seal head orientation or brief movement in response to disturbance which may include turning head towards the disturbance, craning head and neck while holding the body rigid in a u-shaped position, changing from a lying to a sitting position, or brief movement of less than twice the animal's body length
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RICHMOND-SAN RAFAEL BRIDGE HARBOR SEAL DISTURBANCE SURVEY

Date: 11/17/2023 _____ Location: CASTRO ROCKS _____ Observers: Maria Tolymbek, Elizabeth Janz _____

Lowest Tide During Survey: 3.5 ft Time of Lowest Tide During Survey: 8:00 AM

Time	Disturbance Source *	Number Of Source	Sub-Site**	Seal Behavior (level) ***	No. Before Disturbance (Total Seals) & Time of Last Count	No. Adult/ Immature Seals Remain On site	No. pups Remain On site	Total No. Seals Flush Into Water	Seals Rehaul (Y/N) Time	Comments (details of disturbance source, seal reactions)
0800	Construction	1	57	NR	9	9		0	NA	Count, ongoing construction
0830	Construction	1	57	NR	8	8		0	NA	Count, ongoing construction
0900	Construction	1	57	NR	10	10		0	NA	Count, ongoing construction
0930	Construction	1	57	NR	8	8		0	NA	Count, ongoing construction
1000	Construction	1	57	NR	8	8		0	NA	Count, ongoing construction
1030	Construction	1	57	NR	5	5		0	NA	Count, ongoing construction
1100	Construction	1	57	NR	5	5		0	NA	Count, ongoing construction
1130	Construction	1	57	NR	5	5		0	NA	Count, ongoing construction
1200	Construction	1	57	NR	4	4		0	NA	Count, ongoing construction
1230	Construction	1	57	NR	3	3		0	NA	Count, ongoing construction
1245	Construction	1	57	NR	2	2		0	NA	Count, ongoing construction

***DISTURBANCE SOURCE:** construction, motorboat, non-motor boat, vehicle, fisherman, human, researcher, bird, other. Add details to **Comments**.

****SUBSITES:** Piers 54 & 55

*****SEAL BEHAVIOR** (see back for definitions): NR=no response; 1=head alert; 2=movement; 3=flush into water. (Record Strongest Reaction)

Revised October 2023

Table 4-1: NOAA Fisheries Levels of Pinniped Behavioral Disturbance

Level	Type of Response	Definition
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