
Marine Wildlife Protection Plan

Murray Street Bridge (# 36C-0108)

Seismic Retrofit Project

APRIL 2023

Murray Street Bridge
Santa Cruz Small Craft Harbor
City of Santa Cruz
Santa Cruz County, CA
Federal Project Number STPLX-5025 (048)

CITY OF SANTA CRUZ

809 Center Street
Santa Cruz, CA 95060

Prepared by:

DUDEK

725 Front Street #400
Santa Cruz, California 95060

INTENTIONALLY LEFT BLANK

1 Project Overview

1.1 Project Setting and Purpose

The Murray Street Bridge Seismic Retrofit Project (project) consists of a seismic retrofit of the existing Murray Street Bridge which spans the Santa Cruz Small Craft Harbor in Santa Cruz, California. The purpose of the project is to provide additional vertical support to the bridge and resistance to lateral seismic forces by installing additional pilings and supplemental structural elements. The project also includes minor modifications to replace deficient bridge barriers (widening shoulders to standard widths and replacement and improvement of sidewalks and railings).

The project includes both on-land and in-water construction activities. Construction will occur within harbor waters and on lands adjacent to the harbor. On-land construction activities include demolition, pile and anchor installation outside of the waterway, bridge construction, contractor staging, installation of a temporary bypass sewer line, and temporary removal. Relocation and replacement of multiple harbor facilities. In-water construction activities include removal and temporary relocation of docks to accommodate construction access; potential installation of piles for a construction trestle from the bridge; pile driving; transport of materials; and replacement of harbor docks upon completion of the bridge seismic retrofit project. All project-related construction activities that result in noise and vibration may result in incidental take (harassment) of marine mammals present in the area at the time of construction.

A Marine Mammal Monitoring Plan (MMMP) (City of Santa Cruz, Dudek 2022) was drafted to address marine mammal species potentially present within the construction area and identify mitigation measures for the avoidance/minimization of detrimental effects of the project on target marine mammals. The document was prepared in support of the City's Incidental Harassment Authorization (IHA) application submitted to the National Oceanic and Atmospheric Administration (NOAA) Fisheries. The marine wildlife protection measures (Section 2) specified in this Marine Wildlife Protection Plan (MWPP) replace those in the MMMP and IHA Application because they incorporate additional measures from Special Condition 5 of the California Coastal Commission's coastal development permit (CDP 3-22-0165), the proposed IHA (88 FR 12316-12334), the Streambed Alteration Agreement with the California Department of Fish and Wildlife (CDFW) (EPIMS-SCR-23133-R3), and informal consultation with US Fish & Wildlife Service (USFWS) to maximize the project's protection of these species. This document attempts to combine the various overlapping measures from the above sources related to marine mammals and reconciles conflicts or discrepancies between the various agencies to ensure protection of marine mammals and feasible implementation of requirements.

1.2 Target Marine Wildlife

Three marine mammals are known to occur, at least occasionally, within the Santa Cruz Small Craft Harbor (Harbor): southern sea otter (*Enhydra lutris nereis*), harbor seal (*Phoca vitulina richardii*); and the California sea lion (*Zalophus californianus*). All marine mammals are protected under the Marine Mammal Protection Act, and the southern sea otter has additional protection under the federal Endangered Species Act. The docks and other features within the Harbor are haul-out sites for harbor seal and California sea lion. The open water of the project site and surrounding vicinity provides habitat for the southern sea otter, the harbor seal, and California sea lion.

Additional marine mammal species including bottlenose dolphins (*Tursiops truncatus*) and harbor porpoise (*Phocoena phocoena*) may occur in the project vicinity towards the mouth of the harbor, however surveys have not detected these species within the proposed buffer zone and both species appear to have stable or increasing population trends.

1.2.1 California Sea Lion

California sea lions are not federally-listed under the Endangered Species Act but receive protection under the Marine Mammal Protection Act. They occur from California to Canada. California sea lions are known to occur within the Harbor, especially near the UCSC dock and the docks of the west harbor opposite the small vessel boat yard. The species uses the Harbor for foraging and haul-out activities, most often when fish are abundant in the area. The Harbor does not provide mating or breeding habitat or other habitat of a similar ecological significance for the California sea lion.

1.2.2 Harbor Seal

Harbor seals are not federally-listed under the Endangered Species Act but receive protection under the Marine Mammal Protection Act. They occur from Mexico to Alaska. Harbor seals are known to occur in the Harbor, using the open water for foraging and the docks for haul-out activities. The numbers of harbor seals occupying the harbor are likely to be highest during late summer, fall and winter, outside of breeding (March - May) and molting (June - July) seasons. The species is especially sensitive to disturbance, flushing readily from haul-out locations as a result of human activity. The Harbor does not provide mating or breeding habitat or other habitat of a similar ecological significance for harbor seals.

1.2.3 Southern Sea Otter

Southern sea otter is federally-listed as Threatened under the Endangered Species Act. The species occurs from Santa Barbara to San Mateo County in California. Otters occur in the kelp forests just off the coast, where separate groupings of females and young, territorial males, and non-territorial males breed, forage, and groom in close proximity to the Harbor. The southern sea otter appears to be an incidental visitor to the Santa Cruz Small Craft Harbor. The Harbor does not provide mating or breeding habitat for the species. According to consultation with USFWS (2022), a USFWS Incidental Harassment Authorization (IHA) and/or incidental take permit under ESA is not required for sea otter provided the City employs the following measures during project construction: establish a stop-work zone at the 160 decibel isopleth for underwater noise and monitor to ensure no sea otters enter the area within that 160-decibel isopleth during in-water work, and employ standard construction best practices to ensure oil or other fluids associated with heavy machinery do not enter the marine environment. These are described in more detail in Section 2.

2 Marine Wildlife Protection Measures

To avoid or minimize the potential construction-related effects to target marine mammals at or near the Murray Street Bridge Seismic Retrofit site avoidance/minimization and other mitigation measures will be implemented in accordance with the approved Marine Mammal Monitoring Plan (City of Santa Cruz 2022), Special Condition 5 in

the proposed project's Coastal Development Permit (CDP) through the California Coastal Commission, and the proposed IHA (88 FR 12316-12334). These measures are detailed below and generally include:

- Limitation on timing of pile driving;
- Pre-construction monitoring and hydroacoustic monitoring during construction; and
- Establishment of a buffer and monitoring of noise levels.

The following measures will be implemented to avoid or minimize potential project-related effects to southern sea otters, harbor seals, California sea lions and other sensitive marine wildlife species:

1. Timing of Pile Driving. In-water pile-driving activities within Harbor waters will be limited to the period of July 1 to mid-November to protect federally-listed salmonids, unless otherwise permitted by NOAA Fisheries.
2. Impact Hammers. Impact hammers will not be used except in cases where vibratory hammers are not a feasible option, at the discretion of the construction contractor. The construction contractor shall install bubble curtains at all piles driven by impact hammers to reduce sound levels for fish and/or marine mammals that may be present in the area and undetected. If use of an impact hammer results in exceedance of sound thresholds, impact pile driving shall cease and the construction contractor shall revise the sound attenuation method through modifications such as changing bubble density, bubble size, or the number of bubble curtain rings employed. The construction contractor shall conduct additional sound monitoring of five piles or two days to demonstrate that compliance has been achieved, and the modified methods shall be used for the remainder of pile driving.
3. Soft Starts. At the commencement of any impact pile-driving activities, or after a break in impact hammer driving of 30 minutes or more, a soft start procedure shall be implemented. The "soft start" shall consist of an initial set of 3 strikes made by the impact hammer at 40 percent energy, followed by a one-minute waiting period, then two subsequent three-strike sets, before initiating continuous driving. The pile driver shall also employ sound dampening techniques (i.e., wooden blocks, pile cushions, and/or caps) during all impact hammer pile-driving activities. If vibratory pile-driving is used, a soft start procedure shall also be used, but would constitute a gradual ramp up of vibratory intensity as follows: An initial one-minute period of vibratory driving at 40 percent energy, followed by a one-minute waiting period, followed by a two-minute period of vibratory driving at 40 percent energy before commencing vibratory driving at full energy. The purpose of the soft-start procedure is to allow marine mammals a chance to leave the site prior to the impact hammer operating at full capacity.
4. Marine Wildlife Monitors. One or more qualified marine wildlife monitors (MWM) (equivalent to a Protected Species Observer [PSO] as required under the IHA), approved by NOAA Fisheries and California Coastal Commission Executive Director, will be assigned to the project as required depending on the ability for MWMs to observe the full exclusion area. MWMs shall be independent (not construction personnel), be dedicated to observing marine wildlife, and have no other assigned tasks during monitoring periods.

Any MWMs will be qualified wildlife biologists with experience observing marine wildlife and differentiating normal behavior from signs of distress or injury. At least one MWM must have prior experience performing these duties during construction pursuant to a NOAA Fisheries-issued IHA. Additional MWMs can

substitute education or training for this experience. If three or more MWMs are required on the project site, a lead MWM with prior experience working with marine mammals during construction shall be designated.

All MWMs shall have the following qualifications: a) ability to conduct field observations and collect data according to assigned protocols; b) experience or training in the field identification of marine mammals, including the identification of behaviors; c) sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations; d) writing skills sufficient to prepare a report of observations, including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior; and e) ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

5. Pre-Construction Monitoring. Prior to initiation of in-water construction, a qualified MWM (refer to Measure 4) will conduct monitoring of marine mammals to update existing information on the animals' occurrence in and near the project area, their movement patterns, and their use of any haul-out sites. This preconstruction monitoring will take place at least five days prior to the start of in-water construction and will cover a period of at least one week (with at least 5 days of actual observation over a period of 4 hours each day), 2 hours in the morning at the time that construction activities would begin and 2 hours at midday, when construction activities would resume after a lunch break.
6. Pre-Construction Removal of Haul-out Sites. All known and potential haul-out sites that occur in the construction work area shall be removed, preferably to a near-by location outside of the work area prior to construction. These sites could include floating docks (i.e., Dock FF) rubber docks, or boats, such as those used by UCSC.
7. Pre-Construction Workers Training. Prior to in-water construction, the approved MWM (Measure 4) will conduct a worker's training to instruct construction crews regarding the status and sensitivity of the target species in the area and the actions to be taken to avoid or minimize impacts in the event of a target species entering the in-water work area. New personnel joining during the project must be trained prior to commencing work.
8. In-Water Construction Biological Monitoring. Each day, before pile driving (or other loud in-water construction activity) begins, the MWM(s) (Measure 4) will survey for marine mammals for a minimum of 30 minutes within the shutdown zone (a 10-meter/32.8-foot radius area surrounding each work site where construction could cause physical disturbance to a marine mammal) and the exclusion zones (see Measure 10 for preliminary exclusion zones, or as determined through the approved Hydroacoustic Testing Plan as described under Measure 11)¹. The MWM(s) will also scan for target species throughout the shutdown zone and exclusion zones throughout in-water project activities, as elaborated below. At the daily conclusion of pile installation, the MWM will also conduct 30 minutes of post-pile driving activity and clearance monitoring of the exclusion zones before leaving the site, noting changes in marine mammal activity or presence after pile installation activities stop.

¹ The CDFW Streambed Alteration Agreement (EPIMS-SCR-23133-R3) stipulates pre-construction monitoring within a 500-foot buffer zone; given that the exclusion zone is larger than the 500-foot buffer, we have opted to include the larger survey area.

The qualified MWM(s) will be present during all in-water construction activities to search for target marine mammal species and halt project activities that could result in injury or mortality to these species [an estimated 8 hour/day (or for the duration of in-water construction activities each day) during the estimated 10 months of in-water activities plus an additional 16 days of on-land pile driving]. MWMs shall avoid direct physical interaction with marine mammals during construction activity. The MWM(s) should not be assigned duties apart from observing marine mammals to ensure optimal detection probability for wildlife. The MWM(s) shall have all appropriate safety and monitoring equipment (e.g. binoculars) adequate to conduct monitoring activities, and at least one MWM shall be located at an effective vantage point to observe the exclusion zone (with particular focus on the shutdown zone) without obstruction. Multiple MWMs may be employed during periods of low or obstructed visibility and to ensure the entirety of the shutdown and exclusion zones are monitored.

9. Construction Halts. Construction halts will be enacted immediately upon detection of target marine wildlife within the exclusion zone by notifying the equipment operator, and City staff and/or the Construction Manager shall be notified. Pile driving will be delayed until the marine mammal(s) has moved beyond the exclusion zone, verified by visual confirmation by the MWM or lack of visual sighting within the exclusion zone for 30 minutes² following the last sighting. The monitor will record the species, numbers and behaviors of any animal(s) entering the exclusion zone after commencement of work and notify the City of Santa Cruz within 48 hours. If the shutdown zone is not entirely visible (e.g., due to darkness, fog, etc.), pile driving shall not commence or continue to proceed (if it is underway) until visual conditions have improved and the entirety of the shutdown zone is visible to the MWM(s). A halt will also be enacted if a marine mammal species for which the IHA is not authorized, or an authorized species that has surpassed the take allowance is observed within the exclusion zones.
10. Preliminary Exclusion Zones. During hydroacoustic testing in accordance with an approved Hydroacoustic Testing Plan, the following minimum exclusion zones will be implemented for marine mammals for installation of piles:
 - a. During vibratory or impact hammer³ installation of concrete or steel piles, a 410-meter (1,345-foot) exclusion zone for all marine mammals other than southern sea otters.
 - b. During all pile installation regardless of pile type or installation methods, a 63-meter (207-foot) exclusion zone for southern sea otters.

An additional non-pile driving exclusion zone will apply to in-water construction activities that do not result in loud or impulsive sounds, such as the use of heavy equipment to construct bridge abutments. For these activities, a 50-foot radius non-pile driving exclusion zone will be established.

These exclusion zones will be visibly flagged on the banks of the harbor to facilitate construction monitoring efforts. Each day, prior to the start of construction activities, the approved MWM(s) will survey the shutdown zone and exclusion zones for marine mammals.

² The IHA, Streambed Alteration Agreement, and approved MMMP stipulate a 15-minute wait time, which conflicts with the California Coastal Commission permit. Given the conflict, the more protective option of the two (30 minutes) is specified.

³ The CDP Condition 5b applies this preliminary exclusion zone only to installation by vibratory methods. Since installation through use of impact hammers remains a possibility, this exclusion zone has been revised to include both methods to ensure protection of marine mammal species during hydroacoustic testing. The CDP Condition 5b also includes a different exclusion zone for impact hammer installation of timber piles, which is not proposed under the project and has not been included here.

11. Exclusion Zone Changes – Acoustical Monitoring. Acoustical monitoring will be conducted during pile driving activities according to the Hydroacoustic Testing Plan (under separate cover) to determine sound generation and propagation within the Harbor. The preliminary exclusion zone for installation of concrete and steel piles described under Measure 10 (410 meters) may be reduced or increased based on a measurement of the distance that the 160 decibel (db) sound pressure travels underwater and/or through the air. This shall be determined using approved in-water and in-air acoustic monitoring devices operated in accordance with the Hydroacoustic Testing Plan approved by NOAA Fisheries and the CCC Executive Director. The City of Santa Cruz shall notify NOAA Fisheries and the CCC Executive Director in writing of a proposed change in the exclusion zone radius, and will not adjust the exclusion zone without approval from these entities. An approved MWM will operate the monitoring devices during pile driving and any other loud in-water construction activities, such as use of hydraulic tools. The devices, placed at the edge of the exclusion zone, will produce acoustic data for the duration of noise-producing activities. An alarm would alert the monitor to sound levels approaching 160 db. If the 160 db threshold is exceeded at the current approved exclusion zone, the exclusion zone will be increased to the distance along the edges of the harbor where the in-water sound pressure drops below 160 db. This would be a dynamic buffer and would be expected to change as project activities change (e.g., different pile types or sizes are driven or different methods are used), potentially on a daily or weekly basis. The exclusion zone may be reduced or increased based the results of the approved Hydroacoustic Testing Plan (under separate cover), but will not exceed the 160 dB isopleth.
12. Underwater Acoustical Monitoring – Use of Vibratory Pile Driving Equipment. The contractor will be allowed to use vibratory driving if the contractor can demonstrate through implementation of the Hydroacoustic Testing Plan that the 120 dB vibratory threshold will not be exceeded within 1,000 meters (3,281 feet) of pile driving. If this cannot be achieved, the contractor will then be required to use impact driving only and limit measured sound levels to 160 dB or less at 1,000 meters. The distance from the bridge to the breakwater is about 780 meters (2,559 feet). This means that the impact distance for either vibratory or impact driving has the potential to extend about 220 meters (722 feet) into Monterey Bay. These distances do not represent exclusion zones intended to prevent Level A harassment (those are described as part of Measures 10 and 11), but rather distances beyond which Level B harassment could occur.
13. Disturbance Prohibition. No intentional hazing (e.g., disturbance, noise) will be used on eastern Pacific harbor seals, California sea lions, southern sea otters, or other state- or federally-listed threatened or endangered species. The City of Santa Cruz will contact USFWS and NOAA Fisheries as appropriate to determine the best approach for exclusion of the target species from the in-water work area and whether any changes to this wildlife protection plan may be required.
14. Construction Monitoring Records. The approved MWM will keep a record of all observations of the target species. The record for each observation will include: a) name and location of the MWM making the observation; b) date and time of sighting; c) species identification and estimated number of marine mammals observed (min/max/best estimate); d) age and sex class of each marine mammal (if possible); e) activity, distance relative to the work site, and direction of movement; f) ongoing project activities at the time of observation; g) responses of target species to project activities; h) any wildlife behavior patterns or circumstances observed (project- or non-project related), including correlation of behavior to project-related activities (if relevant); and g) number of marine mammals observed in the shutdown and exclusion zones;

and h) detailed information about implementation of any mitigation (e.g., shutdowns and delays), a description of specified actions that ensued, and resulting changes in behavior of the animal(s), if any.

Regardless of whether marine mammals are detected, daily reports should be logged which include: a) the date and time that monitored pile driving activity begins and ends; b) pile driving activities (e.g., the number and type of piles being driven and their location on the wharf, the type of hammer being used (i.e. impact or vibratory) occurring during each observation period); c) weather parameters (e.g., wind speed and direction, percent sky cover, visibility, precipitation, etc.); d) ocean conditions (e.g., water level fluctuation, tide, etc.); and e) a description of other human activities in the area (e.g., fishing, diving, swimming, etc.).

Summary monitoring reports will be submitted to the City of Santa Cruz, who will forward reports to NOAA Fisheries by December 31 of each year that in-water construction activities take place. Additionally, a summary report including copies of MWM logs shall be submitted to the City when mitigation measures such as halt or delay of pile-driving activities are implemented 5 or more times during a 7-day period, who will submit the report to the CCC Executive Director.

A draft marine mammal monitoring report will be submitted to NOAA Fisheries within 90 days after the completion of pile driving activities for each IHA, or 60 days prior to a requested date of issuance of any future IHAs for the project, or other projects at the same location, whichever comes first. The report will include all of the information specified above for recorded observations of target species. If no comments are received from NOAA Fisheries within 30 days, the draft report would be considered final. If comments are received, a final report addressing NOAA Fisheries' comments would be required to be submitted within 30 days after receipt of comments. All MWM datasheets and/or raw sighting data would be submitted with the draft marine mammal report. Reports shall be submitted to (PR.ITP.MonitoringReports@noaa.gov).

A final report summarizing the results of monitoring activities shall be submitted to the City of Santa Cruz following completion of all construction activities, and the City shall submit final report to California Coastal Commission and NOAA Fisheries. The report shall include daily log observations from MWMs, descriptions of any project delays or cessation of operations due to the presence in the project area of marine wildlife subject to protection, and an evaluation of monitoring protocol effectiveness all determined by the MWM(s).

15. Notification of Injury. In the event that the MWM determines that a marine mammal has been injured by project activities, all work shall cease, and the City of Santa Cruz shall be notified. The City of Santa Cruz will consult with NOAA Fisheries and USFWS depending on the species affected to determine if additional measures are necessary. The City of Santa Cruz would report the incident to the Office of Protected Resources (OPR), NOAA Fisheries (PR.ITP.MonitoringReports@noaa.gov) and to the West Coast regional stranding network (866-767-6114) as soon as feasible. If the death or injury was clearly caused by the specified activity, the City of Santa Cruz must immediately cease the activities until NOAA Fisheries OPR is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the IHAs. The report would include the following information: a) time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable); b) species identification (if known) or description of the animal(s) involved; c) condition of the animal(s) (including carcass condition if the animal is dead); d) observed behaviors of the animal(s), if alive; e) if available, photographs or video footage of the animal(s); and f) general circumstances under which the animal was discovered. The City of Santa Cruz would not resume their activities until notified by NOAA Fisheries.

16. Post-Construction Replacement of Haul-out Areas. All known and potential haul-out sites that were removed from the work area prior to construction will be returned to their approximate location.
17. Post-Construction Monitoring. Post-construction monitoring will be conducted to determine if harbor seals resume their use of Dock F and FF as primary haul-out sites. NOAA Fisheries may require additional project conditions, to be applied depending on the outcome of post-construction monitoring.

The above-listed measures shall be implemented during all project-related construction activities.

3 References

- 88 FR 12316-12334. Notice of proposed incidental harassment authorization: “Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Construction Activities Associated With the Murray St. Bridge Seismic Retrofit Project in Santa Cruz, California.” February 21, 2023.
- City of Santa Cruz. 2022. *Marine Mammal Monitoring Plan, Murray Street Bridge ((# 36C-0108) Seismic Retrofit Project*. Prepared by Dudek. Santa Cruz, California: April 2022.
- USFWS. 2022. Email from Lilian Carswell, Southern Sea Otter Recovery and Marine Conservation Coordinator, USFWS, to Stephanie Strelow, Principal, Dudek. June 24.