

RINCON ISLAND CAUSEWAY MARINE BIOLOGICAL SURVEY REPORT

RINCON PHASE 2 DECOMMISSIONING PROJECT VENTURA COUNTY, CALIFORNIA

Project No. 2002-7861

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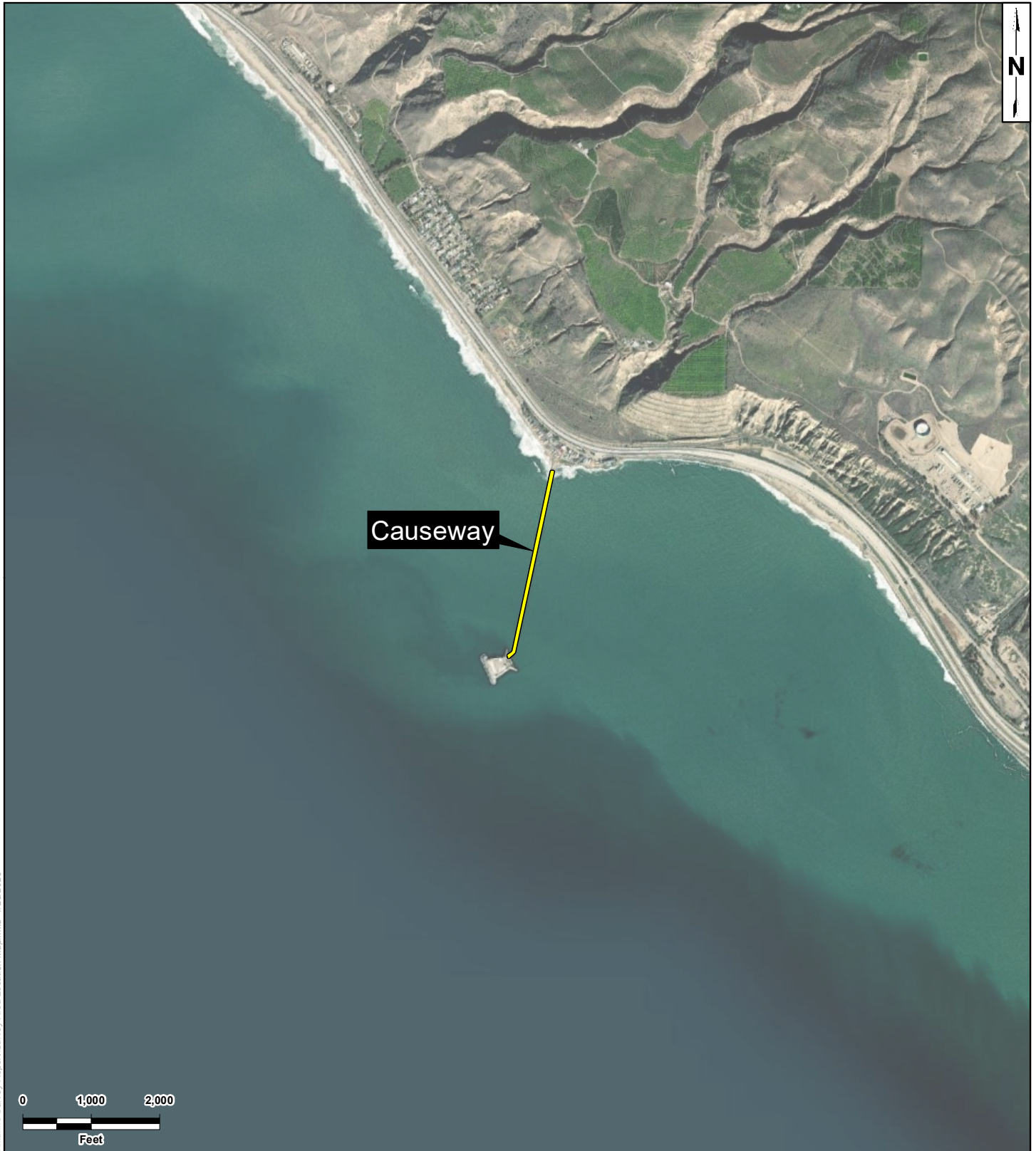
1.0 INTRODUCTION

On behalf of the California State Lands Commission (CSLC), Padre Associates, Inc. (Padre) has prepared this Rincon Island Causeway Marine Biological Survey Report (Report) summarizing the results of marine biological dive surveys conducted on the Rincon Island causeway (causeway) pilings and adjacent seafloor located offshore Punta Gorda in Ventura, California (Study Area) (Figure 1-1). The Report describes the survey methods and associated observations completed during the survey.

The purpose of the marine biological survey was to document the type and location of marine vegetation, macro-epifauna, and fish associated with the causeway pilings and nearby natural rock reef area within the Study Area and to supplement previous biological surveys around Rincon Island.

1.1 PURPOSE AND NEED

In support of the Rincon Phase 2 Decommissioning Project (Project), a marine biological study was conducted of the Rincon Island causeway pilings and any adjacent natural reef habitat. This Report is meant to supplement the results of the University of California, Santa Barbara (UCSB) 2021 Characterization of Marine Habitat and Associated Species at Rincon Island, which did not include the causeway as part of the study area.



LEGEND:

 Study Area

MAP EXTENT:



Source: NOAA Online Nautical Chart Basemap, Esri Online Topo Basemap
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
 Notes: This map was created for informational and display purposes only.

padre
 associates, inc.
 ENGINEERS, GEOLOGISTS &
 ENVIRONMENTAL SCIENTISTS

PROJECT NAME: RINCON ISLAND DECOMMISSIONING VENTURA COUNTY, CA	
PROJECT NUMBER: 2002-7861	DATE: January 2023

**SURVEY AREA
LOCATION MAP**

**FIGURE
1-1**

2.0 PERSONNEL AND EQUIPMENT

The Project dive team included scientific divers Ms. Michaela Craighead and Ms. Natalie Goetz (Padre Marine Biologists). The Project divers are certified through the Professional Association of Dive Instructors (PADI), National Association of Underwater Instructors (NAUI), and the American Academy of Underwater Sciences (AAUS).

The dive survey was conducted from the dive vessel D/V *Siren*, a ridged inflatable boat owned and operated by Phillip Sammet. The vessel was mobilized in Santa Barbara Harbor and transited to the Study Area on the morning of the survey.

Divers were equipped with open circuit Self-Contained Underwater Breathing Apparatus (SCUBA) using steel 72 cubic-foot cylinders pressurized to approximately 2,000 pounds per square inch (psi) and equipped with separate first and second stage regulators. Divers used a GoPro© camera to record underwater video and photographs and were equipped with underwater lights and slates for data collection.

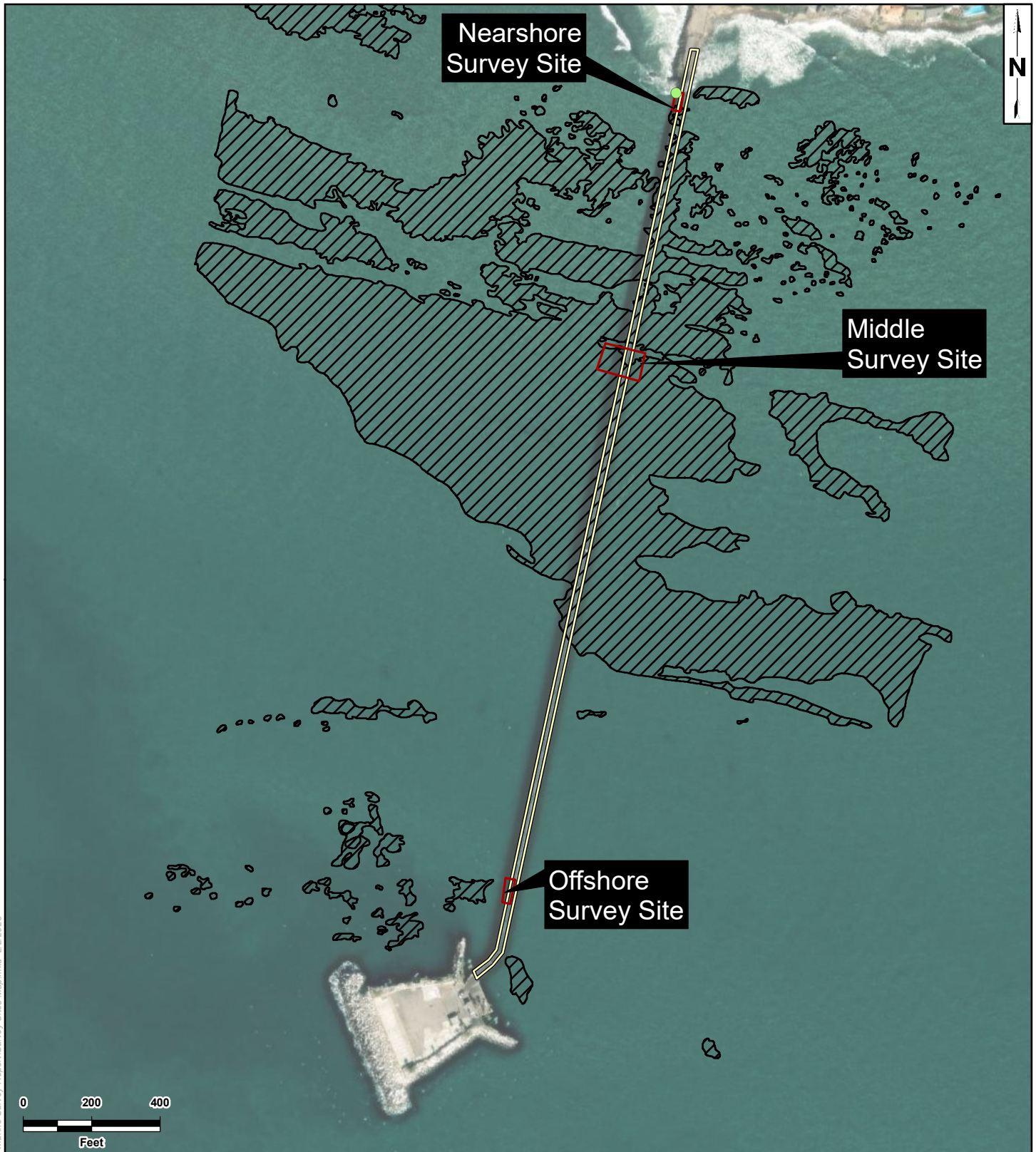
3.0 METHODOLOGY

On November 17, 2022, Padre marine biologists conducted a qualitative characterization survey of the intertidal and subtidal habitats on pilings and seafloor under the Rincon Island causeway. The survey consisted of observational data collection in three individual survey sites within the offshore, middle, and nearshore portions of the causeway and also included the adjacent portion of the rocky reef outcropping that bisects the causeway (Figure 3-1). Survey depths ranged from approximately 5 to 40 feet. The three spatially separate sites were identified to provide a broad representation of the various species communities and habitats present under the causeway.

Twelve pilings in total were surveyed: four offshore pilings closest to Rincon Island (Offshore Survey Site), four pilings approximately halfway along the causeway and intersecting with known areas of rocky seafloor (Middle Survey Site), and four nearshore pilings in the surf zone (Nearshore Survey Site). At the Middle Survey Site, the divers swam approximately 50 feet on either side of the causeway to document habitat and species composition within the natural rock outcropping area. Divers swam along paths of opportunity using flashlights to inspect crevices and ensure 100 percent coverage of the Study Area

During each dive, the divers entered the water from the dive vessel and descended the subject piling. Vertical transects were conducted, beginning at the base of the piling and continuing up to the surface. Divers worked in tandem to cover the survey site, swimming on either side of each pre-determined piling until all four pilings at each survey site were surveyed. Fish species were recorded if they were seen within an 8-foot radius from the piling (maximum limit of visibility at each survey site).

All observation data was recorded on pre-printed data sheets and video footage was collected on a GoPro© video camera. This footage was used to produce still images which have been included as Appendix B – Survey Site Photos.



LEGEND:

- Surfgrass
 Rocky Outcropping (Etrac 2021)
 Survey Site
 Study Area

MAP EXTENT:



Source: Esri Online Imagery Basemap
 Etrac. 2021. Rincon Island Decommissioning Multibeam Survey. Longitude 123, Inc. March 2021
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
 Notes: This map was created for informational and display purposes only.

4.0 RESULTS

The following section details the results of dive surveys conducted on November 17, 2022. The causeway and adjacent rocky outcropping were surveyed in three separate dives, totaling in 124 minutes of dive time. Diver biologists identified habitat types and locations of marine plants, macro-epifauna, and fish associated with various depths along the causeway pilings and the rocky outcropping adjacent to the pilings. Although surveys were not conducted within the eelgrass growing season, eelgrass beds were not observed anywhere in the Survey Area. Please see Appendix A for a complete listing of the species observed during the survey.

Ocean conditions during the surveys consisted of clear skies, with calm winds in the morning (one to two miles per hour [mph]) increasing to eight mph in the afternoon, and a swell height of 0 to 2 feet. The tide was falling from 4.3 feet at 05:43 to 2.9 feet at 11:21 and rising to a 4.7-foot tide at 16:15. The water temperature at depth was 59 degrees Fahrenheit and underwater visibility ranged from 5 to 8 feet; and was generally highest at the surface and decreased as depth increased.

4.1 OFFSHORE SURVEY SITE

Four pilings were surveyed within the Offshore Survey Site in a maximum water depth of 40 feet. In general, epifauna communities were similar among each piling surveyed within the Offshore Survey Site. The seafloor immediately surrounding the pilings consisted of a soft sandy bottom with scattered shell debris. Epifauna and algae species that characterized the piling community near the seafloor within the 40-foot-depth range included golden gorgonians (*Muricea californica*), warty sea cucumber (*Apostichopus parvimensis*), sponges (*Porifera* sp.), stalked tunicate (*Styela montereyensis*), sessile anemones (*Anthopleura sola*), hermit crabs (*Pagurus* sp.), red-rust bryozoans (*Watersipora* sp.), and rock scallop (*Crassodoma gigantea*). Within the 15 to 30-foot-depth range, epifauna species such as feather duster worms (*Eudistylia polymorpha*), ochre sea stars (*Pisaster ochraceus*), golden and brown gorgonian (*Muricea fruticose*), acorn barnacles (*Pollicipes polymerus*) and rock scallop were also identified. Within the five-to-ten-foot range, the invertebrate community was dominated by California mussels (*Mytilus californianus*), gooseneck barnacles (*Pollicipes polymerus*), California barnacles (*Megabalanus californicus*), acorn barnacles, rock scallops, and feather duster worms. Strawberry anemone (*Corynactis californica*) and brown bryozoan (*Bugula* sp.) were observed at all water depths and on all pilings at the Offshore Survey Site.

Fish observed in the Offshore Survey Site included kelp bass (*Paralabrax clathratus*) swimming near the piling, barred sand bass (*Paralabrax nebulifer*) near the seafloor, and topsmelt silverside (*Atherinops affinis*) and sargo (*Diplodus sargus*) throughout the water column. In addition, cabezon (*Scorpaenichthys marmoratus*) were observed using dense bryozoans on the piling for refuge.

4.2 MIDDLE SURVEY SITE

The Middle Survey Site included four causeway pilings, as well as an adjacent natural rocky outcropping. The survey of the rocky outcropping allowed for a comparison with naturally occurring fish and attached epifauna communities in the area.

4.2.1 Pilings

Four pilings were surveyed within the Middle Survey Site in a maximum water depth of 29 feet. In general, epifauna communities were similar among each piling surveyed within the Middle Survey Site. The seafloor immediately surrounding the pilings consisted of sand with scattered shell debris and small to medium sized cobble within the larger rocky outcropping (see Section 4.2.1). Epifauna and algae species that characterized the piling community near the seafloor, within the 29-foot depth range, included brown and golden gorgonians, sessile anemone, warty cucumber, and bat stars (*Patiria miniate*). As depth decreased, there was a noticeable increase of species like red-rust bryozoan, gooseneck, acorn and California barnacles, and California mussels. Within these mussel and barnacle beds, two, giant spined sea stars (*Pisaster giganteus*) were observed on two separate pilings, both measuring approximately 1 foot in diameter. Fish observed within the Middle Survey Site were primarily associated with rocky outcropping and are discussed below.

4.2.2 Rocky Outcropping

To survey the rocky outcropping in the Middle Survey Site, divers swam on approximately 50 feet of either side of the causeway to characterize the rocky habitats at the Middle Survey Site. Figure 4-1 illustrates the extent of the rocky outcropping that extends west of the survey site.

Macroinvertebrates within the rocky outcropping consisted of dense patches of bryozoans (*Watersipora* sp. and *Bulgaria* sp.), stalked tunicates, stripped sea slug (*Navanax inermis*), sponges, golden and brown gorgonians, purple gorgonians (*Egorgia rubens*), limpets (*Lottia* sp.), giant keyhole limpet (*Megathura crenulate*), bat stars, kellet's whelk (*Kelletia kelletii*), ochre sea stars, rock scallops, giant spined sea stars, warty sea cucumbers, chitons (*polyplacophora* spp.) and Spanish shawl nudibranchs (*Flabellina iodine*). An occasional solitary anemone and purple sea urchin (*Strongylocentrotus purpuratus*) were observed underneath and between bedrock. Extensive mussel beds were present at a depth of approximately 26 feet. In addition, numerous California spiny lobster (*Panulirus interruptus*), and a horn shark (*Heterodontus francisci*) were observed within high relief (3 to 5 feet) rock crevices.

Giant kelp was sparse throughout the middle survey site but was primarily attached to rocky substrate and not directly attached to with the causeway pilings. Two individual kelp plants (holdfasts) were counted within the survey area, in addition to several small kelp recruits that were attached to the natural bedrock. Various types of red and brown algae (Genus *Undaria* and classes Phaeophyceae and Florideophyceae, respectively) were also observed throughout the rock outcropping.

Although various fish species were observed throughout the Study Area, the water column above the rock outcropping yielded the highest diversity and abundance of fish species. Observed species within this site included black rockfish (*Sebastes mealops*), kelp rockfish (*Sebastes atrovirens*), cabezon, kelp bass, barred sand bass, topsmelt silverside, painted greenling (*Oxylebius pictus*), kelp greenling (*Hexagrammos decagrammus*), sheephead (*Semicossyphus pulcher*), garibaldi (*Hypsypops rubicundus*), blacksmith (*Chromis punctipinnis*), opaleye (*Girella nigricans*), and sargo.

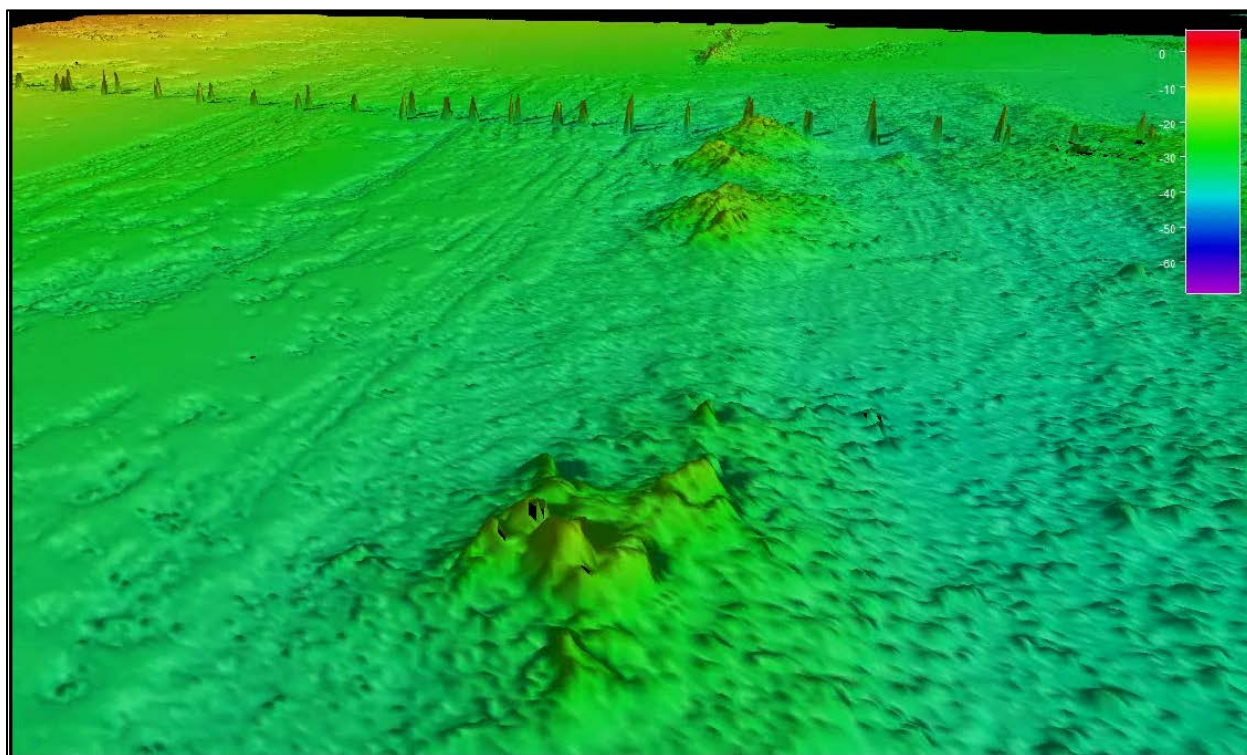


Figure 4-1. Bathymetry at Middle Survey Site with Surrounding Rock and Boulder Fields West of Rincon Island Causeway (Etrac, 2021)

4.3 NEARSHORE SURVEY SITE

Four pilings were surveyed within the Nearshore Survey Site with a maximum survey depth of 15 feet. The seafloor immediately surrounding the nearshore pilings included 1 to 2-inch sand waves with 1 to 2-foot circular depressions surrounding the base of each piling, presumably resulting from dynamic ocean conditions and currents of the surf zone at the Nearshore Survey Site. Clusters of long metal and wooden debris were also present and were colonized by sessile invertebrates (bryozoans and tunicates) and low growing red and brown algae. Calm seas allowed divers to survey into water depths of approximately 5 feet. Due to the shallow and inshore nature of the pilings, species composition remained relatively uniform throughout the water column and was characterized primarily by red-rust bryozoan, brown bryozoan, gooseneck, acorn and California barnacles, California mussels, tube worms, stalked tunicates and sponges. Less abundant species included solitary anemones and two sea star species, ochre star and giant spined sea star, which were present on individual pilings. Kelp and other marine flora present within the Nearshore Survey Site included an approximately 1 square meter patch of surfgrass (*Phyllospadix torreyi*), feather boa kelp (*Egregia menziesii*), sea lettuce (*Ulva spp.*), Laminaria (*Laminaria sp.*) and Turkish towel (*Chondracanthus exasperates*). Fish species were sparse in the Nearshore Survey Site; however, topsmelt silversides were observed near the water's surface.

5.0 DISCUSSION

Padre marine biologists completed a marine biological survey to identify the habitat types, marine vegetation, macro-epifauna and fish associated with the Rincon Island causeway pilings and adjacent seafloor. The causeway was built on top of several substrate types including sand, mixed cobble, boulders and rocky outcroppings. The presence of hard substrates, such as the pilings and natural rock, in an area of seafloor with primarily sand provides an attachment substrate for algae and sessile invertebrates in an area where they would otherwise not occur. In addition, the habitat complexity of the natural rock outcroppings provides substrate variability under the causeway that increases the diversity of the associated species in the Study Area. Algal species and macro-epifauna observed during dive surveys were typical of both manmade structures and natural reefs in southern California marine waters within similar depth ranges and with similar substrate types. Many of the same species observed during the surveys were reported during the previous surveys of Rincon Island (UCSB, 2021). While some species were observed within a narrow depth range, the majority of species were observed throughout the Study Area. The following sections provide a discussion of the significance of each survey site in relation to the overall causeway habitat and the natural habitats that occur in the Study Area.

5.1 OFFSHORE SURVEY SITE

Water depths at the Offshore Survey Site support several trophic levels with larger fish and keystone predators (giant spined and ochre sea stars) occurring on the pilings; however, the piling habitat is fairly simple, in terms of rugosity, and lacks crevices or holes found on natural reefs which are known to support greater overall species diversity. So, although the pilings are covered with dense aggregations of algae and sessile invertebrates, primarily bryozoans, the overall species diversity at the Offshore Survey Site is low in comparison to the Middle Survey Site. Lastly, the pilings at the Offshore Survey Site are located in sandy seafloor where, again, algae and sessile invertebrates are mostly absent due to a lack of complexity and variable substrates.

5.2 MIDDLE SURVEY SITE

Padre marine biologists observed a greater abundance and diversity of nearshore reef species at the Middle Survey Site. Species found directly attached to the pilings in the Middle Survey Site did not differ significantly from the species found on the Offshore Survey Site pilings; therefore, the qualitative increase in diversity is likely due to the presence of natural rock substrates as well as sufficient water depth to support more trophic levels than shallow water depths. The rock reef species and community observed at the Middle Survey Site are likely to occur in other areas of rocky outcropping that are present in the Study Area (Etrac 2021; Figure 3-1). Nearshore rock reef habitat has the potential to support suitable habitat for abalone or other protected species; however, no special-status species were observed during the surveys. The rocky outcropping habitat at the Middle Survey Site did support young kelp and other algae recruits which, as it matures, will contribute to Essential Fish Habitat (EFH) in the region.

5.3 NEARSHORE SURVEY SITE

The algal and invertebrate community observed on the Nearshore Survey Site pilings was characterized by similar species as the Offshore and Middle Survey Site; however, the Nearshore

Survey Site was less abundant due to its location within the surf zone where relatively few specialized species can live in the dynamic sand habitat. The Nearshore Survey Site supported a small area of surfgrass within the surf zone where the revetement meets the causeway; however, no eelgrass species were observed in the Nearshore Survey Site or anywhere else in the Study Area.

5.4 CONCLUSION

The piling habitats had similar species compositions at all survey sites with some variability due to water depth. In contrast, the rock outcropping area at the Middle Survey Site provided greater abundance and diversity for both fish and attached epifauna species. The causeway was built through the middle of an expanse of rock outcropping, so species associated with the Middle Survey Site are also utilizing the greater rocky reef area, and the lack of the same diversity and abundance in other survey sites suggests that use of the piling habitat is circumstantial, and the pilings do not provide uniquely important habitat.

While the causeway pilings do provide additional hard substrate and vertical structure in the Study Area, the rocky outcropping offers natural complexity and substrate variability which provides the primary value to the Study Area and regional marine environment.

6.0 REFERENCES

Etrac. 2021. Rincon Island Decommissioning Multibeam Survey. Longitude 123, Inc. March 2021.

University of California, Santa Barbara (UCSB) Marine Sciences Institute. 2021. Characterization of Marine Habitats and Associated Species at Rincon Island. August 2021.

APPENDIX A

SPECIES LIST

Table A-1. Species Observed at Offshore, Middle and Nearshore Survey Sites

Common Name	Scientific Name
Algae	
Brown algae	Class Phaeophyceae ¹
Red algae	Class Florideophyceae
Turkish towel	<i>Chondracanthus exasperatus</i>
Feather boa kelp	<i>Egregia menziesii</i>
Giant kelp	<i>Macrocystis pyrifera</i>
Laminaria	<i>Laminaria spp.</i>
Undaria	<i>Undaria sp.</i>
Sea lettuce	<i>Ulva spp.</i>
Surfgrass	<i>Phyllospadix torreyi</i>
Invertebrates	
Feather duster worm	<i>Eudistylia polymorpha</i>
Red-rust bryozoan	<i>Watersipora sp.</i>
Brown bryozoan	<i>Bugula sp.</i>
Purple gorgonian	<i>Egorgia rubens</i>
Golden gorgonian	<i>Muricea californica</i>
Brown gorgonian	<i>Muricea fruticosa</i>
Strawberry anemone	<i>Corynactis californica</i>
Solitary anemone	<i>Anthopleura sola</i>
Unidentified sponge	<i>Porifera</i>
Stalked tunicate	<i>Styela montereyensis</i>
California mussel	<i>Mytilus californianus</i>
Rock scallop	<i>Crassodoma gigantea</i>
Gooseneck barnacle	<i>Pollicipes polymerus</i>
Acorn barnacle	<i>Balanus spp.</i>
California barnacle	<i>Megabalanus californicus</i>
Limpits	<i>Lottia spp.</i>
Warty sea cucumber	<i>Apostichopus parvimensis</i>
Giant keyhole limpet	<i>Megathura crenulata</i>
Unidentified chiton	<i>Polyplacophora</i>
Kellett's whelk	<i>Kelletia kelletii</i>
Purple sea urchin	<i>Strongylocentrotus purpuratus</i>
Bat star	<i>Patiria miniata</i>
Ochre sea star	<i>Pisaster ochraceus</i>
Giant spined sea star	<i>Pisaster giganteus</i>
California Spiny lobster	<i>Panulirus interruptus</i>
Hermit crab	<i>Pagurus sp.</i>
Spanish shawl nudibranch	<i>Flabellina iodine</i>
Stripped sea slug	<i>Navanax inermis</i>
Fish	
Black rockfish	<i>Sebastes mealops</i>
Kelp rockfish	<i>Sebastes atrovirens</i>
Cabezon	<i>Scorpaenichthys marmoratus</i>
Kelp Bass	<i>Paralabrax clathratus</i>

Barred sand bass	<i>Paralabrax nebulifer</i>
Topsmelt silverside	<i>Atherinops affinis</i>
Horn shark	<i>Heterodontus francisci</i>
Painted greenling	<i>Oxylebius pictus</i>
Kelp greenling	<i>Hexagrammos decagrammus</i>
Sheephead	<i>Semicossyphus pulcher</i>
Garibaldi	<i>Hypsypops rubicundus</i>
Blacksmith	<i>Chromis punctipinnis</i>
Opaleye	<i>Girella nigricans</i>
Sargo	<i>Diplodus sargus</i>
Notes: ¹ Unidentified brown seaweeds other than giant kelp and feather boa kelp	

APPENDIX B

SURVEY SITE PHOTOS



Photo 1: Cabezon (*Scorpaenichthys marmoratus*) resting on a piling within the Offshore Survey Site.



Photo 2: Golden gorgonian (*Muricea californica*) as epifauna on a piling within the Offshore Survey Site.



Photo 3. Golden gorgonians (*Muricea californica*), strawberry anemone (*Corynactis californica*), and brown bryozoan (*Bugula* sp.) on a piling within the Middle Survey Site.

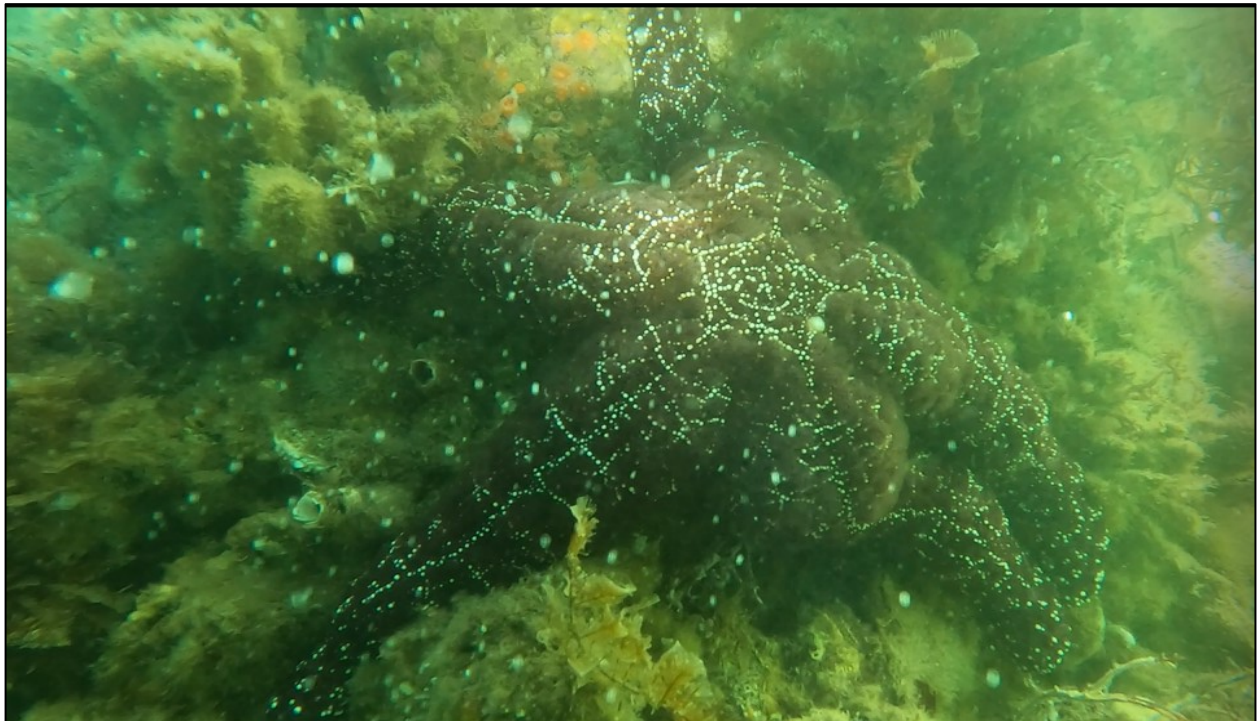


Photo 4. Ochre sea star (*Pisaster ochraceus*) feeding on piling epifauna within the Middle Survey Site.



Photo 5. Giant kelp (*Macrocystis pyrifera*) immediately adjacent a piling within the Middle Survey Site.



Photo 6. California spiny lobster (*Panulirus interruptus*) with multiple juveniles in a crevice within the rocky outcropping in the Middle Survey Site.



Photo 7. Garibaldi (*Hypsypops rubicundus*), sargo (*Diplodus sargus*) and opaleye (*Girella nigricans*) within the rocky outcropping in the Middle Survey Site.



Photo 8. Bat star (*Patiria miniate*), rock scallop (*Crassodoma gigantea*) and solitary anemone (*Anthopleura sola*) within the rocky outcropping in the Middle Survey Site.



Photo 9. Painted greenling (*Oxylebius pictus*) within the rocky outcropping in the Middle Survey Site.



Photo 10. Horn shark (*Heterodontus francisci*) resting in a crevice within the rocky outcropping in the Middle Survey Site.



Photo 11. Ochre sea star (*Pisaster ochraceus*) feeding on piling epifauna within the Nearshore Survey Site.



Photo 12. Giant kelp (*Macrocystis pyrifera*) recruit on metal debris within the Nearshore Survey Site.



Photo 13. Anemones (*Anthopleura sola*) and surfgrass (*Phyllospadix torreyi*) within the Nearshore Survey Site.