

## **APPENDIX G**

### **Marine Resources Biological Assessment Report**

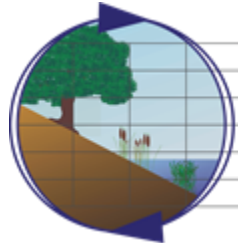
**MARINE BIOLOGICAL TECHNICAL STUDY AND  
ESSENTIAL FISH HABITAT ASSESSMENT FOR  
THE ORANGE COUNTY SAND COMPATABILITY AND OPPORTUNISTIC USE  
PROGRAM**

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**LIST OF ABBREVIATIONS**

ASBS	Areas of Special Biological Significance
BMP	Best Management Practice
CCA	California Coastal Act
CCC	California Coastal Commission
CDFW	California Department of Fish and Wildlife
CEMP	California Eelgrass Mitigation Policy
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
cy	Cubic Yards
ESA	Endangered Species Act
EFH	Essential Fish Habitat
ft	Feet
FGC	Fish and Game Code
FMC	Fisheries Management Council
FMP	Fisheries Management Plan
HAPC	Habitat Area of Particular Concern
km	Kilometer
m	Meter
MHTL	Mean High Tide Line
MMPA	Marine Mammal Protection Act
MBTA	Migratory Bird Treaty Act
MLLW	Mean Lower Low Water
MPA	Marine Protected Area
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
OCPW	Orange County Department of Public Works
OCRSMP	Orange County Regional Sediment Management Plan
PFMC	Pacific Fishery Management Council
R&HA	Rivers and Harbors Appropriation Act
RBSP	Regional Beach Sand Project
RWQCB	Regional Water Quality Control Board
SANDAG	San Diego Association of Governments
SAR	Santa Ana River
SAV	Submerged Aquatic Vegetation
SCCAT	Southern California <i>Caulerpa</i> Action Team
SCoup	Sand Compatibility and Opportunistic Use Program
SLR	Sea Level Rise

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SMCAs	State Marine Conservation Area
SMR	State Marine Reserve
SWRCB	State Water Resources Control Board
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

## 1.0 INTRODUCTION

The County of Orange proposes to implement a Sand Compatibility and Opportunistic Use Program (SCOUP) with pre-established criteria that opportunistically and beneficially utilizes sediment from various sources located within and just outside of Orange County for beach nourishment purposes (Proposed Project). Excess sediment/sand is generated throughout Orange County by a variety of means and this excess sand has the potential for beneficial use as beach nourishment. Beach nourishment has multiple benefits including protection for coastal infrastructure, enhancement of public recreation, improvement of habitat areas, and stimulation of the local economy.

One such type of opportunity for excess sand is the 380 miles of flood channels and 4 dams managed and maintained by Orange County's Department of Public Works (OCPW). While sand sources currently owned and/or maintained by OCPW are a focus, other potential sources outside of OCPW jurisdiction are also considered as this program is intended to be flexible for any potential sand source in the Orange County watershed.

The basic premise of this program is that removal/excavation of the source sediment is already approved by local, State, and Federal agencies as appropriate. Thus, this program is only to obtain approvals for transporting and placing that source material opportunistically on Orange County beaches. The potential receiving sites for the opportunistic sand are public beaches within Orange County which are owned and managed by Orange County coastal cities (from north to south: Seal Beach, Huntington Beach, Newport Beach, Dana Point, and San Clemente), California State Parks, and OC Parks.

M&N (2025) provides preliminary implementation guidelines for utilizing the Orange County SCOUP. It provides specific criteria for material suitability based on grain size, chemical characteristics, color, and other properties. It recommends specific placement locations, rates, and timing in order to maximize the benefits of beach enhancement activities while minimizing environmental impacts, and a monitoring framework is also provided that balances economic feasibility with environmental sensitivity for varying project sizes and locations.

## **2.0 PROJECT LOCATION AND DESCRIPTION**

### **2.1 PROJECT LOCATION**

In an effort to grant sediment managers flexibility on placement of material and allow for the maximum potential opportunistic beach nourishment the majority of the Orange County coastline is considered for opportunistic nourishment. In order to allow for this generalized approach, a rigorous framework of site assessment and monitoring criterion has been created. Potential receiver sites are illustrated in Figure 2-1 and listed in Table 2-1 which also notes the need as well as the per event and annual maximum fill volume for each receiver site. These receiver sites have been identified based on OCPW discussions with City of Seal Beach, City of Huntington Beach, City of Newport Beach, City of Dana Point, City of San Clemente, Orange County Parks, and State Parks staff. All beaches within the City of Laguna Beach have been eliminated from further consideration because of existing sensitive resources, MPAs along the Laguna Beach shoreline, and difficult access for placing sand.

To determine maximum beach fill quantities, a target beach width was determined based on a natural shoreline condition at the subject receiver site, typically 50 – 100 feet (ft). The fill volume was calculated by a rule of thumb factor of 1.5 cubic yards (cy) of sand per 1 ft of beach width for every 1 linear ft of a beach shoreline length for a beach berm fill. For some beaches, such as West Seal Beach, fill estimates were based on estimates for dune creation/enhancement. To ensure these estimates were reasonable and environmentally suitable, a review of historic and/or upcoming nourishment projects and environmental conditions were examined for each receiver site.

Some of the potential receiver sites currently receive sand on a semi-regular basis through already existing programs, such as the OCPW Ocean Outlets Maintenance Program. It is important to note that nourishment events from these programs typically do not come close to providing the required volume of sand necessary to offset the coastal erosive forces contributing to beach width loss. Additionally, they only span a small portion of the entire beach area specified in each receiver site's description. Thus, while these beaches are nourished through other programs, it should not preclude them from being considered for the Orange County SCOUP program.

**Table 2-1. Receiver Sites Summary Table**

Receiver Site	Need	Per Event Maximum Fill (cy)	Per Year (Annual) Maximum Fill (cy)
West Beach, Seal Beach	Low	50,000	100,000
East Beach, Seal Beach	High	50,000	200,000
Surfside Beach	High	100,000	300,000
Sunset Beach	Medium	100,000	200,000
Huntington Harbour Beaches	Low-Medium	1,000-5,000	1,000-5,000
Bolsa Chica State Beach	Medium	100,000	300,000
Huntington Beach Bluffs	High	100,000	300,000
Huntington Beach State Beach	Low	50,000	200,000
West Newport Beach	Medium	100,000	300,000
Balboa Beach	Medium	100,000	200,000
Newport Harbor Beaches	Medium-High	1,000-10,000	1,000-10,000
Newport Dunes	Low	50,000	50,000
Corona Del Mar State Beach	Low	50,000	100,000
Little Corona del Mar	Low	5,000	5,000
Crystal Cove State Park	High	100,000	300,000
Salt Creek Beach	Medium	50,000	200,000
Baby Beach	Low	5,000	10,000
Doheny State Beach	Medium	100,000	300,000
Capistrano Beach County Park	High	50,000	150,000
Poche Beach	High	1,000	1,000
Capistrano Shores	High	100,000	300,000
San Clemente North Beach	High	50,000	150,000
San Clemente City Beaches	High	100,000	300,000
San Clemente State Beach	Medium	100,000	300,000
Cyprus Shore/Cottons Beach	High	100,000	300,000



Figure 2-1. Receiver Site Locations

## 2.2 PROJECT DESCRIPTION

This section outlines basic design elements for various beach placement methods and timing, which can be applied to beach nourishment projects at any of the receiver sites. For each potential beach receiver site, one or more potential sand placement locations within the beach profile (cross-section designs) will be identified. These potential placement locations are:

- on the dry beach as a beach berm;
- on the dry beach as a storm dike;
- below the mean high tide line;
- on the back beach as a dune; and
- on the back beach as a cliff/bluff stabilization measure.

A general beach plan view and cross section profile are provided for each below. Note that the relative scale of the horizontal and vertical axes shown in the cross-sections is not 1:1; the vertical scale is exaggerated, (so as to fit cross-section on single page), which makes the slopes appear much steeper than the slopes would actually be.

### 2.2.1 BEACH BERM

For this placement scenario, fill material is placed as a layer over the existing beach as a berm to widen the sandy beach. The berm will be a level surface extending a certain distance from the back of the beach toward the ocean, then sloping gradually into the water. The elevation, width, length, and slope of the berm will vary for each sand placement opportunity, depending upon the quantity of material to be placed, its qualities and the condition of the beach at the time. Typical design criteria are as follows:

- Beach berm crest height to match the natural beach berm elevation (typically +10 to +15 ft NAVD88 and include additional “freeboard elevation” to account for possible sea level rise (SLR) effects.
- Length and width of the berm based on dimensions of the project area and volume of sediment available for placement.
- Slope seaward of the berm with a constructed slope of 5:1 H:V, which will equilibrate relatively quickly over time to a flatter natural slope.

The typical plan view layout and cross-section for a beach berm placement design are shown in Figure 2-2.

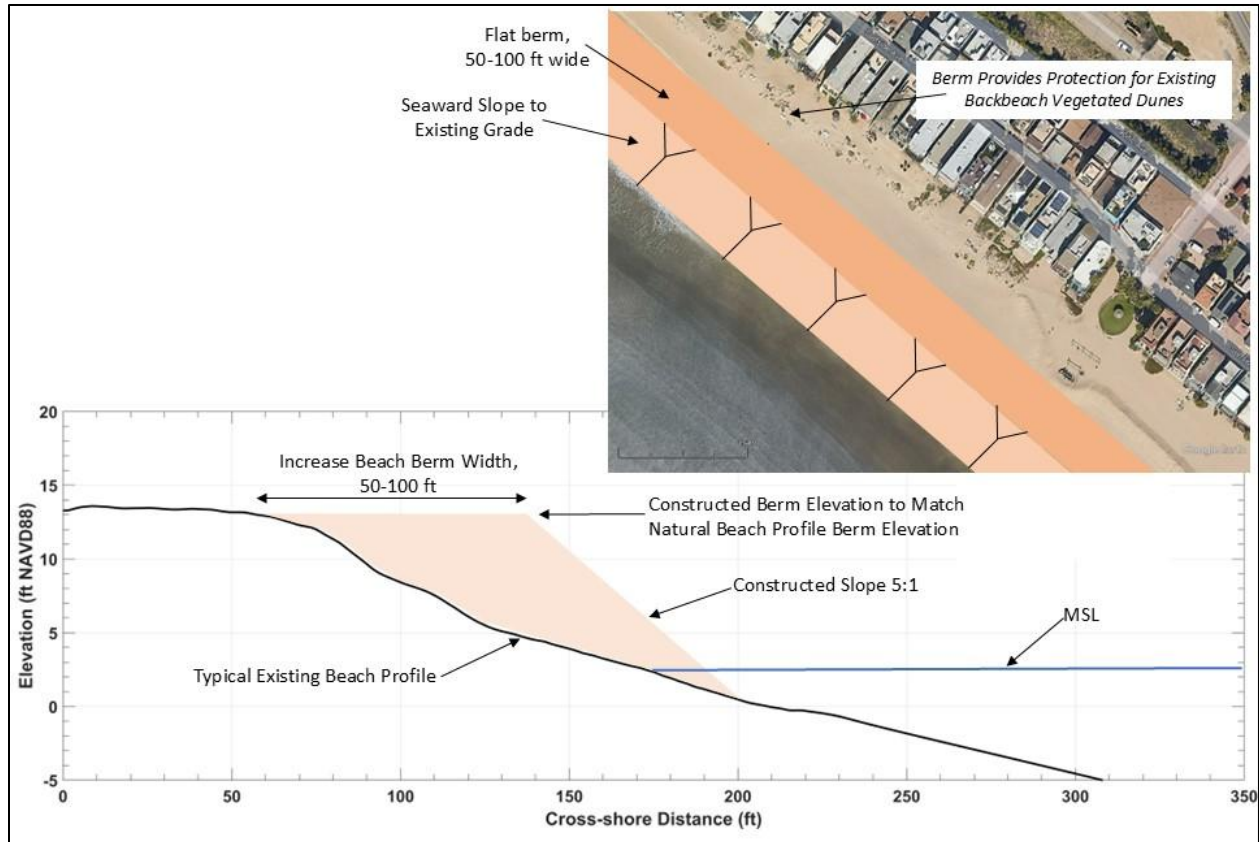


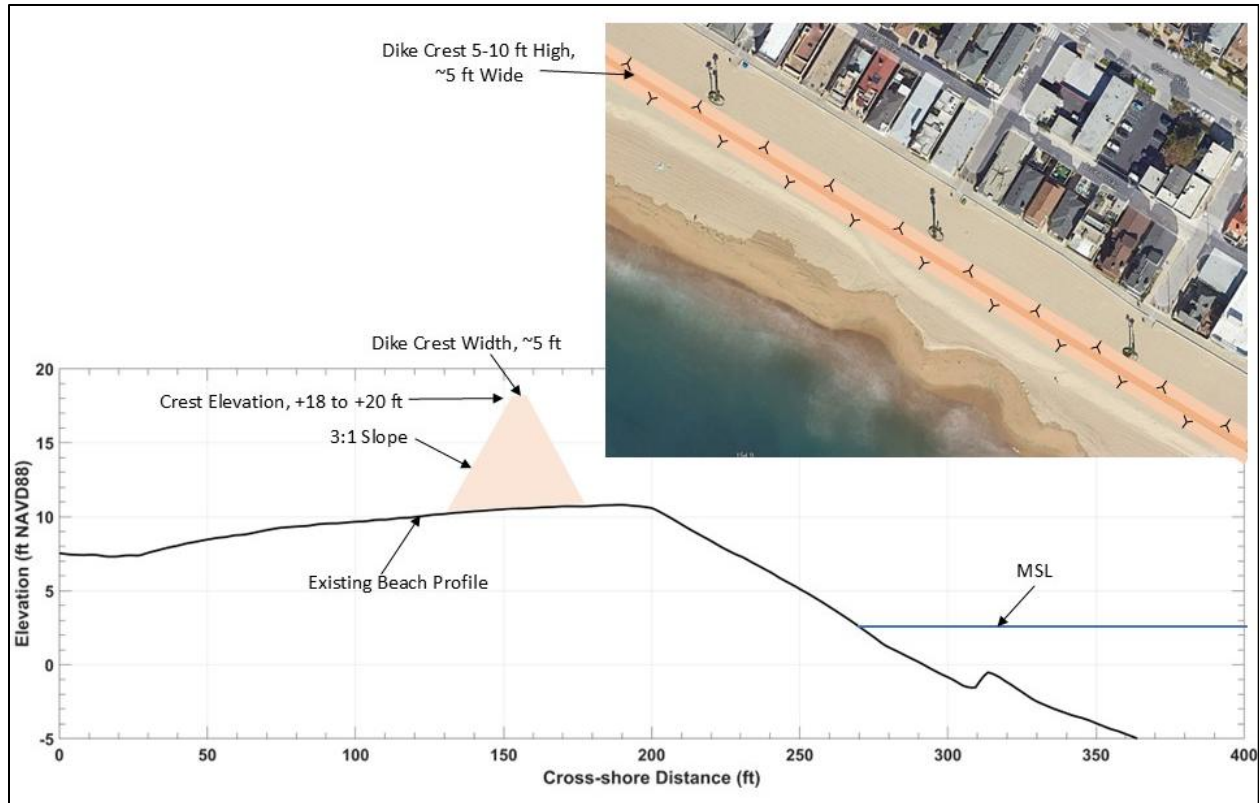
Figure 2-2. Beach Berm Design Plan View and Cross Section

### 2.2.2 BACKBEACH STORM DIKE

For this placement scenario, fill material is placed in a dike-type (linear mound) structure above the dry beach berm and serves to provide wave overtopping protection for landward infrastructure. This type of feature is typically constructed during the winter months when wave action is highest, and beach usage is lower and then flattened in the spring/summer months when beach usage increases. Similar to historic and ongoing dikes construction at Seal Beach East Beach, Sunset Beach, and Long Beach peninsula beach, the typical design criteria are as follows:

- Dike crest height to match the highest runup elevation (typically at least +20 ft NAVD88 for 100-year storm events);
- Dike crest width of at least 5 ft; and
- Dike side slopes of 3:1 H:V.

It is recognized that the higher dike elevation and steeper side slopes are more difficult for public access to the water but is considered a balance with wave overtopping protection. The typical plan view layout and cross-section for a beach dike placement design are shown in Figure 2-3.

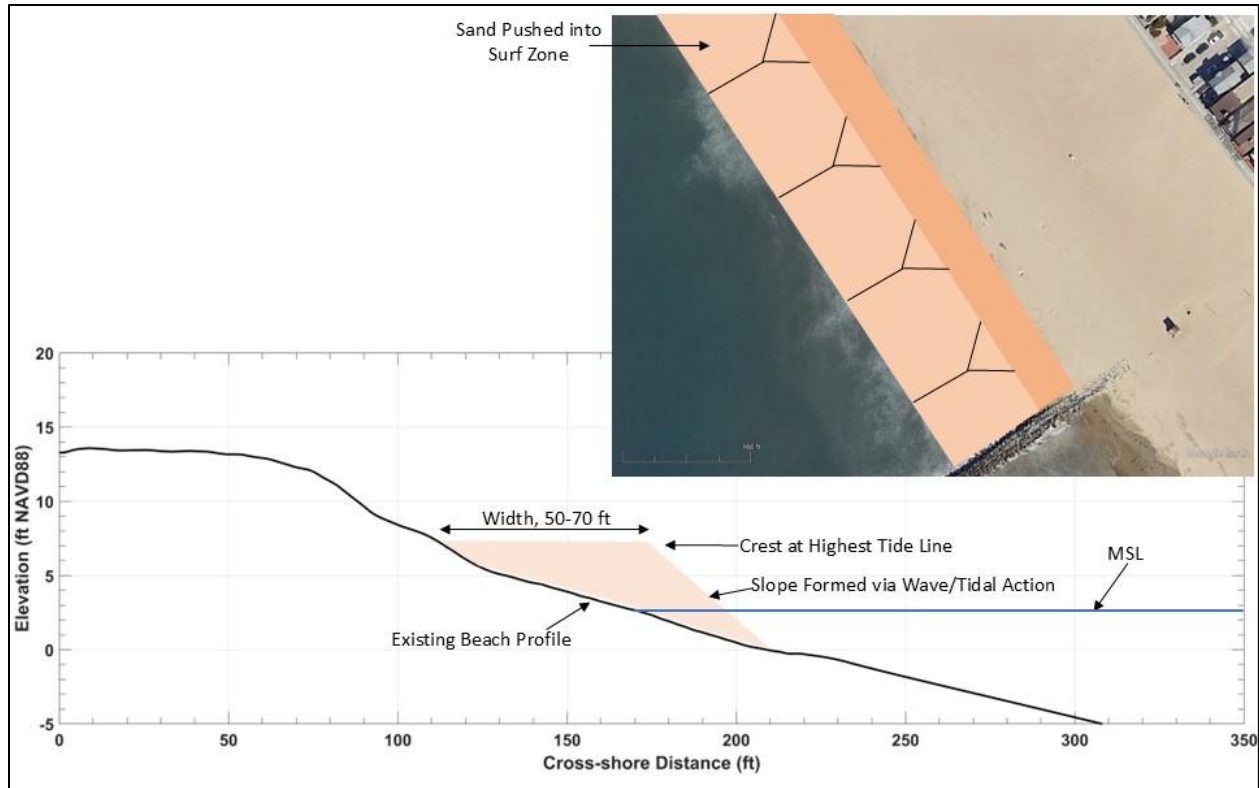


**Figure 2-3. Beach Dike Design Plan View and Cross Section**

### 2.2.3 BELOW MEAN HIGH TIDE LINE

For this placement option, fill is placed below the mean high tide line (MHTL), within the intertidal zone. This scenario is typically used if the source material is darker colored and finer grained than the native beach sand. Sand would be delivered to the beach and pushed by bulldozers to the water's edge. At low tide, the material is pushed as far seaward as possible so that it can be reworked by waves during the following rising tide. The fines would be gradually winnowed out by waves and currents, carried offshore, and sand would be left behind. This option differs from the previous berm placement approach in that, for this option, the fill is placed solely within the intertidal zone, e.g., from elevation +5 ft NAVD88 (approximate MHTL) to elevation 0 ft NAVD88, whereas for the berm option, the sand is placed much higher (e.g., at elevation +10 to +15 ft NAVD88). The typical plan view layout and cross-section for a below MHTL placement design are shown in Figure 2-4.

Placement of nourishment material within the intertidal zone may cause burying of invertebrate species. In order to mitigate invertebrate population decline and encourage quick recolonization of affected areas, linear gaps can be implemented systematically along the placement footprint.

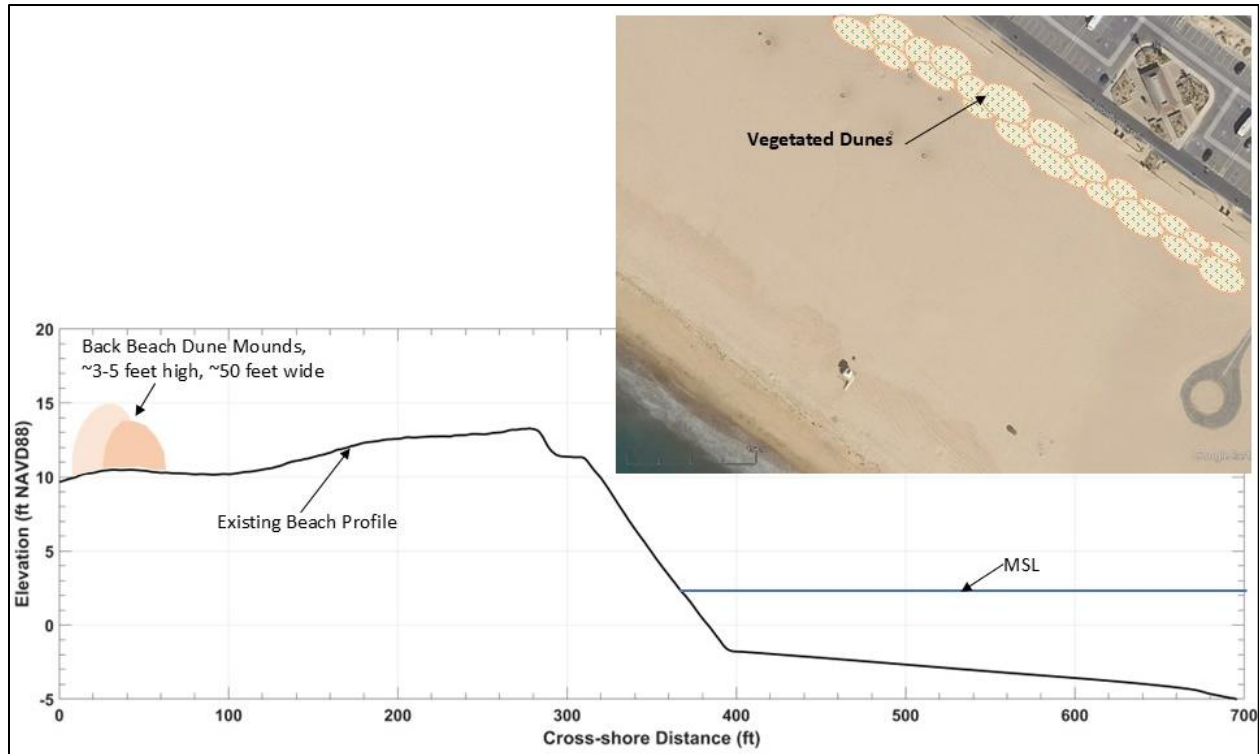


**Figure 2-4. Below Mean High Tide Line Design Plan View and Cross Section**

#### **2.2.4 BACKBEACH DUNES**

Finer-grained source sands may be suitable for placement along the back beach for creation of vegetated dunes, for beach receiver sites with wide sandy fronting berms. These systems provide an aesthetically pleasing buffer between the beach and upland infrastructure. Additionally, the vegetated systems introduce habitat for native vegetation and animal species including foraging birds. Dunes could be created by placing and grading imported sediment onto the back beach to form mounds and subsequently planting native vegetation species within the system. This dune placement option should be implemented in conjunction with beach berm construction if a wide sandy beach does not exist at the beach receiver site. The typical plan view layout and cross-section for a back beach dune placement design are shown in Figure 2-5.

Success of back-beach dunes has been recorded at Southern California beaches including Cardiff State Beach in Encinitas. Constructed in 2019, the Cardiff Living Shoreline is an innovative pilot project to assess the feasibility of utilizing dune systems for shoreline protection. Post-construction monitoring at Cardiff has shown that the dune system is an effective coastal resiliency measure that has performed well against multiple large storm and wave events.

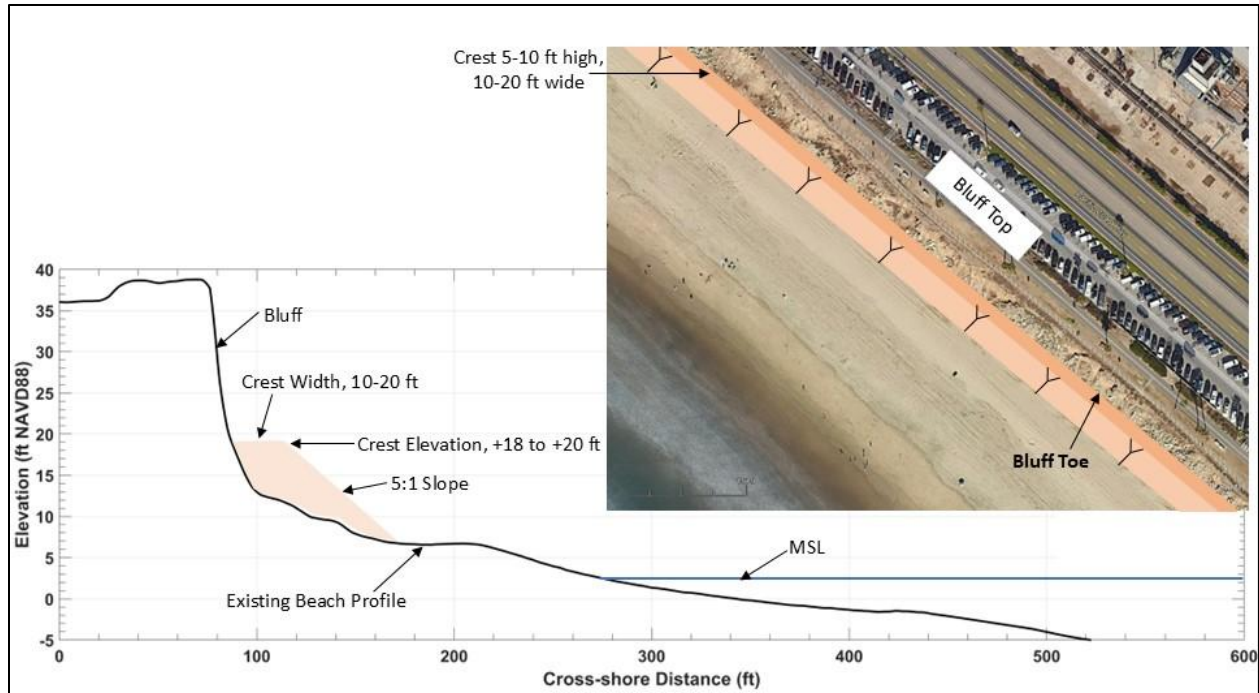


**Figure 2-5. Backbeach Dunes Design Plan View and Cross Section**

### 2.2.5 BACKBEACH BLUFF/CLIFF STABILIZATION

Many segments of the Orange County coastline are backed by bluffs. Increased levels of beach erosion result in less of a buffer between the ocean and the bluffs, which can cause increased scour at the bluff base and subsequently result in an increased risk of bluff erosion. Sediment from sand sources managed under this program may be suitable for placement along the back beach to help combat bluff erosion by creating a stabilizing layer of sand at the base of the bluff or as sand cover on bluff toe rock or seawall protection.

The typical plan view layout and cross-section for a back beach bluff/cliff stabilization placement design are shown in Figure 2-6.



**Figure 2-6. Backbeach Bluff/Cliff Stabilization Design Plan View and Cross Section**

### 2.2.6 PLACEMENT BEYOND THE SURF ZONE

For nearshore placement beyond the intertidal zone, placement would be via hydraulic pipeline which is placed in the water and discharges the sand farther offshore. Historically, this type of placement method has only been utilized for harbor dredging projects where the source material was located close to the receiver beach. Compared to placement within the intertidal zone, hydraulic pumping is typically a more expensive and time-consuming process because of the equipment mobilization required. Based on the type of opportunistic sources identified in this program, e.g., upland sources, and the significant costs to implement, this type of placement is not currently included as a potential placement location option, (at least for the time being).

### 2.3 PLACEMENT TIMING

The placement location and timing of beach fill operations has been considered a significant factor by agencies in conditioning permits. Agencies typically specify that placement of the material should occur away from sensitive resources (least tern and snowy plover foraging activities), should not occur during grunion runs and least tern or snowy plover nesting, should not occur at public beaches during particularly high-use times, and should not be constructed in a manner to interrupt beach access. The typical “no-placement” time window occurs during the Spring and Summer months.

SCoup projects will generally try to avoid the “no-placement” time window to the best extent feasible. However, source sand opportunities from OCPW and other sediment manager’s activities are likely to arise year-round. Many times, source sediment availability overlaps the spring/summertime period when beach nourishment is least ideal, especially given that most flood facility maintenance cannot occur during the rainy season. When/if sediment sources become available during Spring and Summer months, the following can be implemented to minimize impacts:

- Stockpile source sand at an offsite location until beach placement timing is suitable;
- Avoid placement on receiving site beach during weekends;
- Limit the volume to be placed on the beach to minimize the time required to place the material; and
- Perform sensitive bird species and grunion monitoring as defined in Section 6.0.

## **2.4 PLACEMENT RATE**

Beach fill placement rates have sometimes been restricted by regulatory agencies on previous beach fill projects, in order to control water turbidity levels and/or minimize impacts to benthic habitat. Controlled or limited beach fill placement rates will extend the sand placement period and the period of turbid conditions. The restriction has been applied to dredging projects and is expressed as a quantity of sand placed per year or month. The Orange County SCOUP proposes a maximum per nourishment and per year volume for each receiver site that will be implemented as part of the SCOUP program.

## **2.5 MONITORING**

The SCOUP implementation guidelines include a monitoring framework applicable to any combination of sediment source, receiver site, and placement volume, by establishing different monitoring criteria “triggers” for varying categories of projects (M&N 2025). Monitoring for marine biological resources may include:

- Sensitive bird species;
- Grunion;
- Habitat Areas of Concern (estuaries, kelp beds, surfgrass, eelgrass, and rocky reefs);
- Tidal inlet monitoring; and
- Water quality monitoring

The monitoring criteria triggers for each receiver site are summarized in Table 2-2 and Table 2-3 and the following sections, with detailed protocols provided in M&N 2025. Note that monitoring requirements will be assessed prior to project implementation to determine if site-specific modifications or adjustments are necessary based on updated information.

### **2.5.1 SENSITIVE BIRD SPECIES MONITORING TRIGGER CRITERIA**

Sensitive bird species monitoring would be required for any beach nourishment project occurring within the nesting season of California least tern and/or western snowy plover and for over-wintering areas for snowy plovers. The SCOUP receiver sites with potential sensitive birds nesting and over-wintering habitat are noted in Table 5-3.

### **2.5.2 GRUNION MONITORING TRIGGER CRITERIA**

Grunion typically spawn from March through August during middle-of-the-night spring high tides at or above approximately mean high tide line (MHTL) on the beach. The eggs incubate then hatch after approximately two weeks, when the juvenile fish return to the sea during the subsequent spring high tide. Grunion monitoring would be required for any beach nourishment project occurring within the spawning season on any sandy beach where spawning could potentially occur and if sand is to be placed below MHTL. Grunion use sandy beaches for spawning, and thus beaches comprised mostly of cobble or with little to no dry beach during high tides, would likely not host grunion activity.

### **2.5.3 NEARSHORE MONITORING - HABITAT AREAS OF CONCERN**

Federally designated habitat areas of particular concern (HAPCs) occurring within the Orange County coastline include the following: estuaries, kelp beds, surfgrass, eelgrass, and rocky reefs. While understory algae are included in habitat maps included in the Orange County Regional Sediment Management Plan (OCRSMP; Everest et al. 2013) it is only included as an indicator for the potential of HAPCs to exist and therefore the presence of understory algae alone is not considered a HAPC.

If a project occurs in an area known to have eelgrass, surfgrass, kelp or hard substrate within the vicinity, then monitoring of that habitat will be triggered. The exact distance offshore/downcoast considered to be "within the vicinity" will vary depending on the project size. The SCOUP receiver sites with potential sensitive habitat are noted in Table 5-3. Projects will be divided into three categories based on the volume of sand planned to be placed at the beach per event. These categories are defined as follows: small (<25,000 cy), medium (25,000 to 75,000 cy) and large (>75,000 cubic yards). Each monitoring activity will describe the general procedure as well as specific criteria for each project volume category. Criteria will be more stringent as project volume category increases. Eelgrass surveys would be in accordance with the California Eelgrass Mitigation Policy (CEMP) (NMFS 2014).

For small projects (<25,000 cy) on open ocean beaches, nearshore (rocky reef, surfgrass and/or kelp) monitoring is triggered only if the sand is placed below the MHTL **and** an HAPC (rocky reef, surfgrass and/or kelp) exists within 100 ft offshore of the sand placement area (directly offshore or within 1,000 upcoast of the sand placement area's upcoast limit or within 2,000 ft downcoast of the sand placement area's downcoast limit). Monitoring is not triggered if HAPC exists greater than 100 ft offshore in either the upcoast or downcoast direction.

For medium projects (25,000-75,000 cy) on open ocean beaches, nearshore (rocky reef, surfgrass and/or kelp) monitoring is triggered only if the sand is placed below the MHTL **and** an HAPC (rocky reef, surfgrass and/or kelp) exists within 300 ft offshore of the sand placement area (directly offshore or within 2,000 ft upcoast of the sand placement area's upcoast limit or within 5,000 ft downcoast of the sand placement area's downcoast limit). Monitoring is not triggered if HAPC exists greater than 300 ft offshore in either the upcoast or downcoast direction.

For large projects (>75,000 cy) on open ocean beaches, nearshore (rocky reef, surfgrass and/or kelp) monitoring is triggered only if the sand is placed below the MHTL **and** an HAPC (rocky reef, surfgrass and/or kelp) exists within 1,000 ft offshore of the sand placement area (directly offshore or within 2,000 ft upcoast of the sand placement area's upcoast limit or within 5,000 ft downcoast of the sand placement area's downcoast limit). Monitoring is not triggered if HAPC exists greater than 1,000 ft offshore in either the upcoast or downcoast direction.

### **2.5.4 TIDAL INLET MONITORING TRIGGER CRITERIA**

For coastal wetlands/marshes, maintaining a connection to the ocean is essential for the health of the local ecosystem as tidal circulation from ebbing and flooding tides acts to constantly introduce important nutrients, flush out harmful pollutants and regulate important water quality parameters such as salinity and dissolved oxygen. Along the Orange County coastline, there are three wetlands/marshes with tidal inlets whose closure could cause and have caused negative ecosystem impacts on the upstream ecosystem. These wetlands/marshes include from north to south: Bolsa Chica Wetlands, Huntington Beach Wetlands Conservancy, and Santa Ana River Wetlands. Tidal inlet closures are a result of unmaintained shoaling that ultimately forms a sediment barrier between the wetland/marsh and open

ocean. Therefore, monitoring of any project that introduces an influx of sediment in the vicinity of one of these inlets should occur.

Tidal inlet monitoring is potentially required for sand placement at only the following beaches which are adjacent to the three tidal inlets cited above:

- Bolsa Chica State Beach
- Huntington Cliffs
- Huntington State Beach
- West Newport Beach

For small projects (<25,000 cy) at the four beach receiver sites above, tidal inlet monitoring is triggered if a tidal inlet exist within 1,000 ft downcoast or upcoast of the sand placement limits.

For medium projects (25,000 -75,000 cy) and large projects (>75,000 cy) at the four beach receiver sites above, tidal inlet monitoring is triggered if a tidal inlet exists within 2,500 ft downcoast or upcoast of the sand placement limits.

#### **2.5.5 WATER QUALITY MONITORING - TURBIDITY MONITORING TRIGGER**

Turbidity monitoring would only be required if:

- Sand is placed within the active intertidal zone (i.e., below the high tide line), and
- The project is a “large” project (sand placement volume exceeds 75,000 cy) or the project is a “medium” project (sand placement volume between 25,000 – 75,000 cy) with source material exceeding 25% fines.
- Nearshore biological resources (rocky reef, surfgrass, eelgrass, or kelp) are present

**Table 2-2. Proposed Biological Monitoring Guidelines**

Receiver Site/ Location ID	Per Event Volume (cy)	Grunion <sup>1</sup>	Least Tern <sup>2</sup>	Snowy Plover <sup>3</sup>	Reef <sup>4</sup>	Surfgrass <sup>4</sup>	Eelgrass <sup>4</sup>	Kelp Bed <sup>4</sup>
West Beach, Seal Beach/ SB.1	<25K	N	N	S	N	N	N	N
West Beach, Seal Beach/ SB.1	25K-75K	N	N	S	N	N	N	N
West Beach, Seal Beach/ SB.1	>75K	N	N	S	N	N	N	N
East Beach, Seal Beach/ SB.2	<25K	S	N	S	N	N	N	N
East Beach, Seal Beach/ SB.2	25K-75K	S	N	S	N	N	N	N
East Beach, Seal Beach/ SB.2	>75K	S	N	S	N	N	N	N
Surfside Beach/ SB.3	<25K	S	N	S	N	N	N	N
Surfside Beach/ SB.3	25K-75K	S	N	S	N	N	N	N
Surfside Beach/ SB.3	>75K	S	N	S	N	N	N	N
Sunset Beach/ HB.1	<25K	S	N	S	N	N	N	N
Sunset Beach/ HB.1	25K-75K	S	N	S	N	N	N	N
Sunset Beach/ HB.1	>75K	S	N	S	N	N	N	N
Huntington Harbour Beaches/ HB.2	<25K	N	N	N	N	N	Y	N
Huntington Harbour Beaches/ HB.2	25K-75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Receiver Site/ Location ID	Per Event Volume (cy)	Grunion <sup>1</sup>	Least Tern <sup>2</sup>	Snowy Plover <sup>3</sup>	Reef <sup>4</sup>	Surfgrass <sup>4</sup>	Eelgrass <sup>4</sup>	Kelp Bed <sup>4</sup>
Huntington Harbour Beaches/ HB.2	>75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bolsa Chica State Beach/ CA.1	<25K	S	N	S	N	N	N	N
Bolsa Chica State Beach/ CA.1	25K-75K	S	N	S	N	N	N	N
Bolsa Chica State Beach/ CA.1	>75K	S	N	S	N	N	N	N
Huntington Beach Bluffs/ HB.3	<25K	S	N	S	N	N	N	N
Huntington Beach Bluffs/ HB.3	25K-75K	S	N	S	N	N	N	N
Huntington Beach Bluffs/ HB.3	>75K	S	N	S	N	N	N	N
Huntington Beach State Beach/ CA.2	<25K	S	S	S	N	N	N	N
Huntington Beach State Beach/ CA.2	25K-75K	S	S	S	N	N	N	N
Huntington Beach State Beach/ CA.2	>75K	S	S	S	N	N	N	N
West Newport Beach/ NB.1	<25K	S	N	S	N	N	N	N
West Newport Beach/ NB.1	25K-75K	S	N	S	N	N	N	N
West Newport Beach/ NB.1	>75K	S	N	S	N	N	N	N
Balboa Beach/ NB.3	<25K	S	N	S	N	N	N	N

Receiver Site/ Location ID	Per Event Volume (cy)	Grunion <sup>1</sup>	Least Tern <sup>2</sup>	Snowy Plover <sup>3</sup>	Reef <sup>4</sup>	Surfgrass <sup>4</sup>	Eelgrass <sup>4</sup>	Kelp Bed <sup>4</sup>
Balboa Beach/ NB.3	25K-75K	S	N	S	N	N	N	N
Balboa Beach/ NB.3	>75K	S	N	S	Y	N	N	N
Newport Harbor Beaches/ NB.2	<25K	N	N	N	N	N	Y	N
Newport Harbor Beaches/ NB.2	25K-75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Newport Harbor Beaches/ NB.2	>75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Newport Dunes/ OC.1	<25K	N	N	N	N	N	Y	N
Newport Dunes/ OC.1	25K-75K	N	N	N	N	N	Y	N
Newport Dunes/ OC.1	>75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Corona Del Mar State Beach/ NB.4	<25K	S	N	N	Y	Y	N	N
Corona Del Mar State Beach/ NB.4	25K-75K	S	N	N	Y	Y	N	N
Corona Del Mar State Beach/ NB.4	>75K	S	N	N	Y	Y	N	Y
Little Corona del Mar/ NB.5	<25K	S	N	N	Y	Y	N	N
Little Corona del Mar/ NB.5	25K-75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Little Corona del Mar/ NB.5	>75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crystal Cove State Park/ NB.5	<25K	S	N	S	Y	Y	N	Y

Receiver Site/ Location ID	Per Event Volume (cy)	Grunion <sup>1</sup>	Least Tern <sup>2</sup>	Snowy Plover <sup>3</sup>	Reef <sup>4</sup>	Surfgrass <sup>4</sup>	Eelgrass <sup>4</sup>	Kelp Bed <sup>4</sup>
CA.3								
Crystal Cove State Park/ CA.3	25K-75K	S	N	S	Y	Y	N	Y
Crystal Cove State Park/ CA.3	>75K	S	N	S	Y	Y	N	Y
Salt Creek Beach/ OC.2	<25K	S	N	S	N	N	N	N
Salt Creek Beach/ OC.2	25K-75K	S	N	S	Y	Y	N	Y
Salt Creek Beach/ OC.2	>75K	S	N	S	Y	Y	N	Y
Baby Beach/ OC.3	<25K	N	N	N	N	N	Y	N
Baby Beach/ OC.3	25K-75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Baby Beach/ OC.3	>75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Doheny State Beach/ CA.4	<25K	S	N	S	Y	N	N	N
Doheny State Beach/ CA.4	25K-75K	S	N	S	Y	N	N	N
Doheny State Beach/ CA.4	>75K	S	N	S	Y	N	N	Y
Capistrano Beach County Park/ OC.4	<25K	S	N	N	N	N	N	N
Capistrano Beach County Park/ OC.4	25K-75K	S	N	N	N	N	N	N
Capistrano Beach County Park/ OC.4	>75K	S	N	N	Y	N	N	Y
Poche Beach/ OC.5	<25K	S	N	N	N	N	N	N
Poche Beach/ OC.5	25K-75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Receiver Site/ Location ID	Per Event Volume (cy)	Grunion <sup>1</sup>	Least Tern <sup>2</sup>	Snowy Plover <sup>3</sup>	Reef <sup>4</sup>	Surfgrass <sup>4</sup>	Eelgrass <sup>4</sup>	Kelp Bed <sup>4</sup>
Poche Beach/ OC.5	>75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Capistrano Shores/ SC.1	<25K	S	N	N	N	N	N	N
Capistrano Shores/ SC.1	25K-75K	S	N	N	N	N	N	N
Capistrano Shores/ SC.1	>75K	S	N	N	Y	N	N	Y
San Clemente North Beach/ SC.2	<25K	S	N	N	N	N	N	N
San Clemente North Beach/ SC.2	25K-75K	S	N	N	N	N	N	N
San Clemente North Beach/ SC.2	>75K	S	N	N	Y	N	N	Y
San Clemente City Beaches/ SC.3	<25K	S	N	N	N	N	N	N
San Clemente City Beaches/ SC.3	25K-75K	S	N	N	Y	Y	N	N
San Clemente City Beaches/ SC.3	>75K	S	N	N	Y	Y	N	Y
San Clemente State Beach/ CA.5	<25K	S	N	N	N	N	N	N
San Clemente State Beach/ CA.5	25K-75K	S	N	N	N	N	N	N
San Clemente State Beach/ CA.5	>75K	S	N	N	Y	N	N	Y
Cyprus Shore/Cottons Beach/ SC.4	<25K	S	N	S	Y	N	N	N
Cyprus Shore/Cottons Beach/ SC.4	25K-75K	S	N	S	Y	N	N	N
Cyprus Shore/Cottons Beach/ SC.4	>75K	S	N	S	Y	N	N	Y

Source: M&N 2025

Notes: The monitoring specified in this table identifies the potential need for monitoring based on the presence of resources in the vicinity of the maximum potential fill extent footprint. A specific sand placement event may or may not trigger monitoring depending upon the exact location of the event's sand placement within the maximum fill extent footprint.

A green box with Y refers to monitoring required.

A red box with N refers to monitoring not required.

A blue box with S refers to monitoring requirement dependent on seasonality of project.

<sup>1</sup>Grunion monitoring is only necessary between March - August unless other spawning events predicted per CDFW for beach with placement below MHTL.

<sup>2</sup>Least Tern monitoring is only necessary between April 1st - September 15th.

<sup>3</sup>Snowy Plover monitoring is only necessary between March 1st - September 30th. Additional monitoring may be necessary where Snowy Plover are known to overwinter/roost.

<sup>4</sup>Nearshore monitoring is only required when sand is placed below the MHTL and nearshore sensitive biological resources are present

**Table 2-3. Proposed Physical Monitoring Guidelines**

Receiver Site/ Location ID	Per Event Volume (cy)	Turbidity <sup>5</sup>	Surf Conditions <sup>6</sup>	Beach Profiles	Tidal Inlet
West Beach, Seal Beach/ SB.1	<25K	N	N	N	N
West Beach, Seal Beach/ SB.1	25K-75K	N	N	N	N
West Beach, Seal Beach/ SB.1	>75K	N	N	N	N
East Beach, Seal Beach/ SB.2	<25K	N	N	N	N
East Beach, Seal Beach/ SB.2	25K-75K	Y	N	N	N
East Beach, Seal Beach/ SB.2	>75K	Y	Y	Y	N
Surfside Beach/ SB.3	<25K	N	N	N	N
Surfside Beach/ SB.3	25K-75K	Y	N	N	N
Surfside Beach/ SB.3	>75K	Y	Y	Y	N

Receiver Site/ Location ID	Per Event Volume (cy)	Turbidity <sup>5</sup>	Surf Conditions <sup>6</sup>	Beach Profiles	Tidal Inlet
Sunset Beach/ HB.1	<25K	N	N	N	N
Sunset Beach/ HB.1	25K-75K	Y	N	N	N
Sunset Beach/ HB.1	>75K	Y	Y	Y	N
Huntington Harbour Beaches/ HB.2	<25K	N	N	N	N
Huntington Harbour Beaches/ HB.2	25K-75K	N/A	N/A	N/A	N/A
Huntington Harbour Beaches/ HB.2	>75K	N/A	N/A	N/A	N/A
Bolsa Chica State Beach/ CA.1	<25K	N	N	N	Y
Bolsa Chica State Beach/ CA.1	25K-75K	Y	N	N	Y
Bolsa Chica State Beach/ CA.1	>75K	Y	Y	Y	Y
Huntington Beach Bluffs/ HB.3	<25K	N	N	N	N
Huntington Beach Bluffs/ HB.3	25K-75K	Y	N	N	Y
Huntington Beach Bluffs/ HB.3	>75K	Y	Y	Y	Y
Huntington Beach State Beach/ CA.2	<25K	N	N	N	Y
Huntington Beach State Beach/ CA.2	25K-75K	Y	N	N	Y
Huntington Beach State Beach/ CA.2	>75K	Y	Y	Y	Y
West Newport Beach/ NB.1	<25K	N	N	N	Y

Receiver Site/ Location ID	Per Event Volume (cy)	Turbidity <sup>5</sup>	Surf Conditions <sup>6</sup>	Beach Profiles	Tidal Inlet
West Newport Beach/ NB.1	25K-75K	Y	N	N	Y
West Newport Beach/ NB.1	>75K	Y	Y	Y	Y
Balboa Beach/ NB.3	<25K	N	N	N	N
Balboa Beach/ NB.3	25K-75K	Y	N	N	N
Balboa Beach/ NB.3	>75K	Y	Y	Y	N
Newport Harbor Beaches/ NB.2	<25K	N	N	N	N
Newport Harbor Beaches/ NB.2	25K-75K	N/A	N/A	N/A	N/A
Newport Harbor Beaches/ NB.2	>75K	N/A	N/A	N/A	N/A
Newport Dunes/ OC.1	<25K	N	N	N	N
Newport Dunes/ OC.1	25K-75K	Y	N	N	N
Newport Dunes/ OC.1	>75K	N/A	N/A	N/A	N/A
Corona Del Mar State Beach/ NB.4	<25K	N	N	N	N
Corona Del Mar State Beach/ NB.4	25K-75K	Y	N	N	N
Corona Del Mar State Beach/ NB.4	>75K	Y	Y	Y	N
Little Corona del Mar/ NB.5	<25K	N	N	N	N
Little Corona del Mar/ NB.5	25K-75K	N/A	N/A	N/A	N/A

Receiver Site/ Location ID	Per Event Volume (cy)	Turbidity <sup>5</sup>	Surf Conditions <sup>6</sup>	Beach Profiles	Tidal Inlet
Little Corona del Mar/ NB.5	>75K	N/A	N/A	N/A	N/A
Crystal Cove State Park/ CA.3	<25K	N	N	N	N
Crystal Cove State Park/ CA.3	25K-75K	Y	N	N	N
Crystal Cove State Park/ CA.3	>75K	Y	Y	Y	N
Salt Creek Beach/ OC.2	<25K	N	N	N	N
Salt Creek Beach/ OC.2	25K-75K	Y	N	N	N
Salt Creek Beach/ OC.2	>75K	Y	Y	Y	N
Baby Beach/ OC.3	<25K	N	N	N	N
Baby Beach/ OC.3	25K-75K	N/A	N/A	N/A	N/A
Baby Beach/ OC.3	>75K	N/A	N/A	N/A	N/A
Doheny State Beach/ CA.4	<25K	N	N	N	N
Doheny State Beach/ CA.4	25K-75K	Y	N	N	N
Doheny State Beach/ CA.4	>75K	Y	Y	Y	N
Capistrano Beach County Park/ OC.4	<25K	N	N	N	N
Capistrano Beach County Park/ OC.4	25K-75K	Y	N	N	N
Capistrano Beach County Park/ OC.4	>75K	Y	Y	Y	N
Poche Beach/ OC.4	<25K	N	N	N	N

Receiver Site/ Location ID	Per Event Volume (cy)	Turbidity <sup>5</sup>	Surf Conditions <sup>6</sup>	Beach Profiles	Tidal Inlet
OC.5					
Poche Beach/ OC.5	25K-75K	N/A	N/A	N/A	N/A
Poche Beach/ OC.5	>75K	N/A	N/A	N/A	N/A
Capistrano Shores/ SC.1	<25K	N	N	N	N
Capistrano Shores/ SC.1	25K-75K	Y	N	N	N
Capistrano Shores/ SC.1	>75K	Y	Y	Y	N
San Clemente North Beach/ SC.2	<25K	N	N	N	N
San Clemente North Beach/ SC.2	25K-75K	Y	N	N	N
San Clemente North Beach/ SC.2	>75K	Y	Y	Y	N
San Clemente City Beaches/ SC.3	<25K	N	N	N	N
San Clemente City Beaches/ SC.3	25K-75K	Y	N	N	N
San Clemente City Beaches/ SC.3	>75K	Y	Y	Y	N
San Clemente State Beach/ CA.5	<25K	N	N	N	N
San Clemente State Beach/ CA.5	25K-75K	Y	N	N	N
San Clemente State Beach/ CA.5	>75K	Y	Y	Y	N
Cyprus Shore/Cottons Beach/ SC.4	<25K	N	N	N	N
Cyprus Shore/Cottons Beach/ SC.4	25K-75K	Y	N	N	N

Receiver Site/ Location ID	Per Event Volume (cy)	Turbidity <sup>5</sup>	Surf Conditions <sup>6</sup>	Beach Profiles	Tidal Inlet
Cyprus Shore/Cottons Beach/	>75K	Y	Y	Y	N

Source: M&N 2025

Notes: The monitoring specified in this table identifies the potential need for monitoring based on the presence of resources in the vicinity of the maximum potential fill extent footprint. A specific sand placement event may or may not trigger monitoring depending upon the exact location of the event’s sand placement within the maximum fill extent footprint.

A green box with Y refers to monitoring required.

A red box with N refers to monitoring not required.

A blue box with S refers to monitoring requirement dependent on seasonality of project.

<sup>5</sup>Turbidity monitoring is only required when sand is placed below the MHTL. Monitoring may not be necessary for medium projects if maximum fines of source sediment is less than or equal to 10% of maximum fines found at receiver site.

<sup>6</sup>Surf conditions **\*\*DATA NEEDED\*\***

### **3.0 PROJECT REGULATORY REQUIREMENTS**

The Proposed Project is subject to the following regulations related to marine biological resources.

#### **3.1 FEDERAL REGULATIONS**

##### **3.1.1 CLEAN WATER ACT**

The federal Water Pollution Control Act Amendments of 1972 (33 United States Code [USC] 1251–1376), as amended by the Water Quality Act of 1987, and better known as the Clean Water Act (CWA), is the major federal legislation governing water quality. The purpose of the federal CWA is to “restore and maintain the chemical, physical, and biological integrity of the nation’s waters.” Discharges into waters of the United States are regulated under CWA Section 404. Waters of the United States include: 1) all navigable waters (including all waters subject to the ebb and flow of the tide); 2) all interstate waters and wetlands; 3) all other waters, such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, or natural ponds; 4) all impoundments of waters mentioned above; 5) all tributaries to waters mentioned above; 6) the territorial seas; and 7) all wetlands adjacent to waters mentioned above. Important applicable sections of the CWA are discussed below:

- Section 401 requires an applicant for any federal permit that proposes an activity that may result in a discharge to waters of the United States to obtain certification from the state that the discharge will comply with other provisions of the CWA. Certification is provided by the respective Regional Water Quality Control Board (RWQCB). A Section 401 permit from the RWQCB would be required for issuance of a permit by the U.S. Army Corps of Engineers (USACE).
- Section 404 regulates the discharge of dredged or fill materials to waters of the U.S. and provides for issuance of permits by the USACE.

##### **3.1.2 RIVERS AND HARBORS APPROPRIATION ACT**

The Rivers and Harbors Appropriation Act of 1899 (33 USC 403), commonly known as the Rivers and Harbors Act (R&HA), prohibits the construction of any bridge, dam, dike, or causeway over or in navigable waterways of the United States without congressional approval. Under R&HA Section 10, the USACE is authorized to permit structures in or over navigable waters. Building or modifying wharves, piers, jetties, and other structures in or over the waters of the San Diego coastline requires USACE approval through the Section 10 permit process.

##### **3.1.3 ENDANGERED SPECIES ACT**

The Endangered Species Act (ESA) protects plants and wildlife that are listed as endangered or threatened by the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). ESA Section 9 prohibits the taking of endangered wildlife, where taking is defined as to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct” (50 Code of Federal Regulations [CFR] 17.3). The term “harm” is defined as an “act which actually kills or injures wildlife,” including through “significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife.” The term “harass” means an act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, including breeding, feeding or sheltering (50 CFR 17.3). For plants, this statute governs removing,

possessing, maliciously damaging, or destroying any endangered plant on federal land, as well as removing, cutting, digging up, damaging, or destroying any endangered plant on non-federal land in knowing violation of state law. Under ESA Section 7, lead federal agencies are required to consult with the USFWS or NMFS if the lead agency determines that its actions, including permit approvals or funding, may adversely affect an endangered species (including plants) or its critical habitat. Through consultation and the issuance of a biological opinion, the USFWS or NMFS may issue an incidental take statement allowing take of the species that is incidental to another authorized activity, provided the action will not jeopardize the continued existence of the species. In cases where the federal agency determines its action may affect, but would be unlikely to adversely affect, a federally listed species, the agency may choose to informally consult with the USFWS and/or NMFS. This informal consultation typically involves incorporating measures intended to ensure effects would not be adverse. Concurrence from the USFWS and/or NMFS concludes the informal process. Without such concurrence, the federal agency may formally consult to ensure full compliance with the ESA.

#### **3.1.4 MARINE MAMMAL PROTECTION ACT**

The Marine Mammal Protection Act of 1972 (MMPA) prohibits, with certain exceptions, the take of marine mammals in United States waters and by United States citizens on the high seas and the importation of marine mammals and marine mammal products into the United States. Under the MMPA, “take” is defined as “to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal” (16 U.S.C. 1362) and further defined by regulation (50 CFR 216.3) as “to harass, hunt, capture, collect, or kill, or attempt to harass, hunt, capture, collect, or kill any marine mammal”. NMFS administers the MMPA. Under the 1994 Amendments to the MMPA, harassment is statutorily defined as any act of pursuit, torment, or annoyance which:

- Level A Harassment has the potential to injure a marine mammal or marine mammal stock in the wild; or,
- Level B Harassment has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering but which does not have the potential to injure a marine mammal or marine mammal stock in the wild.

#### **3.1.5 MIGRATORY BIRD TREATY ACT**

The Migratory Bird Treaty Act (MBTA) prohibits take of nearly all birds where members of the bird’s taxonomic family are considered to be migratory. This results in the inclusion of most species of birds afforded protection. Under the MBTA, take means only to kill, directly harm, or destroy individuals, eggs, or nests, or to otherwise cause failure of an ongoing nesting effort.

#### **3.1.6 MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT ACT**

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 1976 was established to promote domestic and commercial fishing under sound conservation and management principles. NMFS, as a branch of the National Oceanic and Atmospheric Administration (NOAA), implements the act via eight regional Fisheries Management Councils (FMCs). The FMCs in turn prepare and implement Fishery Management Plans (FMPs) in accordance with local conditions. The Pacific FMC is responsible for the Pacific region, in which the Project site is located. The FMPs also establish EFH for the species they manage and require consultation with NMFS for actions that may adversely affect EFH. Following receipt of an EFH, NMFS will provide EFH Conservation Recommendations to the lead agency detailing measures that

may be taken by the agency to conserve EFH. Within 30 days of receipt of EFH Conservation Recommendation, the project lead agency must respond in writing, including a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. These measures will be incorporated into the final project.

## **3.2 STATE REGULATIONS**

### **3.2.1 CALIFORNIA COASTAL ACT**

The California Coastal Act (CCA) is intended to provide protection of the unique nature and public interest values of the state's coastal fringe. Development activities, which are broadly defined by the CCA to include (among others) construction of buildings, divisions of land, and activities that change the intensity of use of land or public access to coastal waters, generally require a coastal development permit. The CCA is administered by the California Coastal Commission (CCC) or by local jurisdictions operating under adopted Local Coastal Programs that have been approved by the CCC.

### **3.2.2 CALIFORNIA ENDANGERED SPECIES ACT**

The California Endangered Species Act (CESA) authorizes the California Fish and Game Commission to designate endangered, threatened, and rare species and to regulate the taking of these species (California Fish and Game Code [FGC] Sections 2050–2098). The CESA defines endangered species as those whose continued existence in California is jeopardized. State-listed threatened species are those not presently facing extinction, but that may become endangered in the foreseeable future. FGC Section 2080 prohibits the taking of state-listed plants and animals. Unlike the federal ESA, the CESA does not include harassment within its take definition and as such, has a statutorily higher threshold standard for take than does the federal ESA. Pursuant to Section 2081 of the code, the California Department of Fish and Wildlife (CDFW) may authorize individuals or public agencies to import, export, take, or possess state-listed endangered, threatened, or candidate species. These otherwise prohibited acts may be authorized through permits or memoranda of understanding if the take is incidental to an otherwise lawful activity, impacts of the authorized take are minimized and fully mitigated, the permit is consistent with any regulations adopted pursuant to any recovery plan for the species, and the project operator ensures adequate funding to implement the measures required by the CDFW. When a species is both state and federally listed, an expedited request for consistency with the USFWS biological opinion may be issued through a request for a Section 2080.1 consistency determination if take authorization under the CESA is required.

### **3.2.3 MARINE LIFE PROTECTION ACT**

Pursuant to this Act, the CDFW established and manages a network of Marine Protected Areas (MPAs) to, among other goals, protect marine life and habitats and preserve ecosystem integrity. For the purposes of MPA planning, California was divided into five distinct regions (four coastal and San Francisco Bay) each of which had its own MPA planning process. The coastal portion of California's MPA network is now in effect statewide; options for a planning process in San Francisco Bay have been developed for consideration at a future date. The MLPA establishes clear policy guidance and a scientifically sound planning process for the siting and design of MPAs such as: State Marine Reserves (SMRs), which typically preclude all extractive activities (such as fishing or kelp harvesting); State Marine Parks (SMPs), which do not allow any commercial extraction; and State Marine Conservation Areas (SMCAs), which preclude some combination of commercial and/or recreational extraction.

### **3.2.4 CALIFORNIA PORTER-COLOGNE ACT**

This Act is the basic water quality control law for California and works in concert with the federal Act. The Act is implemented by the State Water Resources Control Board (SWRCB) and its nine regional boards which implement the permit provisions of Section 402 and certain planning provisions of Sections 205, 208, and 303 of the federal Act. This means that the state issues one discharge permit for purposes of federal and state law. Permits for discharge of pollutants are officially called National Pollutant Discharge Elimination System (NPDES) permits. Anyone who is discharging waste or proposing to discharge waste that could affect the quality of state waters must file a “report of waste discharge” with the governing RWQCB. Additional water quality permitting requirements under the Porter-Cologne Act may include an NPDES General Construction Activities Stormwater.

### **3.2.5 CALIFORNIA FISH AND GAME CODE**

The FGC is implemented by the California Fish and Game Commission, as authorized by Article IV, Section 20, of the Constitution of the State of California. FGC Sections 3503, 3503.5, 3505, 3800, and 3801.6 protect all native birds, birds of prey, and nongame birds, including their eggs and nests, that are not already listed as fully protected and that occur naturally within the state. Section 3503.5 specifically states that it is unlawful to take, possess, or destroy any raptors (e.g., hawks, owls, eagles, and falcons), including their nests or eggs. As defined in the Fish and Game Code, “take” means to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill (Fish and Game Code Section 86). The CDFW is the state agency that manages native fish, wildlife, plant species, and natural communities for their ecological value and their benefits to people. The CDFW oversees the management of marine species through several programs, some in coordination with NMFS and other agencies.

### **3.2.6 CALIFORNIA EELGRASS MITIGATION POLICY**

It is NMFS’ policy to recommend no net loss of eelgrass habitat function in California, and as such eelgrass is protected by the state and federal government under the CEMP (NMFS 2014). Recognizing that some necessary projects may adversely affect this protected resource, NMFS has developed a mitigation policy to ensure that there is no net loss of eelgrass in California, and compensatory mitigation options include comprehensive management plans, in-kind mitigation, mitigation banks and in-lieu-fee programs, and out-of-kind mitigation. While in-kind mitigation is preferred, the most appropriate form of compensatory mitigation should be determined on a case-by-case basis.

### **3.2.7 CAULERPA CONTROL PROTOCOL**

*Caulerpa taxifolia* is a green alga primarily found in shallow tropical and subtropical waters. There are no *Caulerpa* species native to California, and therefore, *Caulerpa* species pose a substantial threat to marine ecosystems in California, particularly to the extensive eelgrass beds and other benthic environments that make coastal waters such a rich and productive environment. The *Caulerpa* Control Protocol establishes provisions to detect existing infestations and avoid the spread of the invasive species for California nearshore coastal and enclosed bays, estuaries, and harbors from Morro Bay to the U.S.–Mexico border. The protocol outlines the certification, survey, and reporting guidelines when surveying for *Caulerpa* (NMFS 2021).

### **3.3 LOCAL REGULATIONS**

#### **3.3.1 ORANGE COUNTY CENTRAL AND COASTAL SUBREGION NATURAL COMMUNITY CONSERVATION PLAN (NCCP)/HABITAT CONSERVATION PLAN (HCP)**

The Plan provides long-term protection for wildlife and their critical habitats, and regulatory assurances and economic benefits for participating landowners. The Central and Coastal Subregion is a 208,000-acre area that includes the central portion of the County of Orange, incorporating the area from the coastline inland to Riverside County. The subregion extends along the coast from the mouth of the Santa Ana River (Costa Mesa) to the mouth of San Juan Creek (Dana Point). The beach receiver sites are not located within the jurisdiction of an adopted Natural Community Conservation Plan or Habitat Conservation Plan.

#### **3.3.2 COUNTY OF ORANGE GENERAL PLAN**

The General Plan is a blueprint for growth and development. California State law (Government Code Section 65300) requires each city and county to adopt a comprehensive, long-term General Plan for its own physical development and for any land outside its boundaries related to its planning activities. All 34 cities in Orange County have general plans that address their individual jurisdictions. While the Orange County General Plan primarily focuses on the unincorporated area - territory that is not located within a city - the plan also addresses regional services and facilities provided by the County such as regional parks, roads, flood control facilities, etc.

#### **3.3.3 LOCAL COASTAL PLANS**

Several local policies protecting biological resources apply to the beach receiver sites. In partnership with coastal cities and counties, the CCC plans and regulates the use of land and water in the coastal zone through the Coastal Act. The Coastal Act requires that local governments develop Local Coastal Programs (LCP) to carry out policies of the California Coastal Act at the local level.

## 4.0 ENVIRONMENTAL SETTING

### 4.1 HABITATS IN THE PROJECT AREA

Understanding the existing physical and biological conditions at the Project Area beach receiver sites is critical to determining the potential impacts of the Proposed Project. No project-specific surveys were conducted for this report, and the description of the environmental setting is based on existing biological information. Based on the project description, the primary area of concern for marine biological resources from the Proposed Project extends from the back beach to the depth of closure at the receiver site (the depth in which there is no significant net sediment exchange between the nearshore and the offshore), which typically is at depths of -30 ft NAVD88 along the Orange County coastline (M&N 2025).

The Orange County coastline includes a variety of habitats including sandy beaches, soft-bottom subtidal, rocky intertidal and subtidal reefs, bays, estuaries, and harbors. In addition, vegetated habitats such as kelp beds and seagrasses (e.g., eelgrass and surfgrass beds) occur locally on rocky and embayment areas. Several of these habitats are considered sensitive or support sensitive resources. Seven state marine protected areas (MPAs) which provide additional regulatory protection of biological resources occur within the Project Area. State water quality protection areas, which are designated as Areas of Special Biological Significance (ASBS), also are associated with two state marine conservation areas (SMCAs) within the MPA system, those at Robert E. Badham and Irvine Coast locations (within the Crystal Cove SMCA), and Heisler Park (within the Laguna Beach SMCA). ASBS status limits water quality impacts by prohibiting point source and storm drain discharges. Point source waste and thermal discharges are prohibited or limited while nonpoint source pollution is controlled to the extent practicable. No other use is restricted.

Other sensitive resource areas include locations where endangered or threatened species may occur, such as designated critical habitat, protected avian species nesting sites, foraging areas, or over-wintering areas. In addition, major haul out areas, or roosting areas of fully protected avian species or important nursery or spawning areas of state-managed fishery species also are considered sensitive biological areas. Sensitive or high interest species in Orange County coastal areas where sand placement may occur include the following:

- Federal and state endangered California least tern (*Sterna antillarum browni*);
- Federal threatened western snowy plover (*Chardrius alexandrinus nivosus*) and critical habitat;
- Federal endangered Southern California Steelhead (*Oncorhynchus mykiss*) evolutionary significant unit and critical habitat);
- Federal endangered green sea turtle (*Chelonia mydas*) and proposed critical habitat;
- Fully protected marine mammals such as California gray whale (*Eschrichtius robustus*) and protected dolphins, porpoises, seals and sea lions;
- Fully protected California brown pelican (*Pelecanus occidentalis californicus*);
- California grunion (*Leuresthes tenuis*) spawning beaches; and
- Pismo clam (*Tivela stultorum*), if within persistent clam bed areas.

Table 4-1 summarizes the regional distribution of coastal habitats in the Project Area, and Figures 4-1 through 4-5 show locations of hard-bottom, canopy kelp, seagrasses, bays and estuaries (including harbors), man-made hard-bottom structures, selected managed species, and receiver site locations. Site specific resources will be addressed in the impact analysis section (Section 5). Sand or soft bottom

substrate are a dominant substrate type and not represented in the figures and generally it's assumed it is present in areas where hard bottom is not shown.

Note that some hard bottom and soft bottom areas may support vegetated features such as kelp, macroalgae, and eelgrass. Vegetation data are primarily from the OCRSMP (Everest 2013) and are distinguished according to dominant vegetation type (i.e., kelp, understory algae, eelgrass) with updated localized data such as eelgrass beds in Newport Bay, Bolsa Chica, Anaheim Bay, Huntington Harbour, and Dana Point Harbor; CDFW canopy kelp cover; surfgrass and substrate data in San Clemente (ACOE unpub. data), Chambers Group (2016), CMECS substrate data (<https://apps.wildlife.ca.gov/marine/>), and EcoAtlas habitat data (<https://www.ecoatlas.org/regions/ecoregion/south-coast>). Kelp canopy layer may overlap and vary by year depending on environmental conditions. The multiple years of kelp coverage from 1967 through 2016 are combined into a simple kelp feature in the figures. The kelp record provides a good indication of locations with hard-bottom vegetated HAPC, which may or may not have surface kelp canopies. Mapped seagrasses include surfgrass on nearshore hard-bottom substrate or eelgrass on soft-bottom embayment habitats. Note that spatial data was not available for all areas (e.g., spatial data for surfgrass was only available for San Clemente near Pier), and therefore figures may not depict the presence of surfgrass but references may note presence in an area.

Managed species depicted on the figures include California least tern, western snowy plover, and California grunion which are particularly relevant to beach nourishment. Least tern and/or snowy plover nesting sites and potential over-wintering areas for snowy plover and federally designated critical habitat for snowy plover are based on the OCRSMP (Everest 2013). Beach locations where grunion spawning records have been compiled are delineated along the shoreline. The managed species data should be viewed as potential to occur; actual occurrence will vary depending on environmental conditions and year.

A brief description of the major habitats in the Project Area is provided in the following sections.

#### **4.1.1 SANDY BEACH**

The intertidal zone, also known as the littoral zone, in marine aquatic environments is the area of the foreshore and seabed that is exposed to the air at low tide and submerged at high tide (i.e., the area between tide marks). At the receiver sites, the intertidal zone consists of sandy beach habitat. Sandy beaches generally represent unstable habitat with seasonal cycles of sand deposition (accretion) and erosion, which leads to a great deal of temporal and spatial variability in invertebrate populations. Most southern California beaches lose sand in the winter and gain sand in the summer. In addition, daily tidal fluctuations affect the distribution of marine organisms. Therefore, marine organisms common in sandy beach habitats are generally mobile and change position with changes in water level and sediment transport. Generally higher abundances and species diversity are found on long, gently sloping beaches, while lower abundances and diversity are present on steep, coarse-grained beaches. Common invertebrates observed in southern California sandy beaches include sand crabs (*Emerita analoga*), beach hoppers (*Megalorchestia* spp, *Orchestodea* spp.), amphipods (e.g., *Eohaustorius* spp.), isopods (e.g., *Excirologa* spp.), and other crustaceans; bean clam (*Donax gouldii*), Pismo clam (*Tivela stultorum*, and olive snail (*Olivella biplicata*); bloodworm (*Euzonus mucronata*) and other polychaete worms (*Hemipodus borealis*, *Lumbrineris* spp., *Nephtys californiensis*, *Scololepis* spp.); and nemertean ribbon worms (SANDAG 2000, Dugan et al 2015). Terrestrial insects are an important ecological component of the sandy beach and help break down washed ashore kelp and seagrass wrack. The wrack may harbor a variety of insects and invertebrates that are important prey items for gulls and shorebirds.

Sandy beach invertebrates are an important prey base for fish and birds. Nearshore fish forage on the invertebrates when high tides cover the beach. Various shorebirds probe the sand in search of worms, crustaceans, and small clams. Gulls are opportunistic feeders on invertebrates they pick from the swash zone or on wrack, as well as trash or debris left by humans. Beaches are important resting areas for shorebirds, gulls, and other seabirds such as terns and the California brown pelican. Terrestrial birds also may forage along the back beach shoreline. Over 70 species of birds use beaches within the region (SAIC 2011), although actual use at any beach varies according to site-specific conditions, human disturbance, and seasonal patterns of bird migration. California grunion also use sandy beaches as spawning habitat.

**Table 4-1. Regional Distribution of Coastal Habitats in Project Area**

Habitat	Relative Occurrence	Occurrence in Orange County
Sandy Beach	Majority of shoreline	Most shorelines
Sandy Subtidal	Majority of subtidal	Nearshore, embayments
Nearshore Rocky Reefs	Localized areas	Huntington Beach Bluffs, Newport Beach, Laguna Beach, Corona del Mar, Crystal Cove, Salt Creek, Dana Point, San Clemente
Kelp Forests	Localized hard-bottom areas	Newport Beach, Laguna Beach, Dana Point, San Clemente
Surfgrass Beds	Localized hard-bottom areas	Corona Del Mar State Beach, Crystal Cove, Laguna Beach, Dana Point, San Clemente
Eelgrass Beds	Localized in embayments	Anaheim Bay, Seal Beach National Wildlife Refuge, Huntington Harbour, Bolsa Chica Ecological Reserve, Huntington Beach Wetlands, Lower Newport Bay, Dana Point Harbor
Bays, Harbors, Wetlands	Six	Anaheim Bay, Huntington Harbour, Newport Bay, Dana Point Harbor, Bolsa Chica Ecological Reserve, Huntington Beach Wetlands, Los Cerritos Wetlands, Santa Ana River Salt Marsh

Source: Everest 2013.

**4.1.2 SANDY SUBTIDAL**

Soft-bottom nearshore communities have similar characteristics for a given water depth, sediment type, and wave energy. Thus, sandy nearshore communities at all receiver sites are expected to be similar. The subtidal zone is classified into general regions, including the shallow subtidal to a depth of about -30 ft MLLW (generally corresponds to littoral zone), an inner shelf zone from about -30 to -80 ft MLLW, middle shelf from about -80 to -300 ft MLLW, and outer shelf zone from about -300 to -600 ft MLLW. As noted previously, the study area for this Project focuses on the shallow subtidal region or to the depth of closure.

Bottom-dwelling invertebrate species in the shallow subtidal zone are well adapted to shifting sediments and turbidity, with suspension feeders being the dominant group. Many of the sandy beach invertebrates move between the intertidal and shallow subtidal depths and additional species live on and within

sediments within increasing distance offshore as wave energy diminishes toward the seaward limit of the littoral zone. Common species in the shallow subtidal zone of the Orange County SCOUP region include burrowing anemones, sea pansy, sea pen, purple globe crab (*Randallia ornata*), clams, snails, sand dollar, sea star, and tube worms (SAIC 2011). Fish commonly found in shallow subtidal habitat (less than 30 ft) off southern California beaches include California halibut (*Paralichthys californicus*), barred surfperch (*Amphistichus argenteus*), yellowfin croaker (*Umbrina roncadior*), speckled sanddab (*Citharichthys stigmaeus*), California bat ray (*Myliobatus californica*), shovelnose guitarfish (*Rhinobatos productus*), northern anchovy (*Engraulis mordax*), jack mackerel (*Trachurus symmetricus*), round ray (*Urobatus halleri*), walleye surfperch (*Hyperprosopon argenteum*), leopard shark (*Triakis semifasciata*), spotfin croaker (*Roncadior stearnsii*), and topsmelt (*Atherinops affinis*).

#### 4.1.3 ROCKY REEFS

Hard-bottom habitats are productive ecosystems that support a variety of plants and animals. They include rocky intertidal shores and nearshore reefs, and support vegetated habitats such as surfgrass and kelp beds. Rocky habitats are localized in the Project Area and may vary depending on physical characteristics and degree of sand influence. Reef height and complexity are primary factors associated with habitat quality (AMEC 2005, SAIC 2011, SANDAG 2011). Low-lying reefs subject to sand scour support few biological resources while reefs that extend above the height of seasonal sand movement generally support diverse communities of invertebrates, fish, and vegetation.

Biological resources in the intertidal vary with exposure, relief height and complexity. The upper intertidal or splash zone is characterized by simple green algae (*Chaetomorpha* spp., *Enteromorpha* spp., *Ulva* spp.), barnacles (*Cthamalus* spp.), limpets (*Lottia* spp.), and periwinkles (*Littorina* spp.). Intertidal areas not influenced by sand burial and abrasion often support California mussel (*Mytilus californus*), gooseneck barnacle (*Pollicipes polymerus*), aggregating sea anemones (*Anthopleura elegantissima*), hermit crabs (*Pagurus* spp.), striped shore crab (*Pachygrapsus crassipes*), snails (e.g., *Lithopoma* spp., *Kelletia kellytia*, *Tegula* spp.), and chitons (*Mopalia mucosa*, *Nutallina* spp.) (Blanchette et al. 2015). Coralline algae, crusts, and red algal turf are common on low-relief substrate subject to sand influence.

Hard substrate in the low tidal zone and minus tide zone are characterized by a greater diversity of plants and animals including coralline algae, other red algae, brown algae, surfgrass, green sea anemones (*Anthopleura xanthogrammica*), purple sea urchins, California sea hares (*Aplysia californica*), snails, sponges, and starfish (*Asterina miniata*, *Pisaster* spp.). Woolly sculpin (*Clinocottus analis*) is one of the more commonly encountered fish in tidepools.

Subtidal reefs in the shallow nearshore also exhibit considerable variation in resource development associated with the seasonal onshore and offshore migration of sand. Similar to intertidal reefs, substrate factors such as relief height, texture, composition, and size largely determine resource development. Understory algae are common on nearshore reefs and feather boa kelp (*Egregia menziesii*) is conspicuous, growing up to 12 ft in length. The sea palm (*Eisenia arborea*) may co-occur with feather boa kelp at subtidal depths (AMEC 2005, SAIC 2006a, SAIC 2007). A variety of red algae (*Corallina* spp., *Gigartina* spp., *Gracilaria* spp., *Jania* spp., *Lithothrix* spp., *Rhododymenia* spp.) and brown algae (*Cystoseira osmundacea*, dictyotales, *Zonaria farlowi*) may co-occur with feather boa kelp and/or sea palms on nearshore reefs. Persistent reefs support hundreds of species of invertebrates (e.g., crabs, nudibranchs, sea urchins, scallops, sea stars, snails, sponges, tunicates, worms) and attract a variety of fish such as garibaldi (*Hypsypops rubicundus*), blacksmith (*Chromis punctipinnis*), and black perch (*Embiotoca jacksoni*).

Moving farther offshore to depths where seasonal sand movement is less, hard substrates do not need to have as high a relief to support perennial species. Giant kelp (*Macrocystis pyrifera*) attaches to hard substrate by means of a holdfast, and fronds may grow to heights that exceed the water depth, forming leafy canopies at the water surface. Kelp forests are among the most productive marine habitats along the coast of California providing habitat, feeding grounds, and nursery areas for many species of fishes, invertebrates, and marine mammals. The kelp community in the Project Area is dominated by giant kelp, which ranges from water depths of about -20 ft to -80 ft MLLW. Kelp beds in southern California commonly deteriorate to some degree during summer and fall when temperatures are higher and nutrient concentrations are lower. Giant kelp is adversely affected by sedimentation and turbidity (Foster and Schiel 1985). Large amounts of shifting sediment can bury small plants and prevent the settling of microscopic spores, both of which can affect kelp beds. El Niño conditions which result in high waves, higher-than-average temperatures, and low nutrients, have been linked to periodic and widespread reductions in kelp canopy (Foster and Schiel 1985).

Invertebrates found in kelp beds include lobster (*Panulirus interruptus*), sea stars, sea urchins, and mollusks. Surfperch, rockfish (*Sebastes* spp.), cabezon (*Scorpaenichthys marmoratus*), kelp bass (*Paralabrax clathratus*), and wrasses (senorita, rock wrasse, and sheephead) are also commonly observed in southern California kelp beds.

Reef quality or the ability to support sediment-influenced indicator species is directly correlated with reef elevation (i.e., height of the reef), as higher-relief reefs are more resistant to sedimentation and scour, and therefore, allows perennial species to persist (AMEC 2005). Reef heights in relatively higher quality areas generally include a greater percentage of heights >1 ft (0.3 m) compared to relatively lower quality areas. The study of nearshore reefs in San Diego County noted other relationships between indicator species occurrence and reef heights and suggested that it appeared to be influenced by depth distribution (SAIC 2007). Several examples included:

- Surfgrass, which primarily occurred at water depths ≤ 15 ft (5 m), was uncommon on reef heights < 1 ft (0.3 m) and had denser cover on substrate heights ≥ 2 ft (0.6 m) than on 1 ft (0.3 m) heights.
- Giant kelp primarily occurred at water depths > 15 ft (5 m) on reef heights ≥ 1 ft (0.3 m). Giant kelp had sparse occurrence on nearshore reefs. Primary kelp canopies occurred further offshore beyond the depth of closure.
- Sea palm and feather boa understory algae occurred mainly at water depths < 26 ft (8 m), with a similar or greater number of records between 15 and 26 ft (5 and 8 m). Both species had greater cover on reef heights > 1 ft (0.3 m).
- Sea fan occurrence increased with depth, with most records at depths > 26 ft (8 m). Although sea fans mainly occurred on substrate ≥ 1 ft (0.3 m) high, there were more records on reefs < 1 ft (0.3 m) in height than observed for other indicator species, most likely related to less sand influence with increasing depth.
- Hard substrate with opportunistic turf algae, sparse occurrence of opportunistic feather boa kelp, and/or lacking vegetation has been used to distinguish substantially sand influenced (scoured) reef.

#### 4.1.4 SURFGRASS BEDS

The most common type of seagrass along the open coast is surfgrass (*Phyllospadix scouleri*, *P. torreyi*), which is a flowering plant that forms beds on rocky substrate from the minus intertidal level to

approximately -20 ft MLLW. Surfgrass provides an important habitat for a variety of algae, invertebrates, lobsters, and fish, and is a nursery habitat for California spiny lobster. Surfgrass is adapted to withstand shifting sand movement with long shoots which can extend above a variety of sand depths and are protected from sand abrasion by fibrous sheaths. Dense rhizomatous roots bind with sand to form an effective anchor, and growth and colonization are by vegetative propagation of rhizomes and/or seasonal seed production. Surfgrass may recover relatively quickly from disturbance via regrowth if the rhizome mat remains intact, but recovery can take several years if the rhizome mat is removed. Although it is adapted to sand accretion, the amount of sand affects its health and growth. Craig et al (2008) suggested that short-term burial results in shoot mortality, decreased shoot counts, and reduced growth of *P. scouleri*.

#### 4.1.5 EELGRASS BEDS

Eelgrass (*Zostera marina*) is a rooted aquatic plant that inhabits shallow soft bottom habitats in quiet waters of bays and estuaries, as well as sheltered coastal areas. It can form dense beds that provide substrate, food, and shelter for a variety of marine organisms. Eelgrass is considered a Submerged Aquatic Vegetation (SAV), and a “special aquatic site” under the CWA. Pursuant to the MSA, eelgrass is designated as a HAPC within EFH for various federally managed fish species within the Pacific Coast Groundfish FMP (PFMC 2020). Eelgrass beds function as an important habitat for a variety of invertebrate, fish, and avian species. For many species, eelgrass beds are an essential biological habitat component for at least a portion of their life cycle, providing resting and feeding sites along the Pacific Flyway for avian species, and nursery sites for numerous species of fish.

#### 4.1.6 ESTUARIES, HARBORS, AND WETLANDS

Estuaries are protected nearshore areas such as bays, inlets, and river mouths, influenced by the ocean and freshwater. Because of tidal cycles and freshwater runoff, salinity varies within estuaries and results in great diversity, offering freshwater, brackish and marine habitats within close proximity (PMFC 2020). Estuaries in the Project Area include Upper Newport Bay, Bolsa Chica Ecological Reserve, and Aliso Creek, and there are several bays and harbors that have potential receiver sites (i.e., Newport Bay, Huntington Harbour, Dana Point Harbor). The receiver sites are primarily small pocket beaches surrounded by developed areas (e.g., homes, boat slips). Other than the beach, the majority of the receiver site would be considered unvegetated soft bottom habitat consisting of sand, gravel, mud and silt. Eelgrass beds may be present adjacent to some receiver sites. Shallow soft bottom areas in southern California bays contain clumps of red algae (*Gracilaria* spp., *Ceramium* spp.), loose clumps of green algae (*Ulva* spp.), and commonly a film of benthic diatoms forming mats over portions of the bottom. Fish species typically observed include round stingrays (*Urobatis halleri*), barred sand bass (*Paralabrax nebulifer*), spotted sand bass (*Paralabrax maculatofasciatus*), specklefin midshipman (*Porichthys myriaster*), black croaker (*Cheilotrema saturnum*), and Gobies (Family Gobiidae) (U.S. Navy 2014). Burrowing invertebrates include bivalves (*Chione* spp., *Macoma nasuta*), the amphipod (*Grandidierella japonica*), bay ghost shrimp (*Neotrypaea* spp.), burrowing anemones (*Harenactis attenuata*), and tube-dwelling anemones (*Pachycerianthus* spp.). Other invertebrates commonly observed within the shallow waters of southern California bays include the opisthobranch (*Navanax inermis*) and slender sea pen (*Stylatula elongata*), as well as calcareous bryozoans and the invasive soft bryozoan *Amathia verticillatum*. Any debris found on the bottom may support species more typical of hard substrates, including sponges (Phylum Porifera), scale worm (Family Polynoidae), golden gorgonian (*Muricea californica*), invasive non-native tunicates (e.g., *Styela plicata* and *Botrylloides* spp.), and spiny lobster (U.S. Navy and Port of San Diego 2013). The shorelines within southern California bays are usually armored with riprap revetment that supports

barnacles, snails, and arthropods such as the lined shore crab (*Pachygrapsus crassipes*), while shallow subtidal revetment may support invertebrates such native oyster (*Ostrea lurida*) and non-native Pacific oyster (*Crassostrea gigas*). All of the embayments in the Project Area also support eelgrass beds.

Six wetlands are within the Project Area and include Los Cerritos Wetland, Seal Beach National Wildlife Refuge, Bolsa Chica Ecological Reserve, Huntington Beach Wetlands, Santa Ana River Marsh/Newport Banning Ranch, and Upper Newport Ecological Reserve (Everest 2013). They support similar biological resources such as bays and harbors and several could be affected by Project activities including Bolsa Chica Ecological Reserve and Huntington Beach Wetlands that experience periods of accretion that can lead to mouth closure, disrupting the tidal flow and affecting wildlife and habitats.

#### **4.1.7 UPLAND HABITAT**

Most receiver sites are located in developed urban areas, and therefore no native upland terrestrial biological resources would be affected by the Project since construction and staging would occur on existing developed, paved, or disturbed areas. No sensitive terrestrial species are expected to occur and therefore would not be affected by the Project and will not be discussed further. Upland habitat at the Orange County SCOUP stockpile sites is addressed under a separate report.

#### **4.1.8 WILDLIFE CORRIDORS**

The Project Area includes a relatively narrow habitat area extending from the back beach to the depth of closure, and therefore does not provide any terrestrial movement corridors, and no marine mammal, reptile, or fish migratory corridors occur within the Project Area. However, some marine fish species such as anchovy, sardine, and topsmelt move into and out of bays and harbors for spawning, nursery, and foraging. Several whale species migrate along the coast of California including the California gray whale.

#### **4.2 MARINE PROTECTED AREAS**

Seven State Marine Protected Areas (MPAs) occur within Orange County (Figure 4-6). MPAs are management designations that provide additional regulatory protection of biological resources. Of these MPAs, three different classifications exist with varying levels of protection. These include State Marine Reserve (SMR), State Marine Conservation Area (SMCA), and No-Take State Marine Conservation Area (SMCA No Take). Differences between the different MPA classifications includes:



Figure 4-1. Sensitive Biological Resources West Seal Beach to Huntington Beach Bluffs



Figure 4-2. Sensitive Biological Resources Bolsa Chica to Balboa Beach

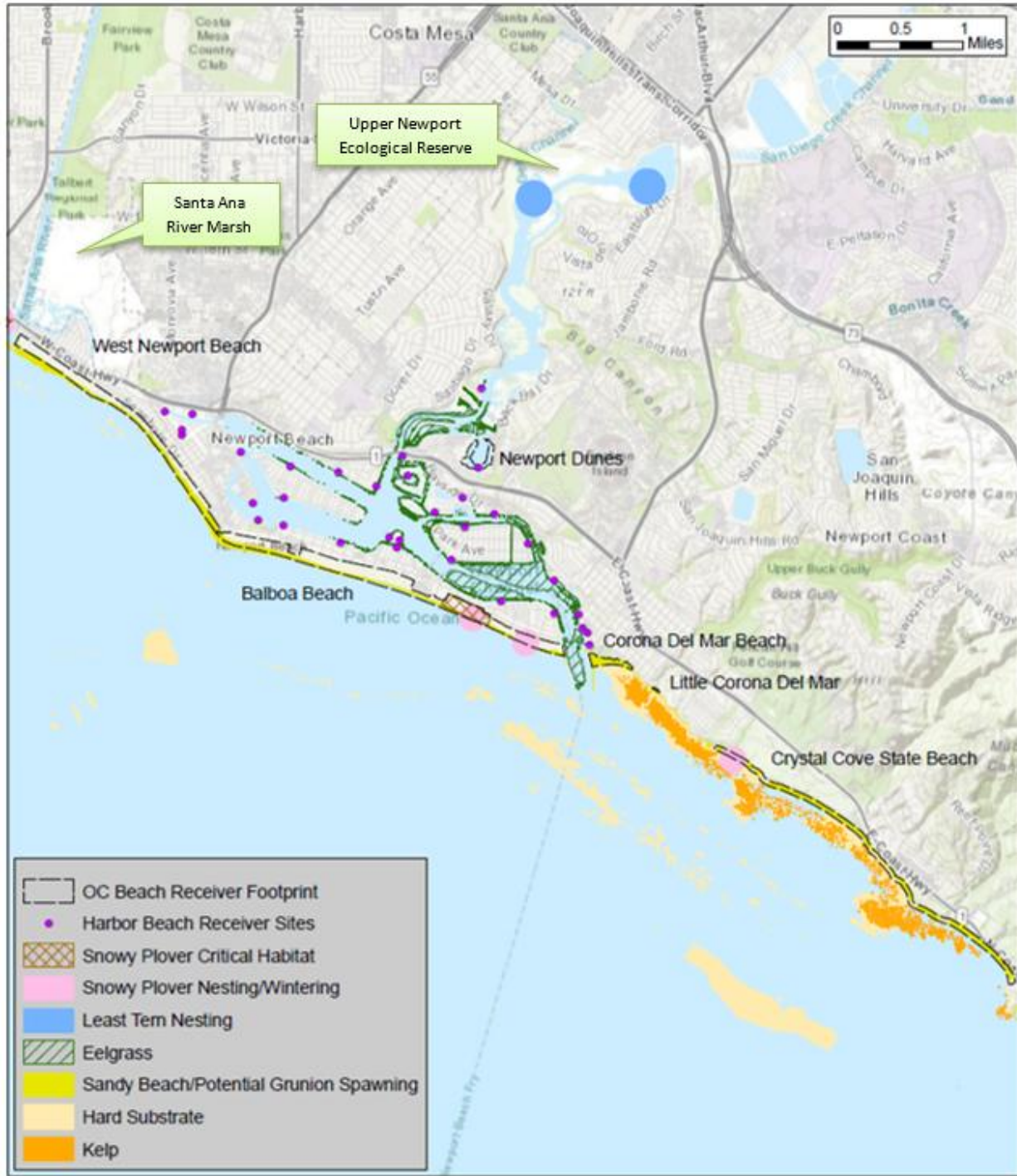


Figure 4-3. Sensitive Biological Resources West Newport Beach to Crystal Cove State Beach

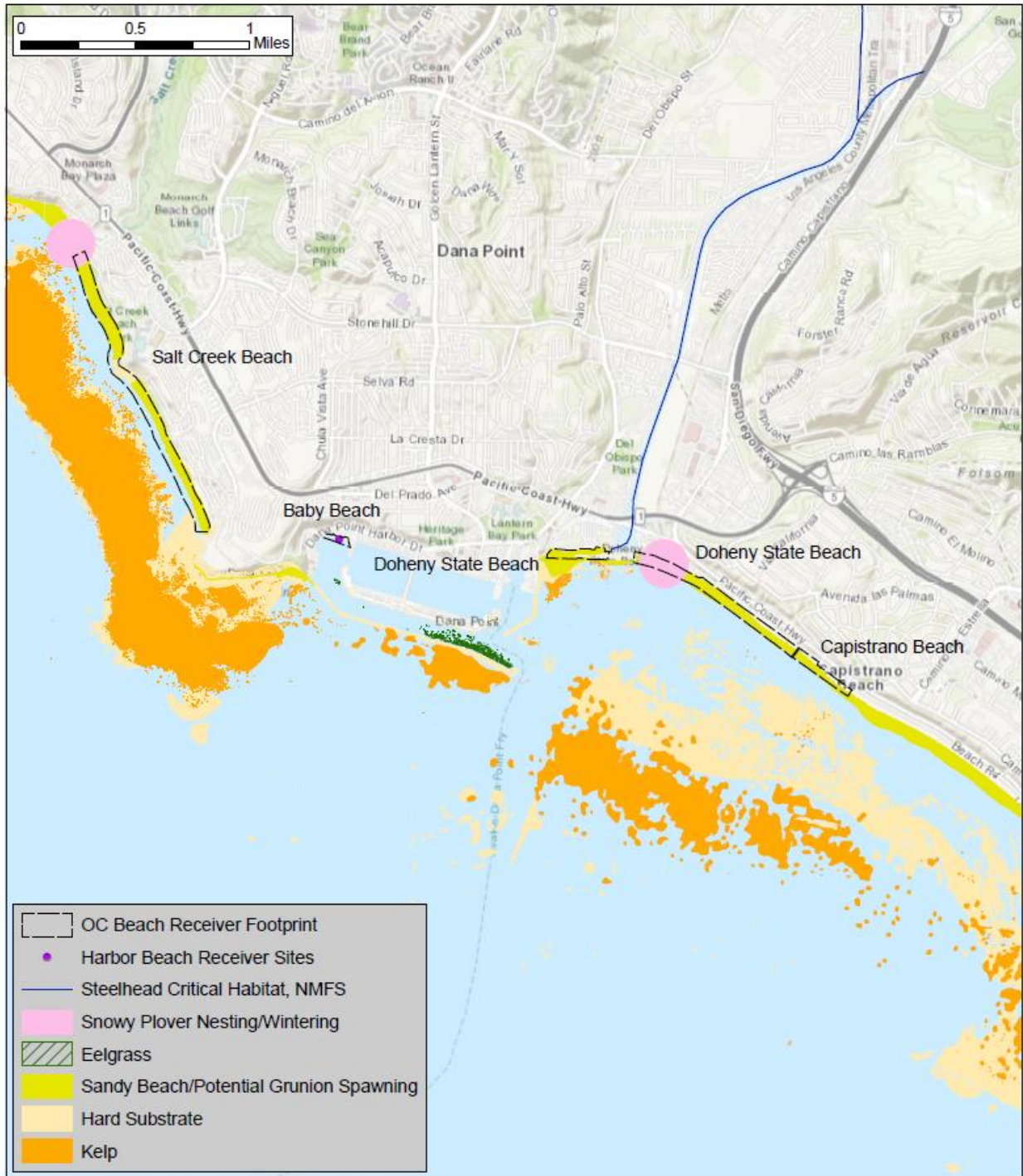


Figure 4-4. Sensitive Biological Resources Salt Creek to Capistrano Beach

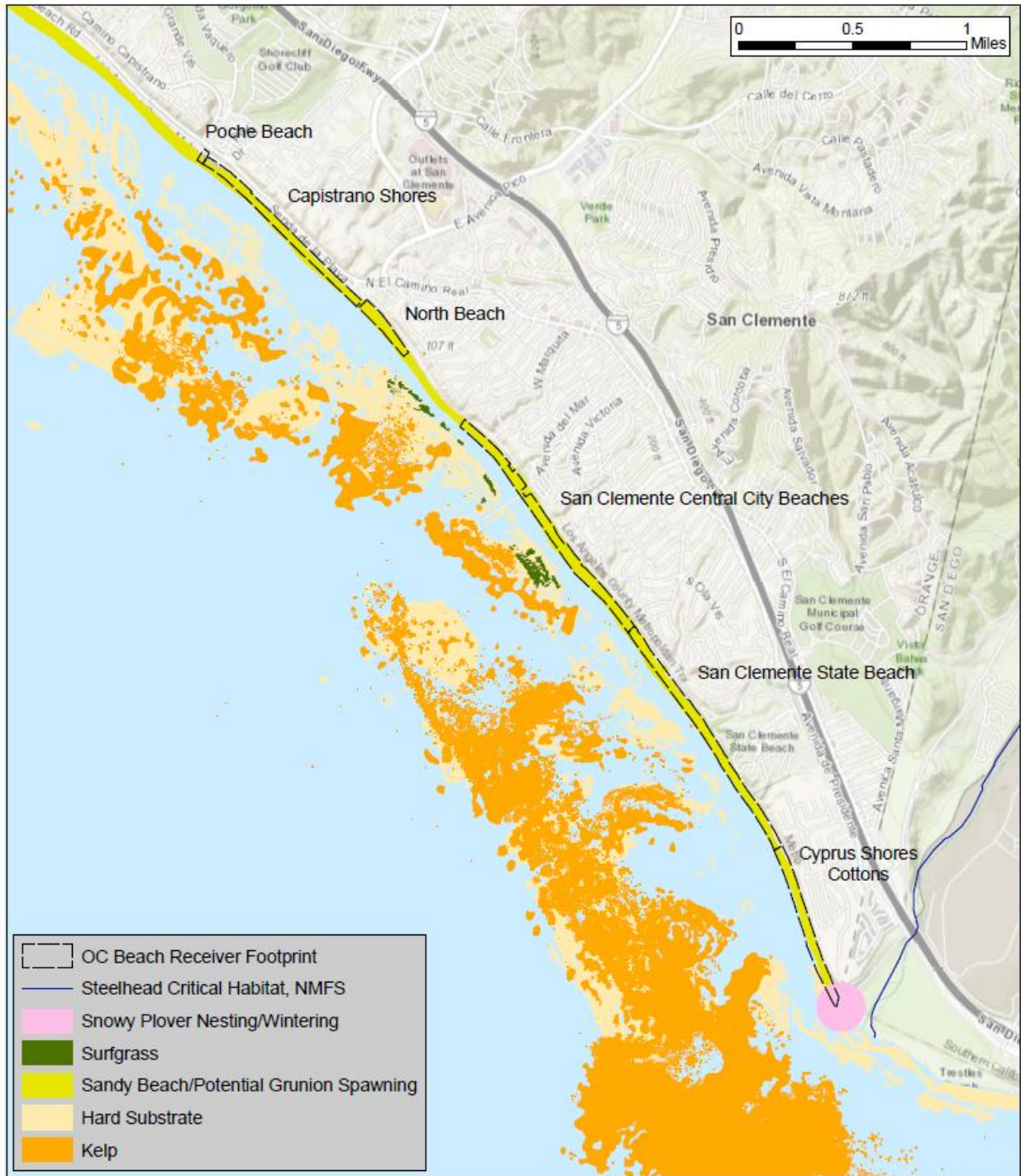


Figure 4-5. Sensitive Biological Resources Poche Beach to San Clemente



Figure 4-6. Marine Protected Areas and Green Sea Turtle Critical Habitat

- State Marine Reserve (SMR) - An MPA designation that prohibits damage or take of all marine resources (living, geologic, or cultural) including recreational and commercial take.
- State Marine Conservation Area (SMCA) - An MPA designation that may allow some recreational and/or commercial take of marine resources (restrictions vary).
- State Marine Conservation Area (No-Take) - An MPA designation that generally prohibits the take of living, geological, and cultural marine resources, but allows potentially affected and ongoing permitted activities such as dredging and maintenance to continue.

### 4.3 ESSENTIAL FISH HABITAT

The MSA requires federal action agencies to consult with NOAA's NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH. The EFH Guidelines (50 CFR 600.05 - 600.930) outline the process for federal agencies, NMFS and the Fishery Management Councils to satisfy the EFH consultation requirement under Section 305(b)(2)-(4) of the Magnuson-Stevens Act. As part of the EFH Consultation process, the guidelines require Federal action agencies to prepare a written EFH Assessment describing the effects of that action on EFH (50 CFR 600.920(e)(1)). The EFH Assessment is a necessary component for efficient and effective consultations between a federal action agency and NMFS.

#### 4.3.1 DEFINITIONS

EFH consist of those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity (16 U.S.C. 1802(10)). The following definitions apply to the sections of this document that address potential project impacts and protective measures:

- Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate (50 CFR 600.10).
- Substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities (50 CFR 600.10).
- Necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem (50 CFR 600.10).
- Healthy ecosystem means an ecosystem where ecological productive capacity is maintained, diversity of the flora and fauna is preserved, and the ecosystem retains the ability to regulate itself. Such an ecosystem should be similar to comparable, undisturbed ecosystems with regard to standing crop, productivity, nutrient dynamics, trophic structure, species richness, stability, resilience, contamination levels, and the frequency of diseased organisms (50 CFR 600.810(a)).
- Adverse effect means any impact that reduces quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810(a)).

#### 4.3.2 HABITAT AREAS OF PARTICULAR CONCERN

EFH guidelines published in Federal regulations identify HAPC as types or areas of habitat within EFH that are identified based on one or more of the following considerations:

- The importance of the ecological function provided by the habitat.
- The extent to which the habitat is sensitive to human-induced environmental degradation.
- Whether, and to what extent, development activities are or will be stressing the habitat type.
- The rarity of the habitat type (50 CFR 600.815(a)(8)).

HAPCs present within the Project Area include estuaries, seagrass, rocky reef, and canopy kelp habitats (PMFC 2020).

The ichthyofauna along sandy beaches has been previously studied (SANDAG 2000, SWRCB 1980). Of the fish species noted in Section 4.1 that are known to inhabit sandy beach and nearshore rocky reef habitats, eight are managed by the NMFS under two Fishery Management Plans (FMPs) – the Pacific Coast Groundfish and Coastal Pelagics Management FMPs (PFMC 2019; PFMC 2020; Table 4-2). In addition, three species (although one is concurrently managed by NMFS) are managed by the CDFW under the California Nearshore FMP (CDFW 2002) and the California Spiny Lobster FMP (CDFW 2016).

**Table 4-2. Managed Species Likely to Occur in the Vicinity of the Project Area**

Fishery Management Plan	Common Name	Scientific Name
Pacific Coast Groundfish (PFMC 2020)	California Scorpionfish <sup>1</sup>	<i>Scorpaena gutatta</i>
Pacific Coast Groundfish (PFMC 2020)	English Sole	<i>Parophrys vetulus</i>
Pacific Coast Groundfish (PFMC 2020)	Leopard Shark	<i>Triakis semifasciata</i>
Coastal Pelagic Species (PFMC 2019)	Pacific Sardine	<i>Sardinops sagax</i>
Coastal Pelagic Species (PFMC 2019)	Northern Anchovy	<i>Engraulis mordax</i>
Coastal Pelagic Species (PFMC 2019)	Pacific (Chub) Mackerel	<i>Scomber japonicus</i>
Coastal Pelagic Species (PFMC 2019)	Jack Mackerel	<i>Trachurus symmetricus</i>
Coastal Pelagic Species (PFMC 2019)	Market Squid	<i>Doryteuthis opalescens</i>
California Nearshore (CDFW 2002)	California Sheephead	<i>Semicossyphus pulcher</i>
California Spiny Lobster (CDFW 2016)	California Spiny Lobster	<i>Panulirus interruptus</i>

<sup>1</sup>species also in California Nearshore FMP

### 4.3.3 BIOLOGICAL DESCRIPTION OF MANAGED SPECIES

#### ***California Scorpionfish***

The California scorpionfish ranges from Santa Cruz, California south to Uncle Sam Bank, Baja California. It is a benthic species found in both sandy and rocky habitats. Individuals are predominantly solitary but are known to aggregate near prominent features both natural and man-made. Young fish live in shallow habitats typically hidden within dense algae and bottom-encrusting organisms. Spawning occurs between May and September and peaks in July. Eggs are laid in a gelatinous mass that floats near the surface. The primary food items include juvenile crabs, small fishes (e.g. northern anchovy), octopus, isopods, and shrimps (PFMC 2020).

#### ***English Sole***

English sole are found from the Bering Sea and Aleutian Islands, to San Cristobal Bay, Baja California Sur. They are usually caught in relatively shallow water, less than 300 ft deep, and on the outer continental shelf community in southern California. Eggs and larvae are pelagic; juveniles and adults are demersal. Small juveniles settle in the estuarine and shallow nearshore areas all along the coast, but are less common in southerly areas, particularly south of Point Conception. Juveniles and adults are carnivorous, apparently feeding primarily during daylight hours. Juveniles feed on harpacticoid copepods, gammarid amphipods, cumaceans, mysids, polychaetes, small bivalves, clam siphons, and other benthic invertebrates, while adult English sole feed on a variety of benthic organisms, but primarily polychaetes, amphipods, molluscs, cumaceans, ophiuroids, and crustaceans (PFMC 2020).

#### ***Leopard Shark***

The leopard shark is most commonly found in sandy or muddy bays and estuaries either at or near the bottom. The shark is most commonly encountered in 20 ft (6.1 meters [m]) of water or less but has been sighted up to 300 ft (91.4 m) deep. Leopard sharks feed primarily on benthic invertebrates and small fish. Their diet includes invertebrates such as crabs, shrimp, octopi, fat innkeeper worms (*Urechis caupo*), clam siphons, and fish such as midshipmen, sanddabs, shiner perch, bat rays, smoothhounds, and a variety of fish eggs. Female leopard sharks are ovoviviparous and can produce litters of 4 to 33 pups. The gestation period of the shark is between ten and twelve months, and birth usually occurs between April and May. During the summer months - June, July and August – leopard sharks gather together in the shallow water off the coast of San Diego.

#### ***Pacific Sardine***

Pacific sardine is a pelagic species. Individuals can be found in estuaries but are most common in open coastal habitats and offshore. The Pacific sardine is wide ranging with sardines in the Alguhas, Benguela, California, Kuroshio, and Peru currents, and off New Zealand and Australia being considered the same species. Changes in distribution are common and linked to environmental conditions. In California, sardines are highly mobile and move seasonally. Older adults move from southern California and northern Baja spawning grounds to feeding grounds off the Pacific Northwest and Canada. Younger individuals (two to four years old) migrate to feeding grounds in central and northern California. Juveniles occur in nearshore habitats off northern Baja and southern California. Although numbers vary greatly, at times sardines are the most abundant fish species in the California current. In southern populations spawning occurs year-round with a peak from April to August between Point Conception and Magdalena Bay. Eggs and larva are found everywhere adults are found. Sardines are planktivores consuming both phytoplankton and zooplankton. They are themselves prey for a variety of predators. Eggs and larvae are

consumed by numerous planktivores with juvenile and adults being consumed by a variety of fish, birds, and mammals (NMFS 2019).

### ***Northern Anchovy***

Northern anchovy historically ranged from the Queen Charlotte Islands, British Columbia south to Cape San Lucas, Baja California. More recently, populations have moved into the Gulf of California, Mexico. Larvae and juveniles are often abundant in nearshore areas and estuaries with adults being more oceanic. However, adults can be abundant in shallow nearshore areas and estuaries and eggs and larvae have been found offshore. Northern anchovy are non-migratory but do make extensive inshore-offshore and along-shore movements. In some populations, juveniles and adults are observed moving into estuaries during spring and summer and then back out during the fall. Spawning occurs throughout the year dependent upon the population. In southern California, spawning occurs between January and May. Larvae consume copepod eggs and nauplii, naked dinoflagellates, rotifers, ciliates, and foraminiferans. Adults and juveniles typically consume phytoplankton, planktonic crustaceans, and fish larvae. Northern anchovy are one of the most abundant fish in the California current and are important prey for a variety of fish, birds, and marine mammals. Finally, they are used as indicator of environmental stress, being affected by low dissolved oxygen and water-soluble fractions of crude oil (Emmett et al. 1991).

### ***Pacific Mackerel***

Pacific mackerel is a pelagic species. In the northeastern Pacific, Pacific mackerel range from southeastern Alaska to Banderas Bay, Mexico. As a group they are the same species as mackerel of a variety of names occurring elsewhere in the Pacific, Atlantic, and Indian oceans. Pacific mackerel usually occur within 20 miles of shore. Local populations spawn from Eureka, California south to Cabo San Lucas, Baja California between 3 and 320 km from shore with peak spawning occurring between late April and July. However, fecundity is more closely tied to sufficient food and environmental conditions than to season. Pacific mackerel larvae eat zooplankton including copepods and fish larvae. Juveniles and adults consume small fishes, fish larvae, squid and pelagic crustaceans. Pacific mackerel larvae are predated by numerous invertebrates and vertebrate planktivores. Juveniles and adults are important prey for many large fishes, marine mammals, and birds. Due to their larger size, they are likely less important as forage than Pacific sardine or northern anchovy which are available to a wider variety of predators and are more abundant (NMFS 2019).

### ***Jack Mackerel***

Jack mackerel is a schooling fish that ranges widely throughout the northeastern Pacific. Individuals are found along the mainland coasts to an offshore limit approximated by a line running from the eastern Aleutian Islands, Alaska to Cabo San Lucas, Baja California. Typically, small jack mackerel (< 6 years of age) are most abundant near the mainland coast and islands in the Southern California Bight. Older individuals fill out the geographic range and are generally found offshore in deep water and along the coastline north of Point Conception, California. Jack mackerel spawn between February and October in California, with peak spawning activity between March and July. Larvae eat primarily copepods with the small jack mackerel found off southern California consuming large zooplankton, juvenile squid and anchovy. Jack mackerel are prey items for large predators such as tuna and billfish. They are likely only of minor significance as prey for marine birds because of the large size of adults and their deep schooling (NMFS 2019).

### **Market Squid**

Market squid, range from the southern tip of Baja California to southeastern Alaska (CDFG 2005). Adults move off the continental shelf by day and can be found to depths of 1500 ft and return to the surface at night to hunt. They are cannibalistic predators that feed on smaller prey species such as fish, crabs, shrimp, molluscs, and other juvenile squids. Spawning market squid tend to congregate in dense schools, usually over sandy habitats where they deposit extensive egg masses. In central California spawning activity starts around April and ends in October, while in southern California spawning events begin around October and end in April or May. Market squid have been reported to die after completing their first and only spawning period. Market squid are an integral part of the food web to many marine vertebrates. Fish, seabirds, and marine mammals all utilize squid as a prey item.

### **California Sheephead**

California sheephead range from Monterey Bay south to the Gulf of California, although they are not common north of Point Conception. Sheephead are found from intertidal areas to water depths of 280 ft. They are considered a resident and solitary species, and adult males have a prominent, fleshy bump on their foreheads and have a black head and tail. Male sheephead have been aged at around 50 years old and can achieve a length of 3 ft and a weight exceeding 36 pounds (CDFW 2002). All sheephead are protogynous hermaphrodites, beginning life as females, but older females developing into males. Sheephead have a broad diet consisting of crabs, barnacles, mussels, and sea urchins, and inhabit nearshore rocky reefs, kelp beds, and surfgrass beds.

### **California Spiny Lobster**

The California spiny lobster is endemic to the North American west coast from Monterey, California southward to at least as far as Magdalena Bay, Baja California. Sub-adult and adult lobster are commonly found on the seafloor at depths ranging from intertidal to 210 ft while the planktonic larvae have been found offshore as far as 329 miles and at depths to 449 ft (CDFW 2016). Rocky structures and reefs are important habitat for California spiny lobster, and high-quality rocky habitat is often characterized by the presence of brown algae such as giant kelp (*Macrocystis pyrifera*), feather boa kelp (*Egregia menziesii*), and stalked kelp (*Pterygophora californica*), as well as surfgrass (*Phyllospadix* spp.). Females with eggs on their tails are referred to as “berried” and are commonly found in California from late April-August and are most abundant June-July. After an incubation period of approximately 8 to 9 weeks, developing embryos hatch from the eggs on the female’s tail and enter the water column as free swimming (pelagic) larvae. Larvae spend 7 to 8 months drifting with ocean currents and feeding on plankton then transform into a stage that closely resembles adults and settle on nearshore reefs then molt into juvenile lobsters. Lobsters typically forage at night, when they exit the relative safety of their shelters and actively search for food, and while they are often described as scavengers, they also function as predators and grazers.

## **4.4 SPECIAL STATUS SPECIES**

Federally listed and state-listed species afforded protection or consideration under the FESA, CESA, MMPA, MBTA, or other federal or state regulations with the potential to occur in the Project Area are briefly described in the following section and listed in Table 4-3.

### **4.4.1 REPTILES**

Several turtle species are found in the eastern Pacific Ocean, including leatherback (*Dermochelys coriacea*), green (*Chelonia mydas*), loggerhead (*Caretta caretta*), and olive ridley (*Lepidochelys*

*olivacea*) sea turtles (NMFS 2012b). The green sea turtle is the species most likely to occur in the Project Area, and therefore is the only one discussed. Green sea turtles, federally-listed as threatened, are found in all temperate and tropical waters throughout the world. They primarily remain near the coastline and around islands and live in bays and protected shores, especially in areas with seagrass beds (NMFS and USFWS 1998). In the eastern Pacific, green turtles have been sighted from Baja California to southern Alaska, but most commonly occur from San Diego south (NMFS 2012b). Opportunistic green turtle sightings have occurred along the southern California coast including Santa Barbara, Ventura, Los Angeles, Orange, and San Diego counties (Hanna et al. 2021). The nearest green sea turtle sightings to the Project Area were reported in the San Gabriel River associated with the warm-water discharge of an electric generating station and in Alamitos Bay (Massey et al. 2023). On July 19, 2023, NMFS published a proposed rule to designate critical habitat for six distinct population segments (DPSs) of the green sea turtle (Federal Register 2023). For the East Pacific DPS of the green sea turtle, the proposed rule includes waters between the mean high water (MHW) line and 20-m depth from Point Dume to the Mexican Border and includes the Project Area (Figure 4-6).

**Table 4-3. Special Status Species with Potential to Occur within the Project Site**

Common Name	Scientific Name	Status	Occurrence in Project Site
Reptiles - Green Sea Turtle	<i>Chelonia mydas</i>	FT	Resident population occur in San Gabriel River and Seal Beach National Wildlife Refuge. Low potential in Project Area.
Birds - California Least Tern	<i>Sternula antillarum browni</i>	FE, SE	Least terns are a migratory species found in the Project Area from approximately April 1 through September 1. Nests and forage in Project Area.
Birds - Western Snowy Plover	<i>Charadrius alexandrinus nivosus</i>	FT	Present year around. Nests and forage in Project Area.
Birds - Brown Pelican	<i>Pelecanus occidentalis</i>	Delisted; MBTA	Present year around. Nest at Channel Islands.
Mammals - Pacific Harbor Seal	<i>Phoca vitulina richardsi</i>	MMPA	Occur in harbors or bays hauled out on buoys, moorings, docks, or breakwaters. Low potential on sandy beaches in region. Low potential in Project Area.
Mammals - California Sea Lion	<i>Zalophus californianus</i>	MMPA	Occur in harbors or bays hauled out on buoys, moorings, docks, or breakwaters. Low potential on sandy beaches in region. Low potential in Project Area.
Mammals - Common and Bottlenose Dolphins	<i>Delphinus delphis; Tursiops truncatus</i>	MMPA	Travel and feed in nearshore and offshore waters. Low potential in Project Area.
Mammals - California Gray Whale	<i>Eschrichtius robustus</i>	MMPA	Very Low Potential – Regular migrant in offshore waters, but uncommon in bay and nearshore waters. Low potential in Project Area.

Notes: FE refers to Federally Endangered; SE refers to State Endangered; FT refers to Federally Threatened; MMPA refers to species protected by the Marine Mammal Protection Act; MBTA refers Migratory Bird Treaty Act

#### **4.4.2 CALIFORNIA LEAST TERN**

The California least tern is a federally listed and state-listed endangered species. Least terns are migratory and are only present in California during the breeding season. Their nesting season extends from April 1 through September 15. They generally feed in shallow estuaries or lagoons on small surface schooling fishes such as topsmelt, northern anchovy, jacksmelt and mosquitofish, and usually forage within one to two miles of breeding colonies (Keane and Smith 2016) although non-breeders may forage at greater distances. In the Project Area, nesting sites include Seal Beach Naval Weapons Station, Bolsa Chica Ecological Reserve, Huntington Beach, and Upper Newport Bay.

#### **4.4.3 WESTERN SNOWY PLOVER**

Snowy plover is a federal threatened species and California Species of Special Concern. Critical Habitat has been designated at several locations in Orange County and includes Bolsa Chica Ecological Reserve, Bolsa Chica State Beach, Santa Ana River Mouth, and Balboa Beach (Federal Register 2012.). The USFWS also has identified locations where habitat may be suitable to support wintering concentrations (wintering areas), although information on actual use is limited (Everest 2013). Ryan et al. (2023) found that from 2012 to 2021 plovers were detected on 18 of 27 beach segments in Orange County. They observed 97% at seven main roosting sites at Surfside, Bolsa Chica State Beach, Huntington State Beach, Balboa Beach, Crystal Cove State Park, Salt Creek, and San Onofre State Beach. Plovers also used small roosts and foraged at Seal Beach, Sunset Beach, Huntington City Beach, Newport Beach, Doheny State Beach, and San Clemente City Beach. The breeding season for western snowy plovers extends from March 1 through September 30 (City of Newport Beach 2022, Knapp and Woodfield 2022), and they feed on sand crabs, sand hoppers, and a variety of insects associated with washed-ashore kelp (wrack). Snowy plovers have cryptic coloration and shelter in depressions, which increases their vulnerability to impacts by vehicles and human disturbance.

#### **4.4.4 BLACK ABALONE**

Black abalone (*Haliotis cracherodii*) are a marine snail that range from about Point Arena, California to Bahia Tortugas and Isla Guadalupe, Mexico. They once were very abundant along the California coast but are now endangered (Federal Register 2011). They live on rocky substrate on intertidal and shallow subtidal reefs (to about 18 ft deep), and typically occur in habitats with complex surfaces and deep crevices that provide shelter for juveniles and adults. Black abalone have the potential occur on intertidal and nearshore rocky reefs between Corona Del Mar State Beach and Dana Point; however, low evidence of recruitment or adult survivorship has been reported in this area by the NMFS (NMFS 2020). No designated critical habitat occurs within the Project Area. There is a very low likelihood that black abalone are present within the Project Area and therefore will not be discussed further.

#### **4.4.5 STEELHEAD TROUT**

Critical habitat for endangered Southern California Steelhead Evolutionary Significant Unit is designated for the San Juan Creek and the Trabuco Creek, which is an upstream tributary (NMFS 2012a). The mouth of San Juan Creek is at Doheny State Beach which is a potential receiver site. Lower San Juan Creek does not support runs of steelhead under current conditions due to significant barriers to upstream migration, although fish occasionally are observed. A steelhead recovery plan for San Juan and Trabuco Creeks was prepared and identifies recovery actions, based upon the best scientific and commercial data available, necessary for the protection and recovery of listed species (NMFS 2012a). There is a very low likelihood that steelhead are present within the Project Area and therefore will not be discussed further.

#### 4.4.6 CALIFORNIA BROWN PELICAN

Brown pelicans (federally and state delisted) are protected under the MBTA. They feed by plunging into the water, stunning small fish with the impact of their large bodies and scooping them up in their expandable throat pouches. When not foraging, pelicans roost around fishing docks, jetties, and beaches or cruise the shoreline. They may rest on a variety of structures (e.g., jetties, floats, docks) and rocks along the mainland, and major roost sites have been reported at the entrance jetties to Anaheim Bay, Bolsa Chica Ecological Reserve, and the jetties of Dana Point Harbor (Everest 2013). Minor roost sites have been reported at the entrance jetties to Newport Bay, Arch Rock, Crystal Cove (Pelican Point), Laguna Beach (Emerald Bay), Dana Point (San Juan rocks), and Doheny State Beach (Everest 2013).

#### 4.4.7 MARINE MAMMALS

Marine mammals with the potential to occur in the nearshore Project Area include harbor seals, sea lions, dolphins, and gray whales. There are no harbor seal (*Phoca vitulina*) or California sea lion (*Zalophus californicus*) rookeries in Orange County (Everest 2013); however, they commonly occur in harbors or bays hauled out on buoys, moorings, docks, or breakwaters. They are rarely observed on beaches in the region. Common dolphins (*Delphinus delphis*) and bottlenose dolphins (*Tursiops truncatus*) are common in the surf zone and in offshore waters. California gray whales (*Eschrichtius robustus*) migrate through the Project Area with the southbound migration beginning in December and lasting through February, with the northbound migration from February through May.

#### 4.5 OTHER SPECIES OF INTEREST

Other species of interest with the potential to occur in the Project Area are discussed in the following section.

##### 4.5.1 CALIFORNIA GRUNION

The California grunion (*Leuresthes tenuis*) is a fish that feeds on plankton and comes to shore to spawn on sandy beaches. Spawning generally extends from March through August, with peak spawning occurring April through June. Grunion spawn at night on any or all of the 3 to 4 nights after the highest tide associated with each full or new moon and then only for a 1- to 3-hour period. Eggs incubate in the sand for approximately 10 days until the next tide series is high enough to reach them, when exposure to wave action triggers their hatching and the baby grunion are washed back into the sea. Grunion are managed as a game species by the CDFW, who post predicted spawning runs on the internet (<https://wildlife.ca.gov/Fishing/Ocean/Grunion>).

##### 4.5.2 PISMO CLAMS

Pismo clams (*Tivela stultorum*) are large clams that live in sandy areas from the intertidal zone to depths of 80 ft and may concentrate in certain areas. They are capable of rapid movement in the sediment due to their well-developed foot and normally bury to a depth of 2 to 6 inches. Pismo clam beds historically occurred between Seal Beach and Newport Beach but were severely impacted in southern California by the 1982-1983 El Niño (Everest 2013). In 1989, 10,000 clams were transplanted to Huntington State Beach from Pismo Beach in central California; however, few clams were found in follow-up surveys (CDFG 2001). No pismo clams were collected from the two Orange County beaches (Crystal Cove and San Clemente) during the 2013 Baseline Sandy Beach Surveys (Dugan et al. 2015); however, Bignami (2022) detected Pismo clams at Bolsa Chica State Beach in the summer of 2022 ( $12.6 \pm 1.0$  clams/m<sup>2</sup>), although most

Orange County sites had few or no detectable clams regardless of season with densities approximately one order of magnitude lower than those detected in San Diego County. Pismo clams are managed as a game species by the CDFW and south of Monterey County may be taken at any time of the year except in state marine reserves or other marine protected areas which prohibit the take of clams.

#### **4.5.3 CAULERPA**

The genus *Caulerpa* comprises a group of green algae with a wide global distribution. *Caulerpa* possess unique characteristics that enable them to withstand a broad range of environmental conditions and give them great invasive potential. There are no *Caulerpa* species native to California and therefore they pose a substantial threat to marine ecosystems in California. In March 2021, *C. prolifera* was discovered in Newport Bay. In response, the Southern California Caulerpa Action Team (SCCAT) implemented eradication efforts and those efforts are ongoing. It should be noted that the City of Newport Beach has conducted habitat monitoring in the bay since 2003 and the most recent monitoring effort in 2022 found that no *Caulerpa* was observed at any time within the surveyed areas. However, per the *Caulerpa* Control Protocol developed by SCCAT, the bay is still considered an “infected system” until eradication and subsequent verification is achieved.

## 5.0 ENVIRONMENTAL CONSEQUENCES

The impact analysis focuses on stressors associated with Proposed Project elements and their potential impact to marine biological resources including sandy beach and nearshore subtidal habitat (e.g., sandy subtidal habitat, open water, and rocky subtidal habitat), and sensitive resources within and in the vicinity of the Project Area. Impacts to marine habitats and wildlife can be measured as direct and/or indirect. Direct impacts are those that have a direct impact on habitats or wildlife and occur contemporaneously with the action. Direct impacts of construction to wildlife include immediate physical and physiological impacts such as abrupt changes in behavior, flight response, diving, evading, flushing, cessation of feeding, and physical impairment or mortality. Direct impacts to habitats can include damage from construction activities, as well as permanent habitat loss due to project construction. In contrast, indirect impacts are effects that are caused by or will result from the proposed action at a later time but are still reasonably certain to occur.

Impacts to marine biota and habitats would be considered significant if the Project would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, regulations; or by CDFW, USFWS, NMFS, or other regulatory agencies.
- Have a substantial adverse effect such as loss or alteration of sensitive habitats identified in local or regional plans, policies, regulations; by CDFW, USFWS, NMFS or other regulatory agencies, such as critical habitat; or federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. Sensitive habitats are defined to include high-relief reefs and vegetated low-relief reefs with one or more of the following indicator species: feather boa kelp (*Egregia menziesii*), giant kelp (*Macrocystis pyrifera*), surfgrass (*Phyllospadix* spp.), large sea fans (*Muricea* spp.), or sea palms (*Eisensia arborea*).
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites that may diminish the chances for long-term survival of species.

The determination of significant effect is based on professional judgment and takes into account available data, literature information about the responses of biota and habitats to disturbances, and the magnitude and duration of the impact and the commercial, recreational, scientific, or regulatory status of the affected resource. The analysis also takes into account the Project-specific monitoring framework that establishes monitoring criteria “triggers” for varying categories of projects (see Section 2.4).

A general discussion of potential direct and indirect impacts is summarized below. These generalized impact assessments can be applied to all receiver sites; however, some receiver sites may support additional resources that would be noted in site-specific assessments.

### 5.1 DIRECT IMPACTS OF SAND PLACEMENT

As noted in Section 2.2, there are several potential sand placement locations within the beach profile and depending on the placement location, the direct impact to marine habitat would differ. Beach Berm and Below Mean High Tide Line placement could affect both upper and lower beach areas, while Back Beach placement would generally affect the upper, dry portion of the beach (Table 5-1). The proposed placement locations for each receiver site are listed in Table 5-2.

### 5.1.1 PLACEMENT SITE IMPACTS

Sandy beach is the predominant habitat along the shoreline of the proposed receiver sites, with no rocky reef or hard bottom habitat in the direct Project footprint. The sandy beach ecosystem is a dynamic system and biota are generally tolerant to a high degree of physical change. The primary direct impact associated with beach nourishment is burial of beach invertebrate animals (e.g., clams, sand crabs, worms) living on or in the substrate at the receiver site. Other direct impacts may result from equipment damage associated with the operation of vehicles to move and spread sand at the receiver sites, and movement of vehicles and equipment during access to and from the receiver site. The loss of benthic organisms within the receiver site footprint is an expected and unavoidable impact of beach replenishment projects. Most invertebrates within the receiver site footprint are not expected to survive, but studies have shown that some mobile animals are able to escape or burrow out from the outer or leading edges of the beach fills where overburden depths are generally 2 ft or less (SAIC 2011).

Most studies have reported rapid recovery within 1 year or less for sandy beach intertidal animals after beach nourishment (SAIC 2012, Rosov et al. 2016). This begins almost immediately after cessation of construction, and recovery occurs via two mechanisms, one is by animals that migrate to the affected area from surrounding habitat and the second is by recruitment from the plankton. Substantial recovery of invertebrate abundance, species number, and biomass occurred within 4 months after placement of 1 mcy of sand at Imperial Beach (Parr et al. 1978). Wooldridge et al. (2016) monitored the intertidal invertebrate community following Regional Beach Sand Project (RBSP) II at eight beaches across San Diego County and found that nearly all taxa had major declines in abundance immediately following replenishment, while talitrid amphipods and bean clams, *Donax gouldii* recovered within one year. Habitat functions were studied for 3 years following RBSP I at several beaches in Encinitas, California, and were found to be enhanced by having increased invertebrate prey variety earlier in the season, greater sand depths and grunion habitat suitability, and increased bird use of wider beach habitat across tide conditions (SAIC 2006). Habitat enhancement also was observed on an adjacent beach downcoast of the receiver site.

Sandy beach invertebrate abundance is generally higher in the spring-summer coincident with recruitment and movement patterns of dominant species between the shallow subtidal and beach habitat. Therefore, the timing of projects may influence recovery times (SAIC 2007, Rosov et al. 2016). Invertebrate recovery (e.g., species, abundance, biomass) on the order of weeks have been reported with projects completed in winter-early spring prior to the spring-early summer recruitment period. While recovery may take several months if construction is completed in summer-fall because recruitment naturally occurs in spring-summer. Regardless, colonization will begin almost immediately, and the development of the invertebrate prey base will proceed naturally via the two mechanisms mentioned above. While rapid recovery is expected for most invertebrates comprising the prey base at sandy beaches, recovery rates may be slower for certain long-lived species, if present. For example, rapid recovery rates would not be expected to apply to slow growing and long-lived species such as Pismo clams.

**Table 5-1. Direct Impact Footprint Based on Dune or Back Beach**

Placement Location	Description	Dune or Back Beach (Dry Zone)
Beach Berm	The berm will be a level surface extending a certain distance from the back of the beach toward the ocean, then sloping gradually into the water.	Yes
Back Beach Storm Dike	Fill material is placed in a dike-type (linear mound) structure above the dry beach berm.	Yes
Below Mean High Tide Line	Sand would be delivered to the beach and pushed by bulldozers to the water's edge. At low tide, the material is pushed as far seaward as possible so that it can be reworked by waves during the following rising tide.	Yes
Back Beach Dunes	Dunes created by placing and grading imported sediment onto the back beach to form mounds	Yes
Back Beach Bluff/Cliff Stabilization	Sediment placed along the back beach at the base of the bluff or as sand cover on bluff toe rock or seawall protection.	Yes

**Table 5-2. Direct Impact Footprint Based on Sandy Beach**

Placement Location	Description	Sandy Beach (Intertidal/Wet Zone)
Beach Berm	The berm will be a level surface extending a certain distance from the back of the beach toward the ocean, then sloping gradually into the water.	Yes
Back Beach Storm Dike	Fill material is placed in a dike-type (linear mound) structure above the dry beach berm.	No
Below Mean High Tide Line	Sand would be delivered to the beach and pushed by bulldozers to the water's edge. At low tide, the material is pushed as far seaward as possible so that it can be reworked by waves during the following rising tide.	Yes
Back Beach Dunes	Dunes created by placing and grading imported sediment onto the back beach to form mounds	No
Back Beach Bluff/Cliff Stabilization	Sediment placed along the back beach at the base of the bluff or as sand cover on bluff toe rock or seawall protection.	No

In summary, marine invertebrates in the fill footprint would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary, and recovery would occur

immediately following construction, the speed of which dependent on project timing. Therefore, impacts would be expected to be less than significant.

There is also the potential to directly impact California grunion individuals or eggs by equipment damage or sand burial, if sand placement or site mobilization activities took place within 10 to 14 days of a spawning run. The area just below the high tide line is most vulnerable during the grunion season if the habitat is suitable for spawning. As noted in Section 2.4.2, grunion monitoring would be required for any beach nourishment project occurring within the spawning season (March through end of August) on any sandy beach where spawning could potentially occur and where project placement would potentially affect spawning habitat. Impacts to grunion have the potential to be adverse but would not be expected to be significant because habitat suitability assessments and monitoring during construction would be used to avoid or minimize impacts to grunion.

**Table 5-3. Proposed Placement Locations for Receiver Sites**

Receiver Site	Beach Berm	Back Beach Storm Dike	Below Mean High Tide Line	Back Beach Dunes	Backbeach Bluff/Cliff Stabilization
West Beach, Seal Beach	No	No	No	Yes	No
East Beach, Seal Beach	Yes	Yes	Yes	No	No
Surfside Beach	Yes	Yes	Yes	Yes	No
Sunset Beach	Yes	Yes	Yes	Yes	No
Huntington Harbour Beaches	Yes	No	No	No	No
Bolsa Chica State Beach	Yes	No	No	Yes	No
Huntington Beach Bluffs	Yes	No	No	Yes	Yes
Huntington Beach State Beach	No	No	Yes	Yes	No
West Newport Beach	Yes	No	Yes	Yes	No
Balboa Beach	Yes	Yes	Yes	Yes	No
Newport Harbor Beaches	Yes	No	No	No	No
Newport Dunes	Yes	Yes	No	No	No
Corona Del Mar State Beach	Yes	No	No	Yes	No
Little Corona del Mar	Yes	No	No	Yes	No
Crystal Cove State Park	Yes	No	No	No	Yes
Salt Creek Beach	Yes	No	No	Yes	No
Baby Beach	Yes	No	No	No	No
Doheny State Beach	Yes	Yes	No	Yes	No
Capistrano Beach County Park	Yes	Yes	No	Yes	No
Poche Beach	Yes	Yes	No	No	No
Capistrano Shores	Yes	Yes	No	No	No
San Clemente North Beach	Yes	Yes	Yes	No	No
San Clemente City Beaches	Yes	Yes	Yes	Yes	No
San Clemente State Beach	Yes	Yes	Yes	Yes	No
Cyprus Shore/Cottons Beach	Yes	Yes	Yes	No	No

Beach nourishment projects could directly impact least tern and western snowy plover nesting if projects are implemented during the nesting season and if birds are nesting at the potential receiver site. The SCOUN receiver sites with potential sensitive bird nesting and over-wintering habitat are noted in Table 5-3, and as noted in Section 2.4.1, sensitive bird species monitoring would be required for any beach nourishment project occurring during the nesting season and at over-wintering areas for snowy plovers to avoid or minimize impacts to sensitive bird species. Therefore, impacts to least terns and snowy plovers nesting are expected to be less than significant.

### **5.1.2 OTHER CONSTRUCTION-RELATED IMPACTS**

All potential beach sediment would require agency approval prior to placement to ensure that there are no contaminants of concern and that it is physically compatible with the potential receiver site. Detailed criteria for potential source material are provided in M&N 2025, and therefore chemical and physical impacts from source material would be less than significant. In addition, operation of equipment on the beach has the potential for introducing contaminants to the marine environment from minor spills and leaks. The probability of accidental discharges is considered low. The construction contractor would be required to develop and implement a Spill Prevention Control and Counter-Measures Plan prior to initiating construction to avoid/minimize potential spills. The contractor would utilize Best Management Practices (BMPs) to avoid potential spills, and if a spill occurred, the contractor would implement measures to control and clean up any spill to minimize degradation of water quality and habitat. For these reasons, impacts to biological resources from accidental discharges would be expected to be less than significant, if they were to occur at all.

It should be noted that monitoring following a beach nourishment project in San Diego resulted in enhanced sandy beach habitat functions (SAIC 2006). The primary benefit was to increase the persistence of sandy beach habitat across seasons such that habitat was suitable early in the season to support the onset of the grunion spawning season and invertebrate recruitment period. It resulted in increased invertebrate diversity earlier in the season, increased bird use across tide conditions, and enhanced habitat for grunion spawning.

## **5.2 INDIRECT IMPACTS OF SAND PLACEMENT**

Indirect impacts from beach nourishment include:

- Turbidity
- Forage Reduction or Alteration
- Disturbance, Displacement, or Interference
- Sedimentation and Burial of Sensitive Nearshore Habitat

Each of indirect impacts are discussed below for habitats and general wildlife. Potential indirect impacts to sensitive species are summarized at the end of this section.

### **5.2.1 TURBIDITY**

Turbidity would only occur at receiver sites where material is placed in or near the waterline (i.e., Beach Berm and Below Mean High Tide Line placement locations). Turbidity within the nearshore environment is naturally variable and has the potential to indirectly impact plankton, fish, marine mammals, birds, vegetated reefs, and benthic invertebrates. Turbidity has the potential to cause physiological stress, reduced feeding, or displacement of marine invertebrates or fish in reef areas as well as soft-bottom

habitats, with effects dependent on the concentration and duration of turbidity. While marine invertebrates and demersal fish are generally tolerant of pulses of high turbidity such as naturally occurs during high wave or storm conditions, adverse effects may result from exposure to very high concentrations or moderate to high concentrations for prolonged periods. Similarly, nearshore vegetated reefs have the potential to be impacted by reduced light transmittance or increased particulate concentrations associated with turbidity plumes if persistent for extended period of time.

Birds that forage on fish may be affected by turbidity generated during sand placement. No adverse effects on bird foraging from turbidity were observed with implementation of the RBSP I (AMEC 2002). Foraging by seabirds and waterbirds on fish prey was patchy and appeared to be prey dependent. There were no obvious patterns as to the effects of dredging or discharge turbidity on foraging locations or prey availability. Similar findings were reported during monitoring of least tern foraging behavior during beach nourishment at Surfside-Sunset, California (SAIC 2011). Keane and Smith (2016) suggested that turbidity from dredging activities may not substantially alter California least tern foraging activity and seasonal restrictions on dredging near active nesting sites provide no protections to this species and are not warranted.

Data from beach nourishment projects indicated that turbidity measurements were within ranges measured during storm or high wave conditions, and that total suspended solids (TSS) concentrations declined with increasing distance outside the breaker zone and up and downcoast and dissipated rapidly after construction ceased (SAIC 2012).

In summary, turbidity impacts would be minimized by limiting the fines content of the source material, be localized and temporary, and are not expected to result in significant effects on marine biological resources offshore of the receiver site and within the distance of the expected turbidity plumes. In addition, turbidity monitoring would be conducted to minimize impact for projects that place sand in the intertidal zone (see Section 2.4.5).

### **5.2.2 FORAGE REDUCTION, ALTERATION, OR MODIFICATION**

There is potential for indirect effects to shorebird foraging from burial of invertebrates within the footprint of the receiver site, and reduced shorebird foraging at nourished beaches may be expected during the invertebrate recovery period. However, each receiver site has unaffected shoreline nearby and recolonization of the receiver site by invertebrates would be rapid (e.g., weeks to months). No adverse effects to forage base or shorebird foraging (including snowy plovers) were detected during a study of nourished and unnourished beach sites two to four years following RBSP I suggesting that any reduced shorebird foraging habitat is temporary (SAIC 2006). The study also concluded that beach nourishment beneficially enhanced sandy beach habitat functions.

This impact has the potential to be adverse but would not be significant because disturbance effects would be temporary and limited to the area of construction; unaffected shoreline occurs adjacent to each receiver site that provides additional foraging opportunities, and the forage base at the receiver site will rapidly recover. In addition, sensitive bird species monitoring would be conducted for any beach nourishment project occurring within the nesting season of California least tern and/or western snowy plover and at over-wintering areas for snowy plovers (see Section 2.4.1).

Marine mammals could also be affected by turbidity when material is placed in or close to the waterline, potentially affecting foraging success. Since turbidity impacts are localized, generally remain within in the

surf zone and are temporary, the area can easily be avoided by marine mammals, and thus impacts would be less than significant.

### **5.2.3 DISTURBANCE**

Construction activities have the potential to disturb shorebirds, gulls, and other coastal birds that may forage or rest on beaches at or near receiver sites. Disturbance impacts are of concern for endangered or threatened species. Birds are generally tolerant of disturbance within certain distances, but generally move away when threat is perceived. Shorebirds may be observed foraging in the swash zone below people sitting on the beach but walk away or flush and settle further down the beach in response to perceived threats moving toward them (e.g., people walking, jogging, and/or exercising dogs, vehicles) (SAIC 2011). These reactions may result in less foraging time by the disturbed birds although studies vary as some note temporary disruption of foraging and roosting of snowy plovers in the path of heavy equipment, while others observed undisturbed snowy plover foraging in the vicinity of a beach discharge (SAIC 2012). Construction during RBSP I appeared to have minor influence on shorebirds (sandpipers, godwits, curlews) at receiver sites (AMEC 2002).

Any disturbance effects would be temporary in duration and limited to the period of construction, and unaffected shoreline occurs adjacent to each receiver site that would provide additional foraging opportunities. Therefore, impacts would be less than significant.

### **5.2.4 SEDIMENTATION AND BURIAL OF SENSITIVE NEARSHORE HABITAT**

Fill material placed in or close to the waterline on individual receiver sites would eventually be washed by waves and redistributed offshore and alongshore through natural processes. Impacts associated with sediment transport away from the receiver site generally focuses on indirect burial of sensitive hard bottom, vegetated habitats, or shoaling of inlets and/or navigational channels of down current embayments. As defined in Section 4.2.1, sensitive hard bottom indicator species consist of surfgrass, feather boa kelp, sea fans, sea palms, and giant kelp, which could be affected if sand transport results in sedimentation at sufficient depth and duration to bury or degrade the hard-bottom habitat. For harbors and embayments, sensitive habitat consists of eelgrass habitat.

Assessment of environmental risk to sensitive habitats from sand movement requires consideration of several factors including volume of placed sand, proximity to sensitive habitats, alongshore sediment transport condition at the time of placement, physical characteristics of the habitat, and existing resource development. For this Project, the receiver site footprint figures depict the maximum potential placement envelope for the specific receiver site over multiple events (multiple years); the actual fill footprint per opportunistic nourishment event would be much smaller as shown by the representative/typical sand fill polygon but can occur anywhere within the bigger maximum extent envelope. To determine maximum beach fill quantities, a target beach width was determined based on a natural shoreline condition at the subject receiver site. The fill volume was calculated by a rule of thumb factor of 1.5 cy of sand per 1 foot of beach width for every 1 linear foot of a beach shoreline length for a beach berm fill in southern California. For some beaches, such as West Seal Beach, fill estimates were based on estimates for dune creation/enhancement. To ensure these estimates were reasonable and environmentally suitable, a review of historic and/or upcoming nourishment projects and environmental conditions were examined for each receiver site (M&N 2025).

Based on this approach, no impacts to sensitive habitat are predicted and therefore impacts are expected to be less than significant; however, based on the potential fill volume and if a project occurs in an area

known to have eelgrass, seagrass, surfgrass, kelp or hard substrate within the vicinity, monitoring of nearshore habitat may be triggered (see Section 2.4.3).

Similarly, no impacts to tidal inlets are predicted and therefore impacts are expected to be less than significant; however, based on the potential fill volume and if a project occurs at Bolsa Chica State Beach, Huntington Cliffs, Huntington State Beach, and West Newport Beach, then tidal inlet monitoring would be triggered (see Section 2.4.4).

### **5.3 IMPACTS TO MARINE PROTECTED AREAS**

Four receiver sites (Newport Dunes, Little Corona Del Mar, Crystal Cove State Beach, and Salt Creek Beach) are located within an SMCA MPA (Figure 4-6). Since measures to protect biological resources are in place for any beach nourishment project, impacts to MPAs would be less than significant.

### **5.4 IMPACTS TO EFH AND MANAGED SPECIES**

The following text discusses the implications of potential construction activities and direct and indirect impacts to EFH and managed species within and adjacent to the Project Area.

Sand placement below mean high tide line would result in impacts to marine life within the sandy beach placement area. The loss of benthic organisms within the placement area is an expected and unavoidable impact during beach replenishment projects. Due to the relatively small project footprint, and widespread occurrence and rapid recovery rates of these types of organisms, direct impacts to marine life within the beach fill footprint are expected to be less than significant. It is anticipated that the newly constructed beach will be rapidly colonized, mirroring the invertebrate communities on the existing beach within a relatively short time period (SAIC 2006b, Rosov et al 2016).

Given the dynamic nature of the surfzone habitat it is anticipated that after several tidal cycles, the material would disperse into the shallow subtidal zone. Similar to the intertidal zone, impacts to the shallow sandy subtidal zone would be the loss of benthic organisms within the placement area; however, organisms are expected to rapidly recolonize the area (Parr et al. 1978). Based on the analysis to determine maximum beach fill quantities (M&N 2025), impacts to adjacent reefs is not expected given the proposed fill volumes; however, the proposed Project may temporarily increase turbidity around adjacent reefs if present, which may temporarily affect shallow nearshore plants and algae. Turbidity and sedimentation from the project are anticipated to result in short-term and less than significant impacts to sandy subtidal habitat, sensitive hard-bottom habitat, kelp, and surfgrass (i.e., HAPC's).

#### **5.4.1 IMPACTS TO MANAGED SPECIES**

Potential impacts to managed species are expected to be minimal and temporary. Loss of potential prey items in the intertidal area is believed to be minor, as few prey items affecting identified FMP species are present (SAIC 2006b). Project activities that could indirectly affect the identified FMP species are the shaping of the existing beach and fill material. These activities may result in localized increases in turbidity during the flood tide as ocean water reaches the construction area. Increases in turbidity could temporarily decrease the foraging efficiency of fishes, however, given the dynamic nature of the habitat and the grain size of the material being excavated (i.e., sand), the effects are likely to be similar to the generally high ambient turbidity. Turbidity monitoring during nourishment activities would be conducted to confirm violations of water quality standards do not occur (M&N 2025). Rocky reef burial,

sedimentation on hard-bottom habitat, or impacts to kelp and surfgrass are not expected, and therefore impacts to rocky reef associated species or lobsters are unlikely.

Impacts from the project would be minor for the pelagic fish species. The coastal pelagics by nature have low site fidelity. Given the small area affected, interruptions causing pelagics to move into other areas would not cause biologically significant increases in competition due to habitat loss. The proposed project would not impede the spawning success of the coastal pelagics, nor cause disturbances that increase predation. The groundfish species are comparatively uncommon in the project area. As a result of the rarity of these species within the nearshore area, project impacts are not probable.

Although grunion are not a NMFS-managed fish species, they are managed as a game species by the CDFW and are considered a species of interest. Because the project area is a sandy beach, it provides suitable grunion spawning habitat. Efforts are recommended to minimize impacts to this fish species, and the proposed monitoring program will ensure that grunion spawning will not be affected by beach fill operations (M&N 2025).

#### **5.4.2 EFH CONCLUSIONS AND DETERMINATION OF EFFECT**

An adverse effect to EFH is any impact that reduces quality and/or quantity of EFH, and may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH. As such and given the relatively low threshold for adverse impact determination, the project is expected to have an adverse effect. However, due to the temporary and low impact nature of the project, habitat type in the project footprint (littoral sands and sandy beach), and with implementation of turbidity and grunion monitoring, it is concluded that the Project would have a minimal and less than significant adverse impact to EFH or HAPC for species managed under the Pacific Coast Groundfish, Coastal Pelagic Species, California Nearshore, or California Spiny Lobster FMPs.

#### **5.5 IMPACTS ASSOCIATED WITH CAULERPA**

As a requirement of the *Caulerpa* Control Protocol for any bottom disturbing activity, a pre-construction survey must be conducted (NMFS 2021). In the event *Caulerpa* is detected, all bottom disturbing activity shall cease until such time as the infestation has been isolated and treated, or the risk of spread from the disturbing activity is eliminated in accordance with the *Caulerpa* Control Protocol. Implementation of *Caulerpa* surveys is noted in the SCoup Implementation Guidelines - Criteria for Beach Fill Sand Sources and would reduce potential impacts from *Caulerpa* (M&N 2025).

#### **5.6 IMPACTS TO WILDLIFE CORRIDORS**

The Project Area includes a relatively narrow habitat area extending from the back beach to the depth of closure, and therefore does not provide any terrestrial movement corridors, and no marine mammal, reptile, or fish migratory corridors occur within the Project Area. Some marine fish species such as anchovy, sardine, and topsmelt may move into and out of bays and harbors for spawning, nursery, and foraging, and several whale species migrate along the coast of California including the California gray whale, but beach nourishment would not block any corridors. Therefore, no impacts to wildlife migration or corridors are anticipated.

## **5.7 IMPACTS TO WETLANDS**

There are no wetlands or riparian habitat at any of the proposed receiver site footprints, and therefore the Project would not have a direct impact on wetland or riparian habitat. However, as discussed in Section 5.2.4 (Sedimentation and Burial of Sensitive Habitat), indirect sedimentation impacts could result in tidal inlet closure which could affect wetlands. No impacts to tidal inlets are predicted and therefore impacts are expected to be less than significant based on tidal inlet monitoring trigger criteria for sand placement at Bolsa Chica State Beach, Huntington Cliffs, Huntington State Beach, and West Newport Beach (see Section 2.4.4).

## **5.8 IMPACTS TO SENSITIVE SPECIES**

### **5.8.1 WESTERN SNOWY PLOVERS**

Western snowy plovers may be affected by equipment associated with beach nourishment activities if located near foraging areas and/or breeding sites. Monitoring results have documented avoidance of the construction area and moving away from vehicles, but no apparent effect on foraging on neighboring beach areas (SAIC 2012). Burial of macrophyte wrack from sand placement has the potential to reduce available forage for threatened western snowy plovers. Dugan et al. (2003) found that the mean abundance of western snowy plovers on various sandy beaches in southern California was positively correlated with the amount of macrophyte wrack on the beach. It is expected that snowy plovers would be able to use and forage in other areas if construction activities occurred when they were present and if the disturbance caused them to avoid the Project Area. For receiver sites located in Snowy Plover Critical Habitat (Bolsa Chica State Beach, Huntington Beach State Beach, Balboa Beach), as noted in Section 5.1, rapid recovery is expected for most invertebrates comprising the prey base at sandy beaches, and therefore, no long-term, permanent impact or loss of critical habitat is expected. However, SCOUP implementation guidelines include sensitive bird species monitoring at nesting and over-wintering areas for any beach nourishment project. Therefore, impacts to snowy plovers would be less than significant.

### **5.8.2 CALIFORNIA BROWN PELICAN**

California brown pelican may be impacted by equipment associated with dredging and/or beach nourishment, if located near roosting sites. Temporary displacement (shifts in position, short-term fly off and return) of pelicans at a breakwater roost area was documented during dredging operations at Marina del Rey, California (SAIC 2011). As discussed in Section 5.1, no adverse effects on bird foraging from turbidity were observed with implementation of the RBSP I (AMEC 2002), and it is expected that pelicans would be able to use other areas if construction activities occurred when they were present and if the disturbance caused them to avoid the Project Area. Therefore, impacts to brown pelicans would be less than significant.

### **5.8.3 CALIFORNIA LEAST TERN**

California least tern may be affected by equipment associated with sediment management activities, if located near breeding sites although it is expected that least terns would be able to use other areas if construction activities occurred when they were present and if the disturbance caused them to avoid the Project Area. As discussed in Section 5.1, no adverse effects on bird foraging from turbidity were observed with implementation of the RBSP I (AMEC 2002), and similar findings were reported during monitoring of least tern foraging behavior during beach nourishment at Surfside-Sunset, California (SAIC 2011). Keane and Smith (2016) suggested that turbidity from dredging activities may not substantially alter California

least tern foraging activity and seasonal restrictions on dredging near active nesting sites provide no protections to this species and are not warranted. Receiver sites that support least tern nesting are avoided and/or seasonal work restrictions may be required. The SCOUP implementation guidelines also include sensitive bird species monitoring for any beach nourishment project occurring during the nesting season of California least tern. Therefore, impacts to least terns would be less than significant.

#### **5.8.4 SHOREBIRDS**

Equipment use associated with beach nourishment may similarly indirectly disturb other shorebirds, as reported above for snowy plover. Construction during RBSP I appeared to have minor influence on shorebirds (sandpipers, godwits, curlews) at receiver sites (AMEC 2002). It is expected that special status birds would be able to use other areas if construction activities occurred when they were present and if the disturbance caused them to avoid the Project Area, and impacts to shorebirds would therefore be less than significant.

#### **5.8.5 MARINE MAMMALS**

Marine mammals could be affected by turbidity when sand is placed in or close to the waterline, potentially affecting foraging success. Since turbidity impacts are very localized, generally remain within the surf zone and are temporary, turbidity plumes can easily be avoided by marine mammals. It is expected that marine mammals would be able to use other areas if construction activities occurred when they were present and if the disturbance caused them to avoid the Project Area. Therefore, impacts to marine mammals would be less than significant.

#### **5.8.6 SEA TURTLES**

Sea turtles could be affected by turbidity when sand is placed in or close to the waterline, potentially affecting foraging success. Since turbidity impacts are very localized, generally remain within the surf zone and are temporary, turbidity plumes can easily be avoided by sea turtles. It is expected that sea turtles would be able to use other areas if construction activities occurred when they were present and if the disturbance caused them to avoid the Project Area. Impacts to proposed green sea turtle critical habitat would also consist of localized and temporary turbidity plumes during construction which would not result in long-term, permanent impacts or loss. No burial or loss of eelgrass or surfgrass habitat would occur. Therefore, impacts to sea turtles would be less than significant.

### **5.9 IMPACTS AT BEACH RECEIVER SITE**

Project-related activities and therefore potential impacts would generally be similar for each receiver site; however, there may be differences based on the proximity to sensitive resources. In addition, there is a range of possible fill volumes that also need to be considered. The following section assesses impacts for each receiver site based on the proximity of sensitive resources and fill volumes. Table 5-3 summarizes the sensitive biological resources in the vicinity of each receiver site. As noted in Section 2.4, the SCOUP implementation guidelines also include a monitoring framework applicable to any combination of sediment source, receiver site, and placement volume, by establishing different monitoring criteria “triggers” for varying categories of projects (M&N 2025). The monitoring criteria triggers for each receiver site are summarized in Table 2-2 and Table 2-3. Monitoring requirements will be assessed prior to project implementation to determine if site-specific modifications or adjustments are necessary.

### 5.9.1 WEST BEACH, SEAL BEACH

The proposed potential placement design at this site is creation/enhancement of back beach dunes. The habitat within the receiver site boundary is sandy beach with non-native ice plant (*Carpobrotus edulis*) in the back beach dune. No sensitive hard bottom or vegetated in-water marine habitat is present within the site boundaries (Table 5-3; Figure 5-1). Invertebrates living within the sandy habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). However, construction would also create new dune habitat. Since sand placement would be above the water line, impacts from and associated with turbidity or to grunion would not occur. Snowy plovers do not nest at the receiver site but may forage in the area. SCOUN implementation guidelines include sensitive bird species monitoring at nesting and over-wintering areas for any beach nourishment project. Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at West Beach, Seal Beach from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

### 5.9.2 EAST BEACH, SEAL BEACH

The proposed potential placement locations at this site are beach berm, beach dike, and possibly below MHTL (Table 5-2). The habitats within the receiver site boundary are sandy beach and sandy subtidal, and no sensitive hard bottom or vegetated in-water marine habitat is present within the site boundaries (Table 5-3; Figure 5-1). Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity and to grunion could occur (see Section 5.2). Least tern nesting sites are located approximately 1.5 miles away at Seal Beach Naval Weapons Station, and while snowy plovers and least terns do not nest at the receiver site, they may forage in the area. SCOUN implementation guidelines include sensitive bird species monitoring at nesting or over-wintering areas for any beach nourishment project (see Section 2.4.1). In addition, seasonal grunion monitoring (see Section 2.4.2) and turbidity monitoring (see Section 2.4.5) may also be conducted. Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at East Beach, Seal Beach from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

### 5.9.3 SURFSIDE BEACH

The proposed potential placement locations at this site are beach berm, beach dike, back beach dunes, and below MHTL (Table 5-2). The habitats within the receiver site boundary are sandy beach and sandy subtidal, and no sensitive hard bottom or vegetated in-water marine habitat is present within the site boundaries (Table 5-3; Figure 5-2). Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity and to grunion could occur (see Section 5.2). Least tern nesting sites are located approximately 1 mile away at Seal Beach Naval Weapons Station, and while snowy plovers do not nest at the receiver site, they may forage in the area. SCOUN implementation guidelines include sensitive bird species monitoring at nesting or over-wintering areas for any beach nourishment project (see Section 2.4.1). In addition, seasonal grunion monitoring (see Section 2.4.2) and turbidity monitoring (see Section 2.4.5) may also be conducted. Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at Surfside Beach from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

#### **5.9.4 SUNSET BEACH**

The proposed potential placement locations at this site are beach berm, beach dike, back beach dunes, and below MHTL (Table 5-2). The habitats within the receiver site boundary are sandy beach and sandy subtidal, and no sensitive hard bottom or vegetated in-water marine habitat is present within the site boundaries (Table 5-3; Figure 5-2). Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity and to grunion could occur (see Section 5.2). Least tern nesting sites are located approximately 1.5 miles away at Seal Beach Naval Weapons Station, and while snowy plovers do not nest at the receiver site, they may forage in the area. SCOUP implementation guidelines include sensitive bird species monitoring at nesting or over-wintering areas for any beach nourishment project (see Section 2.4.1). In addition, seasonal grunion monitoring (see Section 2.4.2) and turbidity monitoring (see Section 2.4.5) may also be conducted. Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at Sunset Beach from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

#### **5.9.5 HUNTINGTON HARBOUR BEACHES**

The harbor contains a small number of pocket beaches (Figure 5-2), and the proposed potential placement location at the various harbor sites is a beach berm (Table 5-2), with the maximum fill volume ranging from 1,000 to 5,000 cy (M&N 2025). The habitats within the receiver site boundaries are sandy beaches and mud/sand subtidal habitats (Table 5-3). Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). While least tern nesting sites are located approximately 1.5 miles away at Seal Beach Naval Weapons Station, the harbor sites provide limited foraging area. Eelgrass beds may be present, but SCOUP implementation guidelines includes eelgrass monitoring protocols per the CEMP (NMFS 2014). In addition, turbidity monitoring (see Section 2.4.5) may also be conducted. Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at Huntington Harbour Beaches from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

#### **5.9.6 BOLSA CHICA STATE BEACH**

The proposed potential placement locations at this site are beach berm, beach dike, and back beach dunes (Table 5-2). The habitats within the receiver site boundary are sandy beach and sandy subtidal, and no sensitive hard bottom or vegetated in-water marine habitat is present within the site boundaries (Table 5-3; Figure 5-3). Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity, to grunion, and to tidal inlets could occur (see Section 5.2). Least tern nesting sites are located less than 1 mile away at the Bolsa Chica Ecological Reserve, and snowy plovers may nest at the receiver site (designated critical habitat), as well as forage in the area. SCOUP implementation guidelines include sensitive bird species monitoring at nesting or over-wintering areas for any beach nourishment project (see Section 2.4.1). In addition, seasonal grunion monitoring (see Section 2.4.2), tidal inlet monitoring (see Section 2.4.4), turbidity monitoring (see Section 2.4.5) may also be conducted. Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at Bolsa Chica State Beach from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

### **5.9.7 HUNTINGTON BEACH BLUFFS**

The proposed potential placement locations at this site are beach berm, back beach bluff/cliff stabilization, and back beach dunes (Table 5-2). The habitats within the receiver site boundary are sandy beach and sandy subtidal, and no sensitive hard bottom or vegetated in-water marine habitat is present within the site boundaries; rocky reefs may be present approximately 0.5 miles offshore of the proposed receiver site (Table 5-3; Figure 5-4). Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity, to grunion, sensitive hard-bottom habitat, and to tidal inlets could occur (see Section 5.2). Least tern nesting sites are located less than 1 mile away at the Bolsa Chica Ecological Reserve, and while snowy plovers do not nest at the receiver site, they may forage in the area. SCOUN implementation guidelines include sensitive bird species monitoring at nesting or over-wintering areas for any beach nourishment project (see Section 2.4.1). In addition, seasonal grunion monitoring (see Section 2.4.2), nearshore monitoring (see Section 2.4.3), tidal inlet monitoring (see Section 2.4.4), and turbidity monitoring (see Section 2.4.5) may also be conducted. Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at Huntington Beach Bluffs from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

### **5.9.8 HUNTINGTON BEACH STATE BEACH**

The habitats within the receiver site boundary are sandy beach and sandy subtidal, and no sensitive hard bottom or vegetated in-water marine habitat is present within the site boundaries (Table 5-3; Figure 5-5). Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity, to grunion, and to tidal inlets could occur (see Section 5.2). Least tern and snowy plover nesting sites are located at the Least Tern Nature Reserve. SCOUN implementation guidelines include sensitive bird species monitoring at nesting or over-wintering areas for any beach nourishment project (see Section 2.4.1). In addition, seasonal grunion monitoring (see Section 2.4.2), tidal inlet monitoring (see Section 2.4.4), turbidity monitoring (see Section 2.4.5) may also be conducted. Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at Huntington State Beach from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

### **5.9.9 WEST NEWPORT BEACH**

The proposed potential placement locations at this site are beach berm, back beach dunes, and below MHTL (Table 5-2). The habitats within the receiver site boundary are sandy beach and sandy subtidal, and no sensitive hard bottom or vegetated in-water marine habitat is present within the site boundaries (Table 5-3; Figure 5-6). Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity, to grunion, sensitive hard-bottom habitat, and to tidal inlets could occur (see Section 5.2). Least tern and snowy plover nesting sites are located adjacent to the receiver site at the Least Tern Nature Reserve, and snowy plovers may forage in the area. SCOUN implementation guidelines include sensitive bird species monitoring at nesting or over-wintering areas for any beach nourishment project (see Section 2.4.1). In addition, seasonal grunion monitoring (see Section 2.4.2), nearshore monitoring (see Section 2.4.3), tidal inlet monitoring (see Section 2.4.4), and turbidity monitoring (see Section 2.4.5) may also be conducted. Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and

indirect impacts at West Newport Beach from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively. Although the area offshore the Santa Ana River mouth is mostly sand, the northwestern portion of the nearshore area supports 13 small rocky outcrops that have considerable habitat value. They are covered by gorgonians as well as other sessile organisms such as sand tube worms, anemones, and bryozoans (Chambers Group 2016). However, most of the outcroppings are in 20-to 25-foot water depth and the project design would not have an adverse effect on any rocky outcrops (Chambers Group 2016).

#### **5.9.10 BALBOA BEACH**

Portions of the Balboa Beach shoreline is an existing beach receiver site for SAR outlet sand under the ongoing OCPW Ocean Outlets Maintenance Program. The proposed potential placement locations at this site are beach berm, beach dike, back beach dunes, and below MHTL (Table 5-2). The habitats within the receiver site boundary are sandy beach and sandy subtidal, and no sensitive hard bottom or vegetated in-water marine habitat is present within the site boundaries (Table 5-3; Figure 5-7). Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity, grunion, and to sensitive hard-bottom habitat could occur (see Section 5.2). Least tern nesting sites are located over 2 miles away at the Least Tern Nature Reserve, and snowy plovers may nest at the receiver site (portions are designated critical habitat), as well as forage in the area. SCoup implementation guidelines include sensitive bird species monitoring at nesting or over-wintering areas for any beach nourishment project (see Section 2.4.1). In addition, seasonal grunion monitoring (see Section 2.4.2), nearshore monitoring (see Section 2.4.3), and turbidity monitoring (see Section 2.4.5) may also be conducted. Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at Balboa Beach from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

#### **5.9.11 NEWPORT HARBOR BEACHES**

There are 32 small beaches (including China Cove, Balboa Island, Harbor Patrol, Bayside Village Marina, Balboa Marina, as well as others) located within Newport Harbor and Newport Bay (Figures 5-6 to 5-8). The proposed potential placement location at the various harbor sites is beach berm placement (Table 5-2). The habitats within the receiver site boundaries are sandy beaches and mud/sand subtidal habitats. Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). While least tern nesting sites are located approximately 1.5 miles away at the Least Tern Nature Reserve, the harbor sites provided limited foraging area. Eelgrass beds may be present, but SCoup implementation guidelines includes eelgrass monitoring protocols per the CEMP (NMFS 2014). In addition, turbidity monitoring (see Section 2.4.5) may also be conducted. Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at Newport Harbor Beaches from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

#### **5.9.12 NEWPORT DUNES**

The Newport Dunes Waterfront Resort is located in the Upper Newport Bay SMCA and includes a public beach, aquatic park, marina, RV camping, and resort amenities (Figure 5-5). The proposed potential placement locations at this site are beach berm and back beach storm dike (Table 5-2). The habitats within the receiver site boundaries are sandy beaches and mud/sand subtidal habitats. Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction

in invertebrates would be localized and temporary (see Section 5.1). Least tern nesting sites are located approximately 4 miles away at the Least Tern Nature Reserve. Eelgrass beds may be present, but SCOUP implementation guidelines includes eelgrass monitoring protocols per the CEMP (NMFS 2014). In addition, turbidity monitoring (see Section 2.4.5) may also be conducted. Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at Newport Dunes from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

### **5.9.13 CORONA DEL MAR STATE BEACH**

The Corona del Mar Beach receiver site is located in the Crystal Cove SMCA. The proposed potential placement locations at this site are beach berm and back beach dunes (Table 5-2). The habitats within the receiver site boundary are sandy beach and sandy subtidal, and no sensitive hard bottom or vegetated in-water marine habitat is present within the site boundaries; however rocky outcroppings/reefs are present offshore and downcoast of the proposed receiver site (Table 5-3; Figure 5-7). Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity, to grunion, and sensitive hard-bottom habitat could occur (see Section 5.2). Therefore, seasonal grunion monitoring (see Section 2.4.2), nearshore monitoring (see Section 2.4.3), and turbidity monitoring (see Section 2.4.5) may be conducted. The receiver site is not considered a sensitive bird nesting or overwintering area and therefore sensitive bird species monitoring is not proposed (see Section 2.4.1). Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at Corona Del Mar State Beach from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

### **5.9.14 LITTLE CORONA DEL MAR BEACH**

Little Corona del Mar Beach is a small pocket beach located in the Crystal Cove SMCA with access via only a path from/to the top of the bluff to/from the beach. The proposed potential placement locations at this site are beach berm and back beach dunes (Table 5-2). The habitats within the receiver site boundary are sandy beach and sandy subtidal, and no sensitive hard bottom or vegetated in-water marine habitat is present within the site boundaries; however rocky outcroppings/reefs are present offshore, upcoast, and downcoast of the proposed receiver site (Table 5-3; Figure 5-8). Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity, to grunion, and sensitive hard-bottom habitat could occur (see Section 5.2). Therefore, seasonal grunion monitoring (see Section 2.4.2), nearshore monitoring (see Section 2.4.3), and turbidity monitoring (see Section 2.4.5) may be conducted. The receiver site is not considered a sensitive bird nesting or overwintering area and therefore sensitive bird species monitoring is not proposed (see Section 2.4.1). Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at Little Corona Del Mar Beach from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

### **5.9.15 CRYSTAL COVE STATE PARK**

The Crystal Cove receiver site is in the Crystal Cove SMCA, and the beach consists of three distinct coves with narrow sandy areas and rocky reefs abutting the water. The proposed potential placement locations at this site are beach berm and back beach bluff/cliff stabilization (Table 5-2). The habitats within the receiver site boundary are sandy beach and sandy subtidal, and no sensitive hard bottom or vegetated in-

water marine habitat is present within the site boundaries; however rocky outcroppings/reefs are present offshore, upcoast, and downcoast of the proposed receiver site (Table 5-3; Figure 5-9). Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity, to grunion, and sensitive hard-bottom habitat could occur (see Section 5.2). SCOUN implementation guidelines include sensitive bird species monitoring at nesting or over-wintering areas for any beach nourishment project (see Section 2.4.1). In addition, seasonal grunion monitoring (see Section 2.4.2), nearshore monitoring (see Section 2.4.3), and turbidity monitoring (see Section 2.4.5) may also be conducted. Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at Crystal Cove State Park from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

#### **5.9.16 SALT CREEK BEACH**

The Salt Creek receiver site is in the Dana Point SMCA, and there are no known previous nourishment projects in this location except for very small amounts of sand from OCPW's Salt Creek outlet maintenance. The proposed potential placement locations at this site are beach berm and back beach dunes (Table 5-2). The habitats within the receiver site boundary are sandy beach and sandy subtidal, and no sensitive hard bottom or vegetated in-water marine habitat is present within the site boundaries; however rocky outcroppings/reefs are present offshore, upcoast, and downcoast of the proposed receiver site (Table 5-3; Figure 5-10). Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity, to grunion, and sensitive hard-bottom habitat could occur (see Section 5.2). SCOUN implementation guidelines include sensitive bird species monitoring at nesting or over-wintering areas for any beach nourishment project (see Section 2.4.1). In addition, seasonal grunion monitoring (see Section 2.4.2), nearshore monitoring (see Section 2.4.3), and turbidity monitoring (see Section 2.4.5) may also be conducted. Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at Salt Creek Beach from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

#### **5.9.17 BABY BEACH**

Baby Beach is located at the northern end of Dana Point Harbor (Figure 5-11). It is a small sandy beach circumvented by a series of grassy areas and a small parking lot. The proposed potential placement location at this site is beach berm (Table 5-2). The habitats within the receiver site boundaries are sandy beaches and mud/sand subtidal habitats. Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Eelgrass beds may be present, but SCOUN implementation guidelines includes eelgrass monitoring protocols per the CEMP (NMFS 2014). In addition, turbidity monitoring (see Section 2.4.5) may also be conducted. Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at Baby Beach from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

#### **5.9.18 DOHENY STATE BEACH**

Doheny State Beach is located east of Dana Point Harbor and the proposed potential placement locations at this site are beach berm, beach dike and possibly back beach dunes (Table 5-2). The habitats within the representative fill receiver site boundary are sandy beach and sandy subtidal, and no sensitive hard

bottom or vegetated in-water marine habitat is present within the site boundaries; however intertidal and subtidal sandy and cobble substrate is present upcoast of San Juan Creek (Table 5-3; Figure 5-11). Vegetated rocky outcroppings/reefs are also present offshore, upcoast and downcoast of the proposed receiver site. Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity, to grunion, and sensitive hard-bottom habitat could occur (see Section 5.2). SCOUP implementation guidelines include sensitive bird species monitoring at nesting or over-wintering areas for any beach nourishment project (see Section 2.4.1). In addition, seasonal grunion monitoring (see Section 2.4.2), nearshore monitoring (see Section 2.4.3), and turbidity monitoring (see Section 2.4.5) may also be conducted. Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at Doheny State Beach from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

#### **5.9.19 CAPISTRANO BEACH COUNTY PARK**

Capistrano Beach County Park is located directly west of Coast Highway on Beach Road and the proposed potential placement locations at this site are beach berm, beach dike, and back beach berm (Table 5-2). The habitats within the receiver site boundary are sandy and cobble beach and subtidal, and no sensitive hard bottom or vegetated in-water marine habitat is present within the site boundaries. However, rocky outcroppings/reefs are present offshore of the proposed receiver site (Table 5-3; Figure 5-12). Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity, to grunion, and sensitive hard-bottom habitat could occur (see Section 5.2). Therefore, seasonal grunion monitoring (see Section 2.4.2), nearshore monitoring (see Section 2.4.3), and turbidity monitoring (see Section 2.4.5) may be conducted. The receiver site is not considered a sensitive bird nesting or overwintering area and therefore sensitive bird species monitoring is not proposed (see Section 2.4.1). Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at Capistrano Beach County Park from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

#### **5.9.20 POCHE BEACH**

Poche Beach is a little pocket beach at the very south end of Dana Point. The proposed potential placement locations at this site are beach berm and beach dike (Table 5-2). The habitats within the receiver site boundary are sandy and cobble beach and subtidal, and no sensitive hard bottom or vegetated in-water marine habitat is present within the site boundaries (Table 5-3; Figure 5-13). However, rocky outcroppings/reefs are present offshore of the proposed receiver site. Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity, to grunion, and sensitive hard-bottom habitat could occur (see Section 5.2). Therefore, seasonal grunion monitoring (see Section 2.4.2), nearshore monitoring (see Section 2.4.3), and turbidity monitoring (see Section 2.4.5) may be conducted. The receiver site is not considered a sensitive bird nesting or overwintering area and therefore sensitive bird species monitoring is not proposed (see Section 2.4.1). Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at Poche Beach from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

### **5.9.21 CAPISTRANO SHORES**

The proposed potential placement locations at this site are beach berm and beach dike (Table 5-2). The habitats within the receiver site boundary are sandy and cobble beach and subtidal, and no sensitive hard bottom or vegetated in-water marine habitat is present within the site boundaries (Table 5-3; Figure 5-13). However, rocky outcroppings/reefs are present offshore of the proposed receiver site. Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity, to grunion, and sensitive hard-bottom habitat could occur (see Section 5.2). Therefore, seasonal grunion monitoring (see Section 2.4.2), nearshore monitoring (see Section 2.4.3), and turbidity monitoring (see Section 2.4.5) may be conducted. The receiver site is not considered a sensitive bird nesting or overwintering area and therefore sensitive bird species monitoring is not proposed (see Section 2.4.1). Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at Capistrano Shores from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

### **5.9.22 SAN CLEMENTE NORTH BEACH**

As part of the OCPW Ocean Outlets Maintenance Program sand from the Segunda Deschecha Canada Outlet (M02) located at the northwestern extent of North Beach is used to nourish roughly 0.20 acres of beach directly southeast of the outlet. Generally, clearing of sediment in the Segunda Deschecha Outlet is required no more than twice per year (once in the fall and once in the following spring) and, for each maintenance event, includes excavation of approximately 1,000 cy of sediment. The proposed potential placement locations at this site are beach berm, beach dike and below MHTL (Table 5-2). The habitats within the receiver site boundary are sandy and cobble beach and subtidal, and no sensitive hard bottom or vegetated in-water marine habitat is present within the site boundaries (Table 5-3; Figure 5-13). However, rocky outcroppings/reefs are present offshore of the proposed receiver site. Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity, to grunion, and sensitive hard-bottom habitat could occur (see Section 5.2). Therefore, seasonal grunion monitoring (see Section 2.4.2), nearshore monitoring (see Section 2.4.3), and turbidity monitoring (see Section 2.4.5) may be conducted. The receiver site is not considered a sensitive bird nesting or overwintering area and therefore sensitive bird species monitoring is not proposed (see Section 2.4.1). Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at San Clemente North Beach from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

### **5.9.23 SAN CLEMENTE CITY BEACHES**

The proposed potential placement locations at this site are beach berm, beach dike, back beach dunes, and below MHTL (Table 5-2). The habitats within the receiver site boundary are sandy beach and sandy subtidal, and no sensitive hard bottom or vegetated in-water marine habitat is present within the site boundaries; however rocky outcroppings/reefs are present offshore, upcoast, and downcoast of the proposed receiver site (Table 5-3; Figure 5-14). Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity, to grunion, and sensitive hard-bottom habitat could occur (see Section 5.2). Therefore,

seasonal grunion monitoring (see Section 2.4.2), nearshore monitoring (see Section 2.4.3), and turbidity monitoring (see Section 2.4.5) may be conducted. The receiver site is not considered a sensitive bird nesting or overwintering area and therefore sensitive bird species monitoring is not proposed (see Section 2.4.1). Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at San Clemente City Beach from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

#### **5.9.24 SAN CLEMENTE STATE BEACH**

The proposed potential placement locations at this site are beach berm, beach dike, back beach dunes, and below MHTL (Table 5-2). The habitats within the receiver site boundary are sandy beach and sandy subtidal, and no sensitive hard bottom or vegetated in-water marine habitat is present within the site boundaries; however rocky outcroppings/reefs are present offshore, upcoast, and downcoast of the proposed receiver site (Table 5-3; Figure 5-15). Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity, to grunion, and sensitive hard-bottom habitat could occur (see Section 5.2). Therefore, seasonal grunion monitoring (see Section 2.4.2), nearshore monitoring (see Section 2.4.3), and turbidity monitoring (see Section 2.4.5) may be conducted. The receiver site is not considered a sensitive bird nesting or overwintering area and therefore sensitive bird species monitoring is not proposed (see Section 2.4.1). In addition, seasonal grunion monitoring (see Section 2.4.2), nearshore monitoring (see Section 2.4.3), and turbidity monitoring (see Section 2.4.5) may also be conducted. Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at San Clemente State Beach from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

#### **5.9.25 CYPRUS SHORE/COTTONS BEACH**

The proposed potential placement locations at this site are beach berm, beach dike and below MHTL (Table 5-2). The habitats within the receiver site boundary are sandy and cobble beach and subtidal, and no sensitive hard bottom or vegetated in-water marine habitat is present within the site boundaries (Figure 5-16). However rocky outcroppings/reefs are present offshore, upcoast, and downcoast of the proposed receiver site (Table 5-3). Invertebrates living within the soft bottom habitat would be killed from burial and construction activities, but the reduction in invertebrates would be localized and temporary (see Section 5.1). Since sand placement could be at the water line, impacts from and associated with turbidity, to grunion, and sensitive hard-bottom habitat could occur (see Section 5.2). SCOUN implementation guidelines include sensitive bird species monitoring at nesting or over-wintering areas for any beach nourishment project (see Section 2.4.1). In addition, seasonal grunion monitoring (see Section 2.4.2), nearshore monitoring (see Section 2.4.3), and turbidity monitoring (see Section 2.4.5) may also be conducted. Table 2-2 and Table 2-3 summarizes the proposed monitoring guidelines for receiver sites. Direct and indirect impacts at Cyprus Shore/Cottons Beach from the Proposed Project would be less than significant for the reasons noted in Sections 5.1 and 5.2, respectively.

## 6.0 PROTECTIVE AND CONSERVATION MEASURES

To avoid or minimize impacts that may occur as a result of the Proposed Project, the SCOUP implementation guidelines include a monitoring framework applicable to any combination of sediment source, receiver site, and placement volume, by establishing different monitoring criteria “triggers” for varying categories of projects (M&N 2025). Monitoring for marine biological resources includes:

- Sensitive bird species;
- Grunion;
- Sensitive habitat (HAPCs such as estuaries, kelp beds, surfgrass beds, eelgrass beds, and vegetated rocky reefs);
- Tidal inlet monitoring; and
- Water quality monitoring.

The monitoring criteria triggers for each receiver site are summarized in Section 2.4, Table 2-2 and Table 2-3, and detailed protocols are included in Section 5 of Orange County SCOUP implementation guidelines (M&N 2025). Note that monitoring requirements will be assessed prior to project implementation to determine if site-specific modifications or adjustments are necessary based on updated information.

**Table 6-1. Sensitive Biological Resources in the Vicinity of Receiver Sites**

Receiver Site	Reef	Kelp	Seagrass	Grunion	Least Tern	Snowy Plover	MPA	Previous Nourishment
West Beach, Seal Beach	Not Present	Not Present	Not Present	Present	Not Present	Overwintering/Roosting	No	No
East Beach, Seal Beach	Not Present	Not Present	Not Present	Present	Not Present	Overwintering/Roosting	No	Yes
Surfside Beach	Not Present	Not Present	Not Present	Present	Not Present	Overwintering/Roosting	No	Yes
Sunset Beach	Not Present	Not Present	Not Present	Present	Not Present	Overwintering/Roosting	No	Yes
Huntington Harbour Beaches	Not Present	Not Present	Eel Grass	Not Present	Not Present	Not Present	No	Yes
Bolsa Chica State Beach	Not Present	Not Present	Not Present	Present	Not Present	Nesting, Overwintering/Roosting	No	Yes
Huntington Beach Bluffs	more than 1,000 ft offshore	Not Present	Not Present	Present	Not Present	Overwintering/Roosting	No	Yes
Huntington Beach State Beach	Not Present	Not Present	Not Present	Present	Nesting	Nesting, Overwintering/Roosting	No	Yes
West Newport Beach	300-1,000 ft offshore	Not Present	Not Present	Present	Not Present	Overwintering/Roosting	No	Yes
Balboa Beach	more than 1,000 ft offshore	Not Present	Not Present	Present	Not Present	Overwintering/Roosting	No	Yes
Newport Harbor Beaches	Not Present	Not Present	Eel Grass	Not Present	Not Present	Not Present	No	Yes
Newport Dunes	Not Present	Not Present	Eel Grass	Not Present	Not Present	Not Present	Yes	Yes
Corona Del Mar State Beach	less than 100 ft	300-1,000 ft offshore	Surf Grass	Present	Not Present	Not Present	Yes	Yes
Little Corona del Mar	less than 100 ft	100-300 ft offshore	Surf Grass	Present	Not Present	Not Present	Yes	Yes
Crystal Cove State Park	less than 100 ft	100-300 ft offshore	Surf Grass	Present	Not Present	Overwintering/Roosting	Yes	Yes
Salt Creek Beach	100-300 ft offshore	300-1,000 ft offshore	Surf Grass	Present	Not Present	Overwintering/Roosting	Yes	No
Baby Beach	Not Present	Not Present	Eel Grass	Not Present	Not Present	Not Present	No	Yes
Doheny State Beach	less than 100 ft	100-300 ft offshore	Not Present	Present	Not Present	Overwintering/Roosting	No	Yes
Capistrano Beach County Park	300-1,000 ft offshore	300-1,000 ft offshore	Surf Grass	Present	Not Present	Not Present	No	Yes
Poche Beach	300-1,000 ft offshore	more than 1,000 ft offshore;	Surf Grass	Present	Not Present	Not Present	No	Yes
Capistrano Shores	300-1,000 ft offshore	more than 1,000 ft offshore;	Not Present	Present	Not Present	Not Present	No	Yes
San Clemente North Beach	300-1,000 ft offshore	more than 1,000 ft offshore;	Surf Grass	Present	Not Present	Not Present	No	Yes
San Clemente City Beaches	100-300 ft offshore	more than 1,000 ft offshore;	Surf Grass	Present	Not Present	Not Present	No	Yes
San Clemente State Beach	300-1,000 ft offshore	300-1,000 ft offshore	Surf Grass	Present	Not Present	Not Present	No	No
Cyprus Shore/Cottons Beach	less than 100 ft	300-1,000 ft offshore	Surf Grass	Present	Not Present	Overwintering/Roosting	No	No

Sources: Everest 2013; Chambers Group 2016, MarineBIOS 2024; EcoAtlas 2024; City of Newport Beach 2022; M&A 2013-2023 (Anaheim Bay, Huntington Harbour, Bolsa Chica, Dana Harbor); Ryan et al. 2017; Ryan et al. 2023.



Figure 6-1. West and East Seal Beach Receiver Sites



Figure 6-2. Surfside Beach, Sunset Beach and Huntington Harbour Beach Receiver Sites



Figure 6-3. Bolsa Chica State Beach Receiver Site



Figure 6-4. Huntington Beach Bluffs Receiver Site

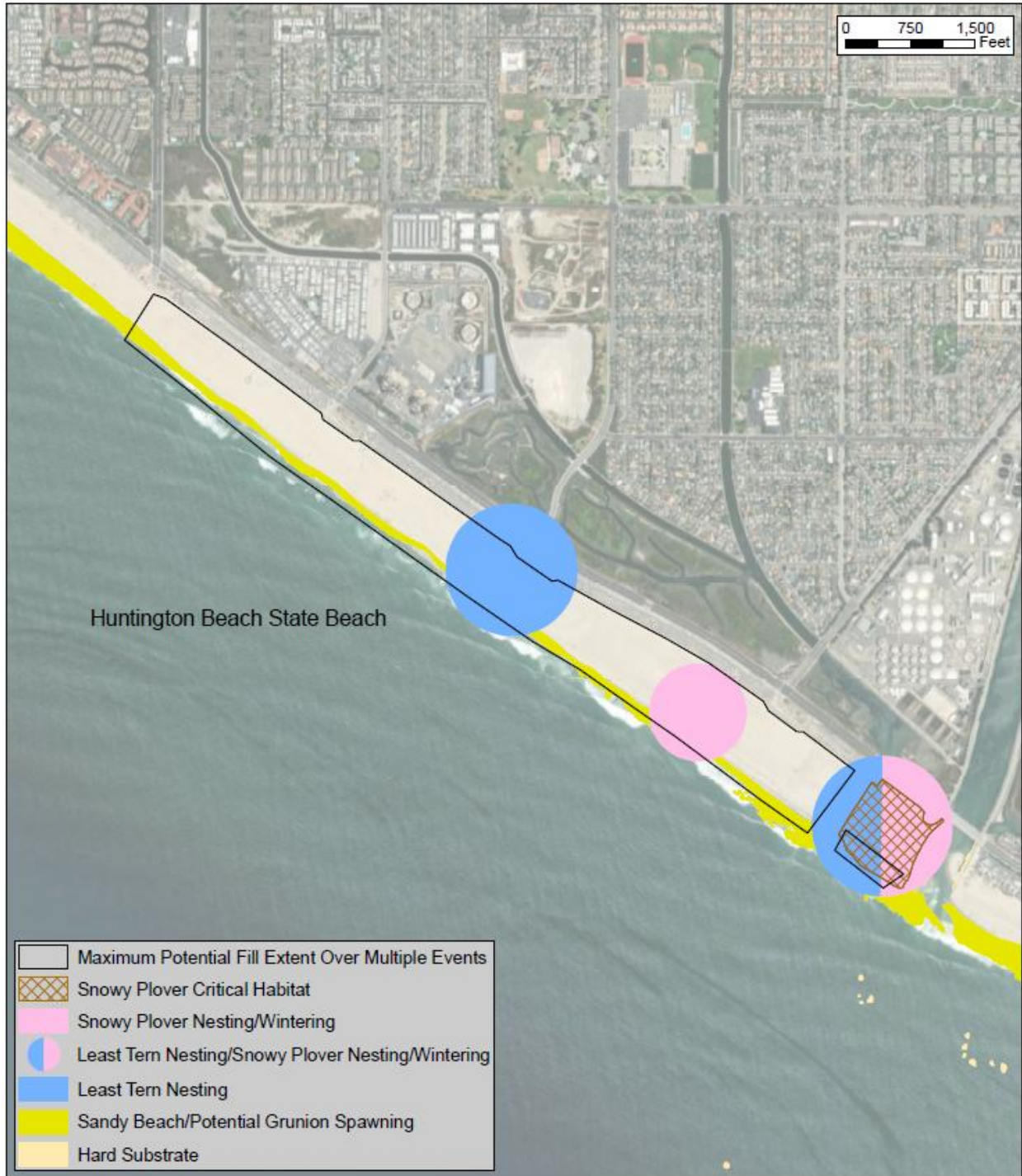


Figure 6-5. Huntington Beach State Beach Receiver Site



Figure 6-6. West Newport Beach and Newport Harbor Beach Receiver Sites

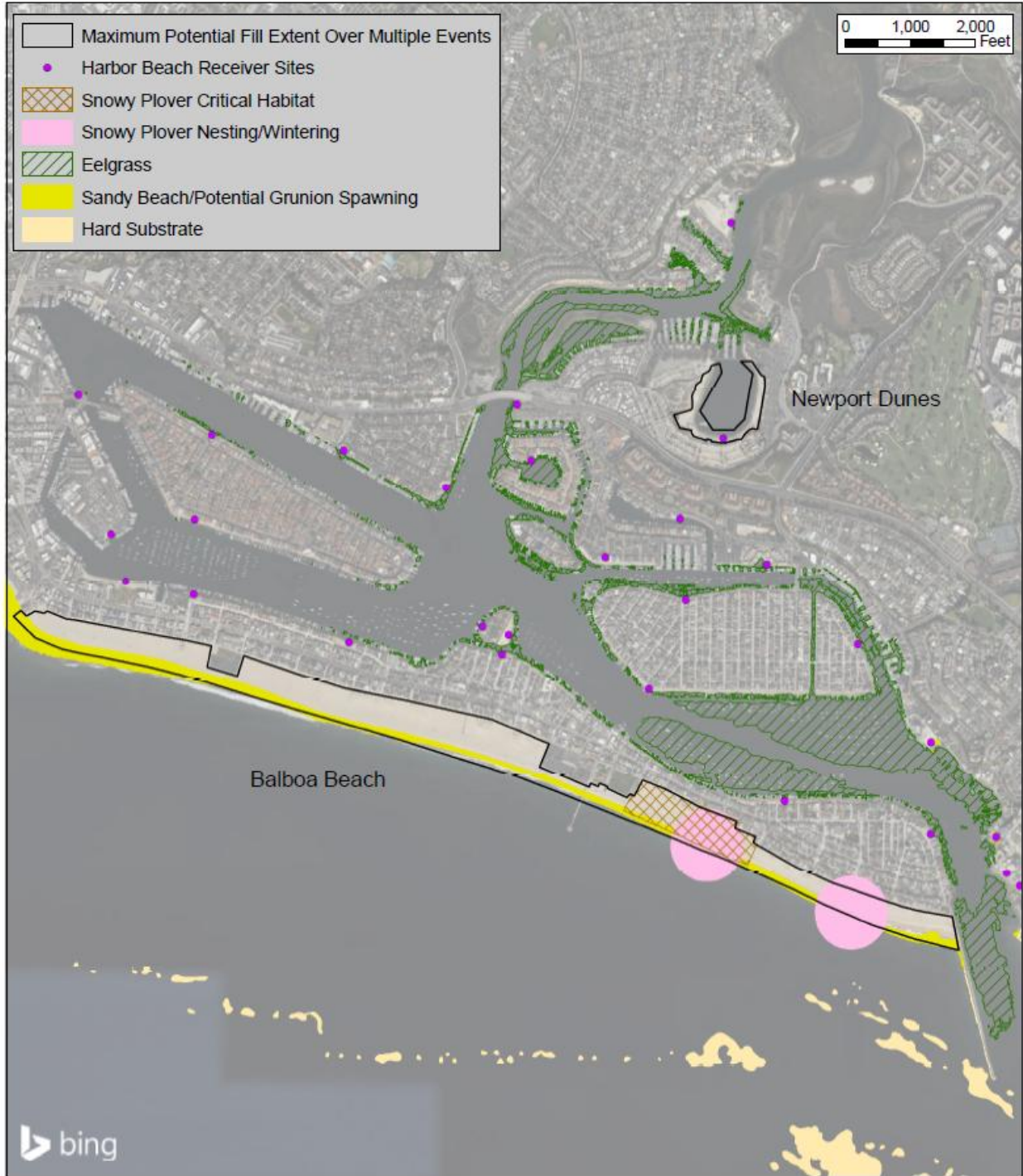


Figure 6-7. Balboa Beach, Newport Harbor, and Newport Dunes Beach Receiver Sites

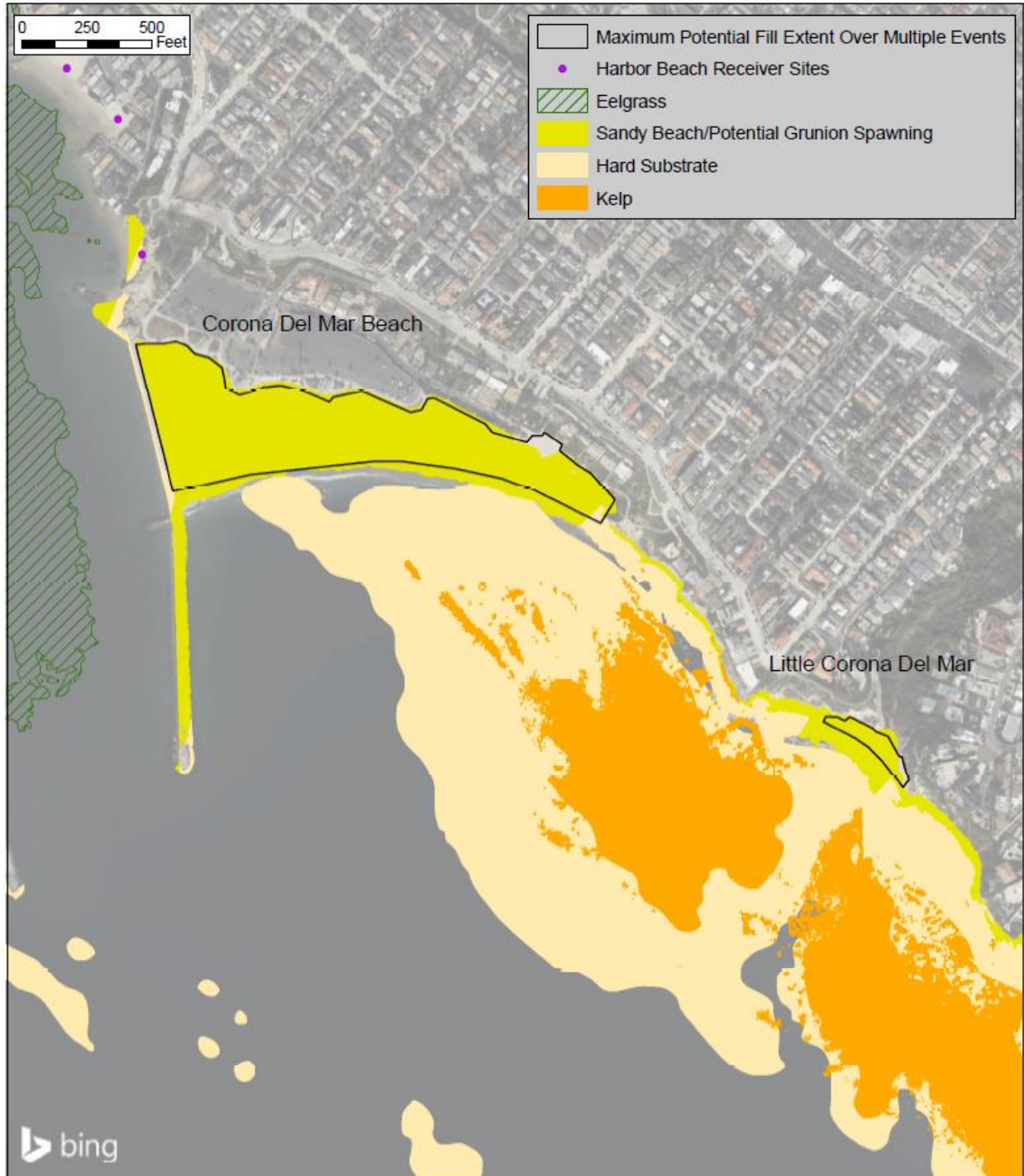


Figure 6-8. Newport Harbor, Corona del Mar, and Little Corona del Mar Beach Receiver Sites

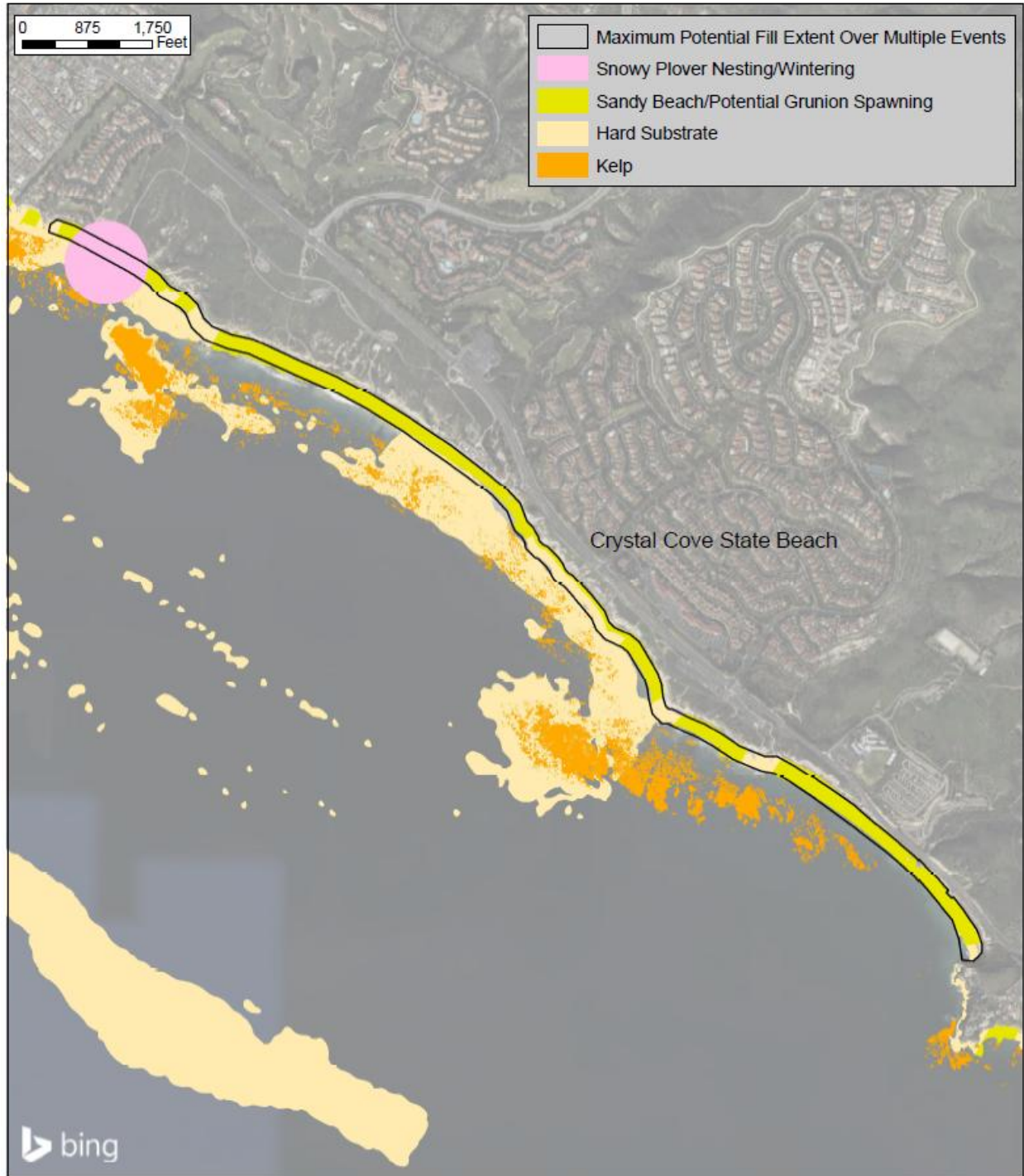


Figure 6-9. Crystal Cove State Beach Receiver Site

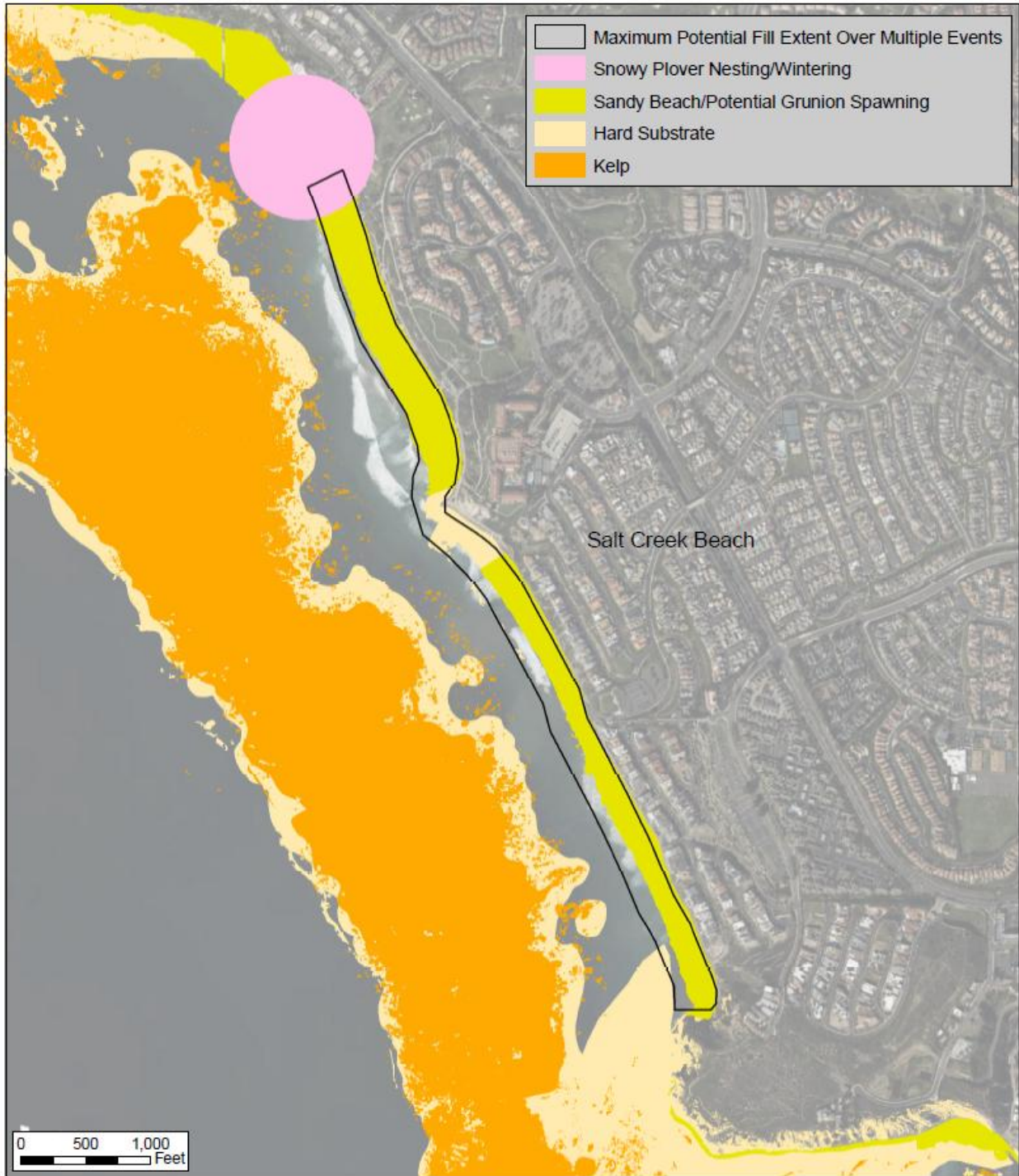


Figure 6-10. Salt Creek Beach Receiver Site

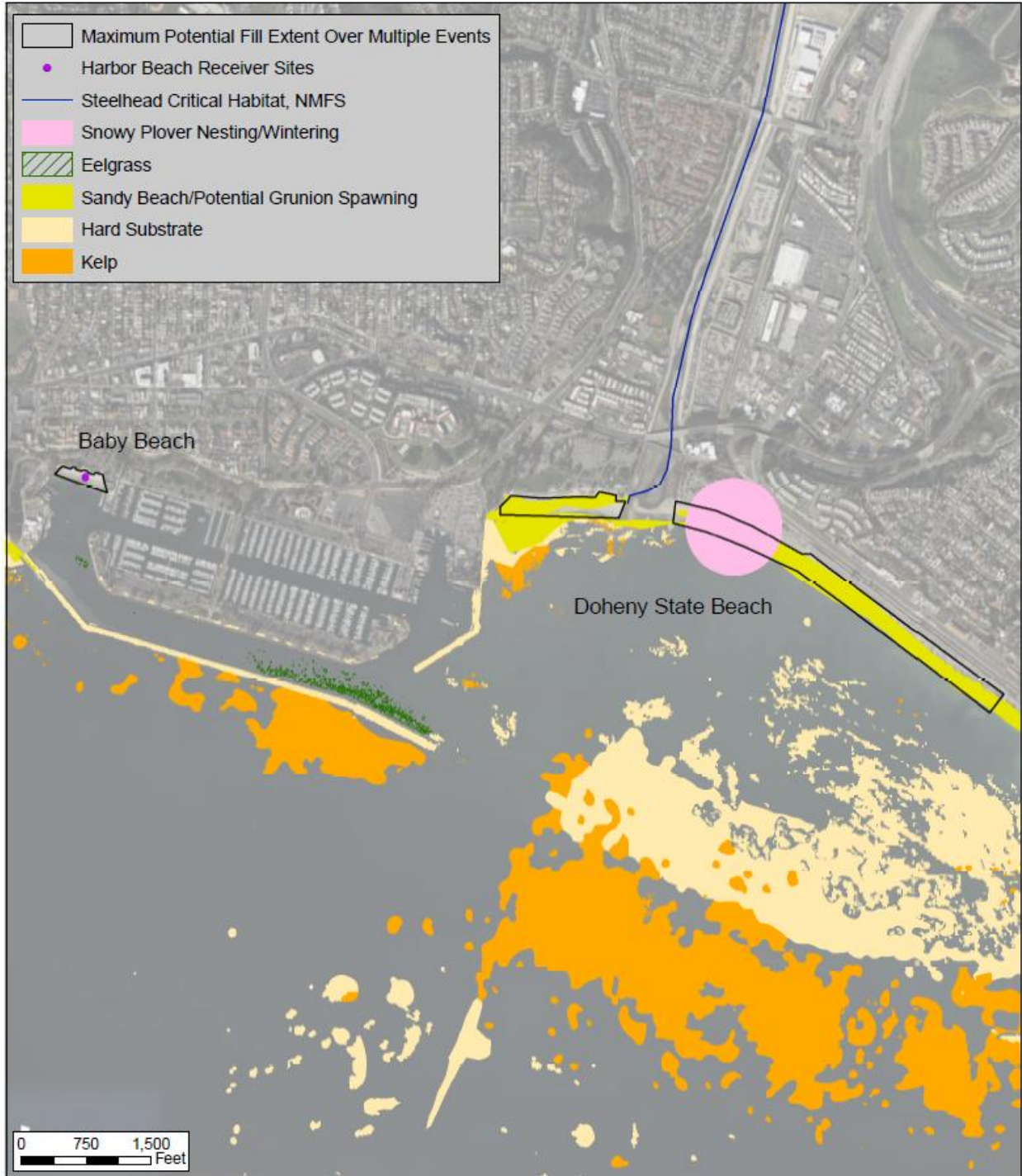


Figure 6-11. Baby Beach and Doheny State Beach Receiver Sites

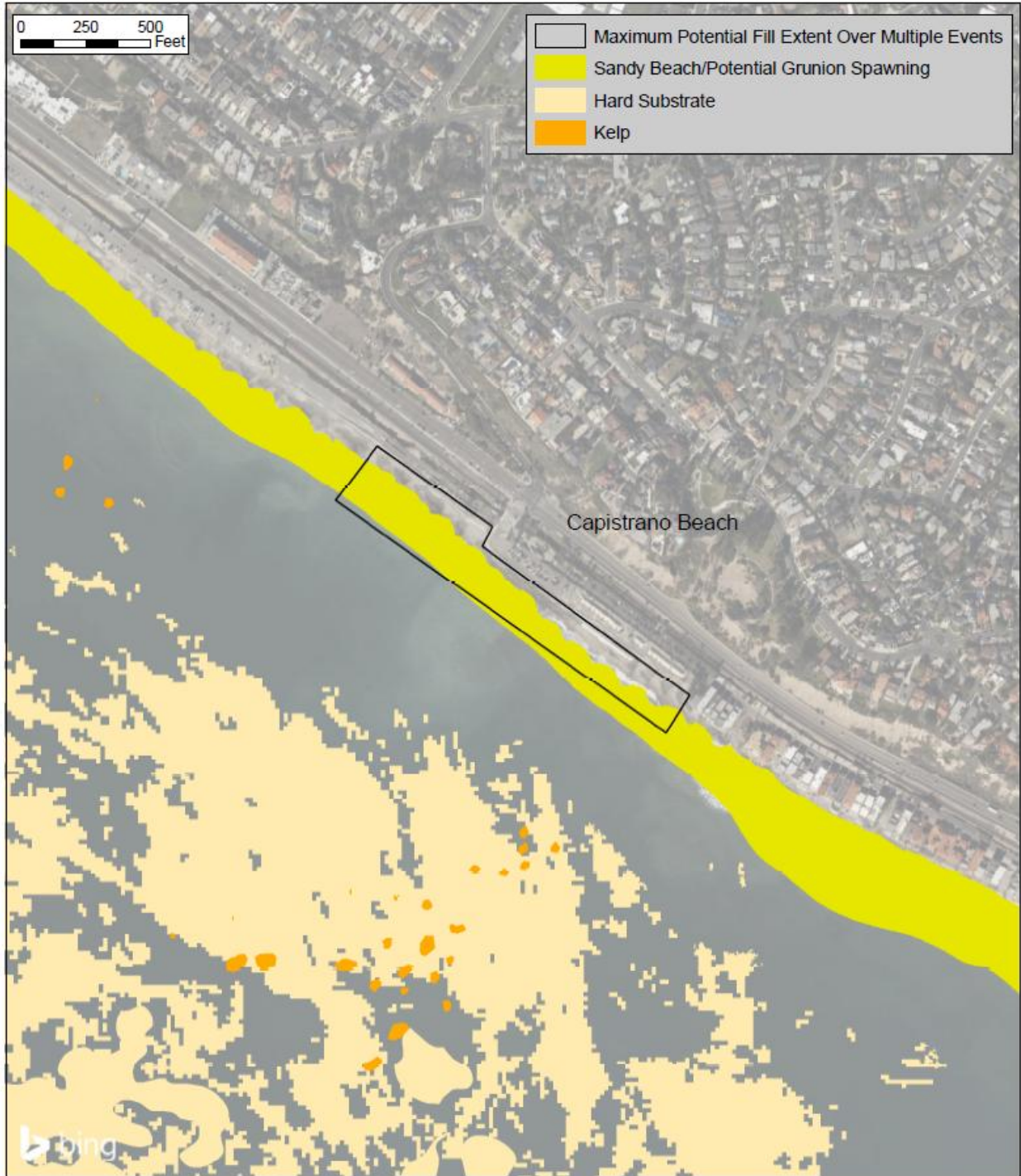


Figure 6-12. Capistrano Beach Receiver Site

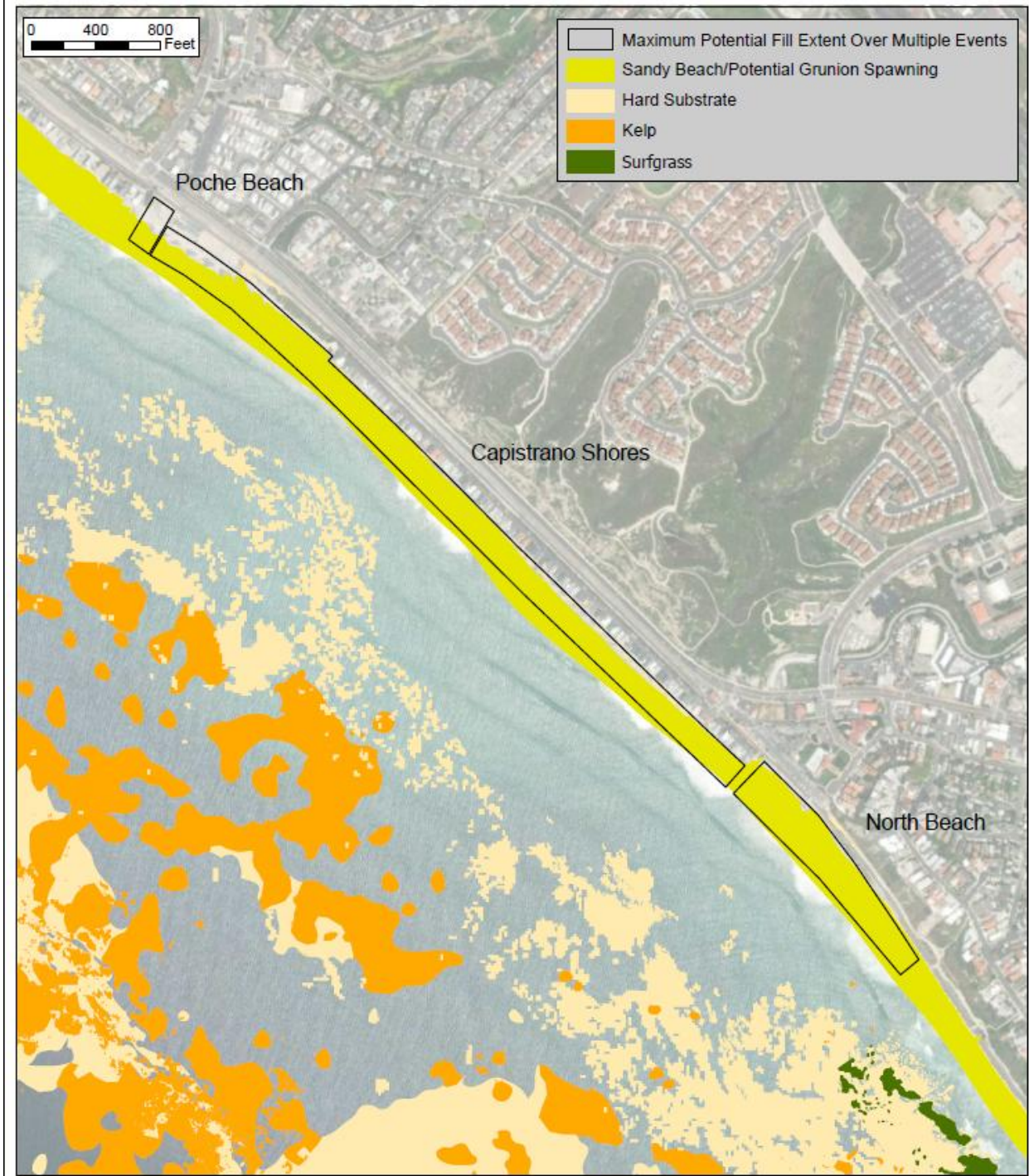


Figure 6-13. Poche Beach, Capistrano Shores, and North Beach Receiver Sites

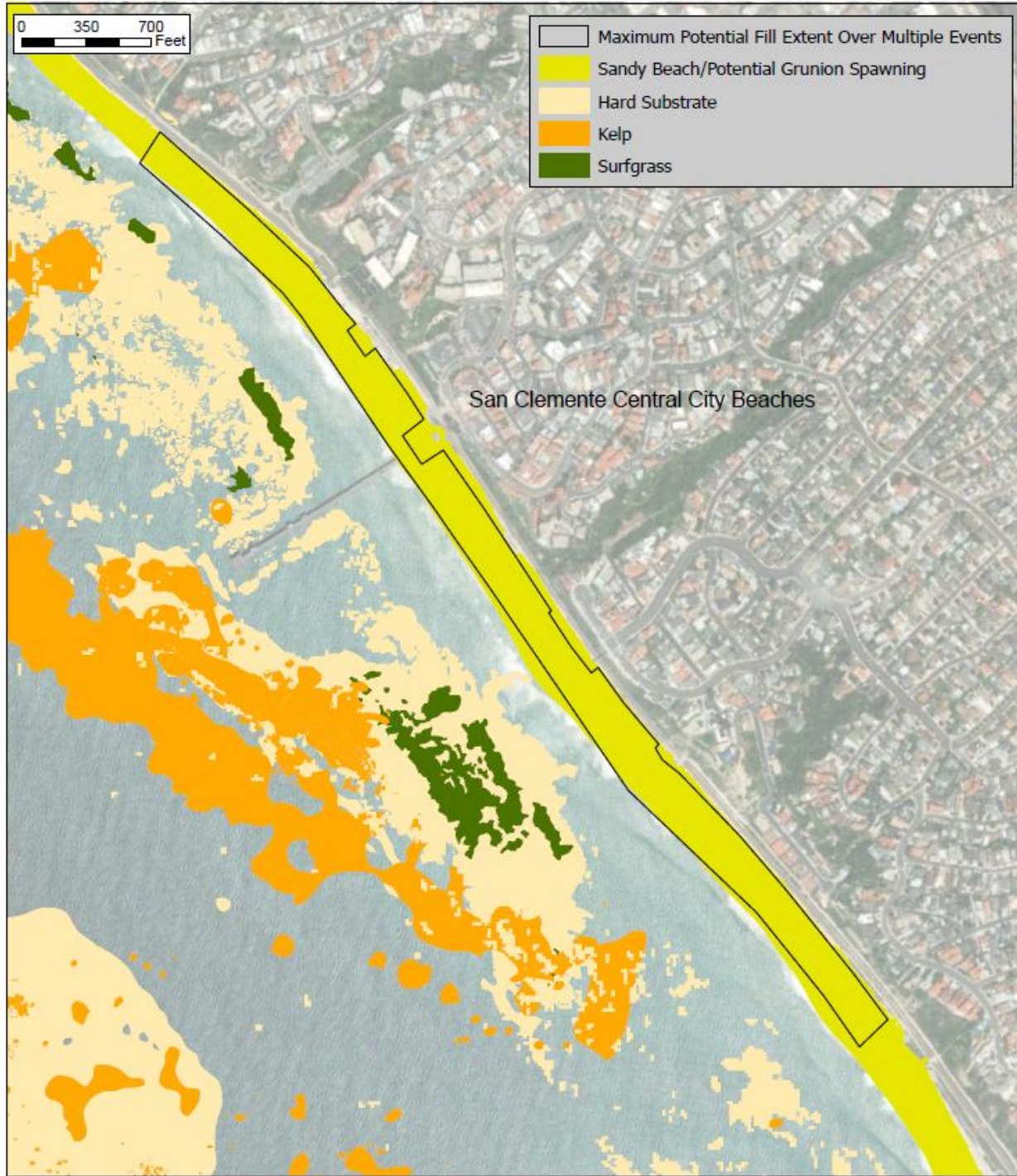


Figure 6-14. San Clemente Central City Beaches Receiver Site



Figure 6-15. San Clemente State Beach Receiver Site

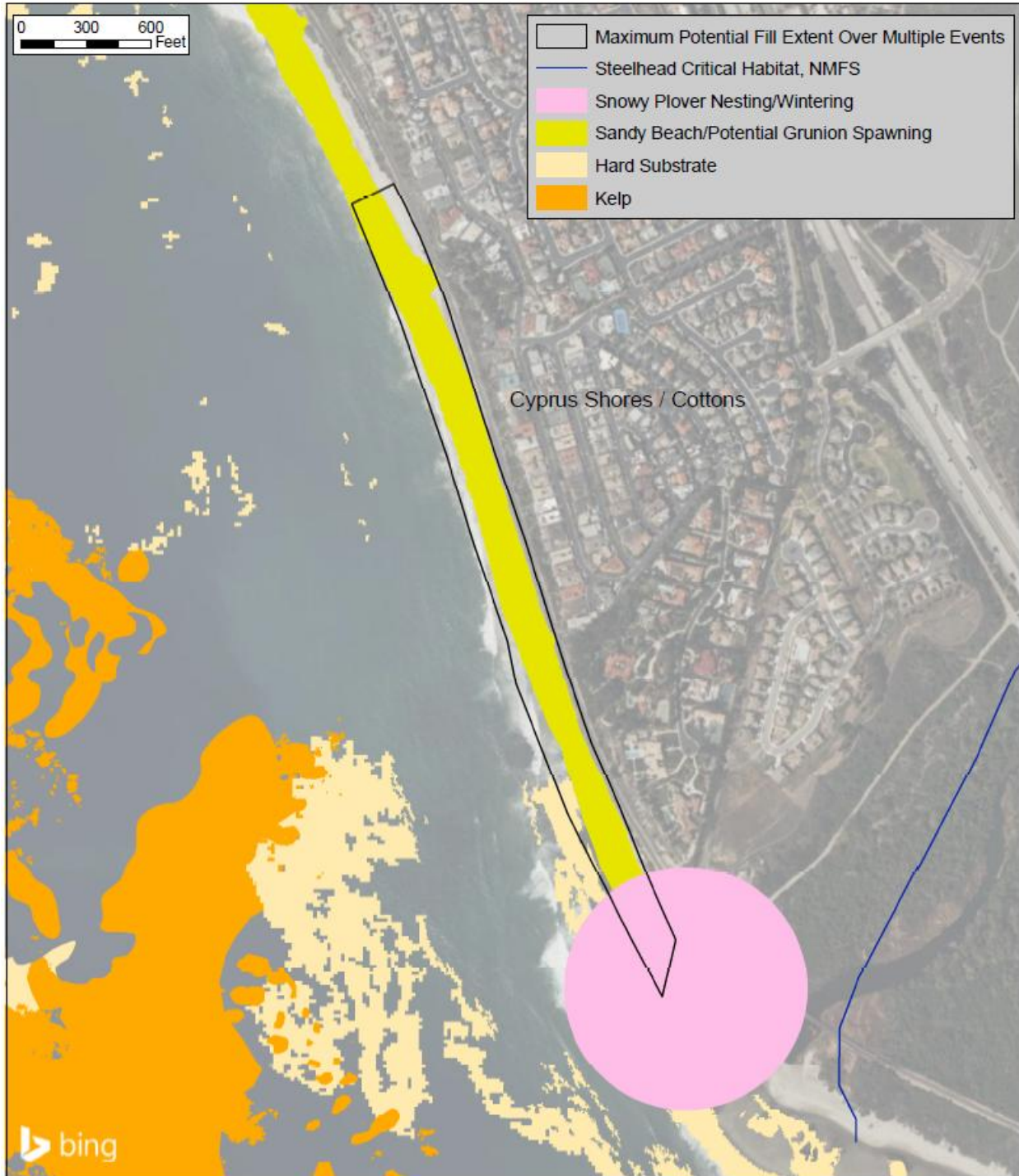


Figure 6-16. Cyprus Shores/Cottons Beach Receiver Site

## 7.0 CONCLUSIONS

The Proposed Action would be expected to result in a number of construction period impacts to local biota and habitats found in the Project Area (e.g., habitat disturbance, increased turbidity). The majority of these impacts are anticipated to be of a short-term, temporary nature and are not expected to have significant permanent or population-level impacts on sensitive habitat or species, EFH or managed fish species. While construction-related impacts would result in temporary impacts to local biota in the project footprint, of greatest concern is the protection of sensitive nesting or foraging bird species and grunion. To address this concern, protective measures such as seasonal avoidance and/or monitoring during construction are built into the Project design and would reduce any impacts to no adverse effect. Potential indirect impacts associated with the Project include increased turbidity and reduced foraging habitat for sensitive species; however, these impacts are expected to be localized and temporary. Given the available unaffected nearby shoreline and rapid recolonization of the receiver site by invertebrates, no long-term permanent impacts are expected. On the contrary, monitoring demonstrated that beach nourishment beneficially enhanced sandy beach habitat functions after the RBSP I (SAIC 2006). The primary benefit was to increase the persistence of sandy beach habitat across seasons such that habitat was suitable early in the season to support the onset of the grunion spawning season and invertebrate recruitment period. It resulted in increased invertebrate diversity earlier in the season, increased bird use across tide conditions, and enhanced habitat for grunion spawning.

Impacts from the Proposed Action would be minor for the managed species identified in Section 4. The coastal pelagics by nature have low site fidelity. Given the small area affected, interruptions causing pelagics to move into other areas would not cause biologically significant increases in competition due to habitat loss. The project would not impede the spawning success of the coastal pelagics, nor cause disturbances that increase predation. Similarly, impacts from the project would be minor for the groundfish species.

Any disturbance to marine mammals or sea turtles is considered harassment and would be considered an adverse impact; however, the direct receiver site footprints extend from the back beach to the intertidal zone, an area where they are unlikely to occur. No direct or indirect adverse impacts to sensitive hard bottom habitats, eelgrass beds, wetlands, or wildlife corridors are anticipated. Protective measures are in place for several resources to avoid and/or minimize impacts to sensitive marine biological resources.

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