## 3.4 TERRESTRIAL BIOLOGICAL RESOURCES

This section of the Revised Analysis of Public Trust Resources (APTR) describes the terrestrial biological resources (i.e., onshore above the tidal zone, including freshwater habitats) with the potential to be impacted by the Broad Beach Restoration Project (Project). Terrestrial biological resources include local habitat types, biological communities, and sensitive species, as well as invasive species. This section also evaluates the impacts that Project implementation may have on these resources. Analysis in this section focuses on terrestrial biological resources at both the CSLC Lease Area and the Public Trust Impact Areas that may be affected directly or indirectly by any of the primary Project components. This analysis is based on information from the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB), U.S. Fish and Wildlife Service (USFWS) critical habitat map portal, Applicant-funded biological reports pertaining to Broad Beach and down coast areas, and reconnaissance-level field surveys of Broad Beach and immediate vicinity performed by AMEC Environment & Infrastructure, Inc. (AMEC).

The information presented here is intended to inform the California State Lands Commission (CSLC) as it considers whether to issue a lease for those portions of the Project within the CSLC's jurisdiction. Implementation of the Project by the Broad Beach Geologic Hazard Abatement District (BBGHAD or Applicant) is statutorily exempt from the California Environmental Quality Act (CEQA) pursuant to Public Resources Code sections 26601 and 21080, subdivision (b)(4) (see Section 1, *Introduction*). Therefore:

- The scope of review and analysis is limited only to those areas where impacts to public trust resources and values within the CSLC's jurisdiction may occur as well as other public trust areas, such as Zuma Beach;
- Areas outside the scope of the CSLC's jurisdiction for this Project include the three existing permitted quarries in inland Ventura County from which the BBGHAD proposes to obtain sand for the Project, and the sand transportation routes between these sites and Broad Beach (see Section 3.7.2, *Traffic and Parking*, for potential traffic impacts from the sand transportation routes). The quarry sites are fully permitted facilities and have been subject to past environmental review by Ventura County for impacts to terrestrial biological resources; therefore, terrestrial biological resources at these quarries are not analyzed in this APTR.

The 2012 Draft APTR relied on a *Protocol-level Special Status Plant and Natural Communities Survey* prepared by WRA, Inc. (2011) as the primary source of information regarding vegetation communities in the Broad Beach vicinity. As part of this survey effort, WRA conducted a background search for potential special-status plant species, as well as three floristic surveys and one reconnaissance site visit conducted

between November 2010 and September 2011. These protocol-level surveys, which covered 2.46 acres, corresponded to the peak blooming or vegetative period for accurately identifying plant species in coastal dune habitats in Los Angeles County. The field surveys were limited in that they occurred after installation of the emergency rock revetment, which was constructed in 2010. Additionally, the surveys did not include coverage of the dune habitat that is located between the residences and the emergency rock revetment, an area that is considered an environmentally sensitive habitat area (ESHA), as defined by the Malibu Local Coastal Program (LCP). Additional biological reports cited in the 2012 Draft APTR comprise various biological assessments, including habitat assessments, specific to individual properties on Broad Beach Road. A number of reports, one of which pertained specifically to the globose dune beetle (*Coelus globosus*), a California Special Animal, were prepared to address the property located at 30732 Pacific Coast Highway. These reports were used to characterize the habitat and the potential wildlife present along Broad Beach.

Following publication of the 2012 Draft ATPR, additional studies have been performed to update the description of the existing setting at Broad Beach (Appendix D). Four overall foredune habitat surveys were conducted along Broad Beach, including recent summertime vegetation and wildlife surveys (WRA, Inc. 2010, 2011, 2012, 2013). These surveys included a larger study area intended to capture habitat conditions in all areas that may be directly affected by the Project (WRA, Inc. 2013). These studies include:

- *Summer Foredune Biological Survey Report* (WRA, Inc. 2013);
- *Broad Beach Foredune Impact Analysis* (WRA, Inc. 2012);
- *Upland Sand Source Coarser-than-Native Grain Size Impact Analysis* (Moffatt & Nichol 2013); and

Potential Impacts to Trancas Lagoon by Equipment Crossing for Broad Beach Restoration Project (Chambers Group 2013).

It should be noted that these studies were generally completed prior to the winter of 2013-2014. This winter season was characterized as a relatively active surf season, including a 25-year storm event on March 2, which caused damage along areas of the coast, including substantial erosion of remaining dune habitat at the east end of Broad Beach. The loss of dune habitat is not reflected in the baseline biological studies described above, but is discussed programmatically below.

### 3.4.1 Environmental Setting Pertaining to the Public Trust

<u>CSLC Lease Area and Public Trust Impact Area</u>

The CSLC Lease Area and Public Trust Impact Area (refer to Figure 1-2) includes Broad Beach and the western portions of Zuma Beach, with proposed beach and dune restoration extending laterally for approximately 6,200 feet from Lechuza Point to

Trancas Creek Lagoon, and vertically from the inland limits of dune construction to the seaward limits of proposed beach nourishment (refer to Figure 1-1). The area encompasses the approximate 46-acre beach and dune construction area, as well as the construction staging at the west end Zuma Beach parking lot, stockpiling of imported sand on Zuma Beach adjacent to the parking lot, and vehicle access from the parking lot to Broad Beach. The CSLC lease area includes approximately 40.5 acres of public trust tidal and subtidal lands held by the State. These public lands are bordered by adjacent privately owned upland parcels that support residual dune habitats, single family residential homes, and the Malibu West Beach Club, portions of which would also be subject to proposed dune restoration.

Approximately 109 residences, varying in size and location relative to the beach, are located along Broad Beach. The undeveloped space located between this development and the Pacific Ocean supports 4,100 feet of emergency rock and sandbag revetment, a degraded coastal dune system, and a wet sandy beach, which generally occurs only during lower tides. Existing terrestrial habitats at Broad Beach are located roughly between the seaward side of existing homes and the mean high tide line (MHTL), consisting primarily of open sand, landscaped dune areas, the revetment, and limited dune habitat. Broad Beach historically supported a wider beach and dune habitat assemblage. As development proceeded and the beach narrowed due to coastal erosion over the last 30 years, both the acreage and quality of dune habitats were reduced. Most recently, from 2008 to 2010, homeowners responded to issues associated with the eroding beach by installing of a series of large sand bag revetments and then by constructing the existing rock revetment in 2010. Large sand bag revetments appear to have been installed along 4,000 feet or more of beach and such revetments may currently extend inland behind the existing rock revetment.

The Public Trust Impact Area also includes the west end of Zuma Beach, including Trancas Creek Lagoon and adjacent beach areas and those down coast, which can support special status wildlife species. While upcoast areas along the Pacific Coast Highway (PCH) are also included within the Public Trust Impact Area, terrestrial habitats in these regions would not be directly affected by the Project activities and, accordingly, this area not further discussed in this section. Down coast beaches, including Zuma Beach and Point Dume State Beach may be indirectly affected by the Project and are discussed as appropriate.

<u>BBGHAD Inland Project Area</u>

The BBGHAD Inland Project Area includes three quarries proposed as sand supply sources, as well as the sand transportation routes inland of PCH, that would be used by heavy haul trucks to transport sand to Broad Beach (see Figure 1-2). These areas do not support public trust resources administered by the CSLC related to terrestrial

biology, were previous assessed and approved for mining by Ventura County and are not discussed further in this section.

*Baseline Environmental Setting Description*

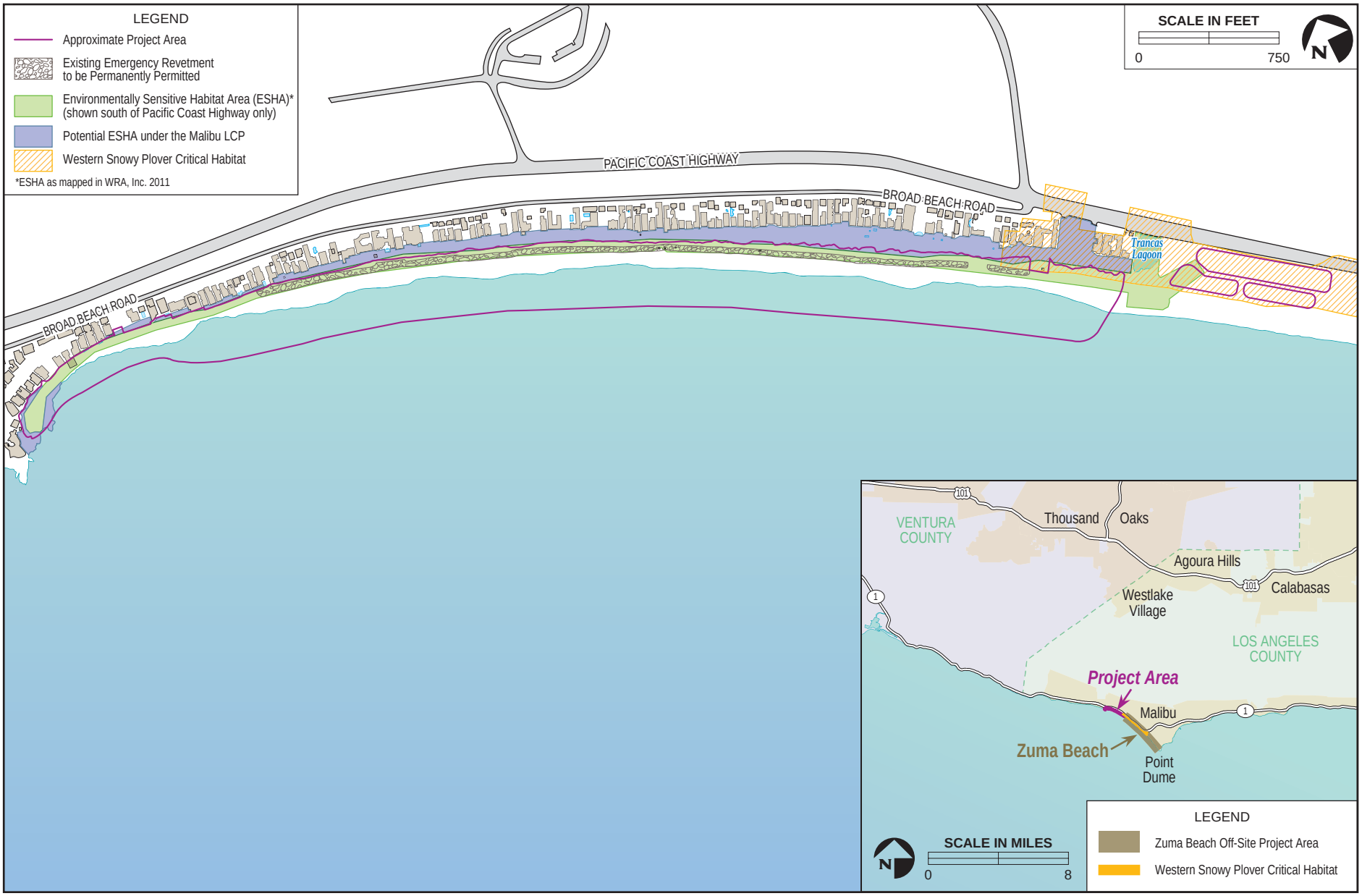
Although both of these emergency actions affected beach and dune habitats through short-term disturbance and direct removal or covering of habitat, such impacts are not well documented, as these actions occurred under emergency permits. However, WRA, Inc. (2012) prepared an analysis based on aerial surveys to estimate the impacts to the foredunes resulting from the installation of these stabilization materials.

The sand bag revetments appear to be six to 12 feet in width at the base and 10 to 12 feet in height. Construction appears to have involved keying these structures into the beach and laying them back into the existing disturbed dune habitat. Therefore, installation likely led to disturbance, removal, and covering of both beach and dune habitat (Illustration 3.4-1). This disturbance had potential additional impacts on any sensitive species that may have been present in the vicinity, including globose dune beetle, a California Special Animal, and red sand-verbena (*Abronia maritima*), a California Rare Plant Rank (CRPR) 4.2. These species, both of which have been documented at Broad Beach, may have been more widespread at the site in 2005 when a relatively larger area of foredune containing native dune mat vegetation likely existed and thus could have been disturbed through sand bag revetment installation in 2008-2009.

***Illustration 3.4-1.*** *Initial construction and installation of sand bag revetments along Broad Beach included limited disturbance of degraded dune habitat along large sections of Broad Beach for laying back these revetments.*

According to estimates made by WRA, Inc. (2012), from false infrared aerial imagery there were approximately 12.23 acres of remnant foredune habitat in 2005, prior to the construction of the sand bag revetments. A maximum of approximately 2.05 acres of remnant foredune habitat could have been permanently impacted by the installation of these shoreline stabilization materials.[1] However, much of this habitat may have been lost to shoreline erosion prior to sand bag revetment installation. The lack of detailed records associated with the installation of the pre-2010 shoreline stabilization materials

[1] The assessment is based on the assumption that the landward location of the sand bags and other materials represents the inland extent of impacts associated with their installation. This also assumes that all habitat between the 2005 beach/foredune escarpment line and the shoreline stabilization materials was impacted by the installation of the pre-2010 rock revetment sand bags.

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**Terrestrial Biological Resources along Broad Beach and West Zuma Beach**

**FIGURE 3.4-1**

makes it difficult to accurately determine what portion of the 2.05-acre loss of foredune habitat was due to installation of the sand bag revetments and which may have been related to shoreline erosion (WRA, Inc. 2012).

The existing emergency rock revetment is located between the existing dunes and the wet sandy beach. The installation of a 4,100-foot-long, 31-foot-wide, and 13-foot-high rock revetment in 2010 entailed placement of approximately 36,000 tons of rock, leading to the disturbance to and covering of beach and dune habitat (Illustration 3.4-2). Consequently, portions of this structure likely affected the disturbed dune system, which is identified as an ESHA under the Malibu LCP. It is unclear how much of the emergency rock revetment was installed abutting the pre-2010 sand bag revetments and how much may have been installed adjacent to or on remainder foredune habitat. As such, impacts to foredune habitat associated with the installation of the rock revetment in 2010 would have been limited to those areas within or adjacent to the revetment where 1) sand bag revetment materials were not located or 2) where the 2010 revetment footprint extended inland of the sand bag revetments or 3) where sand bag revetments had been destroyed by wave action. Based on analysis of false infrared aerial imagery, WRA, Inc. (2012) estimated disturbed areas at approximately 1.57 acres.[2] Consequently, installation of the sand bag and rock revetments is estimated to have resulted in the direct removal of approximately 3.62 acres of foredune habitat. However, additional temporary impacts to foredune habitat associated with the installation of the emergency rock revetment may have occurred where equipment and/or materials were staged at the seaward edge of foredune habitat.

***Illustration 3.4-2.*** *Emergency construction of 4,100 feet of rock revetment on Broad Beach involved operation of heavy equipment on and placement of more than 36,000 tons of boulders over more than 3 acres of beach and degraded dune habitat.*

The 2012 Draft APTR analyzed a number of off-site areas that would have the potential to be impacted by the Project. These areas included the 3 miles of beach down coast from Broad Beach between Trancas Creek and Point Dume, as well as the beaches adjacent to and down coast of formerly proposed sand sources in the Ventura Harbor sand trap and offshore of Dockweiler State Beach. Terrestrial biological resources in these off-site areas, including sandy beach and wetland habitats, were analyzed for potential indirect effects resulting from proposed dredging activities or changes in

[2] WRA estimate account for only 1 and 2 above; it remains unclear to what extent sand bag revetments had been destroyed or removed by wave action by rock revetment installation in 2010.

longshore sand transport resulting from the proposed addition to or withdrawal of sand from these littoral cells. However, the use of offshore sand sources (Ventura Harbor, Dockweiler State Beach, and Offshore Trancas) is not a part of the currently proposed Project.

Relationship between Terrestrial Biological Resources and Public Trust Resources and Values

Two Supreme Court cases provide the basis of the wildlife trust doctrine, a branch of the broader public trust doctrine that deals specifically with wildlife. In *Martin v. Waddell* (1842), the court applied English common law to reject a landowner's claim to an oyster fishery located under the public waters of the State of New Jersey. Additionally, the same logic was applied to terrestrial wildlife in *Geer v. Connecticut* (1896). In this case, the court held that wildlife was public property. These cases set the stage for modern wildlife management by State agencies, in which States act as trustees, managing and conserving wildlife resources on behalf of their citizens (Bruskotter et al. 2011). Historical cases that have upheld the wildlife trust doctrine include *People v. Stafford Packing Co.* (1925) 195 Cal. 548 and *California Trout, Inc. v. State Water Resources Control Bd.* (1989) 207 Cal.App.3d 585. A more recent case handed down by the California Supreme Court, *Environmental Protection and Information Center v. California Dept. of Forestry & Fire Protection* (2008) 44 Cal.App.4th 459, also upheld the notion that the public trust doctrine can be used to protect wildlife and is not limited to waterways and water resources. Consequently, impacts to terrestrial biological resources resulting from the Project inherently have the potential to affect public trust resources, as well as the public's use and enjoyment thereof.

Habitat Types within the CLSC Lease Area and the Public Trust Impact Area

The CSLC Lease Area and the Public Trust Impact Area support three primary terrestrial habitat types, including sandy beach, coastal dunes, and estuary. Both the sandy beach and the degraded dune system are important coastal habitat types that often support a number of State-listed threatened or endangered plant and wildlife species. However, native beach and dune vegetation communities at Broad Beach are restricted to remnant, disturbed elements of a native community, and are typically interspersed with invasive or landscape species, such as ice plant as well as open sand (WRA, Inc. 2011). The degraded dune system at Broad Beach is identified as an ESHA under the Malibu LCP. These dunes are a remnant of a more widespread system that historically occurred along parts of the Malibu coastline and elsewhere in Southern California. Additionally, Trancas Lagoon and Zuma Wetlands, both of which are identified as an ESHA under the Malibu LCP, drain portions of the Santa Monica Mountains National Recreation Area, located north of Broad Beach. These habitats, in addition to those in the Zuma Beach area are discussed in more detail below.

A total of 84 plant taxa have been identified at Broad Beach during surveys conducted by WRA in 2010, 2011, and 2013 (WRA, Inc. 2013). Table 3.3-1 shows the acreages associated with each vegetation type observed in Broad Beach's foredune habitat.

**Table 3.3-1. Vegetation Community Types at Broad Beach**

| Community Type | Area (Acreage)* |
|---|---|
| Developed (including revetment) | 8.06 |
| Dune mat | 0.10 |
| Invasive | 2.89 |
| Landscaped | 4.27 |
| Open sand | 10.38 |
| **Total Study Area** | **25.70** |

*Source: WRA, Inc. 2013.*

* Acreages may not account for erosion that occurred in winter 2013-2014.

Native dune mat vegetation was observed in approximately three discrete locations totaling about 0.10 acre. Additional areas containing one or more species typical of native dune mat communities were observed; however, these areas contained ice plant at greater than 50 percent cover, and as such, were identified as invasive communities. In general, the vegetation at the site is highly degraded, with a predominance of invasive ice plant and non-native ornamental species. As discussed above, these figures may not fully represent recent conditions where portions of existing dunes at the east end of Broad Beach were washed away during the winter of 2013-2014. Beach and Dune Habitats

With the exception of a limited beach berm and remnant dunes near Broad Beach's east end, Broad Beach has been reduced to an almost entirely low-tide, wet-sand intertidal beach, lacking coastal strand habitat and associated areas, with beach wrack and colonizing plant species. However, as discussed below, the Zuma Beach public trust area supports a significantly wider beach as well as dune habitats.

Dune systems typically consist of a foredune, dune crest, and back dune areas with plant species composition and cover varying by area. Southern foredune habitat generally consists of perennial herbs and low-growing shrubs that occupy wind-blown beach sand and receive salt spray from steady onshore sea breezes. This habitat type occurs along the immediate coast and intergrades with open beach sand on the ocean side, and coastal scrub on the coastal bluffs or often wetlands landward. Southern foredune habitats within the CSLC Lease Area and Zuma Beach area are typically dominated by invasive non-native plant species (e.g., European searocket [*Cakile maritima*] and ice plant [*Carpobrotus edulis*]) with interspersed native dune species, including red sand-verbena, beach bursage (*Ambrosia chamissonis*) and beach primrose (*Camissoniopsis cheiranthifolia* ssp. *cheiranthifolia*).

Open bare sand habitats occur in the CSLC Lease Area and Zuma Beach area along the beaches generally directly adjacent to the ocean. Open sand is subject to tidal action, and is mostly devoid of vegetation due to the frequent movement of substrates. Sandy beaches typically interface with the sandy intertidal, rocky intertidal and seasonally rocky intertidal marine and estuarine habitats (refer to Section 3.3, *Marine Biological Resources*).

Existing dunes at Broad Beach have been substantially altered by historic residential development, coastal erosion, and the installation of both sand bag and rock revetments, with the majority of foredune and dune crest having been eliminated and the majority of back dune areas converted to bare ground or landscaped yard space. The exception is the eastern 550 feet of Broad Beach east of the existing rock revetment, where remnant dune formations, though reinforced by sand bag revetments in places, retain a semblance of natural dune formations (approximately 0.10 acre, see Table 3.3-1). These areas support a mix of native, naturalized, landscaped species, and invasive plant species as discussed below. A portion of this area may have been damaged by coastal erosion in winter 2013-2014.

Beach and dune habitats within the Zuma Beach area have not been surveyed recently; however, site visit reconnaissance and aerial photography suggests that this area is dominated by sandy beach habitat that is relatively devoid of vegetation, and is heavily affected by human use. However, dune habitat, as described above, can be found in some areas of Zuma Beach, specifically those located to the southeast of the Zuma Wetlands (City of Malibu 1995).

*Wetland and Estuarine Habitats*

Coastal wetlands in the Public Trust Impact Area potentially affected by the Project include brackish and freshwater estuaries. Wetland and estuarine habitat adjacent to Broad Beach is limited to the Trancas Lagoon, located immediately east of Broad Beach. However, Zuma Beach supports a more extensive wetland and estuarine area, the Zuma Wetlands, located approximately 1.6 miles down coast. Both the Trancas Lagoon and the Zuma Wetlands provide habitat for wildlife and plant species held under public trust by the CDFW.

Coastal wetlands include a number of natural communities that share the combination of aquatic, semi-aquatic, and terrestrial habitats that result from periodic flooding by tidal waters, rainfall, or runoff. Wetlands provide habitat for a vast array of organisms, including many special-status species. During peak annual migration periods, hundreds of thousands of birds migrating along the Pacific Flyway descend upon these coastal wetlands in search of refuge and food. Coastal wetlands provide a vital link between land and open sea, exporting nutrients and organic material to ocean waters, and

harboring juveniles of numerous aquatic species. Water flow in these highly productive communities circulates food, nutrients, and waste products throughout the system.

Open lagoons and estuaries in Southern California typically support southern coastal salt, brackish, and freshwater marsh habitats. These wetlands are exposed to marine tidal influences during the winter months, but are isolated during other times of the year as stream flows decline and the sand berm develops. Dominant salt marsh native species include pickleweed (*Salicornia virginica*), saltgrass (*Distichilis spicata*), alkali heath (*Frankenia grandifolia*), spearleaved saltbush (*Atriplex patula*), and alkali weed (*Cressa truxillensis*). Other common species include California bulrush (*Schoenoplectus californicus*), narrowleaved cattail (*Typha angustifolia*), umbrella sedge (*Cyperus eragrostis*), and rushes (*Juncus* ssp.). Non-native species often include brass buttons (*Cotula coronopifolia*), curly dock (*Rumex crispus*), and rabbit's-foot grass (*Polypogon monspeliensis*).

Adjacent to the eastern end of Broad Beach, Trancas Lagoon supports a mix of southern coastal salt marsh and brackish and freshwater marsh habitats (Illustration 3.4-3). Trancas Lagoon itself measures approximately 10 acres in area, with approximately 0.50 acre located seaward of PCH. This lagoon is created by a sand berm, which limits tidal exchanges and causes the creek to pond during high seasonal flows or during times of tidal inundation or wave run-up. A jurisdictional wetland delineation was completed for the Trancas Lagoon in 2002 and identified 0.92 acre and 450 linear feet of federal jurisdictional wetlands and waters of the U.S. The lagoon supports native species, such as California bulrush, pickleweed and alkali heath; non-native species, such as brass buttons and tamarisk (*Tamarix* spp.); and substantial areas of open water. Wildlife species known to use the lagoon and the sandy beach in the immediate vicinity include common waterfowl, such as mallard (*Anas platyrhynchos*), as well as a number of shorebirds, such as double-crested cormorant (*Phalacrocorax aurilus*) and gulls (*Laridae* spp.). Additionally, western snowy plover, a federally threatened species and a CDFW species of special concern, has federally designated critical overwintering and foraging habitat in the immediate vicinity of the lagoon and construction staging area (see Figure 3.4-2). However, the lagoon is not known to support any federally or State-listed fish, such as the tidewater goby (*Eucyclogobius newberryi*) or southern steelhead *(Oncorhynchus mykiss)*, both federally endangered species (Chambers Group 2013).

***Illustration 3.4-3.*** *Trancas Lagoon lies at the east end of Broad Beach. Water levels vary seasonally, with approximately 0.50 acre of open water, salt and brackish marsh vegetation on the seaward side of PCH adjacent to the Project area; the lagoon is open to the ocean only intermittently.*


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**Vegetation Communities at Trancas Creek with Staging Area and Beach Stockpile Areas**

**FIGURE 3.4-2**

The Chambers Group (2013) conducted a biological survey at Trancas Creek, including a literature review and site visit, to assess the potential impacts to Trancas Lagoon by heavy equipment associated with the Project crossing the lagoon. During this survey, Chambers Group inventoried and mapped vegetation surrounding the lagoon. A small amount of Southern Foredunes habitat (i.e., 0.01 acre) was mapped south of the PCH bridge adjacent to a large patch of non-native ice plant. Native plant species typical of this vegetation community that were documented included: beach sand verbena (*Abronia maritima*), beach evening primrose (*Camissoniopsis cheiranthifolia*), and beach-bur (*Ambrosia chamissonis*). Additionally, native Southern Coastal Salt Marsh habitat was mapped (approximately 0.34 acre) and included fleshy jaumea (*Jaumea carnosa*), which was abundant in this area, saltgrass (*Distichlis spicata*), small amounts of beach-bur, salt heliotrope (*Heliotropium curassavicum* var. *oculatum*), spearscale (*Atriplex prostrata*), small amounts of Parish's pickleweed (*Arthrocnemum subterminale*), and Utah arrow grass (*Triglochin concinna*). Coastal Brackish Marsh habitat (approximately 0.02 acre) was also mapped south of the PCH bridge and included native California bulrush (*Schoenoplectus californicus*) and spearscale, as well as non-native annual beard grass (*Polypogon monspeliensis*).

The south coast branching phacelia (*Phacelia ramosissima* var. *austrolitoralis*), a CRPR 3.2 species, is the only sensitive plant species that has potential to occur in the lagoon south of the PCH bridge (Chambers Group 2013). This perennial herb grows in chaparral, coastal dunes, coastal scrub, and within coastal salt marshes and swamps on sandy or sometimes rocky soils. This species flowers between March and August and would have been conspicuous and identifiable during the biological survey. Neither south coast branching phacelia nor any other sensitive plant species was observed during the survey and therefore can be considered absent from the lagoon mouth (Chambers Group 2013).

Los Angeles County Parks and Recreation Department, under oversight of the CDFW, performs limited breaching of the Trancas Lagoon sand berm to prevent flooding, generally on an annual basis. The lagoon has been impacted by urban development and trash and pollutants from the nearby parking lot are routinely deposited into the lagoon (California Resources Agency 1997). However, the Santa Monica Bay Restoration Commission (formerly known as the Santa Monica Bay Restoration Company) recently approved funding for the acquisition and restoration of Trancas Creek and Trancas Lagoon, in order to restore and maintain a wildlife corridor between upland and sandy beach habitats (Santa Monica Bay Restoration Company 2010). This restoration project is in the early planning stages, including preparation of hydrologic, wetland delineations and other foundations studies. Initial objectives to be addressed in restoration design will include: 1) provide essential habitat and passage improvement for numerous coastal fish species, including endangered tidewater gobies and southern steelhead trout; 2) reduce sedimentation and erosion; 3) reduce water quality problems related to nutrient loading; 4) restore wetland and riparian vegetation and remove

invasive exotics; 5) restore transitional upland and coastal sage scrub vegetation; and 6) provide opportunities for public access, trail connections to the upper watershed and educational outreach opportunities.

Additionally, Trancas Canyon has been identified as potential southern steelhead (*Oncorhynchus mykiss irideus*) habitat by the National Park Service (NPS), as Trancas Creek is a perennial stream with healthy riparian habitat and a connection to the marine environment. The hydrologic and geo-morphologic conditions of Trancas Creek were evaluated for fish passage constraints in 2004 as part of the Santa Monica Mountains Steelhead Habitat Assessment Report (CalTrout 2006). The NPS is developing a conceptual design plan for restoring Trancas Lagoon and the fish passage function of the upstream 1,000- to 2,000-foot-long trapezoidal concrete culverts.

Within the Zuma Beach area, Zuma Creek, located approximately 1.6 miles southeast of Trancas Creek supports a 6-acre freshwater estuary, including associated wetland vegetation (CSLC 2010). Despite seasonal influences of salt water, the Zuma Wetlands are predominately characterized as freshwater wetland habitat (City of Malibu 1995). Although the creek mouth is currently heavily impacted by urban development, the Zuma Wetlands have historically served as a wildlife corridor and nesting site for a variety of birds and small mammals (Tiszler et al. 1998). In 1997, the Zuma Wetlands underwent restoration, including freshwater marsh, riparian woodland, saltgrass terrace, and locally rare foredune habitats (Tiszler et al. 1998). Additional restoration completed in 2001 included removal of several exotic species, grading, and planting of more than 6,000 native plants (Information Center for the Environment [ICE] 2011). Zuma Creek was recently ranked in the Santa Monica Mountains Steelhead Assessment as being of high importance in the conservation of southern steelhead (Harrison et al. 2005). Consequently, future restoration is planned along Zuma Creek within Zuma Canyon (Los Angeles County Flood District 2006).

*Landscaped Communities*

In addition to restricted elements of dune mat vegetation, several parcels at Broad Beach support planted native landscape species including field sedge (*Carex praegracilis*), yarrow (*Achillea millefolium*), salt grass (*Distichlis spicata*), beach strawberry (*Fragaria chiloensis*), and dune grass (*Elymus* sp.) (refer to Table 3.3-1). The majority of parcels have been planted with non-native landscape species, including calla lily (*Zantedeschia aethiopica*), American century plant (*Agave americana*), lion's tail (*Agave attenuate*), Krantz' aloe (*Aloe arborescens*), shrubby daisybush (*Dimorphotheca fruticosa*), pride-of-Madeira (*Echium candicans*), New Zealand hebe (*Hebe speciosa*), and New Zealand flax (*Phormium tenax*).

*Invasive Communities*

The majority of the vegetated areas at Broad Beach are dominated by ice plant, a low-growing prostrate perennial herb that has been widely planted for soil stabilization and landscaping in coastal habitats throughout California. The ice plant mat vegetation alliance is dominated by ice plant and occasionally occurs with pampas grass (*Cortaderia* sp.) (Sawyer et al. 2009). Ice plant (Illustration 3.4-4) and pampas grass are non-native invasive species ranked as high in terms of negative ecological impact by the California Invasive Plant Council (Cal-IPC) (Cal-IPC 2012). Pampas grass is a large perennial grass that favors dunes, bluffs, and disturbed areas (Cal-IPC 2012). Additional invasive plant species occurring within this vegetation alliance include calla lily, cape ivy (*Delairea odorata*), and Bermuda buttercup (*Oxalis pes-caprae*) (Sawyer et al. 2009 and WRA, Inc. 2011, 2013).

***Illustration 3.4-4.*** *Ice plant is the dominant vegetation in the Project area.*

Non-native species that have been observed at Broad Beach include those listed in Table 3.4-2 below. In addition to the species listed in Table 3.4-2, invasive species occurring in the Zuma Beach area, specifically in the vicinity of the Zuma Wetlands, include Bermuda grass (*Cynodon dactylon*), bristly ox-tongue (*Helminthotheca echioides*), castor bean (*Ricinus communis*), crystalline ice plant (*Mesembryantheme crystallinum*), curly dock (*Rumex crispus*), Lamb's quarters (*Chenopodium album*), and rip gut brome grass (*Bromus diandrus*) (ICE 2011).

<u>Special-Status Species and Invasive Species</u>

Special-status species data were collected from a variety of sources, including the CNDDB, California Native Plant Society's (CNPS's) Inventory of Rare and Endangered Plants of California, Applicant-prepared biological surveys, and other available literature including information on the presence and distribution of federally or State-listed special status species.

*Special Status Plant Species*

No State-listed threatened or endangered plant species are known to occur at Broad Beach (Chambers Group 2013). Seven sensitive plant species listed by CNPS are known or have either moderate or high potential to occur in the Project vicinity; however, only red sand-verbena has been documented (WRA, Inc. 2011, 2013) (see Table 3.4-3). Red sand-verbena was identified in limited patches of native dune mat vegetation along the length of the Study Area, primarily in association with undeveloped parcels at the site.

## Table 3.4-2. Non-Native Plants Known to Occur in the Broad Beach Vicinity

| Species Name | Common Name | Cal-IPC inventory Ranking[1] |
|---|---|---|
| *Agave americana* | American century plant | - |
| *Agave attenuate* | Lion's tail | - |
| *Aira caryophyllea* | silver hairgrass | - |
| *Aloe arborescens* | Krantz' aloe | - |
| *Aloe* sp. | aloe | - |
| *Anagallis arvensis* | pimpernel | - |
| *Atriplex semibaccata* | Australian salt bush | Moderate |
| *Bromus madritensis* ssp. *madritensis* | foxtail chess | High |
| *Cakile maritima* | European sea rocket | Limited |
| *Carpobrotus eduilis* | ice plant | High |
| *Cortaderia* sp. | pampas grass | High |
| *Delairea odorata* | Cape ivy | High |
| *Dimorphotheca fruticosa* | shrubby daisy-bush | - |
| *Echium candicans* | pride-of-Madeira | Limited |
| *Erodium cicutarium* | redstem filaree | Limited |
| *Euphorbia peplus* | petty spurge | - |
| *Foeniculum vulgare* | fennel | High |
| *Hebe speciosa* | New Zealand hebe | - |
| *Helminthotheca echioides* | bristly ox-tongue | Limited |
| *Limonium perezii* | Perez's sea lavender | - |
| *Medicago polymorpha* | bur medic | Limited |
| *Oxalis pes-caprae* | Bermuda buttercup | Moderate |
| *Phoenix canariensis* | Canary Island date palm | Limited |
| *Phormium tenax* | New Zealand flax | - |
| *Pittosporum undulatum* | Victorian box | - |
| *Pseudognaphalium luteoalbum* | everlasting cudweed | - |
| *Rhaphiolepis indica* | Indian hawthorn | - |
| *Sonchus asper* ssp. *asper* | prickly sow thistle | - |
| *Sonchus oleraceus* | common sow thistle | - |
| *Zantedeschia aethiopica* | calla lily | Limited |

*Sources: Cal-IPC 2012; WRA, Inc. 2011.*

*Notes*: These species were documented at Broad Beach within the 2.46-acre area surveyed by WRA, Inc. (2011); additional non-native species may be present in other areas of Broad Beach, which were not surveyed by WRA, Inc.

[1]Cal-IPC categorizes plants as High, Moderate, or Limited, reflecting the level of each species' negative ecological impact in California

## Table 3.4-3. Sensitive Plants Known or Having the Potential to Occur within the CSLC Lease Area and Zuma Beach Area

| Species | Status | Notes/Occurrence |
|---|---|---|
| Project Area – Broad Beach[1] | | |
| *Abronia maritima*<br>red sand-verbena | CRPR 4.2 | Present. This species has a high potential to occur within the southern foredune habitat and was observed during the protocol-level rare plant survey. |
| *Atriplex coulteri*<br>Coulter's saltbush | CRPR 1B.2 | Not Observed. This species has a moderate potential to occur at Broad Beach due to the presence of coastal dune habitat; however, Coulter's saltbush was not observed during the 2010 or 2011 protocol-level rare plant surveys or during the 2013 biological survey. |
| *Camissoniopsis lewisii*<br>Lewis' evening-primrose | CRPR 3 | Not Observed. This species has a high potential to occur within the southern foredune habitat; however, it was not observed during the protocol-level rare plant surveys in 2010 and 2011, nor was it observed during the 2013 biological survey. |
| *Chaenactis glabriuscula* var. *orcuttiana*<br>Orcutt's pincushion | CRPR 1B.1 | Not Observed. Though this species has a high potential to occur within the southern foredune habitat, it was not observed during the protocol-level rare plant surveys in 2010 and 2011, nor was it observed during the 2013 biological survey. |
| *Dlphinium parryi* spp. *Blochmaniae*<br>dune larkspur | CRPR 1B.2 | Not Observed. This species has a moderate potential to occur at Broad Beach due to the presence of coastal dune habitat; however, it was not observed during the 2010 or 2011 protocol-level rare plant surveys or during the 2013 biological survey. |
| *Hordeum intercedens*<br>vernal barley | CRPR 3 | Not Observed. This species has a moderate potential to occur at Broad Beach due to the presence of coastal dune habitat; however, it was not observed during the 2010 or 2011 protocol-level rare plant surveys or during the 2013 biological survey. |
| *Phacelia ramosissima* var. *austrolitoralis*<br>south coast branching phacelia | CRPR 3.2 | Not Observed. This species has a moderate potential to occur at Broad Beach due to the presence of coastal dune habitat; however, it was not observed during the 2010 or 2011 protocol-level rare plant surveys or during the 2013 biological survey. |
| Off-site Project Area – Zuma Beach[2] | | |
| *Abronia maritima*<br>red sand-verbena | CRPR 4.2 | Present. This species was reintroduced as a part of the Zuma Beach Restoration Plan (1997). |

*Sources: [1]WRA, Inc. 2011, 2013; [2]Psomas and Associates 1997; CNPS 2014.*

*Notes*:

CNPS California Rare Plant Rank (CRPR)

- 1A - Presumed extinct in California
- 1B - Rare, threatened, or endangered in California and elsewhere
- 3 - Plants about which CNPS needs additional information.
- 4 - Plants of limited distribution
- 0.1 - Seriously threatened in California (>80% of occurrences threatened)
- 0.2 - Fairly threatened in California (20 to 80% of occurrences threatened)
- 0.3 - Not very threatened in California (<20% of occurrences threatened)

**Red sand-verbena**. Red sand-verbena (Illustration 3.4-5) is a trailing succulent found mostly on coastal strand from San Luis Obispo County south to Baja California, and blooms between February and November (Hickman 1993). The plant is part of the single dune mat vegetation association (comprised of beach bur, red sand-verbena, and sea); this vegetation community is located entirely near the ocean edge and is dominated by red sand-verbena and beach bur, with a subdominant presence of sea rocket and beach evening primrose (*Camissoniopsis cheiranthifolia* spp. *cheiranthifolia*) (WRA, Inc. 2011). However, the cover of this vegetation alliance at Broad Beach is minimal and primarily limited to the eastern end of Broad Beach (WRA, Inc. 2011, 2013). Red sand-verbena is also known to occur at Zuma Beach.

***Illustration 3.4-5.*** *Red sand-verbena is a sensitive plant species documented in the Project area; past revetment construction as well as creation of a new dune system may impact individuals of this species. Photograph courtesy of Calflora.*

*Special Status Wildlife Species*

Several wildlife species inhabit the Malibu coastline and may occur at Broad Beach or down coast beaches such as Zuma Beach. The federally threatened western snowy plover, CDFW fully protected California brown pelican (*Pelecanus occidentalis californicus*), and California Special Animal globose dune beetle have recently been documented at Broad Beach (Chambers Group 2010 and Sandoval 2008). Allen's hummingbird (*Selasphorus sasin*), a USFWS Bird of Conservation Concern, was detected in point count surveys conducted by WRA, Inc. (2013). California least tern (*Sterna antillarum browni*), which may forage off Broad Beach, may also occur at Broad Beach (Forde Biological Consultants 2005) along with the silvery legless lizard (*Anniella pulchra pulchra*) and sandy beach tiger beetle (*Cicindela hirticollis gravida*); however, none of these species was identified in recent biological surveys (WRA, Inc. 2013).

**Western snowy plover**. The western snowy plover was listed as federally threatened in 1993 and is also a CDFW species of special concern (Illustration 3.4-6). This species, which includes a coastal and an interior population, breeds on the Pacific coast from southern Washington to southern Baja California, Mexico, as well as in interior areas. The Pacific coast population of the western snowy plover has not been found to have distinct genetic differences from western snowy plovers that

***Illustration 3.4-6.*** *The eastern end of the Project area and Zuma Beach support critical overwintering habitat for the western snowy plover. Photograph courtesy of USFWS.*

breed in the interior (USFWS 2007a); however, they are geographically isolated from one another due to a lack of dispersal among the two populations. The Pacific coast population is defined as those individuals that nest adjacent to or near tidal waters, and includes all nesting colonies on the mainland coast, peninsulas, offshore islands, adjacent bays, and estuaries (USFWS 2007a). The coastal population of the species consists of both resident and migratory birds (Warriner et al. 1986). Although some individuals overwinter in the same areas used for breeding, migratory coastal western snowy plovers travel either north or south within their coastal range (USFWS 2007a).

The western snowy plover forages primarily in wet sand at the beach-surf interface and feeds on marine worms, small crustaceans, and insects (USFWS 2007a). This species is most likely to nest in shallow depressions on undisturbed, flat areas with loose substrate, such as sandy beaches and dried mudflats along the California coast. Typically, two to three eggs are laid by each female, and are incubated by both sexes. These eggs hatch in 25 to 30 days and nestlings fledge (i.e., are able to fly) after approximately 1 month (USFWS 2007a). The nesting season for this species can extend from early March through early September, but generally occurs up to 2 to 4 weeks earlier in Southern California (USFWS 2007a).

The decline in the western snowy plover population is primarily attributed to human disturbance, urban development, introduced European beachgrass (*Ammophila arenaria*), and expanding predator populations (USFWS 2007a).

Western snowy plovers are known to occur within both the CSLC Lease Area and the Zuma Beach area, along the sandy beach extending from just west of the Trancas Lagoon to Point Dume, where they have federally designated critical habitat (refer to Figure 3.3-1). The essential habitat features in these areas include stretches of sandy beach, generally barren to sparsely vegetated, located both above and below the high tide line terrain (USFWS 2005). In addition to providing habitat conducive to predator avoidance, these features also provide individuals with occasional surf-cast wrack supporting small invertebrates for foraging. Western snowy plovers do not nest near Trancas Lagoon; however, Zuma Beach is listed as federally designated critical habitat because it is an important wintering area with up to 213 western snowy plovers recorded during a single season over the last seven years (WRA, Inc. 2013). Zuma Beach supports the largest wintering population of snowy plovers in Los Angeles County. During construction of the emergency revetment in 2010, biological monitors observed snowy plovers on the sand bar at the mouth of Trancas Lagoon (WRA, Inc. 2013). This critical habitat unit extends about 3 miles north along the coast from the north side of Point Dume to the base of Trancas Canyon. This unit includes the following physical or biological features essential to the conservation of the species: areas of sandy beach above and below the high-tide line with occasional surf-cast wrack supporting small invertebrates and generally barren to sparsely vegetated terrain (Federal Register 2012).

**California brown pelican**. The California brown pelican (Illustration 3.4-7) was recently delisted under the California Endangered Species Act (CESA) due to increasing populations and increased nesting; however, its classification as a fully protected species by CDFW remains. Pursuant to the Fish and Game Code, fully protected species may not be taken or possessed at any time and no permits or licenses can be issued to take any fully protected species, except in the instance of take resulting from recovery activities for State-listed species. Like any bird in the pelican family (i.e., Pelecanidae), the California brown pelican is easily identified by its large body, long bill, webbed feet, and large gular pouch; this particular species is differentiated by its dark plumage (Burkett et al. 2007). The species occurs along most of the Pacific coast, preferring warm coastal marine and estuarine environments. California brown pelicans are chiefly diurnal, and primarily forage in shallow coastal waters or inland seas (Burkett et al. 2007). Roosting occurs during the day, in groups on sand bars or jetties, or on man-made structures such as piers and docks (Shields 2002). During the most recent biological survey, flocks of brown pelicans were observed flying offshore adjacent to Broad Beach, where they are likely to opportunistically forage offshore (WRA, Inc. 2013). This species was documented at Broad Beach during the construction of the emergency rock revetment (Chambers Group 2010). California brown pelican individuals in this region may be dependent on resources located in both the CLSC Lease Area and the Zuma Beach area, particularly Trancas Lagoon and the Zuma Wetlands.

***Illustration 3.4-7.*** *California brown pelicans were documented by monitoring biologists during construction of the emergency revetment at Broad Beach in 2010. Photograph courtesy of the USFWS.*

**Allen's hummingbird**. Allen's hummingbird is not a federally or State-listed threatened or endangered species; however, this species a USFWS Bird of Conservation Concern (Illustration 3.4-8). Male Allen's hummingbirds have green backs and orange-red throats while females have green backs with reddish sides and tail bases. These birds take cover in trees and shrubs and nest above ground often in shaded areas. Allen's hummingbirds are known to breed in woodlands and dense scrub from mid-February to early August. Allen's hummingbirds were documented at Broad Beach during the most recent biological surveys;

***Illustration 3.4-8.*** *Allen's hummingbird is a USFWS Bird of Conservation Concern. This species eats consumes nectar and insects and takes cover in trees and shrubs, including ornamental vegetation near the Project area. Photograph provided by Will Elder, NPS.*

however, these birds were only observed interacting with ornamental flowering plants in landscaped areas near residences and not within any areas that would be directly modified by implementation of the Project (WRA, Inc. 2013).

**California least tern**. The California least tern was listed as federally endangered in 1970 and State-listed as endangered in 1971 (Illustration 3.4-9). This migratory species is found along the Pacific coast of California, from San Francisco southward to Baja California (USFWS 2009). Its non-breeding range is presumed to be the Pacific coast of North America from central Mexico south to Panama, but robust evidence is lacking (USFWS 2009). Further, populations are localized and have become increasingly fragmented as coastal development continues. This species feeds exclusively on small fish caught in estuaries, bays, and near-shore marine waters (USFWS 2009). Today, nest sites are restricted to a few defined locations, some of which are artificial and most of which persist only because of strict management (USFWS 2009).

***Illustration 3.4-9.*** *California least terns may be observed flying up and down coastal areas in search of suitable foraging locations; however, nesting within the Project area is unlikely due to the fragmented condition of the coastal dune features and proximity of coastal development and human activity. Photograph courtesy of the USFWS.*

The California least tern is the smallest of the North American terns. Individuals nest in colonies on relatively open beaches kept free of vegetation by natural scouring from tidal action. The typical colony size is 25 pair (USFWS 2006). The California least tern generally arrives in nesting areas in mid-April to early May (USFWS 2006). Pair bonds may form before or immediately upon arrival with well-defined courtship patterns. Nest locations are usually undisturbed open sand, dirt, or dried mud close to estuaries or a dependable food supply (USFWS 2006). California least terns are colonial, creating loose aggregations of nests approximately 10 feet apart with one to four eggs laid in small depressions (USFWS 2006). Their nest is a simple scrape in the sand or shell fragments (USFWS 2009). A typical clutch is two eggs and both adults incubate and care for the young. Fall migration commences between the last week of July and the first week of August (USFWS 2006). Several weeks before the fall migration, adults and young wander along marine coastlines, congregating at prime fishing sites (USFWS 2006).

While California least tern may be observed flying over Broad Beach, moving up and down coastal areas in search of suitable foraging locations, this area is not considered to be critical habitat or recent breeding habitat, as the conspicuous presence of human activity at Broad Beach limits the potential for nesting colonies at Broad Beach (Forde Biological Consultants 2005).

**Golden Eagle.** While the golden eagle is not a federally or State-listed threatened or endangered species, it is fully protected in California, and federally protected by the Bald and Golden Eagle Protection Act (BGEPA), the Migratory Bird Treaty Act (MBTA), and the Lacey Act. Each of these regulations restricts activities that could have a detrimental effect on golden eagle populations Golden eagles are large dark brown raptors with golden feathers on the head and neck. Located in the Northern Hemisphere, their habitats include semi-open country, chaparral, shrubland, cliffs and bluffs. Breeding activities for the golden eagle typically occur in the spring, and their eggs are incubated by the female for 6 weeks after laying them. The golden eagle is a powerful predator that hunts many animals of medium size (USFWS 2011). While Golden Eagle may be observed flying over Broad Beach, moving up and down coastal areas in search of suitable foraging locations, individuals have not been observed during any recent surveys of Broad Beach.

**Silvery legless lizard**. The silvery legless lizard is a CDFW species of special concern. This burrowing reptile is slender, with no legs, a shovel-shaped snout, smooth shiny scales, and a blunt tail (NatureServe 2012) (Illustration 3.4-10). This species lives mostly underground, foraging in loose sandy soil during the day and emerging to the ground surface at dusk or at night. Silvery legless lizards primarily eat larval insects, beetles, termites, and spiders, concealing themselves beneath leaf litter or substrate before ambushing their prey. This species typically inhabits sand or loose soil in a variety of habitats, including areas with sparse vegetation such as beaches, chaparral, pine-oak woodland, and riparian areas characterized by sycamores (*Plantus* spp.), cottonwoods (*Populus* spp.), and oaks (*Quercus* spp.) (NatureServe 2012). Silvery legless lizards are also found in dune habitats, specifically in areas with bush lupine (*Lupinu*s spp.) and mock heather (*Ericameria ericoides*), which are habitat indicators for this species (NatureServe 2012). They are often present in greater densities in areas where soil moisture is greater and in lower densities where soils are disturbed and ice plant mats occur (Kuhnz et al. 2005). Silvery legless lizards have not been recently documented in the Broad Beach or Zuma Beach areas. No individuals were encountered in pit-fall traps included during the most recent biological survey at Broad Beach (WRA, Inc. 2013). However, this species is found within similar coastal backdune

***Illustration 3.4-10.*** *While the silvery legless lizard has been documented in the Ventura Harbor sand trap and in the general locality, especially in the vicinity of McGrath Lake, it has not been documented at Broad Beach. However, this species is known to co-occur with ice plant, and has been found in similar coastal dune habitat. Photograph courtesy of California Herps.*

habitat and may occur within other areas along the Malibu coastline (Broughton et al. 2006).

**Southwestern pond turtle**. The southwestern pond turtle (*Emys marmorata pallida*), a CDFW species of special concern, is a genetically distinct sub-species of the western pond turtle (*Emys marmorata*), and is found south of San Francisco Bay (Lovich 1998) (Illustration 3.4-11). Historically, this subspecies had a relatively continuous range along the Pacific slope drainages from southern Washington to Baja California (Lovich 1998). Habitat requirements for this species include still or slow-moving water and the availability of aerial and aquatic basking sites. The reproductive biology of the species is poorly known (Lovich 1998). Courtship and mating have been observed in the field during most of the year except December and January, while nesting extends from late April through August with a peak in late May and early July (Lovich 1998). Southwestern pond turtles eat a variety of food items including algae, plants, snails, crustaceans, isopods, insects, fish, and frogs (Lovich 1998).

***Illustration 3.4-11.*** *The southwestern pond turtle has been documented in Trancas Canyon just north of Trancas Lagoon. Photograph courtesy of the Bureau of Land Management.*

The greatest single threat to this species is habitat destruction. Over 90 percent of the wetland habitats within its historic range in California have been eliminated due to agricultural development, flood control, water diversion projects, and urban development (Lovich 1998). The southwestern pond turtle has not been observed atat Broad Beach; however, this species has historically been documented in Trancas Canyon, upstream of the lagoon. This species would be highly unlikely in the lagoon seaward of the PCH bridge, but they can occur in brackish water and could occur just upstream of the bridge (Chambers Group 2013).

**Tidewater goby**. The tidewater goby was listed as a federally endangered species in 1994 and is a CDFW species of special concern (Illustration 3.4-12). The tidewater goby is a small estuarine fish reaching only 2 inches in length. Preferred habitat for this species includes lagoons, marshes, and tributaries with tidal influence between Del Norte County and San Diego County, California (USFWS 2007b). The tidewater goby resides in coastal streams within 2 miles of

***Illustration 3.4-12.*** *While the tidewater goby has not been documented at Trancas Lagoon, proposed federally designated critical habitat for the species is located at Zuma Wetlands. Photograph courtesy of USFWS.*

the ocean and characterized by slow, shallow, brackish water (USFWS 2007b). They usually inhabit water bodies with a salinity content less than 12 parts per thousand (ppt); however, they can tolerate salinities up to 28 ppt (Swift et al. 1989). This species feeds on small aquatic invertebrates and insect larvae (USFWS 2007b). The majority of tidewater gobies live only one year, making this species highly sensitive to adverse environmental conditions during the breeding season (USFWS 2007b).

Although this species has not been documented in Trancas Lagoon or the Zuma Wetlands, it has been documented in the nearby Malibu Lagoon. New proposed critical habitat for this species includes the Zuma Wetlands, which may provide habitat for dispersal of tidewater goby individuals. Additionally, the Zuma Wetlands are identified in the tidewater goby recovery plan as a potential introduction site, as this water body could provide habitat for maintaining the tidewater goby metapopulation in the region.

**Southern steelhead.** The southern steelhead *(Oncorhynchus mykiss)* was listed as federally endangered in 1998 and is a CDFW species of special concern (Illustration 3.4-13). Most steelhead populations within the Southern California steelhead distinct population segment (DPS) have been severely reduced, particularly near the southern extent of their range in the vicinity of the Santa Monica Mountains (National Oceanic and Atmospheric Administration [NOAA] 2011). Land use in these watersheds is highly variable; however, typically the lower reaches along the coast are highly urbanized and are characterized by a loss of estuarine habitat. Trancas Creek not federally-designated critical habitat for southern steelhead.

***Illustration 3.4-13.*** *Although southern steel head does not occur in the Project area, restoration efforts in Trancas and Zuma Canyons have focused on bringing southern steelhead runs back to these creeks. Photograph courtesy of NOAA.*

The southern steelhead is an anadromous salmonid species, which can live up to six years (NatureServe 2012). In freshwater systems, these fish feed primarily on insects and fish; however, in the ocean their diet consists primarily of fish and crustaceans (NatureServe 2012). Southern steelheads are capable of adapting to a wide range of environmental conditions (NatureServe 2012). They utilize all portions of a river system, including the estuary at the mouth, and the spawning and nursery areas in the headwaters, to complete their life cycle (NOAA 2011). Consequently, southern steelheads require access between marine and freshwater environments, usually provided by a lagoon, or other estuary system.

Southern steelhead occurred historically in Trancas Creek as recently as the 1980's (Dagit et al. 2005). While southern steelhead have been recently documented in the nearby Malibu Creek, this species has not been observed since the 1980s in Trancas Creek or Zuma Creek, likely due to the barriers to fish passage, which exist in the higher reaches (Chambers Group 2013). However, both Trancas Lagoon and the Zuma Wetlands are both considered ESHAs under the Malibu LCP, and have been identified by NPS as potential southern steelhead habitat, which has led to a number of restoration efforts, particularly in the vicinity of the Zuma Wetlands. The NPS has also identified Trancas Creek for restoration efforts that would include the removal of barriers to fish passage.

*Special Status Invertebrate Species*

**Globose dune beetle**. The globose dune beetle (Illustration 3.4-14), a California Special Animal, is one of four species of dune beetles restricted to coastal sand dunes and beaches along the Pacific coast. Its distribution covers coastal dunes from Bodega head in Sonoma County to northwestern Baja California (Sandoval 2008). However, despite its large distribution, the habitat requirements of the globose dune beetle restrict this species to the narrow fringe of foredunes immediately adjacent to the ocean and immediately above the mean high tide line (Sandoval 2008). This species, similar to the other three coastal dune beetles, is strongly fossorial (i.e., burrowing). It spends nearly its entire life burrowing in loose sandy areas among common dune plants, such as sand-verbena, beach bur, and sea rocket (Broughton et al. 2006). Adults and larvae are sometimes found in open sandy areas, but more typically are found in the sand a few inches beneath the plants (Broughton et al. 2006).

***Illustration 3.4-14*** *The globose dune beetle, a California Special Animal, has been documented at Broad Beach and may have been impacted by past emergency revetment construction. This species may also be impacted by construction of the new dune system. Photograph courtesy of Kevin Lentz.*

Globose dune beetles occur in foredune habitats at 30732 Pacific Coast Highway, which is located at the eastern extent of Broad Beach (Sandoval 2008). Sandoval (2008) found that globose dune beetle individuals were most abundant on the front and top of the foredune ridge, specifically where native vegetation was present. Further, Sandoval (2008) found that individuals were less abundant at sites that were irrigated, and when houses were present the distribution of individuals was shifted lower on the beach.

Although pit-fall traps, one of which was installed in the aforementioned undeveloped lot at 30732 Pacific Coast Highway, failed to detect globose dune beetles during the most

recent survey efforts, WRA biologists observed subterranean beetle tracks, suggesting that this species is still extant in foredune habitat at the site (WRA, Inc. 2013). It is likely that the beetle occurs in only limited areas where dune mat or other sparse vegetation occurs (WRA, Inc. 2013).

**Sandy beach tiger beetle**. The sandy beach tiger beetle (Illustration 3.4-15), a California Special Animal, occupies sandy beaches and coastal scrub habitats near estuaries in central and Southern California (Broughton et al. 2006). This species can be found in moist sand near the ocean, including swales behind dunes or upper beaches beyond normal high tides (Broughton et al. 2006). Adult sandy beach tiger beetles are carnivorous and feed on flies as well as other insects common in the tidal zone (NatureServe 2012). The species' range has been drastically reduced from its former reach across Southern California. Threats to this species include coastal development, exotic plants, and heavy recreation use of shore areas (NatureServe 2012). The sandy beach tiger beetle was not detected during the most recent biological survey efforts at Broad Beach, and suitable habitat for sandy beach tiger beetle was determined to be absent from Broad Beach (WRA, Inc. 2013).

***Illustration 3.4-15.*** *Sandy beach tiger beetles have a high potential to occur within Broad Beach. Photograph courtesy of Bug Guide.*

### 3.4.2 Selected Regulations Pertaining to Terrestrial Biological Resources

State and other statutes related to marine biological resources are listed in Table 3.3 in Section 3.0, *Issue Area Analysis*.

### 3.4.3 Public Trust Impact Criteria

Impacts to terrestrial biological resources would be considered to have a major adverse effect should Project implementation result in one or more of the following:

- Potential for any part of the population of a threatened, endangered, or candidate species to be directly or indirectly affected or disturbed, or conflict with an adopted species recovery plan;
- "Take" of a federal or state-listed endangered, threatened, regulated, fully protected, or sensitive species;
- Prolonged disturbance to or destruction of, the habitat of a species that is recognized as biologically or economically significant in local or State policies, statues, or regulations;

- Conflict with an adopted habitat conservation plan or result in a net loss in the functional habitat value of a ESHA, critical habitat for a federally listed species, southern foredune, beach, coastal lagoons or estuaries, sea bird rookeries, or other areas of special biological significance;
- Permanent change in the community composition or ecosystem relationships among species that are recognized for scientific, recreational, ecological, or commercial importance;
- Permanent alteration or destruction of habitat that precludes reestablishment of native biological populations; or
- Interference with established native resident or migratory wildlife corridors or the use of native wildlife nursery sites.

Where applicable, this impact analysis considers Broad Beach both in its existing setting, following the 2010 emergency rock and sand bag revetments installation, and in its historical setting without the emergency revetments, characterized by a narrow beach and dune habitat.

### 3.4.4 Public Trust Impact Analysis

Historical Biological Characteristics of Broad Beach

According to estimates made by WRA, Inc. (2012) based on false infrared aerial imagery, there were approximately 12.23 acres of degraded remnant foredune habitat at Broad Beach in 2005, prior to construction of the sand bag revetments. Conditions of areas landward of the existing rock and sand bag revetments have not changed substantially over time in terms of habitat coverage and quality. However, sensitive species including globose dune beetles and red sand-verbena, both of which have been documented at Broad Beach, may have been more widespread at the site in 2005 when a relatively larger area of foredune containing native dune mat vegetation likely existed (WRA, Inc. 2013). Impacts associated with the installation of sand bag and rock revetments on such habitats are discussed below in Impact TBIO-1.

**Impact TBIO-1: Impacts to Terrestrial Biological Resources Resulting from the Installation of Sand Bag and Rock Revetments**

**Past installation of sand bag and rock revetments resulted in direct adverse impacts to dune habitat, considered an environmentally sensitive habitat area (ESHA) under the Malibu Local Coastal Program (LCP), as well as to sensitive species such as the globose dune beetle (Major Adverse Effect, Class Mj).**

Impact Discussion (TBIO-1)

Installation of sand bag revetments after 2005 followed by the installation of the temporary emergency rock revetment in 2010 created direct and indirect major adverse effects on both the sandy beach and dune environments at Broad Beach. As these sand

bag and rock revetments were constructed under emergency permits, environmental analysis was not completed prior to installation, which limits the information available regarding the specific impacts on terrestrial biological resources. However, as discussed below, adverse impacts resulting from the installation of the sand bag and rock revetment may have included the potential take of sensitive wildlife and plant species, as well as the reduction in the aerial extent, foraging and functional values of sandy beach and coastal dune habitats.

The emergency sand bag and rock revetments were placed directly onto the dune system fronting the Broad Beach properties, which is considered ESHA under the Malibu LCP (refer to Figure 3.3-1). While the dune system was of variable quality due to past disturbance (e.g., installation of sand bag revetments, introduction of non-native species, construction of homes patios and walkways, etc.), it was directly and adversely affected by the installation of emergency sand bag and rock revetments. According to estimates made by WRA, Inc. (2012) based on overlays of aerial imagery, installation of the emergency sand bag and rock revetments resulted in the direct removal of approximately 3.62 acres of foredune habitat.

Operation of heavy material staging and work crew activity within and adjacent to foredune habitat may have resulted in additional trampling or destruction of native dune vegetation. Disruption of dunes may have resulted in takes of sensitive wildlife and native plant species, including globose dune beetle and red sand-verbena. Both of these species have been observed at Broad Beach and may have been more widespread at the site prior to installation of the sand bag and rock revetment in 2008 to 2009 when a relatively larger area of foredune containing native dune mat vegetation likely existed (Sandoval 2008 and WRA, Inc. 2011, 2013).

In addition, construction of the emergency revetments may have impacted the western snowy plover as this species' critical habitat extends from the east end of Broad Beach across Zuma Beach. In particular, unmonitored construction activities associated with the installation of the emergency sand bag revetments may have disturbed overwintering plovers within nearby critical habitat. However, although involving more intense construction, installation of the emergency rock revetment was subject to biological monitoring and, based on reports prepared for that monitoring effort, does not appear to have created substantial disturbance to snowy plover populations at the time.

Revetment installation also adversely affected the functional value of the coastal dune system by disrupting coastal processes, such as the natural interchange of sand between the sandy beach and dunes and dune mobility by fixing this system's seaward edge. This major alteration of existing natural coastal processes in the area interferes with the ability of the dune system to contract or expand in response to long-term natural climatic cycles, such as changes in storms and wave activity, consequently altering the natural functioning of this system over the long-term.

Avoidance and Minimization Measure(s)

**AMM TBIO-1a. Implementation of a Comprehensive Dune Restoration Plan.** In order of off-set past impacts to foredune habitats from installation of emergency sand bag and rock revetments, the Applicant shall prepare and implement a Comprehensive Dune Restoration Plan (Plan). The Plan shall manage and implement the creation of the proposed new coastal dune system across the length of Broad Beach (Section 2, *Project Description)*. The Plan shall include, but not be limited to, the following measures:

- Conform to any conditions of approval pursuant to the California Coastal Commission's (CCC) Coastal Development Permit for mitigation of ESHA related impacts.
- If applicable, conform to U.S. Fish and Wildlife Service (USFWS) Biological Opinion requirements for protection of federal special status species and western snowy plover critical habitat.
- In consultation with the California Department of Fish and Wildlife (CDFW) and USFWS, to the extent feasible, the Plan shall be designed and managed to support the state and federal special status species identified as impacted through installation of the emergency sand bag and rock revetments.
- The Plan shall include a landscape plan that details specific planting plans, with native vegetation specific to foredune (e.g., red sand-verbena, pink sand-verbena, beach bur, and beach morning glory), dune crest, and back dune habitats.
- The Plan shall require and outline specific measures for invasive species removal in on public and private lands in the degraded dune system (e.g., ice plant and pampas grass). It shall also outline specific measures regarding native species salvaging and revegetation, highlighting details regarding appropriate planting densities and planting methods.
- The Plan shall outline that the Applicant is responsible for long-term monitoring and maintenance activities, including monitoring and survey methods, as well as detailed monitoring and maintenance schedules.
- The Plan shall address the potential for dune habitat disturbance associated with vertical public and private access by limiting the number and frequency of walkways across the dune system. Access into the dune system shall be controlled through use of bollards, ropes, fencing, and signage. The Plan shall also address access for maintenance activities in and adjacent to the restored dune system.
- The Plan shall establish a shared walkway across the landward edge of the restored dune system with access ways across the dunes to the beach spaced not less than 300 feet.
- The Plan shall detail specific adaptive management strategies, such as additional native vegetation installation or restoration and invasive

species removal should monitoring find that restoration goals are not be met.

*Additional Plan Requirements and Timing*

The Plan shall be subject to review and approval by the California State Lands Commission (CSLC), the CCC, CDFW, USFWS, and the city of Malibu. The Applicant shall provide the agency approved Plan to CSLC prior to commencement of construction and staging activities. Prior to the commencement of beach and dune nourishment, the Applicant shall file a performance bond with CSLC to complete restoration and maintain plantings until pre-established performance criteria are met. Permits from other regulatory agencies (as necessary) shall also be obtained prior to Project implementation.

*Monitoring*

A qualified local biologist approved by CSLC shall monitor implementation of the Plan for compliance. Monitoring and maintenance shall be confirmed through site inspections. Detailed monitoring reports shall be submitted to the CSLC, the CCC, the CDFW, and the city of Malibu after completion of initial construction and on an annual basis thereafter. These reports shall address success of installation and maintenance of native plantings and dune management and management actions required to maintain and protect the dune system.

**AMM TBIO-1b. If Applicable, Conform to California Coastal Commission (CCC) Coastal Development Permit for Off-Site Mitigation of ESHA.** If applicable, to ensure mitigation for loss of ESHA from installation of the emergency sand bag and rock revetments, the Applicant shall conform with any CCC Coastal Development Permit conditions of approval for Off-site mitigation of ESHA. The Applicant shall provide the CCC approved Off-site ESHA mitigation plan to California State Lands Commission (CSLC) staff prior to commencement of construction and staging activities.

<u>Rationale for Avoidance and Minimization Measure(s)</u>

The installation of the emergency sand bag and rock revetments resulted in major adverse effects, including the displacement and covering of 3.62 acres of beach and dune habitat and the likely take of sensitive wildlife and plant species, which cannot be replaced. However, while this impact cannot be wholly offset, implementation of the Applicant's proposed dune creation and restoration proposals as part of the Project and AMM TBIO-1a would serve to substantially reduce long-term adverse impacts to the functional value of the dune system. Success of the implementation of AMM TBIO-1a would be based on the achievement of success criteria outlined in the conceptual Foredune Creation and Enhancement Plan (see Appendix C) and further defined in the Comprehensive Dune Restoration Plan.

As explained in the Conceptual Foredune Creation and Enhancement Plan, foredune creation and enhancement is primarily intended to provide a reservoir of sand for natural beach nourishment and an additional buffer of relatively stabilized sand between the ocean and the residences. A secondary goal of foredune creation and enhancement is to increase the area of high-value foredune habitat at Broad Beach. It should be recognized that the ecological factors that promote the formation and maintenance of dune systems are generally disrupted at Broad Beach. The sandy beach habitat to be created by the proposed beach nourishment will provide a source of sand that can provide short- to mid-term support of natural dune habitats following the initial foredune construction and enhancement (e.g., up to 20 years). However, the natural processes of dune formation will be limited by the residential development on the landward side of the beach, which limits the area available for dune movement. Over the long term, with erosion of the beach, reduced availability of sand from the beach may also affect natural dune functions. The limited area available for the landward movement of dunes necessitates increased levels of dune stability relative to natural dune formations, which are inherently less stable. To create increased stability, the foredune design includes a planting palette of native sub-shrubs and shrubs and a denser spacing of vegetation than might otherwise occur in natural foredune formations (WRA 2013). Additional considerations include that the proposed sand source is substantially courser than the median grain size of the existing remaining native dune sand. The existing rock revetment, when eventually exposed by future shoreline erosion, could also disrupt sand exchange between the beach and dune system. Although the Comprehensive Dune Restoration Plan would enhance and increase foredune habitat value in comparison to existing limited degraded foredune habitat areas, for the above reasons, the Plan may not result in creation of a sustainable dune system over the long-term, particularly after cessation of nourishment activities. Therefore, the CCC would need to review these factors when considering if this dune system would be recognized as ESHA to serve as in-kind replacement of previously existing foredune habitat impacted by installation of the sand bag and rock revetments. Therefore, Impact TBIO-1 would continue to have a major adverse effect over the long-term.

The Project also contains a provision for installation of emergency sand bag revetments during erosion events along the eastern 550 feet of Broad Beach that is not protected by the existing rock revetment. Such sand bag revetments would be installed outside of and fronting the restored dunes and would only be installed during periods of erosion such as toward the end of the useful life of the initial or follow-up nourishment events. Sand bags would be filled using beach sand only. This Project component would increase the longevity of the dune system at the unprotected east end of Broad Beach.

**Impact TBIO-2: Short-Term Project-Generated Construction Impacts to Terrestrial Biological Resources**

**Construction activities associated with proposed beach nourishment and dune creation may adversely impact existing sandy beach and foredune habitats and biological resources, as well as the Trancas Lagoon (Major Adverse Effect, Class Mj)**

Impact Discussion (TBIO-2)

Short-term construction associated with the proposed initial and second subsequent beach nourishment and dune restoration/creation events would involve deposition of imported inland sand onto stockpiles on up to 5 acres of Zuma Beach and hauling of sand down to and along 6,200 feet of Broad Beach. The stockpiled sand would be distributed across the CSLC Lease area with heavy earthmoving equipment (e.g., scrapers, large 40-ton capacity off-road trucks, and bulldozers) to nourish Broad Beach and create the dune system.

Two sand stockpile areas would be established for the initial nourishment event along 1,000 feet of the west end of Zuma Beach seaward of Zuma Beach Parking Lot 12. Stockpiles are proposed to be located a minimum of 100 feet east of Trancas Lagoon. Beach stockpile areas would range in size over the 8 months of initial proposed nourishment and dune construction activities, with up to 7 acres of dry sand beach berm at Zuma Beach being covered by sand stockpiles, disturbed by heavy equipment, or used for construction staging. Within this area, beach face and intertidal beach would be impacted at Broad Beach and Zuma Beach from operation of heavy equipment accessing the sand storage area and transporting the sand along the intertidal beach to the deposition areas. Equipment staging and storage for the Project would occur within Parking Lot 12 during the 8-month construction period of the proposed nourishment and dune construction activities. No construction equipment would be stored or staged on Broad Beach or Zuma Beach and further, standard best management practices would be implemented at the staging area to prevent potential impacts to the surrounding natural habitats.

Access between the Zuma Beach Parking Lot staging and sand storage areas and Broad Beach would be along a defined travel route beginning at the southern edge of Parking Lot 12 and sand storage areas and continuing west along the intertidal beach. The access route will occur seaward of any inundated portion of Trancas Lagoon, thereby minimizing potential impacts to this sensitive habitat.

However, while heavy equipment could cross the sand bar fronting Trancas Lagoon throughout the majority of the 8-month construction period, during winter, high flows in Trancas Creek and/or large winter waves may cause this sandbar to breach (Chambers Group 2013). In order to safely cross and avoid impacts to Trancas Lagoon when the

sand bar is breached, construction would be halted during periods when Trancas Creek is flowing to the ocean. Further, although special status fish species (e.g., southern steelhead) are not known to currently spawn in Trancas Lagoon, this halt in construction activities during periods of breaching would avoid adverse impacts to fish passage.

Beach nourishment activities may adversely impact Trancas Lagoon, dry sand beach berm, and intertidal beach habitats due to the operation of heavy equipment and the stockpiling of sand in the immediate vicinity of this coastal wetland and its transport along the intertidal beach. Construction activities would disturb and displace roosting sea birds (e.g., seagulls, pelicans) from the dry sand beach at the west end of Zuma Beach. In addition, construction activities and sand transport would disturb or displace resident and migratory foraging shore birds and potentially sensitive species using the lagoon and intertidal beaches, including the western snowy plover, which occupies federally designated critical habitat in this area (refer to Figure 3.3-1). For example, the movement of heavy-haul trucks and equipment from the proposed staging area access point to the stockpiles within the 100-foot buffer proposed between the western edge of stockpile #1 and Trancas Lagoon would reduce the effectiveness of the buffer in reducing impacts to biological resources and habitat within the lagoon mouth areas. As proposed, the truck transport routes require a minimum of 30 feet to allow for adequate passage. As such, the truck access would encroach approximately 30 feet into the designated 100-foot buffer (Figure 3.3-2). Additionally, during construction, windblown sand from the stockpile areas could result in siltation of the lagoon. However, these impacts would be considered minor due to their short-term duration.

With shorebirds and sensitive species temporarily displaced to other adjacent beaches during stockpiling and construction activities, such species would be expected to reuse the area after cessation of construction activities. Further, these activities would not directly impact the hydrologic processes of Trancas Creek Lagoon, as no major alteration of topography would occur near the mouth of the lagoon. Compaction of sand from heavy equipment may slightly alter subservice hydrology and drainage over the short term. However, by nature, the large grain size and roughness of sand resists compaction and the beach and berm in this area are continually reworked by wave and wind action, resulting in negligible effects to the hydrology of Trancas Lagoon.

The distribution of inland sand across Broad Beach may also impact terrestrial biological resources through sand compaction and burial. These activities may also cause disturbance or take of sensitive wildlife or plant species in ESHA habitat, such as the foredune system. Sand distribution across Broad Beach using heavy equipment (e.g., bulldozers) to pile sand over the existing revetment and into existing back dune areas to create a new dune system could impact sensitive plant and wildlife species, such as red sand-verbena, globose dune beetles, and western snowy plovers, which are known to occur in the Public Trust Impact Area. Further, these activities may impact the sandy beach tiger beetles and silvery legless lizards, which, while not identified in

recent biological surveys, are known to occur in similar habitats (WRA, Inc. 2013). Impacts to sensitive species would be considered to have a major adverse effect.

Mortality of sandy beach infauna species (e.g., sand crabs, blood worms), which is generally considered to be complete when burial exceeds 3 feet, is also likely to occur as a result of the Project (Beach Erosion Authority for Clean Oceans and Nourishment [BEACON] 2007). This would be expected to result in subsequent impacts to shorebird foraging that would extend beyond the 6- to 8-month construction periods for the initial and follow-up nourishment projects, especially if construction activities are conducted during the spring and summer months when sandy beach invertebrate forage production is greatest (BEACON 2007). Further, increased noise levels would also likely disturb sensitive avian species (BEACON 2007).

The Project includes placement of additional sand on Broad Beach when specified triggers for renourishment are met. The impacts of proposed renourishment would be similar to those impacts described above, except that the restored dunes system would remain generally undisturbed and construction impacts would be limited to the sandy beach, reducing, but not eliminating the potential for take of sensitive species. Impacts resulting from the distribution of sand over the beach would be similar to the Project. However, should coastal erosion encroach upon the restored dune habitat, impacts of construction to restore or nourish dunes within that newly established habitat could be much more severe than for the Project, due to the greater likelihood for the presence of sensitive species, particularly rare plant species, following the original dune restoration.

The Project may contribute to impacts to Trancas Lagoon resulting from future related projects, including the PCH bridge replacement and Trancas Creek Restoration Project. During construction, these related projects may remove wetland vegetation, cause siltation, create temporary adverse impacts to wetland habitat, and displace forging and roosting shorebirds and sensitive species. However, impacts to Trancas Lagoon resulting from the Project would be temporary, and long-term impacts associated with the related projects would be beneficial. For example, the PCH bridge replacement would result in the removal of bridge piers from the lagoon, enhancement of wetlands, and restoration efforts to restore fish passage to Trancas Creek. Further, these future projects are not anticipated to go to construction for another 3 to 5 years.

<u>Avoidance and Minimization Measure(s)</u>

**AMM TBIO-2a. California State Lands Commission (CSLC)-Approved Biologist and Biological Monitors for Construction Activities.** The Applicant shall retain a Project biologist and Project monitors approved by the CSLC staff, California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), and California Coastal Commission (CCC) to supervise sand deposition and all other construction related activities. The biological monitors shall be present to

ensure that damage to any sensitive habitat or sensitive species is minimized and that construction crews strictly comply with all AMMs. Prior to commencement of construction and staging activities, the Applicant shall provide to CSLC staff a Biological Monitoring and Reporting Plan demonstrating conformance with the following requirements:

- If applicable, conform with USFWS Biological Opinion requirements pertaining to construction activities and access for protection of federal special status species and western snowy plover critical habitat.
- If applicable, conform with CDFW Streambed Alteration Agreement conditions of approval for construction access across the mouth of Trancas Creek and all other construction activities.
- Conform with all project construction conditions of approval pursuant to the CCC's Coastal Development Permit.
- Prior to the commencement of construction-related activities, conduct protocol-level surveys for native plant species, with a special focus on sensitive species, in potential ESHA areas, beyond that which was surveyed by WRA, Inc. (2011, 2013).
- Prior to the commencement of construction-related activities, conduct protocol-level surveys for globose dune beetle and western snowy plover.
- Where feasible, prior to and during construction, collect and relocate sensitive plant, invertebrate, and reptile species that are likely to be impacted by the proposed nourishment and dune creation activities.
- Conduct an additional protocol level survey for western snowy plover and California least tern prior to any construction during the breeding season between March and September. Should breeding individuals be identified, all work within a 300-foot-radius of the nest shall be halted and the Applicant shall immediately contact the USFWS and CDFW. Nourishment and dune construction activities within the 300-foot-radius shall resume only with approval from these agencies and with implementation of mitigation measures provided by these agencies if applicable.
- Be present during all construction activities that may potentially cross ESHA as defined by in the Malibu Local Coastal Program, including the degraded dunes and Trancas Lagoon.
- Ensure the implementation of all measures associated with AMM TBIO-1a, including the complete implementation of the Comprehensive Dune Restoration Plan, with associated maintenance and monitoring activities. The biological monitors shall record observations and the Project biologist shall submit a weekly report regarding the implementation of and compliance with all construction-related AMMs. Additionally, this report shall include any relevant biological observations, including a list of species encountered at

Broad Beach. These reports shall eventually be incorporated into a mid-Project Sensitive Biological Resources Report (see AMM TBIO-3c).

**AMM TBIO-2b. Sensitive Resources Impact Avoidance.** In consultation with the California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), and California Coastal Commission (CCC), the Project biologist and the Project engineer shall clearly designate all ESHAs, including areas within 100 feet of the Trancas Lagoon as "sensitive resource zones" on the Project maps and construction plans. The Applicant shall provide a Sensitive Resource Impact Avoidance Map to CSLC staff for review and approval prior to commencement of Project construction and staging activities. Construction equipment and operations shall be prohibited in these zones to avoid impacts to special-status biological resources. During construction, heavy equipment shall be operated in accordance with standard best management practices as well as the following measures:

- Vehicles and construction equipment shall be confined to a pre-defined equipment access path no greater than the minimum width necessary to complete the necessary construction activities.
- In areas of high vehicle traffic on dry sandy beach, driving mats will be laid down prior to the commencement of construction-related activities in order to avoid unnecessary adverse effects to the sandy beach environment.
- The location of the sand stockpile shall be moved east toward Zuma Beach to an extent that would allow for passage of trucks and construction equipment without encroachment upon the delineated 100-foot ESHA buffer. If, given the proposed location of stockpiles and access points, trucks and construction equipment are unable to access the sand from the staging area without encroaching upon the 100-foot ESHA buffer, an alternate access point shall be selected along the eastern portion of Parking Lot 12.

**AMM TBIO-2c. Protect Stockpiles of Excavated Material.** Inland sand shall not be stockpiled within ESHAs or other sensitive resource zones, including federally designated western snowy plover habitat. Beach sand stockpiles should be protected to the extent feasible by synthetic impervious covers to prevent erosion by wind and/or rainfall. This notation shall be included on Project construction plans.

**AMM TBIO-2d. Storage of Materials or Heavy Equipment Prohibited Outside of Staging Area.** Overnight storage of materials other than sand stockpiling, or heavy equipment on the beach or outside of the construction staging area at Zuma Beach Parking Lot 12 shall be strictly prohibited. This notation shall be included on Project construction plans.

Rationale for Avoidance and Minimization Measure(s)

Implementation of AMMs TBIO-2a through TBIO-2d would reduce short-term construction related impacts on terrestrial biological resources by protecting sensitive resources along Broad Beach, at Trancas Creek Lagoon and adjacent Zuma Beach, providing for construction supervision, and requiring restoration of dune habitat. However, after implementation of AMMs TBIO-2a through TBIO-2d, impacts to terrestrial biological resources from short-term construction activities would be reduced but would still result in the potential for take of sensitive species.

**Impact TBIO-3: Long-term Construction Impacts of Backpassing to Terrestrial Biological Resources**

**Future beach maintenance using backpassing may impact existing environmentally sensitive habitat areas (ESHAs) and/or created sensitive habitat areas, including sandy beach and foredune habitats, as well as Trancas Lagoon (Minor Adverse Effect, Class Mi).**

Impact Discussion (TBIO-3)

Following completion of the initial proposed beach nourishment and dune creation, the Project would include an Adaptive Management Plan for long-term monitoring of beach width and profile and required actions to transport sand back up coast as needed through backpassing using heavy equipment (Moffatt & Nichol 2013). Monitoring as described in the Adaptive Management Plan would include: semi-annual measurement and record keeping of beach profiles at 12 locations along the beach and down coast; monthly measurements of berm width; visual observations of the conditions at Trancas Lagoon mouth; and dune geomorphic observations.

Adaptive management actions would be performed in response to data gained from long-term monitoring and would include backpassing of sand to prolong the longevity of major nourishment actions (refer to Section 2, *Project Description* and Figures 2-13 and 2-14). Backpassing of sand to maintain beach widths would involve the use of heavy equipment (e.g., scrapers and bulldozers) to excavate sand from the downdrift, eastern segment of Broad Beach for transport updrift to the eroding segment on the west end of Broad Beach. It is anticipated that backpassing will occur on an annual basis for the life of the Project. Backpassing would involve excavation of approximately 5.3 acres in a roughly rectangular area of 3,520 feet long and 75 feet wide to a maximum depth of 6 feet (see Section 2.0*, Project Description*). Up to 35,000 cy of excavated material from the eastern dry sand beach berm of Broad Beach would be transferred to approximately 5 acres of the depleted western portions. This redistribution of sand at Broad Beach would disturb approximately 10 acres of beach sand and seaward dune habitat.

Impacts to terrestrial biological resources resulting from backpassing would be similar to those listed under Impact TBIO-2, except that backpassing would be focused on dry

sandy beach areas, including dry beach berm and, if needed, intertidal areas, seaward of created dune habitats. Backpassing would cause infauna species mortality due to burial or direct mortality (i.e., crushing via sand compaction), which would have subsequent adverse impacts on shorebird foraging as full infauna species recovery would require several months[i3]. Backpassing impacts to infauna would be more severe if conducted during the spring and summer months when sandy beach invertebrate forage production is greatest (BEACON 2007). Additionally, backpassing would reduce the presence of beach wrack, consequently adversely affecting the wildlife species that depend on it for habitat or foraging material (refer to discussion in Section 3.1, *Coastal Processes, Sea Level Rise, and Geologic Hazards*). However, over the long-term, backpassing activities would conserve sandy beach habitat, serving to slow the erosion of newly created beach habitats at Broad Beach. Additional short-term direct adverse impacts resulting from backpassing may include the disturbance of wildlife and the potential take of CDFW species of special concern. Adverse short-term impacts would also include increases in noise levels, which would disturb shore birds and other avian species (BEACON 2007).

Beneficial effects resulting from backpassing include the long-term preservation of sandy beach and coastal dune habitats, which would otherwise be negatively affected by the subsequent erosion of Broad Beach. Conservation of these habitat types may potentially result in indirect increases in sensitive species, such as the globose dune beetle and western snowy plover, each of which depend on foredune and beach habitat. Additional beneficial effects resulting from backpassing include reducing the adverse impacts associated with longshore sand deposition (see Impact TBIO-5) in the vicinity of Trancas Lagoon and the Zuma Wetlands, both of which are designated as ESHAs under the Malibu LCP.

Adverse impacts on terrestrial biological resources resulting from backpassing would be considered minor with inclusion of AMMs. While these impacts would be adverse, backpassing activities would also result in beneficial effects including conservation of sensitive habitat areas, both in the CSLC Lease and Zuma Beach impact areas.

<u>Avoidance and Minimization Measure(s)</u>

**AMM TBIO-3a. Biologist and Biological Monitors for Backpassing Activities.** The Applicant shall retain a Project biologist and Project monitors approved by the California State Lands Commission (CSLC) staff, California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), and California Coastal Commission to

[3] Results of studies assessing the recovery of organisms at nourished beaches are highly variable (Greene 2002). Some studies conclude that beach infauna populations may recover to previous levels between two to seven months; other studies suggest recovery times are much longer (Greene 2002). Peterson et al. (2000) found a large reduction in prey abundance and body size of benthic macroinvertebrates at a nourished intertidal beach that likely translated to trophic level impacts on surf zone fishes and shorebirds.

supervise backpassing and all other construction related activities. The Project monitor shall ensure that damage to any sensitive habitat or sensitive species within or adjacent to construction zones is minimized. Prior to commencement of construction and staging activities, the Applicant shall provide to CSLC staff a Biological Monitoring and Reporting Plan demonstrating how the Project monitor will conform with the following requirements:

- If applicable, conform with USFWS Biological Opinion requirements pertaining to construction and backpassing activities for protection of federal special status species and western snowy plover critical habitat.
- If applicable, conform with CDFW Streambed Alteration Agreement conditions of approval for construction access across the mouth of Trancas Creek and all other construction activities.
- Conform with all project construction and backpassing conditions of approval pursuant to the CCC's Coastal Development Permit.
- Conduct preconstruction trainings with the construction crew leaders so they can readily identify sensitive plant and wildlife species.
- Conduct preconstruction surveys of the sandy beach and dune habitats as well as in the vicinity of Trancas Lagoon.
- Flag the toe of the dune on the seaward side of all foredune vegetation.
- Conduct a preconstruction meeting with all construction crew leaders and construction crewmembers to discuss the implementation of appropriate mitigation measures.

**AMM TBIO-3b. Avoidance of Sensitive Resource Zones and Vegetation.** Following the completion of pre-construction biological surveys, in consultation with the California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), and California Coastal Commission, the Project biologist shall clearly designate "sensitive resource zones" on the Project maps and construction plans. These zones would include any ESHAs or otherwise sensitive biological resources. Sensitive resource zones are defined as areas where construction would be limited, depending on the particular environmental conditions and construction requirements. No native vegetation shall be impacted or removed during backpassing-related activities.

Wetland areas shall be prohibited from use for disposal or temporary placement of excess sand. All equipment used in or near Trancas Lagoon shall be clean and free of leaks and/or grease. Emergency provisions shall be in place prior to the onset of construction and at all times during construction to deal with accidental spills. The Applicant shall provide a Sensitive Resource Impact Avoidance Map to the California State Lands Commission (CSLC) staff for review and approval prior to commencement of Project construction and staging activities.

**AMM TBIO-3c. Sensitive Biological Resources Report.** Following the third complete year of Project implementation, the Applicant shall prepare a Sensitive Biological Resources Report. The report shall include the results of past protocol-level surveys, as well as biological surveys conducted prior to each backpassing event. The report shall assess the presence of sensitive species and habitat and analyze the trends in occurrence of sensitive species or habitat. The document shall also include any biologically relevant information gathered during construction monitoring activities. This report shall be submitted to the California State Lands Commission (CSLC) staff within six months following the third complete year of Project implementation and shall be used to direct the timing of future backpassing and renourishment events in order to minimize impacts to biological resources to the maximum extent feasible.

**AMM TBIO-2a**. (CSLC-Approved Biologist and Biological Monitors for Construction Activities) would apply for construction activities and access pertaining to backpassing. **AMM TBIO-2b**. (Sensitive Resources Impact Avoidance) would apply for construction activities and access pertaining to backpassing.

Rationale for Avoidance and Minimization Measure(s)

Implementation of AMMs TBIO-3a, TBIO-3b, and TBIO-3c, as well as TBIO-2a and TBIO-2b, would reduce the negative impacts resulting from backpassing to onshore biological resources by protecting sensitive resources in the Public Trust Impact area, providing for construction supervision, and limiting the extent of construction activities. Implementation of these measures would reduce short-term negative impacts to the extent that the overall impact of backpassing activities would be slightly beneficial, as they would conserve the newly created beach and dune habitats.

**Impact TBIO-4: Hazardous Spill Impacts to Beach, Coastal Dunes, and Coastal Wetland Biological Resources**

**An accidental hazardous spill and subsequent cleanup efforts would potentially result in take of special-status species, the loss or degradation of functional habitat values, or cause a substantial loss of a population or habitat of native fish, wildlife, or vegetation (Major Adverse Effect, Class Mj).**

Impact Discussion (TBIO-4)

Equipment and material for the Project would be stored at the Zuma Beach Parking Lot 12, with beach access provided near the western end of the parking lot. Hazardous pollutant spills from construction equipment, including bulldozers, scrapers, and heavy haul trucks could potentially occur during initial nourishment, all renourishment events, and backpassing activities. Throughout the proposed initial 8-month nourishment and

the follow up 6-month renourishment 10 years following, the potential exists for a hazardous spill to occur on the sandy beach or dune system. Potentially major impacts that may result from a hazardous spill include 1) the take of CDFW species of special concern and 2) the loss or degradation of an ESHA (including existing or created dune habitat, as well as Trancas Lagoon or any other locations that support sensitive special-status species). Small leaks or spills that would be contained and remediated quickly within at Broad Beach would likely have localized minor or negligible adverse impacts on terrestrial biological resources. The cleanup operation would result in impacts to habitat in the vicinity of the Project, with the extent of disturbance determined by the magnitude of the spill.

Hazardous spills from construction activities on or near the beach, or disturbances resulting from cleanup efforts within the sandy beach and foredune habitats have the potential to affect federally listed species, including the western snowy plover and California least tern, among other special-status invertebrate and plant species. Adverse impacts of a hazardous spill on the sandy beach or foredune environment would potentially result in direct mortality of wildlife and plant species. However, it would also likely contaminate or increase the mortality of invertebrates that are forage material for wildlife species, particularly the western snowy plover, resulting in indirect negative impacts on individuals or their breeding success.

The Project would also contribute to potential impacts to Trancas Lagoon resulting from related projects, including the PCH bridge replacement and the Trancas Creek Restoration Project. During construction of these related projects, the potential for hazardous spills within or immediately adjacent to delineated wetland habitat would increase. Impacts of hazardous pollutants on biological resources would depend on factors such as the physical and chemical properties of the pollutant, environmental conditions at the time of the spill, and species present. Vegetation recovery would potentially be slow in areas of contaminated sand, because of lingering toxicity or altered soil characteristics. Depending on the remediation method, the impacts resulting from cleanup may also be more substantial than the impacts of the spilled pollutant.

Adverse impacts resulting from a spill may potentially be substantial depending on the size of the spill and the environmental conditions at the time of the spill. Additionally, adverse impacts resulting from a potential spill may be short-term or long-term depending on the size of the spill and the method of remediation.

<u>Avoidance and Minimization Measure(s)</u>

**AMM TBIO-4a. Emergency Action Plan Measures Regarding Protection of Biological Resources.** Before commencement of project construction and staging activities, the Applicant shall submit to the California State Lands Commission (CSLC) staff an Emergency Action Plan (EAP) to address protection of sensitive biological resources that would potentially be disturbed

during a hazardous spill or subsequent cleanup activities. At a minimum, the EAP shall include:

- Industry-standard best management practices to avoid potential spills.
- Specific measures to avoid impacts on state and federal special status species and western snowy plover critical habitat, and ESHAs, during response as well as cleanup operations.
- Identification, where feasible, of low-impact, site-specific, and species-specific remediation techniques.
- Identification of standards of a spill response personnel-training program.
- An outline of a restoration plan, including preemptive identification of access and staging points and procedures for timely reestablishment of functional habitat values.
- A contact list, coordinated with related projects, of key points of contact and emergency response agencies to be retained at all job sites during construction activities.

**AMM TBIO-4b. Maintain Equipment and Adhere to Work Plan.** All equipment used on-site shall be properly maintained such that no leaks of oil, fuel, or residues will occur. Provisions shall be in place to remediate any accidental spills, in both the terrestrial and marine environments. All equipment shall only be stored in the appropriate equipment staging areas.

The Applicant shall submit a work plan to the California State Lands Commission (CSLC) staff, California Coastal Commission (CCC), California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), Los Angeles Regional Water Quality Control Board, and city of Malibu for review and approval prior to the commencement of construction and staging activities. The Applicant shall also demonstrate to the approving agencies how construction personnel will be trained on the requirements of the work plan. The work plan shall include a list of all heavy equipment and shall require all equipment to be stored and fueled in the Zuma Beach Parking Lot 12, which shall be conspicuously demarcated. Heavy equipment and construction activities shall be restricted to the defined construction areas, as demarcated by the Project engineer. Additionally, vehicles and personnel shall only use existing access roads to the maximum degree feasible. The work plan shall be retained on the project site at all times during construction and staging activities.

<u>Rationale for Avoidance and Minimization Measure(s)</u>

Implementation of AMMs TBIO-4a and TBIO-4b would reduce long-term impacts to sandy beach, dune, and freshwater aquatic habitat by providing contingency responses for accidental spills occurring in both the marine and terrestrial environment. After implementation of AMMs TBIO-4a and TBIO-4b, major impacts to terrestrial biological

resources from hazardous spills would be reduced, however, a spill would still result in the potential take of sensitive species.

**Impact TBIO-5: Longshore Sand Transport and Down Coast Impacts to Terrestrial Biological Resources**

**Nourishment of Broad Beach with 600,000 cubic yards of beach sand would increase sand supply available for longshore transport down coast, potentially altering the hydrology of the Trancas Lagoon and the Zuma Wetlands ESHAs by widening the beach berm, but also increasing sand supply to beach and dune habitats down coast (Minor Adverse Effect, Class Mi).**

Impact Discussion (TBIO-5)

The Project would include use of coarse grain size sand to prolong the retention of sand on the beach (Table 3.3-4).

**Table 3.4-4. Sand Types at Broad Beach**

| Sand Identification | Median Grain Size (millimeters) |
|---|---|
| Broad Beach – Beach Sample Above 0' MLLW | 0.25 |
| Broad Beach Dunes | 0.32 |
| Zuma Beach (three Locations along its Reach) | 0.40 |
| Grimes Rock Quarry | 0.47 |
| CEMEX Quarry | 0.85 |
| P.W. Gillibrand Quarry | 1.00 |

Use of coarse sand and annual backpassing would slow, but not eliminate longshore transport of sand toward Zuma Beach. Beach fill sand would be carried down coast by tides, waves, and currents, incrementally nourishing downdrift beaches via littoral transport (e.g., Zuma Beach). Even with use of coarse grained sand and backpassing, erosion and down coast transport of approximately 50,000 cubic yards (cy) of sand annually from Broad Beach would increase littoral drift down coast from approximately 280,000 cy to roughly 330,000 cy annually, a roughly 18 percent increase. This increased littoral transport could create both adverse and beneficial effects on down coast terrestrial biological resources as discussed below.

Increased longshore sand transport of sand from Broad Beach down coast could potentially impact Trancas Lagoon and the Zuma Wetlands through increases in beach berm width and height fronting these estuaries. Major adverse effects could result from changes in the hydrology of these estuaries due to a larger sand berm interfering with lagoon mouth opening and tidal interchange, as both estuaries area periodically open to the marine environment (City of Malibu 1995). Both estuaries are considered ESHA under the Malibu LCP, and have been identified by the NPS as potential habitat for southern steelhead. As described above, Trancas Creek is proposed for restoration to ease fish passage. Increases in longshore sand transport, as a result of the proposed

beach nourishment, would increase sand transport and deposition at Trancas Lagoon and the Zuma Wetlands, potentially reducing the overall period of time these lagoons are open to the ocean. Interference with opening of these estuaries to tidal interchange may impact water quality and adversely affect restoration of southern steelhead runs or tidewater goby habitat. Further, as longshore sand transport may incrementally reduce the period of time that these lagoons are open to the marine environment, the Project may indirectly decrease the functional value of these ESHAs.

Such potential impacts would be substantial at Trancas Lagoon as it supports a relatively narrow beach berm of roughly 180 feet in width and is immediately down coast from a newly widened 200 foot-wide section of sandy beach at Broad Beach. In particular, during establishment of the post construction equilibrium beach, the berm fronting Trancas Lagoon could be substantially widened. The addition of substantial amounts of sand to this berm could materially affect frequency and duration of hydrological interchange with the ocean, reducing lagoon functionality. In contrast, such impacts would appear negligible at Zuma Wetlands, which lie 1.6 miles down coast and are fronted by a much larger beach berm, averaging approximately 360 feet in width. This distance from Broad Beach and greater average berm width would tend to diminish the proportionate contribution of increased littoral sand transport.

Use of coarse grained sand would reduce potential adverse impacts to estuary hydrology by slowing rate of littoral sand transport down coast. Additionally, proposed backpassing would somewhat reduce these impacts by retaining sand on Broad Beach. Additionally, longshore sand transport resulting in a wider beach profile at Zuma Beach may increase habitat for sensitive species that require sandy beach habitat, such as the western snowy plover (BEACON 2007). This may constitute a beneficial effect, resulting in local population increases for a number of sensitive species, including the California least tern and the western snowy plover.

<u>Avoidance and Minimization Measure(s)</u>

**AMM TBIO-5a. Maintain the Hydrology of Trancas Lagoon.** Prior to commencement of construction and staging activities at Broad Beach, the Applicant shall prepare a Trancas Lagoon Beach Berm Management Plan in coordination with the Santa Monica Mountains Resource Conservation District, U.S. Army Corps of Engineers (USACE), California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), and the California Coastal Commission (CCC). The Plan shall be submitted to CSLC staff, the CDFW, USFWS, USACE, and CCC for review and approval prior to commencement of construction and staging activities. The proposed Beach Berm Management Plan shall identify the anticipated rate of sand deposition in front of the mouths of these water bodies and include potential measures to maintain the connection between these wetlands and the marine environment, as determined by the approving agencies.

**AMM TBIO-5b. Coordination of Backpassing and Berm Breaching.** Prior to commencement of construction and staging activities, the Applicant shall coordinate with California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (USACE), the California Coastal Commission (CCC), and the Santa Monica Mountains Resource Conservation District to determine if backpassing sand should be obtained to aid in breaching of the Trancas Lagoon.

Rationale for Avoidance and Minimization Measure(s)

Implementation of AMMs TBIO-5a and TBIO-5b would reduce these long-term impacts to onshore freshwater aquatic habitat by providing for the maintenance of the connection between Trancas Lagoon and to the Pacific Ocean. Through the maintenance of this connection, this water body will continue to be a good candidate for restoration, including recovery of southern steelhead populations. After implementation of AMMs TBIO-5a and TBIO-5b, impacts to terrestrial biological resources from longshore sand transport would be minor.

**Impact TBIO-6: Impacts to Terrestrial Biological Resources Resulting From Dune Restoration**

**The proposed dune restoration would result in potential short- to mid-term beneficial effects through enhancement of dune habitat values, as well as potentially increase populations of special-status wildlife or plant species (Beneficial Effect, Class B).**

Impact Discussion (TBIO-6)

The Project includes the deposition of 600,000 cy of sand onto Broad Beach, creating a wide sandy beach backed by a system of sand dunes of up to 15 feet higher than mean lower low water (MLLW), which is the average of the lower low water height of each tidal day observed over a fixed time period (NOAA 2012). The proposed dune restoration would be expected to result in potential beneficial effects during the approximately 20-year Project horizon as dune restoration would potentially result in the direct increase of functional dune habitat value.[4] Further, dune restoration activities would also potentially result in the introduction of suitable habitat for CNPS rare plant species. Additional beneficial effects resulting from beach nourishment and dune restoration would potentially include long-term indirect increases in sensitive species, such as the globose dune beetle and western snowy plover, which would benefit from the restoration of beach and dune habitats (BEACON 2007). Finally, shoreline erosion resulting from 2014 winter storm events has substantially reduced remaining foredune habitat at the east end of Broad Beach unprotected by the rock revetment. Therefore,

[4] Estimates of how long the proposed beach nourishment will effectively create and maintain a wider sandy beach range from a low of 10 to 20 or more years.

the proposed dune system could substantially increase and potentially enhance dune habitat value at Broad Beach in comparison to the existing limited dune areas.

However, large-scale dune restoration is a difficult process and requires substantial inputs of time, funding, and ongoing maintenance, weed removal, and remedial planting beyond the initial restoration activities. It is possible that the proposed restoration activities would be less than sufficient to restore the ESHA qualities of former and existing dune habitat. This would result in major adverse effects to the existing limited remaining ESHA in the short-term, as existing foredune habitat would be temporarily affected during dune building activities. Dune enhancement may also result in the incidental take of sensitive species, such as the globose dune beetle, and/or CNPS-listed plants such as red sand-verbena, both of which may be adversely impacted by sand burial (BEACON 2007). Further, potentially adverse impacts in the mid- to long-term may also result as dune habitat degradation at Broad Beach may intensify due to the Project's disturbance of the remnant dunes.

**Impact TBIO-7: Impacts to Terrestrial Biological Resources Resulting from Increased Private and Public Access**

**The proposed beach nourishment, including the dune habitat restoration, would occur adjacent to existing private residences. Private and public access ways to Broad Beach would interrupt the continuity of undisturbed dune habitat and may ultimately decrease the functional value of the restored dune system or result in an increase in incidental take, disturbance, and/or harassment of sensitive species (Minor Adverse Effects, Class Mi).**

Impact Discussion (TBIO-7)

Under the Project, lateral access through the entirety of the restored dry sandy beach and dune system would be increased relative to the current conditions. The integrity of the dune system to provide viable habitat areas is related to the continuity of the system and the level and duration of disturbance that could occur from human activities, including vertical access points. As proposed, the Project may result in habitat fragmentation of the dune system caused by the creation of up to 109 private residential access ways, one private beach club access way, and two vertical public access ways approximately 5 to 8 feet in width, traversing the length of the restored dune habitat, the majority of which would extend onto public lands. These vertical access ways would traverse the dunes, and would be bordered by unobtrusive access control features in order to preserve the dune habitat restored under the Project. However, these breaks in the undisturbed dune system, especially related to the regularly spaced private access ways, would reduce the effectiveness of the proposed dune restoration.

Although foot traffic across each private access walkways is expected to be minimal, current conditions at Broad Beach indicate that foot traffic creates an adverse impact in that clear access pathways are visible from the majority of residences. Adverse impacts

resulting from increased access to Broad Beach would likely be less than substantial in the short- to mid-term, as the low-key access control features, including informational signs, would reduce direct adverse impacts on the dune system Consequently, foot traffic on the proposed 112 access ways across the restored dune system would likely result in take (i.e., trampling, uprooting, etc.) of dune plants, and may ultimately substantially reduce the potential benefits of dune restoration, as these pathways would create linear unvegetated bands and corridors of disturbance through the dune habitat. Further, indirect impacts resulting from private access walkways would likely include disturbance of wildlife due to interactions with residents and/or their pets (i.e., dogs or cats). Additionally, no access management plan is currently in place; therefore, private access over public land would be largely unregulated.

Following the cessation of the additional renourishment event and backpassing, coastal erosion will again likely reduce lateral public access, prompting increased foot traffic trampling through the restored coastal dune. Consequently, adverse impacts to the restored dunes would become substantial over the long-term.

Avoidance and Minimization Measure(s)

**AMM TBIO-7. Restrict Access Across the Newly Restored Dune System.** Through Applicant consultation with the California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), the California Coastal Commission (CCC), and California State Lands Commission (CSLC), access to and across the restored dune system shall be restricted to approved vertical access ways designated with a low-key rope and bollard fence as a means of protecting dune habitat and limiting the adverse impacts associated with increased private and public access to the restored dune system. Such a rope and bollard fence shall be placed at the toe of the dune and along all approved vertical access ways in order to restrict all access to the dunes and accomplish the goal of reducing impacts to the proposed dune habitat. The Applicant shall provide a Dune Restoration Access Plan, approved by the specified agencies to CSLC staff prior to commencement of construction and staging activities.

**AMM TBIO-1a.** (Implementation of a Comprehensive Dune Restoration Plan) would apply for long-term restoration of the dune system and restriction of private access paths.

Rationale for Avoidance and Minimization Measure(s)

Implementation of AMM TBIO-7 would ensure additional protection for sensitive plant and wildlife species and reduce long-term impacts to restored dune by reducing habitat

breaks for private and public access. After implementation of AMM TBIO-7, impacts on terrestrial biological resources from increased public access would be minor. Access ways every 300 feet would increase habitat continuity and would provide more suitable habitat for sensitive plant and wildlife species. After implementation of AMM TBIO-1a, impacts to terrestrial biological resources from private access would be minor.

**Impact TBIO-8: Long-term Degradation and Erosion of Newly Created Dune Habitat**

**Following cessation of the additional renourishment event and backpassing, newly restored dune habitat would gradually erode, eventually exposing the revetment and likely leading to a return to emergency measures for protection of property not protected by the revetment or impacted by the degradation of the revetment (Minor Adverse Effect, Class Mi).**

Impact Discussion (TBIO-8)

As proposed, an initial nourishment event would occur followed by periodic backpassing and one future renourishment event. However, following the final backpassing activities, areas of the restored dunes seaward of or overlying the revetment would eventually be eroded exposing the revetment and potentially resulting in major adverse effects to special-status species, including the globose dune beetle and the western snowy plover, should the new dune system provide suitable habitat for these species. The erosion of the coastal dune environment would undermine all short to mid-term beneficial effects of the Project, resulting in major adverse long-term impacts. Exposure of the revetment may also see a return to emergency measures to protect private property not protected by the revetment or subject to impacts resulting from the degradation of the revetment. This may result in additional major adverse effects to the proposed dune habitat and restored habitats behind the revetment. Based on this assessment, WRA (2012) estimated that as much as 4.63 acres of created foredune habitat could be permanently lost under beach nourishment failure.

Avoidance and Minimization Measure(s)

**AMM TBIO-1a** (Implementation of a Comprehensive Dune Restoration Plan) would apply for long-term restoration of the dune system and restriction of private access paths.

**AMM TBIO-7** (Restrict Access Across the Newly Restored Dune System) would apply for long-term protection of dune habitat.

**AMM REC-4a** (Requirement of Additional Nourishment) would also apply.

Rationale for Avoidance and Minimization Measure(s)

The Project would result in short- to mid-term beneficial effects to sensitive terrestrial biological resources; however, there are no plans in place regarding the protection of these public trust resources following the cessation of the Project. Implementation of AMMs TBIO-1a, TBIO-7, and REC-4a would reduce, but not necessarily eliminate, the major adverse effects associated with this long-term impact.

### 3.4.5 Summary of Terrestrial Biological Resources Impacts and AMMs

| Impact | Class | AMMs |
|---|---|---|
| **TBIO-1**: Impacts to Terrestrial Biological Resources Resulting from the Installation of the Emergency Rock Revetment | **Mi** | **AMM TBIO-1a**: Implementation of a Comprehensive Dune Restoration Plan<br>**AMM TBIO-1b:** If Applicable, Conform to CCC's Coastal Development Permit for Off-Site Mitigation of ESHA |
| **TBIO-2**: Short-Term Project-Generated Construction Impacts to Terrestrial Biological Resources | **Mi** | **AMM TBIO-2a**: California State Lands Commission (CSLC)-Approved Biologist and Biological Monitors for Construction Activities<br>**AMM TBIO-2b**: Sensitive Resource Impact Avoidance<br>**AMM TBIO-2c**: Protect Stockpiles of Excavated Material<br>**AMM TBIO-2d**: Storage of Materials or Heavy Equipment Prohibited Outside of Staging Area |
| **TBIO-3**: Long-term Construction Impacts of Backpassing to Terrestrial Biological Resources | **Mi** | **AMM TBIO-3a**: California State Lands Commission (CSLC)-Approved Biologist and Biological Monitors for Backpassing Activities<br>**AMM TBIO-3b**: Avoidance of Sensitive Resource Zones and Vegetation<br>**AMM TBIO-3c**: Sensitive Biological Resources Report<br>**AMM TBIO-2a**: California State Lands Commission (CSLC)-Approved Biologist and Biological Monitors for Construction Activities<br>**AMM TBIO-2b**: Sensitive Resource Impact Avoidance |
| **TBIO-4**: Hazardous Spill Impacts to Beach, Coastal Dune, and Coastal Wetland Biological Resources | **Mi** | **AMM TBIO-4a**: EAP Measures Regarding Protection of Terrestrial Biological Resources<br>**AMM TBIO-4b**: Maintain Equipment and Adhere to Work Plan |
| **TBIO-5**: Longshore Sand Transport and Down coast Impacts to Terrestrial Biological Resources | **Mi** | **AMM TBIO-5a**: Maintain the Hydrology of Trancas Lagoon and the Zuma Wetlands<br>**AMM TBIO-5b**: Coordination of Backpassing and Berm Breaching |
| **TBIO-6**: Impacts to Terrestrial Biological Resources Resulting From Dune Restoration | **B** | No AMMs Recommended |
| **TBIO-7**: Impacts to Terrestrial Biological Resources Resulting from Increased Private and Public Access | **Mi** | **AMM TBIO-7**: Restrict Access Across the Newly Restored Dune System<br>**AMM TBIO-1a**: Implementation of a Comprehensive Dune Restoration Plan |
| **TBIO-8**: Long-term degradation and erosion of newly created ESHA | **Mi** | **AMM TBIO-1a**: Implementation of a Comprehensive Dune Restoration Plan<br>**AMM TBIO-7**: Restrict Access Across the Newly Restored Dune System<br>**AMM REC-4a**: Requirement of Additional Nourishment. |