
Protocol-level Special Status Plant and Natural Communities Survey

Broad Beach
Malibu, Los Angeles County, California

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1.0 INTRODUCTION

The Broad Beach Project Area (Project Area, Figure 1), located in Malibu, Los Angeles County, California, is bounded by Broad Beach Drive to the North, Pacific ocean to the south, Trancas creek to the east, and coastal bluffs to the west. The Study Area (Study Area, Figure 1), a subset of the Project Area, supports fragmented native and non-native naturalized habitats located on remnant foredunes composed of a mix of native, naturalized, and landscaped plant species. The purpose of this document is to summarize the methods and results of a protocol-level special status plant survey conducted by WRA, Inc. (WRA) on November 30 and December 1, 2010 and May 24 and July 23, 2011 in the Study Area. The primary purpose of the survey was to determine the presence/absence of all special status plant species and natural communities with particular attention focused on three special status plant species in the Study Area. A WRA botanist, familiar with the flora of South Coast California coastal dunes, conducted three protocol-level special status plant surveys within the Study Area that coincided with the blooming period of all three species. Fifty plant species were observed in the Study Area.

1.1 Study Area Description

The Study Area, a sub set of the Project Area, consists of approximately 4,800 feet of beach and foredune habitat along Broad Beach, approximately 3.5 miles north of Malibu, Los Angeles County, California (Figure 1). The Study Area includes a portion of land situated between private beachfront homes and the Pacific Ocean. An emergency rock revetment, located within the Study Area, was erected in winter 2009-2010 in response to significant erosion from winter storms. A proposed project calls for reinforcement of the existing rock revetment with steel beams, followed by a sand covering, and substantial restoration foredune habitat with native plant species.

1.1.1 Vegetation

The Study Area supports areas of landscaped vegetation and two herbaceous vegetation alliances, dune mat (*Abronia latifolia*-*Ambrosia chamissonis* Herbaceous Alliance; *Ambrosia chamissonis*-*Abronia maritima*-*Cakile maritima* Association) and ice plant mats (*Carpobrotus edulis* Semi-natural Herbaceous Stands) (Sawyer et al. 2009). Stabilized dunes are present landward, near the residential community, while remnant foredunes with native (dune mat), naturalized (ice plant mat) vegetation alliances, as well as native and non-native landscaped species that have been installed by the surrounding property owners are present seaward. The native and naturalized vegetation alliances within the Study Area are described below.

Native Vegetation

Dune mat (*Abronia latifolia*-*Ambrosia chamissonis* Herbaceous Alliance). G3 S3.2. Dune mat is known from the entire coast of California where open sand and sand dunes occur, from Del Norte County to San Diego County. Typically, species composition is more diverse on the inner dunes than on the foredune ocean edge due to reduced salt spray and saltwater overwash during storm events (Sawyer et al. 2009).

The dune mat vegetation alliance within the Study Area contains one vegetation association, the beach bur-red sand verbena-sea rocket herbaceous association. This vegetation community is located entirely near the ocean edge and is dominated by red sand verbena (*Abronia maritima*) and beach bur (*Ambrosia chamissonis*), with a subdominant presence of sea rocket (*Cakile maritima*) and beach evening primrose (*Camissoniopsis cheiranthifolia*). The cover of this vegetation type is minimal, only represents a fraction of the overall vegetation within the Study Area, and lacks species richness. In areas where dune mat occurs it is frequently mixed with

ice plant (*Carpobrotus edulis*) (Figures 2a, 2b, 2c & 2d, 0.14 acres); however, small pure stands of dune mat were observed with in the Study Area (0.04 acres).

Naturalized Vegetation

Ice plant mats (*Carpobrotus edulis* Semi Natural Herbaceous Stands). Not Ranked. The majority of the vegetated portions of the Study Area are dominated by ice plant mats (Figures 2a, 2b, 2c, & 2d, 0.28 - 0.45 acres). Ice plant is a low-growing prostrate perennial herb that has been widely planted for soil stabilization and landscaping in coastal habitats throughout California. Primarily due to its tolerance of a wide range of soil moisture and nutrient conditions, ice plant commonly spreads beyond landscaped areas to invade dune mat and other coastal plant communities (Sawyer et al. 2009). An additional 0.14 acres of the Study Area supported small stands of dune mat intermixed with invasive ice plant.

The ice plant mat vegetation alliance is dominated by ice plant and occasionally occurs with pampas grass (*Cortaderia* sp.). Ice plant and pampas grass are non-native invasive species ranked as high by the California Invasive Plant Council (Cal-IPC 2006). Pampas grass is a large perennial grass found commonly along the coast of California and in the Coast Ranges. Pampas grass was introduced as an ornamental plant and for erosion control, and favors dunes, bluffs, and disturbed areas. Both ice plant and pampas grass were mapped in the Study Area during the special status plant survey (Figures 2a, 2b, 2c, & 2d). Other plant species observed within this vegetation alliance include calla lily (*Zantedeschia aethiopica*), Cape ivy (*Delairea odorata*), and Bermuda buttercup (*Oxalis pes-caprae*), all non-native species. A total of 0.28 acres of ice plant mats and pampas grass were mapped as invasive.

Landscaped Vegetation

In addition to restricted elements of dune mat vegetation, several parcels within the Study Area also 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.). In total 0.10 acre of native landscaped vegetation was mapped in the Study Area.

As the Study Area includes portions of private oceanfront residence parcels, some of which have been planted with non-native landscape species including calla lily, American century plant (*Agave americana*), lion's tail (*A. attenuata*), Krantz' aloe (*Aloe arborescens*), shrubby daisy-bush (*Dimorphotheca fruticosa*), pride-of-Madeira (*Echium candicans*), New Zealand hebe (*Hebe speciosa*), and New Zealand flax (*Phormium tenax*). The ornamental species frequently co-occur with invasive ice plant and thus the two are mapped together as the "Mixed B" plant community (Figures 2a, 2b, 2c, & 2d) and total 0.17 acres.



Study Area
Approximate Project Area



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Broad Beach
Los Angeles County, CA

Figure 1

Broad Beach
Restoration Project
and
Study Area
Location Map












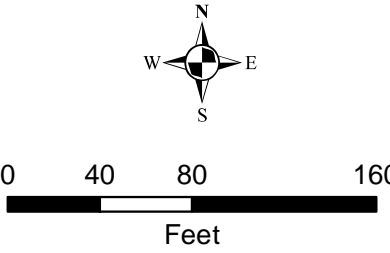
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Feet

Map Date: December 2010
Map By: Derek Chan
Base Source: ESRI; Moffatt Nichol

Broad Beach
Los Angeles County,
California

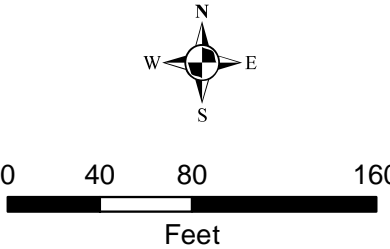
Figure 2a
Vegetation Map
at the
Broad Beach
Restoration Project
Study Area

-  Study Area
-  Emergency Repair Revetment
-  Unvegetated Sand - 1.73 acres
-  Dune Mat - 0.04 acre
-  Invasive Species (Iceplant and Pampas Grass) - 0.28 acre
-  Pampas Grass
-  Mixed A (Invasive and Dune Mat) - 0.14 acre
-  Mixed B (Invasive and Non-native Landscape Species) - 0.17 acre
-  Native Landscape Species - 0.10 acre



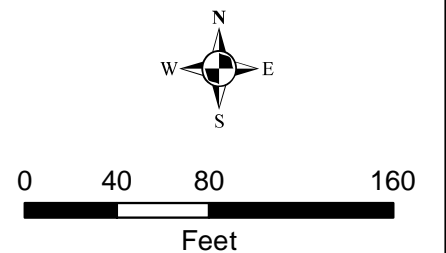
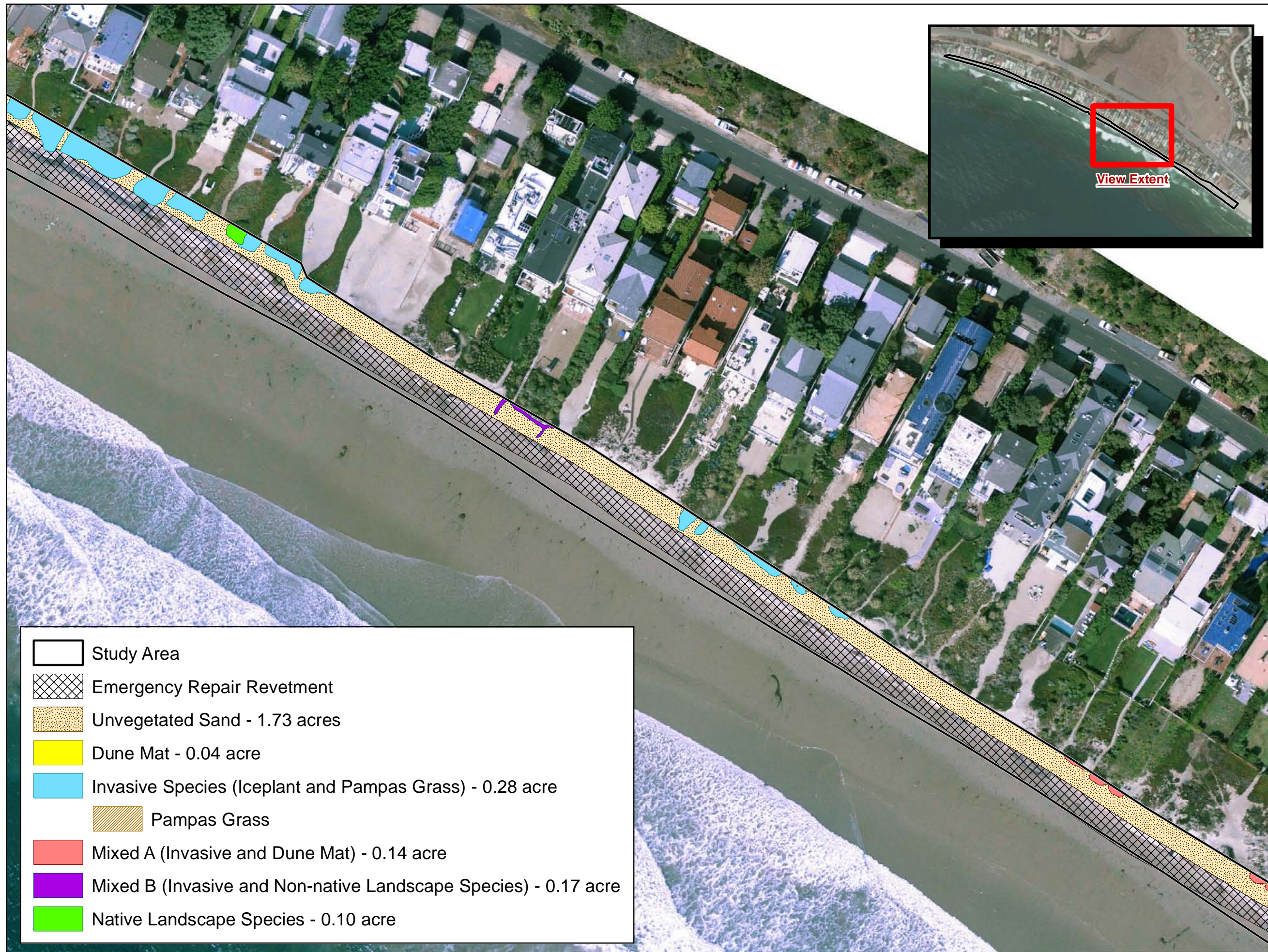
Broad Beach
Los Angeles County,
California

Figure 2b
Vegetation Map
at the
Broad Beach
Restoration Project
Study Area



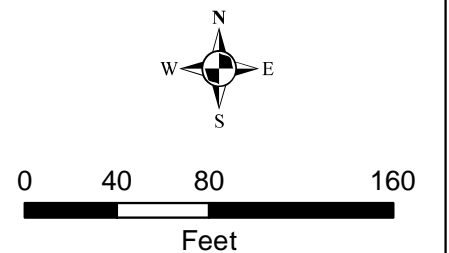
Broad Beach
 Los Angeles County,
 California

Figure 2c
 Vegetation Map
 at the
 Broad Beach
 Restoration Project
 Study Area



Broad Beach
 Los Angeles County,
 California

Figure 2d
 Vegetation Map
 at the
 Broad Beach
 Restoration Project
 Study Area



1.1.2 Soils

The Soil Survey of Los Angeles County, California (USDA 1980) indicates that the Study Area contains one native soil type: Aaft-Beaches-Urban land complex, 0 to 5 percent slopes described in detail below.

Aaft-Beaches-Urban land complex. The Aaft-Beaches-Urban land complex consists of 55 percent Aaft series, 30 percent beaches, and 15 percent of urban land. This soil complex is comprised of very deep loamy sand derived from mixed sources formed from eolian processes located on shore complexes as dunes. These soils are excessively drained, with negligible runoff, and rapid permeability. The Aaft-Beaches-Urban land complex is not considered hydric (CSRL 2011, USDA 1980).

A typical profile of the Aaft series consists of an A-horizon of neutral (pH 6.8) brown (10YR 4/3) stratified sandy loam from 0 to 13 inches depth. This is underlain by a C-horizon of neutral (pH 6.8) brown (10YR 4/3) stratified sand from 13 to 59 inches depth (CSRL 2011, USDA 1980).

No profile descriptions are documented for beaches and urban land as these components are comprised of shifting sands without a soil matrix (beaches) or the underlying substrate is considerably altered and currently covered with impervious surfaces (urban land).

1.1.3 Climate and Topography

The dominant precipitation at the Study Area falls as rain, with over two thirds falling between January and March (average: 8.26 inches). Average annual rainfall for Santa Monica, Los Angeles County, approximately 18 miles east from the Study Area, is 12.75 inches (WRCC 2011). The annual highest high temperatures occur are during July through October, while the annual lowest low temperatures occur are during December through February with annual maximum temperature average of 66.7°F and minimum average of 56.4°F (WRCC 2011). A WETS analysis for precipitation data for Santa Monica, Los Angeles County demonstrates that rainfall was above normal for water year 2011 (October 1, 2010 – September 30, 2011), with above normal rainfall in December 2010, and March, May, June, July, and August 2011 (UC-IPM 2011).

2.0 METHODS

2.1 Background Data Search

Special status plants are defined here to include: (1) all plants that are federal- or state-listed as rare, threatened or endangered, (2) all federal and state candidates for listing, (3) all plants included in Lists 1 and 2 of the CNPS Inventory (Skinner and Pavlik 2001), and (4) plants that qualify under the definition of "rare" in the California Environmental Quality Act, section 15380. CNPS list 3 and 4 plants are not typically afforded protection under CEQA and are not considered ESHAs in the Malibu LCP.

Sensitive natural vegetation communities are defined here to include those that may be afforded special consideration under CEQA, all vegetation alliances with a State ("S") ranking of S1 through S3, and/or designated with a star (*) in *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986), and/or jurisdictional under the Clean Water Act or Section 1602 of the California Fish and Game Code were classified as sensitive.

A background information search was conducted to identify potential special status plant

species that may occur in the Study Areas vicinity. A table of these species, and their protection status, habitat requirements, and likelihood to occur in the Study Area is provided in Appendix B. Sources for this search included the United States Fish and Wildlife Service (USFWS) Species List for Los Angeles County (USFWS 2011), California Consortium of Herbaria (CCH 2011), California Department of Fish and Game (CDFG) Natural Diversity Database (CDFG 2011) records, and the California Native Plant Society (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS 2011) for the USGS Point Dume, Newbury Park, Thousand Oaks, Calabasas, Malibu Beach, and Triunfo Pass 7.5-minute quadrangles.

All special status plant species documented within the greater vicinity of the Study Area were then assessed based on vegetation communities, soil affinity, associated species, topographic position, shade tolerance, disturbance tolerance, and documented population distribution to determine the potential for these species to occur in the Study Area (Appendix B). The potential for each special status plant species to occur in the Study Area was then evaluated according to the following criteria:

Present: Species is observed on the site or has been recorded (i.e. CNDDDB, other reports) on the site recently.

High Potential: All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

Moderate Potential: Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

Unlikely: Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

No Potential: Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

2.2 Field Survey

Three floristic, protocol-level special status plant surveys and one reconnaissance site visit were conducted between November 2010 and September 2011. The protocol level surveys corresponded to peak blooming or vegetative periods for observing and accurately identifying hundreds of plant species in coastal dune habitats in Los Angeles County, including the three vascular special status plant species determined to have the potential to occur in the Study Area. The field surveys were conducted by a botanist familiar with the flora of dune habitats of coastal California. Where and when possible, WRA consulted with other botanists, reviewed dates of historical documentation, or conducted reference site visits to ensure that the surveys were conducted within a period sufficient to identify the potentially occurring special status plant species.

The surveys followed the protocol for plant surveys described by Nelson (1987), which complies with recommended resource agency guidelines (CNPS 2001, CDFG 2000, CDFG 2009, USFWS 1996). All plants were primarily identified using *The Jepson Manual II* (UC Regents 2011), to the taxonomic level necessary to determine rarity. Some plants were cross referenced and identified using *The Jepson Manual* (Hickman 1993) as some agencies and jurisdictions may base rarity on older names. Names given within this report follow *The Jepson Manual II*,

with those from Hickman noted in brackets in Appendix A. The plant surveys were floristic in nature with all observed species recorded and included as a species list provided in Appendix A.

An additional reconnaissance site visit was also conducted on September 26, 2011 to evaluate the potential habitat for special status plant species in the western portion of the Project Area along the coastal bluff not originally surveyed in during the protocol level surveys.

3.0 RESULTS

3.1 Background Data Search Results

Based upon a review of CNDDDB (CDFG 2011), CNPS Electronic Inventory (CNPS 2011), USFWS Species List (USFWS 2011), and CCH (2011) resources and databases, 36 special status plant species have been documented in the greater vicinity of the Study Area; the CNDDDB occurrences recorded within a 5-mile radius of the Study Area are illustrated in Figure 3. Three species were determined to have a moderate or high potential to occur in the Study Area, and are described in detail below. The remaining 33 species were determined to have low or no potential to occur based primarily on the lack of suitable habitat. A table of all 36 special status plant species, including their habitat requirements, blooming periods, elevation ranges, and status, is provided in Appendix B.

Coulter's saltbush (*Atriplex coulteri*) CNPS List 1B. Moderate Potential. Coulter's saltbush is a perennial forb in the goosefoot family (Chenopodiaceae) that blooms from March to October. It typically occurs on ocean bluffs, ridgetops, and alkaline low places in coastal bluff scrub, coastal dune, coastal scrub, and valley and foothill grassland habitat at elevations ranging from 10 to 1510 feet (CNDDDB 2011, CNPS 2011). Documented associated species typically include coyote brush (*Baccharis pilularis*), purple needlegrass (*Stipa pulchra*), long-beak filaree (*Erodium botrys*), foxtail barley (*Hordeum murinum*), soft chess (*Bromus hordeaceus*), wild oats (*Avena barbata*), blue-eyed grass (*Sisyrinchium bellum*) and Australian salt bush (*Atriplex semibaccata*) (CNDDDB 2011).

Coulter's saltbush is known from 49 USGS 7.5-minute quadrangles in Los Angeles, Orange, Santa Barbara, San Bernardino, San Diego, San Luis Obispo, and Ventura counties (CNPS 2011). There are two CNDDDB (2011) records in the greater vicinity of the Study Area, and 38 CCH (2011) records from Los Angeles County. The nearest documented occurrence is from an undated year in the 1900s at Point Dume, approximately three miles southeast of the Study Area (CNDDDB 2011). The most recent documented occurrence from Los Angeles County is from April 1993 on Santa Catalina Island, approximately 40 miles south of the Study Area (CCH 2011). Coulter's saltbush has a moderate potential to occur in the Study Area due to the presence of suitable substrate and dune habitat; however, many of the documented associated plant species are not present in the Study Area. This species was not observed in the Study Area during surveys.

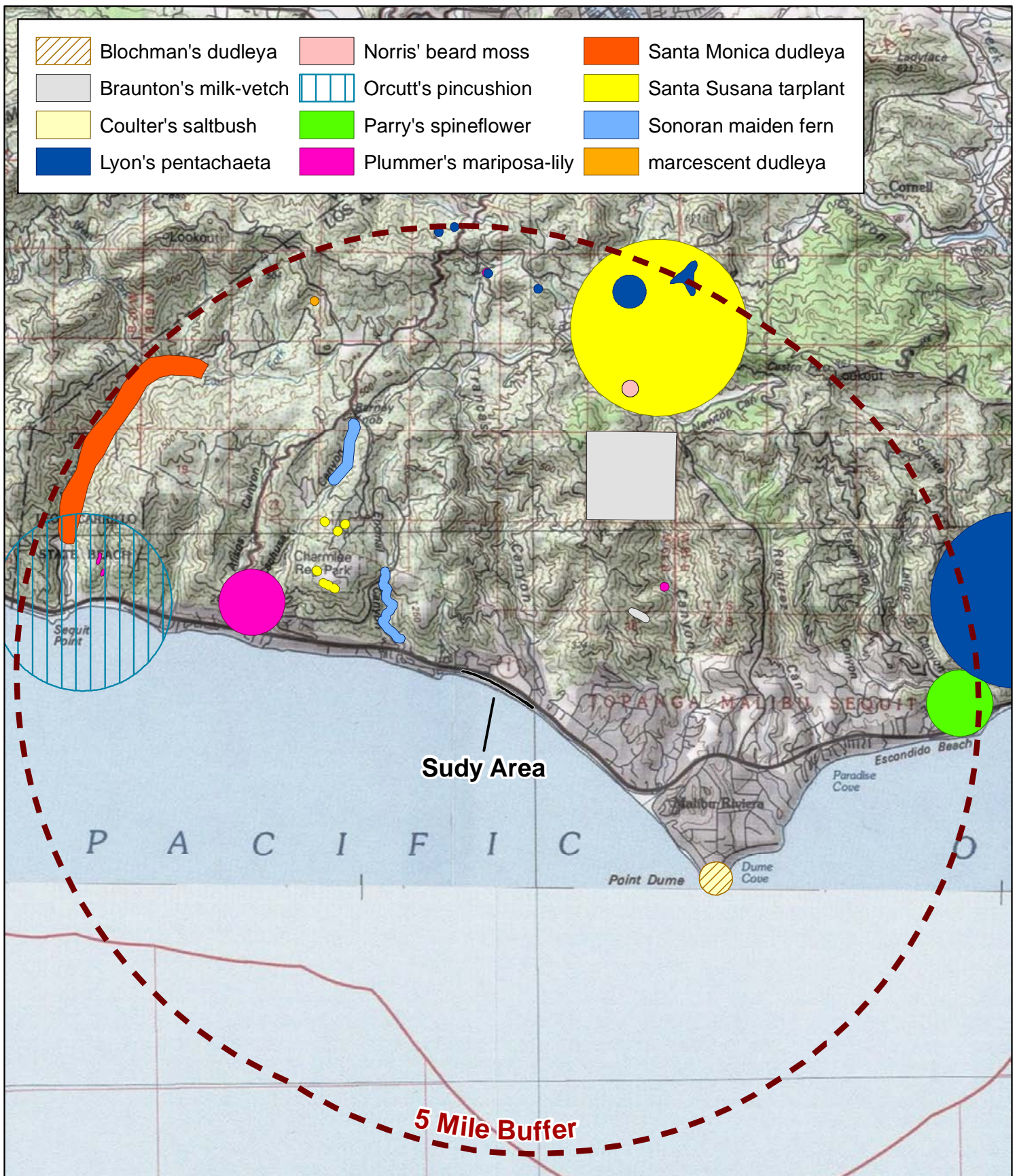


Figure 3. CNDDDB Documented Occurrences within Five Miles of the Study Area

Broad Beach
Los Angeles County, California



0 1 2 Miles



Date: September 2011
Basemap: USGS Topo Quad
Map By: Michael Rochelle

Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana*) CNPS List 1B. High Potential. Orcutt's pincushion is an annual forb in the sunflower family (Asteraceae) that blooms from January to August. It typically occurs in coastal dunes and coastal bluff scrub, at elevations ranging from 0 to 325 feet (CNDDDB 2011, CNPS 2011). Documented associated species typically include pink sand verbena, beach bur, beach sage, California sun cup (*Camissoniopsis bistorta*), beach evening-primrose, Lewis' evening-primrose (*Camissonia lewisii*), branching phacelia (*Phacelia ramosissima* var. *australitoralis*), and dune bush lupine (*Lupinus chamissonis*) (CNDDDB 2011).

Orcutt's pincushion is known from 15 USGS 7.5-minute quadrangles in Los Angeles, Orange, San Diego, and Ventura Counties (CNPS 2011). There is one CNDDDB (2011) record in the greater vicinity of the Study Area, and eight CCH (2011) records from Los Angeles County. The nearest documented occurrence is from March 1898 near South Beach, approximately five miles northwest of the Study Area (CNDDDB 2011). The most recent documented occurrence from Los Angeles County is from May 2010 at Sand Dune Park, Manhattan Beach, approximately 25 miles southeast of the Study Area (CNDDDB 2011). Orcutt's pincushion has a high potential to occur in the Study Area due to the presence of suitable substrate, associated species within coastal dune habitat, and relative location of documented occurrences. This species was not observed in the Study Area during surveys.

Dune larkspur (*Delphinium parryi* ssp. *blochmaniae*) CNPS List 1B. Moderate Potential. Dune larkspur is a perennial forb in the buttercup family (Ranunculaceae) that blooms from April to May. It typically occurs in on rocky areas and dunes in coastal dune and maritime chaparral at elevations ranging from 0 to 650 feet (CNDDDB 2011, CNPS 2011). Documented associated species include California sagebrush (*Artemisia californica*), western prickly pear (*Opuntia littoralis*), wild oats, ripgut brome (*Bromus diandrus*), California poppy (*Eschscholzia californica*), plantain (*Plantago* sp.), miniature lupine (*Lupinus bicolor*), and California buckwheat (*Eriogonum fasciculatum*) (CNDDDB 2011).

Dune larkspur is known from 13 USGS 7.5-minute quadrangles in Santa Barbara, San Luis Obispo, and Ventura Counties (CNPS 2011). There is one CNDDDB (2011) record in the greater vicinity of the Study Area, and no CCH (2011) records from Los Angeles County. The nearest documented occurrence is from 1987 near Lake Eleanor, approximately seven miles north of the Study Area (CNDDDB 2011). The most recent documented occurrence from Ventura County is from April 1969 at Thousand Oaks, approximately ten miles north of the Study Area (CCH 2011). Dune larkspur has a moderate potential to occur in the Study Area due to the presence of suitable substrate and coastal dune habitat; however, many of the documented associated plant species are not present in the Study Area. This species was not observed in the Study Area during surveys.

3.2 Field Survey Results

No special status plant species were observed in the Study Area. However, approximately 0.04 acres of a potential CDFG sensitive vegetation alliance, dune mat (*Abronia latifolia*-*Ambrosia chamissonis* Herbaceous Alliance containing the *Ambrosia chamissonis*-*Abronia maritima*-*Cakile maritima* Herbaceous Association)(Sawyer et al. 2009) was observed and mapped within the Study Area (Figures 2a, 2b, 2c, & 2d). A combined total of 50 species were observed during the survey. Of these, 17 species are native to California. Of the remaining 33 non-native species, 17 are considered invasive, including four classified as High and two classified as Moderate by Cal-IPC (2006). Three floristic surveys were conducted throughout the Study Area with particular focus in areas with favorable microhabitat characters for the three special status plant species with the potential to occur.

4.0 CONCLUSIONS

No special status plant species were observed in the Study Area in 2010 and 2011 during the protocol-level and reconnaissance special status plant surveys. Although red sand verbena was observed in the Study Area, it is a CNPS List 4 species which are afforded little or no protection under CEQA and is not considered an ESHA under the Malibu LCP. Although, the dune mat natural community may be considered sensitive by the CDFG and afforded protection under CEQA. However, dune mat only comprises a fraction of the overall vegetation within the Study Area and could easily be transplanted to a nursery and replanted prior to construction activities. In addition, given that the end result of the proposed project aims to restore and expand dune habitat and native dune vegetation (including dune mat) throughout the Project Area, the resulting acreage and species richness of the dune mat community will likely improve substantially compared with existing conditions.

Due to favorable climate conditions (i.e. within or above normal rainfall) and a review of the documented occurrences, it is assumed that the surveys were conducted within a period sufficient to identify the special status plant species and natural communities with the potential to occur in the Study Area. A WRA botanist familiar with the vegetation and species of South Coast California coastal dune habitats traversed the entire Study Area on foot and recorded all plant species observed.

Protocol level surveys were not conducted on the Project Area outside of the Study Area. The majority of the Project Area to the west of the Study Area is subject to tidal action and supports minimal terrestrial vegetation. An exception to this is in the western most portion of the Project Area where coastal bluffs rise above the high tide line. However, during reconnaissance site visit to this area in September 2011, WRA biologists observed that most of this habitat is either, covered with ice plant, mostly un-vegetated, or supports minimal native vegetation, which was later confirmed by information provided to WRA by the project engineer. In addition, only two special status plant species, Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana*) and Blochman's dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*) have potential to occur in coastal bluff habitat (Appendix B). It is likely both of these species would have been evident, at least in vegetative form, during the September 2011 site visit and neither of these species nor their genera was observed.

5.0 RECOMENDATIONS

A dune restoration and invasive species management plan (restoration plan) should be produced to ensure that future restoration and re-vegetation efforts are successful. The restoration plan should outline specific goals and actions for (1) the removal of all invasive species listed as High or Moderate, (2) the collection, propagation, and transplantation of native species, including red sand verbena and associated dune mat species, and (3) success criteria and contingency plans to guide future management of the restoration area. Target invasive species include ice plant, Cape ivy, pampas grass, Bermuda buttercup, and Australian salt bush. The restoration plan should address specific invasive species treatment methods consistent with regulations governing the use of biological and chemical agents in coastal dune habitat and should take into consideration the widespread cover of iceplant outside the Project Area.

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APPENDIX A

Plant Species Observed in the Study Areas

Table A. Plant species observed in the Study Area, November 30 and December 1, 2010, and May 24 and July 23, 2011

Family	Scientific name	Common name	Life form	Origin	Invasive Status ¹	Rare Status ²	Wetland indicator ³
Agavaceae [Liliaceae]	<i>Agave americana</i>	American century plant	Evergreen shrub	non-native	N/A	N/A	NL
Agavaceae [Liliaceae]	<i>Agave attenuata</i>	lion's tail	Evergreen shrub	non-native	N/A	N/A	NL
Aizoaceae	<i>Carpobrotus edulis</i>	Hottentot Fig	Perennial herb	non-native	high	N/A	NL
Anacardiaceae	<i>Rhus integrifolia</i>	lemonade sumac	Evergreen shrub	native	N/A	N/A	NL
Apiaceae	<i>Foeniculum vulgare</i>	fennel	Perennial herb	non-native	high	N/A	FACU
Araceae	<i>Zantedeschia aethiopica</i>	calla lily	Perennial herb	non-native	limited	N/A	OBL
Arecaceae	<i>Phoenix canariensis</i>	Canary Island date palm	Evergreen tree	non-native	limited	N/A	NL
Asphodelaceae [Liliaceae]	<i>Aloe arborescens</i>	Krantz' aloe	Evergreen shrub	non-native	N/A	N/A	NL
Asphodelaceae [Liliaceae]	<i>Aloe</i> sp.	Aloe	Evergreen shrub	non-native	N/A	N/A	NL
Asteraceae	<i>Achillea millefolium</i>	common yarrow	Perennial herb	native	N/A	N/A	FACU
Asteraceae	<i>Ambrosia chamissonis</i>	beach bur	Perennial herb	native	N/A	N/A	NL
Asteraceae	<i>Baccharis pilularis</i>	coyote brush	Evergreen shrub	native	N/A	N/A	NL
Asteraceae	<i>Conyza canadensis</i> var. <i>canadensis</i>	Canadian horsetweed	Annual herb	native	N/A	N/A	FAC
Asteraceae	<i>Leptosyne gigantea</i> [<i>Coreopsis gigantea</i>]	giant coreopsis	Perennial herb	native	N/A	N/A	NL
Asteraceae	<i>Delairea odorata</i> [<i>Senecio mikanioides</i>]	Cape ivy	Perennial herb	non-native	high	N/A	NL
Asteraceae	<i>Pseudognaphalium luteo-album</i> [<i>Gnaphalium luteo-album</i>]	Everlasting Cudweed	Annual herb	non-native	N/A	N/A	FACW
Asteraceae	<i>Dimorphotheca fruticosa</i> [<i>Osteospermum fruticosum</i>]	shrubby daisy-bush	Perennial herb	non-native	N/A	N/A	NL
Asteraceae	<i>Helminthotheca echioides</i> [<i>Picris echioides</i>]	bristly ox tongue	Perennial herb	non-native	limited	N/A	FACW
Asteraceae	<i>Sonchus asper</i> ssp. <i>asper</i>	prickly sow thistle	Annual herb	non-native	assessed	N/A	FAC
Asteraceae	<i>Sonchus oleraceus</i>	common sow thistle	Annual herb	non-native	N/A	N/A	NI
Asteraceae	<i>Taraxacum officinale</i>	Dandelion	Perennial herb	non-native	assessed	N/A	FACU
Boraginaceae	<i>Echium candicans</i>	pride-of-Madeira	Evergreen shrub	non-native	limited	N/A	NL

Family	Scientific name	Common name	Life form	Origin	Invasive Status ¹	Rare Status ²	Wetland indicator ³
Boraginaceae	<i>Heliotropium curassavicum</i>	Heliotrope	Perennial herb	native	N/A	N/A	OBL
Brassicaceae	<i>Cakile maritima</i>	sea rocket	Annual herb	non-native	limited	N/A	FACW
Chenopodiaceae	<i>Atriplex semibaccata</i>	Australian salt bush	Perennial herb	non-native	moderate	N/A	FAC
Cyperaceae	<i>Carex praeegracilis</i>	clustered field sedge	Perennial herb	native	N/A	N/A	FACW
Euphorbiaceae	<i>Chamaesyce</i> sp.	sandmat	Annual herb	various	N/A	N/A	NL
Euphorbiaceae	<i>Euphorbia peplus</i>	petty spurge	Annual herb	non-native	N/A	N/A	NL
Fabaceae	<i>Medicago polymorpha</i>	Bur medic	Annual herb	non-native	limited	N/A	NL
Geraniaceae	<i>Erodium cicutarium</i>	redstem filaree	Annual herb	non-native	limited	N/A	NL
Hemerocallidaceae	<i>Phormium tenax</i>	New Zealand flax	Perennial herb	non-native	N/A	N/A	NL
Juncaceae	<i>Juncus patens</i>	common rush	Perennial herb	native	N/A	N/A	FAC
Nyctaginaceae	<i>Abronia maritima</i>	pink sand verbena	Perennial herb	native	N/A	List 4	NL
Onagraceae	<i>Camissoniopsis cheiranthifolia</i> ssp. <i>cheiranthifolia</i> [<i>Camissonia cheiranthifolia</i> ssp. <i>cheiranthifolia</i>]	beach evening primrose	Perennial herb	native	N/A	N/A	NL
Oxalidaceae	<i>Oxalis pes-caprae</i>	Bermuda buttercup	Perennial herb	non-native	moderate	N/A	NL
Pittosporaceae	<i>Pittosporum undulatum</i>	Victorian box	Evergreen shrub	non-native	assessed	N/A	NL
Plumbaginaceae	<i>Armeria maritima</i> ssp. <i>californica</i>	California sea pink	Perennial herb	native	N/A	N/A	FACU
Plumbaginaceae	<i>Limonium perezii</i>	Perez's sea lavender	Perennial herb	non-native	N/A	N/A	NL
Poaceae	<i>Aira caryophyllea</i>	silver hairgrass	Annual herb	non-native	assessed	N/A	NL
Poaceae	<i>Bromus madritensis</i> ssp. <i>madritensis</i>	foxtail chess	Annual herb	non-native	N/A	N/A	NL
Poaceae	<i>Cortaderia</i> sp.	Pampas grass	Perennial herb	non-native	high	N/A	NL
Poaceae	<i>Distichlis spicata</i>	salt grass	Perennial herb	native	N/A	N/A	FACW
Poaceae	<i>Leymus</i> sp.	creeping wild rye	Perennial herb	native	N/A	N/A	FAC
Poaceae	<i>Muhlenbergia rigens</i>	deer grass	Perennial herb	native	N/A	N/A	NL
Polygonaceae	<i>Eriogonum parvifolium</i>	coast buckwheat	Perennial herb	native	N/A	N/A	NL
Primulaceae	<i>Anagallis arvensis</i>	pimpernel	Annual herb	non-native	N/A	N/A	FAC
Rosaceae	<i>Fragaria chiloensis</i>	beach strawberry	Perennial herb	native	N/A	N/A	NL
Rosaceae	<i>Rhaphiolepis indica</i>	Indian hawthorn	Evergreen shrub	non-native	N/A	N/A	NL

Family	Scientific name	Common name	Life form	Origin	Invasive Status ¹	Rare Status ²	Wetland indicator ³
Scrophulariaceae	<i>Hebe speciosa</i>	New Zealand hebe	Evergreen shrub	non-native	N/A	N/A	NL
Xanthorrhoeaceae	<i>Phormium tenax</i>	New Zealand flax	Perennial herb	non-native	N/A	N/A	NL

- All species identified using the *Jepson Manual II: Vascular Plants of California* (Jepson 2011)
- Nomenclature follows *Jepson Manual II: Vascular Plants of California* (Jepson 2011) with those Families, Genera, and Species in brackets from *Jepson Manual* (Hickman 1993)

¹Invasive Status: California Invasive Plant Inventory [Cal-IPC 2006]

²Rare Status: The CNPS Inventory of Rare and Endangered Plants [CNPS 2011]

³Wetland Status: National List of Plant Species that Occur in Wetlands, California – Region 10 [Reed 1988]

APPENDIX B

Potential for Special Status Plant Species to Occur in the Study Areas

Table B. Potential for Special Status Plant Species to Occur in the Study Area. List compiled from the California Department of Fish and Game (CDFG) Natural Diversity Database (December 2011), U.S. Fish and Wildlife Service (USFWS) Species Lists (December 2011), and California Native Plant Society (CNPS) Electronic Inventory (December 2011) searches of the Point Dume, Newbury Park, Thousand Oaks, Calabasas, Malibu Beach, and Triunfo Pass USGS 7.5' quadrangles.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RECOMMENDATIONS
red sand-verbena <i>Abronia maritima</i>	List 4	Coastal dunes. Elevation range: 0 – 325 feet. Blooms: February – November.	High Potential. The Study Area contains coastal dune habitat sufficient to support this species.	Present. This species was observed within the Study Area.
western spleenwort <i>Asplenium vespertinum</i>	List 4	Chaparral, cismontane woodland, coastal scrub; located on rocky sites. Elevation range: 585 – 3250 feet. Blooms: February – June.	No Potential. The Study Area does not contain chaparral, woodland, or scrub habitat necessary to support this species.	No further actions are recommended for this species.
Braunton's milk-vetch <i>Astragalus brauntonii</i>	FE; List 1B	Closed-cone coniferous forest, chaparral, coastal scrub, valley and foothill grassland; recent burns, disturbed areas; located on saline to alkaline substrate. Elevation range: 10 – 2080 feet. Blooms: January – August.	No Potential. The Study Area does not contain forest, chaparral, or grassland habitat necessary to support this species.	No further actions are recommended for this species.
Coulter's saltbush <i>Atriplex coulteri</i>	List 1B	Coastal bluff scrub, coastal scrub, coastal dunes, valley and foothill grassland; located on ocean bluffs, ridgetops, and alkaline low sites. Elevation range: 10 – 1495 feet. Blooms: March – October.	Moderate Potential. The Study Area contains coastal dune habitat sufficient to support this species.	Not Observed. This species was not observed during the protocol-level rare plant survey. No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RECOMMENDATIONS
Malibu Baccharis <i>Baccharis malibuensis</i>	List 1B	Coastal scrub, chaparral, cismontane woodland; located on Conejo volcanic substrates, often roadsides. Elevation range: 485 – 995 feet. Blooms: August.	No Potential. The Study Area does not contain chaparral, woodland, or scrub habitat necessary to support this species.	No further actions are recommended for this species.
round-leaved filaree <i>California macrophyllum</i>	List 1B	Cismontane woodland, valley and foothill grassland; located on clay substrates. Elevation range: 45 – 3900 feet. Blooms: March – May.	No Potential. The Study Area does not contain woodland or grassland habitat, or clay substrate necessary to support this species.	No further actions are recommended for this species.
Catalina mariposa lily <i>Calochortus catalinae</i>	List 4	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland. Elevation range: 45 – 2275 feet. Blooms: February – June.	No Potential. The Study Area does not contain chaparral, woodland, scrub, or grassland habitat necessary to support this species.	No further actions are recommended for this species.
slender mariposa lily <i>Calochortus clavatus</i> var. <i>gracilis</i>	List 1B	Chaparral, coastal scrub; located on grassy slopes and shaded canyons. Elevation range: 1040 – 3250 feet. Blooms: March – June.	No Potential. The Study Area does not contain chaparral and scrub habitat necessary to support this species.	No further actions are recommended for this species.
Plummer's mariposa lily <i>Calochortus plummerae</i>	List 1B	Coastal scrub, chaparral, valley and foothill grassland, cismontane woodland, lower montane coniferous forest; located on rocky and sandy sites derived of granite alluvial material; common following fire. Elevation range: 325 – 5525 feet. Blooms: May – July.	No Potential. The Study Area does not contain scrub, chaparral, grassland, woodland, or forest habitat necessary to support this species.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RECOMMENDATIONS
Lewis' evening-primrose <i>Camissoniopsis lewisii</i>	List 3	Coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub, valley and foothill grassland; located on sandy or clay substrates. Elevation range: 0 – 975 feet. Blooms: March – June.	High Potential. The Study Area contains coastal dune habitat that may support this species.	Not Observed. This species was not observed during the protocol-level rare plant survey. No further actions are recommended for this species.
southern tarplant <i>Centromadia parryi</i> ssp. <i>australis</i>	List 1B	Marshes and swamps, valley and foothill grassland; located in mesic sites on alkaline on grassland-marsh transitions. Elevation range: 0 – 1385 feet. Blooms: May – November.	No Potential. The Study Area does not contain marsh, swamp, or alkaline grassland habitat necessary to support this species.	No further actions are recommended for this species.
Orcutt's pincushion <i>Chaenactis glabriuscula</i> var. <i>orcuttiana</i>	List 1B	Coastal bluff scrub, coastal dunes; located on sandy substrate. Elevation range: 0 – 325 feet. Blooms: January – August.	High Potential. The Study Area contains coastal dune habitat that may support this species. The Project Area supports coast bluff scrub habitat.	Not Observed. This species was not observed during the protocol-level rare plant survey. This species was not observed during the September site visit to the western end of the Project Area.
San Fernando Valley spineflower <i>Chorizanthe parryi</i> var. <i>fernandina</i>	FC; SE; List 1B	Coastal scrub; located on sandy substrate. Elevation range: 485 – 3965 feet. Blooms: April – July.	No Potential. The Study Area does not contain coastal scrub habitat necessary to support this species.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RECOMMENDATIONS
Parry's spineflower <i>Chorizanthe parryi</i> var. <i>parryi</i>	List 1B	Coastal scrub, chaparral; located on dry slopes and flats underlain by sandy substrate often at margins of two vegetation communities. Elevation range: 890 – 3965 feet. Blooms: April – June.	No Potential. The Study Area does not contain scrub or chaparral habitat necessary to support this species.	No further actions are recommended for this species.
Santa Susana tarplant <i>Deinandra minthornii</i>	List 1B	Chaparral, coastal scrub; located on sandstone outcrops and crevices in shrubland habitat. Elevation range: 910 – 2470 feet. Blooms: July – November.	No Potential. The Study Area does not contain chaparral or coastal scrub habitat necessary to support this species.	No further actions are recommended for this species.
dune larkspur <i>Delphinium parryi</i> ssp. <i>blochmaniae</i>	List 1B	Chaparral, coastal dunes; located on rocky sites and maritime dunes. Elevation range: 0 – 650 feet. Blooms: April – May.	Moderate Potential. The Study Area contains coastal dune habitat that may support this species.	No further actions are recommended for this species.
Norris' beard moss <i>Didymodon norrisii</i>	List 2	Cismontane woodland, lower montane coniferous forest; located seasonally wet exposed rock or terraces with drying in summer. Elevation range: 1950 – 6415 feet.	No Potential. The Study Area does not contain woodland or forest habitat necessary to support this species.	No further actions are recommended for this species.
Blochman's dudleya <i>Dudleya blochmaniae</i> ssp. <i>blochmaniae</i>	List 1B	Coastal scrub, coastal bluff scrub, valley and foothill grassland; located open, rocky slopes often underlain by shallow clay derived from serpentine. Elevation range: 15 – 1465 feet. Blooms: April – June.	No Potential. The Study Area does not contain scrub or grassland habitat necessary to support this species.	No further actions are recommended for this species. This species was not observed during the September site visit to the western end of the Project Area.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RECOMMENDATIONS
Agoura hills dudleya <i>Dudleya cymosa</i> ssp. <i>agourensis</i>	FT; List 1B	Chaparral, cismontane woodland; located on rocky, volcanic breccias. Elevation range: 650 – 1625 feet. Blooms: May – June.	No Potential. The Study Area does not contain chaparral or woodland habitat necessary to support this species.	No further actions are recommended for this species.
marcescent dudleya <i>Dudleya cymosa</i> ssp. <i>marcescens</i>	FT; SR; List 1B	Chaparral; located on rock faces of volcanic cliffs. Elevation range: 485 – 1690 feet. Blooms: April – July.	No Potential. The Study Area does not contain chaparral habitat necessary to support this species.	No further actions are recommended for this species.
Santa Monica dudleya <i>Dudleya cymosa</i> ssp. <i>ovatifolia</i>	FT; List 1B	Chaparral, coastal scrub; in canyons of sedimentary conglomerates on north-facing slopes. Elevation range: 485 – 5445 feet. Blooms: March – June.	No Potential. The Study Area does not contain chaparral or scrub habitat necessary to support this species.	No further actions are recommended for this species.
many-stemmed dudleya <i>Dudleya multicaulis</i>	List 1B	Chaparral, coastal scrub, valley and foothill grassland; located on heavy clay or sandy substrate in grassy sites. Elevation range: 45 – 2570 feet. Blooms: April – July.	No Potential. The Study Area does not contain chaparral, scrub, or grassland habitat necessary to support this species.	No further actions are recommended for this species.
conejo dudleya <i>Dudleya parva</i>	FT; List 1B	Coastal scrub, valley and foothill grassland; located on clay volcanic derived substrate in grassy hillsides. Elevation range: 195 – 1465 feet. Blooms: May – June.	No Potential. The Study Area does not contain scrub or grassland habitat necessary to support this species.	No further actions are recommended for this species.
Verity's dudleya <i>Dudleya verityi</i>	FT; List 1B	Chaparral, cismontane woodland, coastal scrub; located on volcanic outcrops in Santa Monica Mountains. Elevation range: 195 – 390 feet. Blooms: May – June.	No Potential. The Study Area does not contain chaparral, woodland, or scrub habitat necessary to support this species.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RECOMMENDATIONS
conejo buckwheat <i>Eriogonum crocatum</i>	SR; List 1B	Chaparral, coastal scrub, valley and foothill grassland; located on Conejo volcanic outcrops. Elevation range: 160 – 1885 feet. Blooms: April – July.	No Potential. The Study Area does not contain chaparral, scrub, or grassland habitat necessary to support this species.	No further actions are recommended for this species.
vernal barley <i>Hordeum intercedens</i>	List 3	Coastal dunes, coastal scrub, valley and foothill grassland, vernal pools; located on saline flats and depressions. Elevation range: 15 – 3250 feet. Blooms: March – June.	Moderate Potential. The Study Area contains coastal dune habitat that may support this species.	Not Observed. This species was not observed during the protocol-level rare plant survey. No further actions are recommended for this species.
Coulter's goldfields <i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	List 1B	Coastal salt marsh, playa, valley and foothill grassland, vernal pools; typically in alkaline playa, sink, and grassland sites. Elevation range: 0 – 3965 feet. Blooms: February – June.	No Potential. The Study Area does not contain salt marsh, playa, vernal pool, or alkaline grassland habitat necessary to support this species.	No further actions are recommended for this species.
Ojai navarretia <i>Navarretia ojaiensis</i>	List 1B	Chaparral, coastal scrub, valley and foothill grassland; located in openings of shrublands and grasslands. Elevation range: 890 – 2015 feet. Blooms: May – July.	No Potential. The Study Area does not contain chaparral, scrub, or grassland habitat necessary to support this species.	No further actions are recommended for this species.
chaparral nolina <i>Nolina cismontana</i>	List 1B	Chaparral, coastal scrub; typically located on sandstone, shale, and gabbro substrates. Elevation range: 455 – 4140 feet. Blooms: May – July.	No Potential. The Study Area does not contain chaparral or scrub habitat necessary to support this species.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RECOMMENDATIONS
California Orcutt grass <i>Orcuttia californica</i>	FE; SE; List 1B	Vernal pools. Elevation range: 45 – 2145 feet. Blooms: April – August.	No Potential. The Study Area does not contain vernal pool habitat necessary to support this species.	No further actions are recommended for this species.
Lyon's Pentachaeta <i>Pentachaeta lyonii</i>	FE; SE; List 1B	Chaparral, valley and foothill grassland; located on the margins of grassland and shrubland; often on roadsides and firebreaks. Elevation range: 95 – 2045 feet. Blooms: March – August.	No Potential. The Study Area does not contain chaparral or grassland habitat necessary to support this species.	No further actions are recommended for this species.
Hubby's phacelia <i>Phacelia hubbyi</i>	List 4	Chaparral, coastal scrub, valley and foothill grassland; located gravelly, rocky, or talus sites. Elevation range: 0 – 3250 feet. Blooms: April – June.	No Potential. The Study Area does not contain chaparral, scrub, or grassland habitat necessary to support this species.	No further actions are recommended for this species.
South Coast branching phacelia <i>Phacelia ramosissima</i> var. <i>austrolitoralis</i>	List 4	Chaparral, coastal dunes, coastal scrub, coastal salt marshes and swamps; located on sandy, sometimes rocky substrates. Elevation range: 20 – 975 feet. Blooms: March – August.	High Potential. The Study Area contains coastal dune habitat that may support this species.	Not Observed. This species was not observed during the protocol-level rare plant survey. No further actions are recommended for this species.
white rabbit-tobacco <i>Pseudognaphalium leucocephalum</i>	List 2	Chaparral, cismontane woodland, coastal scrub, riparian woodland; located on gravelly and sandy substrate. Elevation range: 0 – 6825 feet. Blooms: July – December.	No Potential. The Study Area does not contain chaparral, woodland, scrub, or riparian habitat necessary to support this species.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RECOMMENDATIONS
chaparral ragwort <i>Senecio aphanactis</i>	List 2	Cismontane woodland, coastal scrub; located on drying alkaline flats. Elevation range: 45 – 2600 feet. Blooms: January – April.	No Potential. The Study Area does not contain woodland or scrub habitat necessary to support this species.	No further actions are recommended for this species.
Sonoran maiden fern <i>Thelypteris puberula</i> var. <i>sonorensis</i>	List 2	Meadows and seeps; located on seepy streamsides. Elevation range: 160 – 1985 feet.	No Potential. The Study Area does not contain meadow or seep streamside habitat necessary to support this species.	No further actions are recommended for this species.

*** Key to status codes:**

FE	Federal Endangered
FT	Federal Threatened
FC	Federal Candidate
FD	Federal De-listed
BCC	USFWS Birds of Conservation Concern
SE	State Endangered
SD	State Delisted
ST	State Threatened
SR	State Rare
SSC	CDFG Species of Special Concern
CFP	CDFG Fully Protected Animal
WBWG	Western Bat Working Group High or Medium Priority species
List 1A	CNPS List 1A: Plants presumed extinct in California
List 1B	CNPS List 1B: Plants rare, threatened or endangered in California and elsewhere
List 2	CNPS List 2: Plants rare, threatened, or endangered in California, but more common elsewhere
List 3	CNPS List 3: Plants about which CNPS needs more information (a review list) <i>[not special status]</i>

Species Evaluations:

No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements (cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

Unlikely. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

Present. Species was observed on the site or has been recorded (i.e. CNDDDB, other reports) on the site recently.

APPENDIX C

Representative Photographs of the Study Areas



Top: View of dune mat vegetation on remnant foredune.

Bottom: View of dune mat vegetation surrounded by ice plant.

Photographs taken July 2011





Top: View of the emergency rock revetment, unvegetated sand, and ice plant mats.

Bottom: View of ice plant mats with pampas grass in the background.

Photographs taken July 2011





Top: View of the relatively unvegetated coastal bluff habitat and rocky tidal zone at the western end of the Project Area.

Bottom: View of ice plant mats coving coastal bluff habitat at the western end of the Project Area.

Photographs taken September 2011

