Protocol Rare Plant Surveys: 2010-2011

Ballona Wetlands Ecological Reserve
Marina del Rey, Los Angeles County, California

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EXECUTIVE SUMMARY

The following document summarizes the methods and results of the focused, protocol-level rare plant surveys conducted 7 to 10 July 2010, and the results of the floristic, protocol-level rare plant surveys conducted 4 to 6 October 2010 and 5 to 8 April 2011 at the Ballona Wetlands Ecological Reserve (Reserve). The surveys were conducted to update the previously conducted, protocol-level floristic surveys of the site to determine the presence or absence of 30 potential special-status plant species known to occur in the vicinity of the site in similar habitat types which bloom during July, October, and April. In addition, coast buckwheat (*Eriogonum parviflorum*), which provides habitat for two special-status butterfly species, was mapped within the Reserve during the July survey.

Previous floristic, protocol-level surveys of the Reserve for special-status plant species were conducted in 1991 and 1995 as part of the Playa Vista project, but are not current due to the amount of time that has lapsed; the California Department of Fish and Game (CDFG) requires updates of rare plant surveys every 5 years. Additional phases of the Playa Vista project triggered supplementary botanical surveys to be conducted in 2002 and 2005. The CDFG later conducted surveys of plant associations in 2008. Additional surveys of the site have been conducted since 1995 by Psomas (1995), WRA (2002), CLAEMD (2004/2005), BOLD (2007), and the Ballona Wetlands Baseline Assessment Program (2011) as part of on-going restoration being conducted at the Reserve that have focused on several of the special-status species that are the focus of these protocol level surveys.

Prior to the current surveys that are the subject of this report (2010 and 2011), WRA, Inc. (WRA) and ICF International (ICFI) assessed the California Native Plant Society (CNPS), United States Fish and Wildlife Service (USFWS), and the California Natural Diversity Database (CNDDB) lists to determine the habitat preferences for special-status species recorded in the vicinity of the Reserve and determined that 30 special-status plant species have the potential to occur within the Reserve: July 2010 surveys coincided with peak blooming periods for 11 potentially occurring special-status plant species; October 2010 coincided with peak blooming periods for 6 special-status plant species; and April 2011 coincided with peak blooming periods for 13 special-status plant species. In addition, WRA staff spoke with knowledgeable botanists from the Rancho Santa Ana Botanic Garden who are familiar with these species and visited reference populations of species, as possible, to determine the likelihood of presence of sensitive plant species in the Project Area prior to surveys.

WRA conducted focused, rare plant surveys to update all previously conducted floristic, protocol-level surveys for the 30 potential special-status plant species with potential to occur within the Reserve during July. WRA also conducted floristic, protocol-level surveys in October and April. All three surveys were conducted by walking transects or traversing areas with suitable habitat throughout the site. Per CDFG 2009 guidelines, rainfall data was collected for Santa Monica, California, the nearest rainfall gauge. Rainfall data for this region indicated that precipitation was within the normal range for 2010 and is slightly above the average for 2011. Staff conducting the surveys possess educational and professional experience conducting rare plant surveys in habitat types similar to those present on the site.

Approximately 15 individuals of suffrutescent wallflower (*Erysimum insulare* ssp. *suffrutescens* CNPS List 4), 85 individuals of woolly seablite (*Suaeda taxifolia* CNPS List 4) were observed within the Reserve in July and October 2010. Approximately 12,300 individuals of Lewis' evening primrose (*Camissoniopsis lewisii* CNPS List 3), 350 individuals of Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana* CNPS List 1B), approximately 600 individuals of South Coast branching phacelia (*Phacelia ramosissima* var. *austrolitoralis* CNPS List 4), and an

additional 14 individuals, for a total of 29 individuals, of suffrutescent wallflower were observed within the Reserve in April 2011. No other special-status plant species were observed in the Reserve. In addition, approximately 0.24 acres of coast buckwheat habitat for Quino checkerspot (*Euphydryas editha quino*) and/or El Segundo blue (*Euphilotes battoides alluni*) butterflies was observed on the site.

Based upon guidelines provided by the CDFG (2009), these surveys are considered valid for a period of 1 year within grassland habitat types and 5 years within shrub habitat types, assuming that existing conditions remain constant (i.e., there is no fire, major earthwork, flooding, or such events that could result in changes to the existing conditions as described in this report).

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1.0 INTRODUCTION

On 7 to 10 July 2010, WRA, Inc. (WRA) performed focused protocol-level rare plant surveys and floristic protocol-level rare plant surveys 4 to 6 October 2010, and 5 to 8 April 2011, at the Ballona Wetlands Ecological Reserve (Reserve) in Playa Vista, Los Angeles County, California (Figure 1). The Reserve is owned by the California Department of Fish and Game (CDFG) and the State Lands Commission (SLC). The purpose of the surveys was to identify the presence and location of potentially occurring special-status plant species. July 2010 surveys coincided with peak blooming periods for 11 potentially occurring special-status plant species; October 2010 coincided with peak blooming periods for 6 special-status plant species; and April 2011 coincided with peak blooming periods for 13 special-status plant species. Focused surveys for all of the 30 potentially occurring special-status plant species were conducted in all habitat types present within the Reserve.

1.1 Reserve Description

The Reserve contains approximately 605 acres of open space located in Los Angeles County, California. The Reserve is bounded on all sides by urban development; development activities throughout the years within and adjacent to the wetland and upland habitats have altered the natural topography, hydrology, vegetation communities, and soil composition within the Reserve.

1.1.1 Site History

The current structure and extent of the Ballona Wetlands has been greatly altered by development activities. Prior to the late 1890s, the Ballona Wetlands extent covered a total of 2,120 acres of wetlands, approximately 3.5 times larger than it is today. The extensive lagoons within the marsh provided ample space for duck hunting lodges and resorts for sailing, and rowing activities. Construction within the wetlands began in the 1880s with the construction of the Atchison, Topeka, and Santa Fe Railways. Review of the 1896 United States Geological Survey (USGS) Redondo 7.5-minute quadrangle map indicated that the Ballona Wetlands had since been reduced to 1,550 acres and that approximately 34 percent of the site was now comprised of a series of lagoons and interconnecting channels with some islands in the lagoons. The interconnecting lagoons connected to a 1.7-mile channel, with the entire system emptying into the Pacific Ocean at Port Ballona. By this time, railways were fully assembled and a newly constructed roadway into Port Ballona was present. During this period, hydrologic input to the Ballona marsh system was provided by three main sources; Ballona Creek, Centinela Creek, and artesian wells.

By 1924, the Ballona wetlands was reduced to 1,150 acres as development near and on the marsh continued. An 18-mile speedway [Culver Boulevard] extended through the marsh along with the Pacific Electric Railroad Line. Furthermore, Ballona Creek was channelized, though runoff still emptied into the northern wetlands. Most of the contributing hydrologic flow from Ballona Creek into the wetlands was cut off in 1938 when the U.S. Army Corps of Engineers (Corps) extended the creek channel to the ocean. Dredge material from the construction of this creek extension were subsequently dumped into the adjacent marsh lands. Within 2 years, the entire natural inlet for the wetlands system was closed due to sedimentation.

Development and construction continued at a steady pace for the next 3 decades. The 1950 Venice USGS 7.5-minute quadrangle map shows only approximately 550 acres of wetland habitat remained, that would further be reduced by discharge and dredge materials from the construction of Marina del Rey and its harbor (Henrickson 1991).

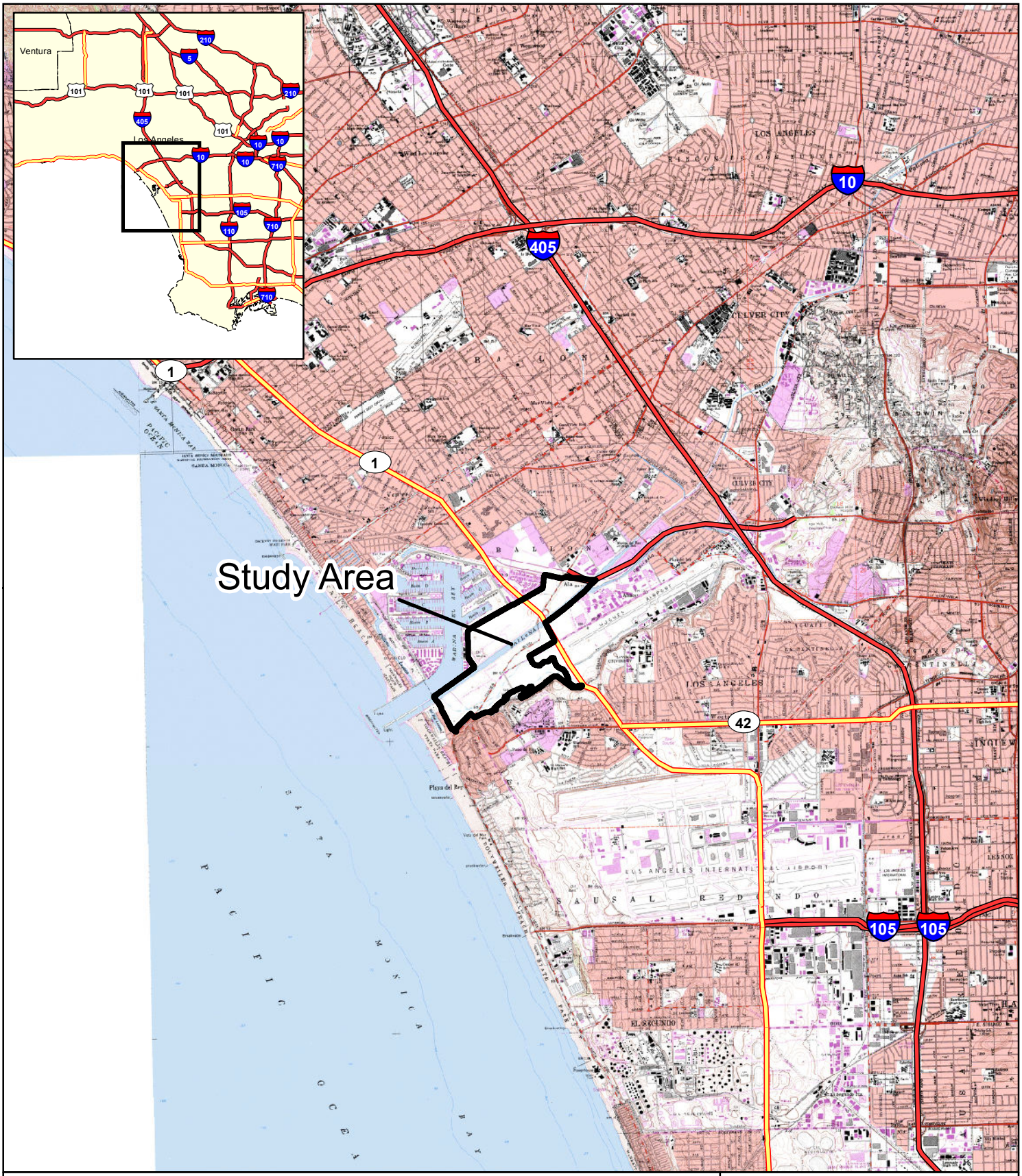

Figure 1. Location Map

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Ballona Creek Wetlands Ecological Reserve
Marina Del Rey, California

Date: April 2010
Map By: Sundaran Gillespie
Filepath:I:\Acad2000\00000\00016-3\gis\Arcmap\Location Map.mxd

To date, there are approximately 267 acres of wetlands and non-wetland waters, as delineated by the Corps and the California Coastal Commission (CCC) guidelines, present within the Reserve (WRA 2010). Roads and one large channel (Ballona Creek) separate the Reserve into three distinct regions: Areas A, B, and C, which also coincide with previous study descriptions (Figure 1). Further descriptions of these individual areas are described below.

1.1.2 Vegetation

Area A

Elevations were drastically changed for Area A with the disposal of dredge materials from the construction of the Ballona Creek Channel and Marina del Rey. Historically the overall elevation was less than 5-feet; it now ranges from a low of 9.3 feet in an area 600 feet south of the intersection of Admiralty Way and Fiji Way to a high of about 17.4 feet at the far western end of the site. Since the majority of the dredge material placed was from other areas of the historic Ballona wetlands, they mostly consist of marsh or wetland clayish soils (Henrickson 1991).

The topography and salinity of Area A resulting from the placement and settlement of fill material is presumably the cause for the current vegetation zonation present within this area. All of the plant species observed have colonized on this placed fill material. Internal drainage carries salts leached from old marsh soils from marginal areas at elevations of 15 to 18 feet above mean sea level to central areas which range from 11 to 9.3 feet above mean sea level (Henrickson 1991). One large area of non-tidal salt marsh wetland habitat occurs within the central portion of Area A and consists of intermixed mudflat and hydric vegetation, with a broad transition to pure upland habitat surrounding the wetland. As a result, the central and northern portions of Area A are dominated by pickleweed species (*Salicornia virginica, S. europaea,* and *S. subterminalis*), large saltbush (*Atriplex lentiformis*), slender-leaf iceplant (*Mesembryanthemum nodiflorum*), annual bluegrass (*Poa annua*), and open, unvegetated mud flat/salt scald areas. In the southwestern portion of Area A, there are concentrated patches of alkali heath (*Frankenia salina*).

In addition to the introduced fill material, many areas appear to be heavily disturbed with social trails, localized soil compaction, and trampled vegetation, presumably from the presence of homeless encampments throughout. Due to the high disturbance in these areas, vegetation was dominated primarily by non-native, invasive species such as dense, head-high mustard (*Brassica* sp. and *Hirschfeldia incana*) and Garland daisy (*Chrysanthemum coronarium*). Large patches of sea fig (*Carpobrotus* sp.) with stands of mulefat (*Baccharis salicifolia*) and coyote brush (*Baccharis pilularis*) are also present along the western boundary.

Area B

Area B is the only area within the Reserve that contains salt marsh habitat that has not been previously filled. Current elevations throughout Area B range from 2.4 to 5 feet and extend to 50 feet along the property line on the southern bluffs. The Del Rey bluffs continue upward to about 160 feet in elevation. Marsh flats have elevations of 0.6 to 1.6 feet above mean sea level with channels at -2.2 feet below mean sea level. Prior to the channelization of Ballona Creek, the site received the majority of its waters from both the Ballona and Centinela Creeks (Henrickson 1991). Tidal channels provide some additional hydrological input to a large portion of the wetlands in this area, and vegetation communities observed here were composed primarily of estuarine marsh species. However, the area does not receive normal tidal flushing due to the placement of a series of tide gates which connect this area with Ballona Creek. Outflow of water from the site through the tide gates is unrestricted but inflow from the channel

is partially controlled. These tide gates allow local canals to fill and keep the marsh areas adjacent to Ballona Creek generally wetted.

Dominant vegetation in moist habitat types includes bristly ox-tongue (*Picris echioides*), alkali ryegrass (*Leymus triticoides*), annual bluegrass, brass buttons (*Cotula coronopifolia*), toad rush (*Juncus bufonius*), pickleweed species, salt grass (*Distichlis spicata*), broadleaf cattail (*Typha latifolia*), narrow leaf willow (*Salix exigua*), arroyo willow (*Salix lasiolepis*), and Italian rye grass (*Lolium multiflorum*). In addition, many patches of coast buckwheat (*Eriogonum parviflorum*) habitat were found along the western boundary of this parcel. Some areas of this parcel also appeared to be heavily disturbed with the presence of many non-native species such as Eucalyptus (*Eucalyptus* sp.) trees in the south central area, pampas grass in the southeast corner and sea fig along most of the area south of the slough. In addition, stands of willow (*Salix* sp.), coyote brush, and acacia (*Acacia* sp.) trees were also present along the western boundary near the levee. Area B currently has the most-balanced salt marsh flora within the Reserve and thus supports the greatest number of native salt marsh plant species of all the Areas (Henrickson 1991).

Area C

Similar to Area A, Area C has been filled with dredge material from various sources. Dredge from berms of the adjacent railroad, the Ballona Creek channel, the Marina del Rey Small Craft Harbor and the Marina Freeway have all been deposited into what is now known as Area C. Recorded elevations in 1950 indicate the site ranged from approximately 5 feet above mean sea level in the western portion, to slightly over 10 feet in the southwestern corner. Current elevations indicate a slight change in the topography of the site. A man-made depression south of Culver Boulevard, east of the on-ramp from east-bound Culver Boulevard to north-bound Lincoln Boulevard, registers at an artificial low of 4.6 feet above mean sea level while dirt mounds in the southwestern portion register a height of 25.6 feet elevation. Additional depressions are present in the eastern portion of the site north of Culver Boulevard where elevations extend down to 9.4 and 7.4 feet. Elevations of the ditch in the northern portion are down to 2.4 to 4.1 feet. Aside from these specific areas, the majority of the site sits at elevations ranging from 12 to 20 feet above mean sea level, a reflection of past deposition of fill (Henrickson 1991).

1896 topography maps indicate that the Ballona Creek ran through Area C, made a northwestward turn and continued west. This historic path of Ballona Creek corresponds with later maps, from 1981, depicting the Fiji ditch that bisects the northern portion of this area. In addition, the western most portion of Area C previously contained ponds (Henrickson 1991).

In its present state, the majority of Area C is further disturbed (i.e., after fill placement) and highly degraded by the presence of high amounts of trash, debris, and numerous homeless encampments. These areas are mostly dominated by non-native species such as acacia, coyote brush, and mustards. Dominant vegetation within ditches and wetland areas include bristly ox-tongue, curly dock (*Rumex crispus*), Italian rye grass, large saltbush, slender-leaf iceplant, and alkali heath. In the northeastern corner of the upper portion of Area C, the wetland area contains patches of bare ground with soil cracking, as well as a dominance of hydrophytic vegetation, including large saltbush and pickleweed. The eastern portion of Fiji Ditch is dominated by large saltbush. Four developed baseball fields with associated food stands and parking lots are present in the central portion of the southern portion of this Area and are primarily devoid of vegetation. Lastly, the drainage ditch located along the north eastern boundary of adjacent to the baseball fields is dominated by bristly ox-tongue, curly dock, Italian rye grass, and black mustard.

Despite the vast degradation of Area C, it still contains some, albeit small, areas inhabited by native species within the depressional areas. Newly established populations of native species such as pickleweed and alkali heath have colonized these depressional areas, and speak towards the resilience of such native species.

Ballona Creek

Ballona Creek has been channelized and is currently a lined trapezoidal creek from its mouth at Santa Monica Bay to the intersection of Venice Boulevard and Pickford Street, approximately nine miles upstream. The planned restoration of the site will create natural habitat in this area, increasing the value of this habitat to native plant species. The creek's bottom widths vary from 80 to 200 feet and depths vary from 19 to 23 feet from the top of the levee. The side slopes are composed of concrete, paving stones and riprap. The bottom of the creek is only open in the lower, estuarine, tidally influenced portion while the remaining portions are armored. The vegetation growing along the side slopes consists primarily of ruderal, weedy vegetation including bristly ox-tongue, slender-leaf iceplant, and Garland daisy. Ballona Creek is tidally influenced, and the CDFG owns the portion of creek that flows through the Reserve.

1.1.3 Soils

The Los Angeles Area Soil Survey (USDA 2010) indicates that the Reserve has one native soil type: Delhi - Urban Land – Beaches. The soil description from the soil survey for this soil type is described in detail below. Although this soil type has been mapped in the Reserve, substantial amounts of fill material have been deposited on the native soils since the soil was last surveyed and it is likely that the majority of existing soils are that of fill material.

Delhi - Urban Land - Beaches. The Delhi series consists of very deep, somewhat excessively drained soils. The soils formed in wind-modified material weathered from granitic rock sources. Delhi soils are found on floodplains, alluvial fans, and terraces. Delhi soils are on 0 to 15 percent slopes at elevations of 25 to 1,400 feet. When moist, the C horizon color is brown (10YR 5/3). A typical profile consists of sand, fine sand, loamy fine sand or loamy sand from 0 to 21 inches. The clay content ranges from 0 to 5 percent.

1.2 Survey Information

Protocol-level rare plant surveys should be conducted in a manner that will locate any special-status plants species that may be present. Two types of protocol-level rare plant survey were conducted by WRA, focused and floristic. These surveys employ the same field methods; however, a list of all species observed is recorded and reported in a floristic survey only. California Native Plant Society's (CNPS 2001) guidelines state that surveys should be conducted "at the proper time of year when rare, threatened, or endangered species are both *evident and identifiable*. Usually, this is when the plants are in bloom; however, there are species that are identifiable outside of the blooming period because non-floral structures (e.g. leaves, roots) are sufficient to make a species determination and/or floral structures (e.g. fruits, buds) are necessary to be in a state of maturity beyond or prior to the documented blooming period (e.g. *Juncus acutus* ssp. *leopoldii*). When special-status plants are known to occur in the type(s) of habitat present in the project area, nearby, accessible occurrences of the plant (reference sites) should be observed to determine that the plants are identifiable at the time of the survey. In addition, the CDFG (2009) and the USFWS (2000) give detailed instructions pertaining to the adequacy of surveys and results. The following section provides details related to precipitation and other conditions that may affect the survey results and includes detailed information about the results of previous surveys conducted on the site.

1.2.1 Precipitation

Using WETS data from the NOAA station CA5114 (Natural Resource Conservation Service [NRCS] 2010), located near the Los Angeles Airport, it was determined that the normal annual rainfall for this area totals 13.20 inches, with a 30 percent chance that the rainfall will be greater than 15.64 inches and a 30 percent chance that the rainfall will be less than 9.34 inches. According to California Irrigation Management Information System (CIMIS) provided by the University of California Integrated Pest Management (UC-IPM 2011), the precipitation recorded in the vicinity of the Reserve (near Santa Monica CIMIS station ID #99 [the station nearest the Reserve], California, located north of the Reserve) totaled 14.59 inches during the 2009 to 2010 water year (October to May each year). Therefore, rainfall during this period and prior to the field work conducted for this rare plant survey was within the normal range for the area and is 1.39 inches above the yearly average for the area. Rainfall for the period preceding the April 2011 survey totaled approximately 18.49 inches, above normal rainfall for the area.

1.2.2 Conditions Affecting Results

The CDFG plant survey guidelines (2009) state that "adverse conditions may prevent investigators from determining the presence of, or accurately identifying, some species in potential habitat of target species. Disease, drought, predation, or herbivory may preclude the presence or identification of target species in any given year." WRA did not observe any signs of disease, drought (see precipitation data, above), predation, or herbivory that would preclude the presence or identification of target species during 2010 or 2011. Rather, non-native, invasive plant species appear to dominate larger areas of the entire site than were present during either of the previous floristic, protocol-level rare plant surveys conducted on the site (Henrickson 1991 and Psomas 1995).

CDFG (2009) also states that "the failure to locate a known special-status plant occurrence during one field season does not constitute evidence that this plant occurrence no longer exists at this location, particularly if adverse conditions are present. For example, surveys over a number of years may be necessary if the species is an annual plant having a persistent, long-lived seed bank and is known not to germinate every year. To further substantiate negative findings for a known occurrence, a visit to a nearby reference site may ensure that the timing of the survey was appropriate." To document that 2010 and 2011 are suitable years to conduct rare plant surveys within this region of Los Angeles County, WRA visited reference populations of special-status plant species (see below). In addition, staff from Rancho Santa Ana (RSA) Botanic Garden who have over 20 years experience conducting rare plant surveys within Los Angeles County confirmed that 2010 and 2011 were acceptable years to conduct surveys, given the precipitation and observations of other species observed (pers. com. RSA). Further, none of the species previously observed on the site or thought to have potential to occur on the site are documented in the literature as not readily germinating given suitable environmental conditions.

1.2.3 Past Surveys

Botanical species within the Ballona Wetlands Ecological Reserve have been well documented throughout the years. Multiple botanical surveys have been conducted within the Reserve for various projects over the past two decades, most notably the Playa Vista Project. The Playa Vista Project as originally proposed was a combined restoration/development project planned for the Ballona Wetlands of Marina del Rey. The various stages of this project have necessitated the need to assess the vegetation present in various areas of these wetlands thereby yielding detailed species lists. Each of the surveys conducted is discussed in detail below.

Henrickson Study 1991

Triggered by the Playa Vista Project, James Henrickson, PhD. conducted a botanical resources survey of the Reserve in April to October 1990. The entire limits of Areas A, B, and C (and D, which is no longer part of the Reserve) were traversed on foot with a detailed account of all plant species present along with community associations observed. As documented by Henrickson (1991), each of these areas is quite diverse in habitat type and species composition. Three special-status plant species were observed in Area B; woolly seablite (*Suaeda taxifolia* CNPS List 4), Lewis' evening primrose (*Camissoniopsis lewisii* CNPS List 3), and suffrutescent wallflower (*Erysimum insulare* ssp. *suffrutescens* CNPS List 4).

Populations of woolly seablite, a typical salt marsh species, were observed in areas classified as tidal pickleweed flats but were restricted to the upland margins of the Ballona Creek channel. Lewis' evening primrose and suffrutescent wallflower were also observed in Area B but were concentrated in areas classified as sand dunes and flats habitat, which are remnants of the extensive dune system that bordered the Santa Monica Bay. These species were not found in any other region of the Reserve. Of all the remaining plant species documented by Henrickson during his 1991 survey of the Reserve, none were considered special-status.

Psomas Study 1995

A follow up of Henrickson's 1991 survey was conducted in April to mid-October 1995, led by Dr. Edith Read of Psomas and Associates and field support staff provided by Impact Sciences. Presence or absence of the special-status species reported by Henrickson were confirmed during the 1995 walking surveys and any additional special-status species observed along with any notable differences in vegetation communities were documented (Psomas 1995). Prior to any field work commencing, Psomas and Associates compiled a list of plant species of potential concern from the California Natural Diversity Database (CNDDB), the California Native Plant Society's Inventory of Rare and Endangered Vascular Plants (CNPS), and Henrickson's 1991 survey. On account of the extensive nature of Henrickson's survey and the detailed species list obtained, it was justified that the 1995 studies would solely focus on the flowering and fruiting periods of the sensitive species (Psomas 1995). If possible, reference populations for targeted species in the southern coastal California area were visited to confirm accurate survey timing for each species.

Results of the Psomas Study (1995) concluded that two of the same sensitive species mapped by Henrickson (1991), Lewis' evening primrose and suffrutescent wallflower, were still present on site. In addition, southern tarplant (*Centromadia parryi* ssp. *australis*) was also observed for the first time. Woolly seablite was documented as an observed special-status species by Henrickson; however, no mention of this species was found within the Psomas Study (1995).

Populations of Lewis' evening primrose were recorded in Areas B and C, which coincide with documented observations made by Henrickson (1991). No individuals of this species were observed elsewhere within the Reserve. It is estimated that the total population size in Area B was approximately 5,000 individuals and Area C contained approximately 6,000 individuals. All observed individuals were found to occur on sandy soils, in areas away from dense grasses and weeds. This species was found to commonly co-occur with California sun cup (*Camissoniopsis bistorta*), a species which holds no sensitivity status. Due to the close relationship of these species and their nearly identical morphology, it is believed by Dr. Read that hybrids between these two species are possible in areas where they co-occur, which she believed could lead to potential mis-identification. Because of this potential hybridization between species, individuals mapped during the Psomas Study (1995) may have been hybrids and therefore results of this study were unable to determine whether this species had expanded or declined.

The Henrickson Study (1991) documented suffrutescent wallflower as occurring in the dune habitats of Area B and its continued existence was confirmed by the Psomas 1995 surveys with approximately 10 individuals observed. It was not indicated by Henrickson (1991) as to how many individuals were present during his surveys, so it is unclear as to this populations' progression. Results of the 1995 Psomas study reported that the expansion of this species appeared to be hindered by increasing densities of ripgut brome (*Bromus diandrus*).

Southern tarplant was not observed by Henrickson (1991) but was recorded during the Psomas 1995 surveys in areas east of the baseball fields of Area C. Specific morphological characteristics, such as black anthers and prickly, sticky foliage, make this species easily identifiable from other species in this genus. Extensive surveys were conducted during the 1995 surveys for this species to avoid overlooking individuals that occur within dense stands of common tarplant (*Deinandra fasciculata* [*Hemizonia fasciculata*]). All individuals, except for one, of this species were found to occur in compacted, clay soil in shallow depressions and openings in dense stands of curly dock (*Rumex crispus*) and horseweed (*Conyza canadensis*). The population of southern tarplant in Area C is the only known population in the region of Marina del Rey. The nearest population outside of the Ballona Wetlands is in Harbor Regional Park, approximately 10 miles south. Botanists involved with the Psomas Study (1995) visited this population prior to field surveys to confirm proper timing of surveys. This population was found to be extant.

Vegetation communities reported in the Psomas 1995 study matched the communities discussed by Henrickson (1991) except for two areas in Area B where pickleweed saltmarsh areas and freshwater marsh habitat along Jefferson had since expanded.

WRA 2002 Study

As part of on-going restoration at the Reserve, the dune habitat in the western end of Area B was monitored in 2002 by Michael Josselyn and Becky Miller of WRA. The purpose of this monitoring effort was to provide all interested parties with an update of the Ballona Dunes post-restoration activities and also to provide a baseline for which all future restoration could be measured against. All vegetation in the sand dune habitat was assessed during the 2002 study by walking homogenous stands of plant communities with an advanced GPS backpack unit. Multiple species, both native and non-native, were recorded within this area. Many of the dominant plant species observed in the dune areas on the western edge of Area B during the WRA 2002 study coincided with species observed during focused rare plant surveys conducted in 2010 and 2011, such as dune lupine (*Lupinus chamissonis*), sand verbena (*Abronia* sp.), and coast buckwheat. The area east of the dunes in Area B, made up of coastal salt marsh habitat, continued to be dominated by species indicative of this habitat such as pickleweed, alkali heath, salt grass, and saltbush (*Atriplex lentiformis*) during the WRA 2002 study. These same species were observed again during protocol level rare plant surveys conducted in 2010 and 2011.

Results of 2002 vegetation survey did not report any observations of suffrutescent wallflower, though past surveys (Henrickson 1991 and Psomas 1995) have confirmed presence of this species in Area B. Furthermore, some sun cup species (*Camissoniopsis* spp. [*Camissonia* spp.]) were observed; however, they were not identified to species so it is unclear whether any of these species observed were considered rare (e.g. Lewis' evening primrose).

Though no special-status species were observed during these 2002 surveys, results of this survey are still useful in providing an updated species account of this area.

CLAEMD Study 2004/2005

Upon completion of the installation of two self-regulating tide gates and a one-way flap gate in March 2003 in Area B, between Ballona Creek and the Reserve, it was determined by agencies involved in the flap gate installation process (USACE, National Marine Fisheries Service, City staff, Kathy Keane Biological Consulting, and MEC Analytical Systems/Weston Solutions) that vegetation surveys were necessary to assess any change in pickleweed stands with respect to increased inundation (CLAEMD 2005). Expert assistance was obtained from Dr. Philippa Drennan of Loyola Marymount University (LMU) for taxonomic and protocol quality assurance. Methods for vegetation surveying consisted of the establishment of 10 permanent transects at various locations. Eight transects were located at various distances (3-m, 5-m, 9-m, and 18-m) parallel to their closest channel while the remaining two transects were located somewhat equidistant between and perpendicular to the two main channels of Area B. Eight of the 10 transects were specifically positioned to capture any changes in vegetation percent cover, canopy height, and soil chemistry[1] as a result of increased inundation. The remaining two transects, those set at equidistance from the two main channels, functioned as controls. 0.25 m^2 quadrats at 5-meter intervals along transects were used to assess vegetation. Tallest plant shoot measurements and identification of all species within the quadrat were recorded. This process was repeated for each transect.

Though, the majority of the results of the CLAEMD Study (2004/2005) were not intended to provide floristic survey data, they do provide data on presence, but not absence, of species within the western portion of Area B. Populations of seablite were observed on site; however, it is unclear as to whether these stands are of those of the special-status species (woolly seablite). In addition, coast buckwheat was observed within the Reserve. Due to the nature of the survey, no exact locations of seablite or coast buckwheat were reported in the CLAEMD Study (2004/2005). It is assumed that exact species locations are available from actual hard copy field data collected during transect surveys.

BOLD Study 2007

As part of an agreement between the Playa Vista landowners and the Friends at Ballona Wetlands, an 8-acre parcel located in the southwest corner of Area B was designated as the site for an outdoor learning laboratory, referred to as the Ballona Outdoor Learning and Discovery (BOLD) area (BOLD 2007). An assessment of the BOLD area, which included soil and groundwater characteristics, hydrology assessments, wetland delineation, biota present, and cultural resources, was necessary in order to proceed with permitting activities and ultimately begin construction. The above assessment required a detailed account of all plant species observed on site which included plant species identification and mapping of plant communities present. Expert assistance was provided by Dr. Philippa Drennan of LMU who also assisted in the CLAEMD Study 2004/2005. A first broad assessment of the area found it to be dominated by mostly non-native, invasive species such as sea-fig (*Carpobrotus edulis*). Lower elevations in the northwest corner of the BOLD parcel were dominated by pickleweed with small amounts of salt grass present, an indication that this particular area currently receives sufficient tidal flushing to support coastal wetland vegetation (BOLD 2007).

[1] Soil chemistry measurements were a separate component of the 2004 vegetation surveys. Their results are not pertinent for the purpose of this discussion.

The following is a description of the methods employed for the BOLD Study 2007:

> *Site visits were conducted in March through June 2005. The entire area to be assessed included the full 8-acre BOLD parcel along with an additional 100-foot radius to the north and east. In order to prepare a vascular plant checklist for the BOLD area, all vascular plant taxa within the BOLD and BOLD-adjacent areas were identified and, where possible, collected during site visits on the following dates: 10 March 2005, 5 April 2005, 19April 2005, 26 April 2005, 10 May 2005, 1 June 2005, 8 June 2005, 17 June 2005, and 22June 2005.*

Vegetation surveying was accomplished by establishing transect lines, 30-m in length, at 21 sites within the BOLD area that showed spatial and/or vegetation differences. An additional site was sampled in the dunes area at the western edge of the Reserve. The percentage of species cover within 0.25 m^2 quadrats and positioned at 5 m intervals along each transect was used to characterize the dominant species for each vegetation type. Transect sampling was conducted on 24 June 2005 and 27 June 2005 (BOLD 2007).

Results of the above vegetation surveys concluded that there were 134 total species present within the BOLD area. Of these 134 species found, 85 were considered non-native (BOLD 2007). None of the potentially occurring special-status species were found to occur within the BOLD parcel. Stands of coast buckwheat were, however, found to occur within this area though exact location was not specified.

Other Studies

Although not a rare plant survey, the CDFG also mapped association-level habitats within the Reserve during 2006, noting “characteristic species” and compiling a thorough species list.

Ballona Wetlands Baseline Assessment Report 2011

Plant species observed were documented by the team conducting vegetation transect surveys throughout all areas of the Reserve during 2010-2011; however, these surveys were not floristic in nature and sampled each habitat type using quadrats along pre-determined transects.

1.2.4 Qualifications

Individuals who conducted the 2010 and 2011 rare plant surveys have experience with the natural community ecology of the area and the rare plant species that could occur along the South Coast, have extensive experience in conducting or working on focused and floristic rare plant surveys, or have both experience along the South Coast and protocol-level rare plant survey experience.

Amanda McCarthy received her PhD in Plant Ecology from the University of California, Davis in 2005 and her Bachelor’s of Science degrees in Botany and Environmental Biology from Humboldt State University in 2000, focusing on plant taxonomy and plant ecology. In addition, she taught the Botany laboratory for 3 years while at Davis. She is familiar with the plants of Los Angeles County from her work conducting rare plant surveys as an environmental consultant for the past 5 years and is familiar with the flora of the Reserve from her work conducting the formal wetland delineation of the site. She has conducted numerous floristic surveys during her career, including surveys of over 50 linear miles within Los Angeles County. She is familiar with the CNPS, CDFG, and USFWS guidelines related to rare plant surveys, plant collections, and plant identification and has analyzed project impacts to sensitive habitat

types and special-status plant species on over 50 California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) documents during her consulting career.

Bianca Dailey received a Bachelor's of Science degree in Biology with an emphasis in plant ecology from San Francisco State University in 2007 and is currently pursuing a Masters of Science in Marsh Ecology from the same institution. She is widely familiar with Southern California plants, specifically in Los Angeles and San Diego counties, from past, extensive delineation work from within these areas. In addition, Bianca Dailey is familiar with the plants of the Reserve from her work on the wetland delineations of this Reserve. She currently has 2 years of consulting experience and has performed both floristic and focused rare plant surveys under the supervision of an experienced botanist. Through her continued experience in conducting rare plant surveys, she is actively familiarizing herself with the CNPS, CDFG, and USFWS guidelines pertaining to survey protocols, plant collections, and plant identification.

Aaron Arthur received a Bachelor's of Art degree in Geography from the University of California, Berkeley in 2005 and a Master's of Science in Physical Geography from Oregon State University in 2007, focusing on vegetation and floristic changes in forested systems. Mr. Arthur has more than 4 years experience surveying and monitoring rare and endangered plants and sensitive habitats in a variety of habitats throughout California including coastal, wetland, grassland, forest, chaparral, and montane communities. He is familiar with CNPS, CDFG, and USFWS guidelines pertaining to survey protocols, plant collections, and plant identification. He currently has 4 years of experience conducting rare plant surveys, vegetation community analysis, invasive species management, and wetland delineations in the coastal brackish and coastal salt marsh habitats of the San Francisco Bay and Delta Region.

Morgan Trieger received a Bachelor's of Science degree in Conservation and Resource Studies from the University of California, Berkeley in 2005, focusing on ecology and forestry. Mr. Trieger has more than 4 years experience surveying and monitoring rare and endangered plants and sensitive habitats in a variety of habitats throughout California including coastal, wetland, grassland, forest, chaparral, and montane communities. He is familiar with CNPS, CDFG, and USFWS guidelines pertaining to survey protocols, plant collections, and plant identification. He currently has more than 5 years experience conducting rare plant surveys and vegetation management in coastal scrub, woodland, and wetland habitats along the South Coast.

2.0 METHODS

2.1 Background Data

Rare 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 through 4 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.

Previous surveys (Henrickson 1991) and studies (Psomas 1995, WRA 2002, CLAEMD 2004/2005, and BOLD 2007) identified one CNPS List 1B (southern tarplant), one CNPS List 3 (Lewis's evening primrose) and two CNPS List 4 (woolly seablite and suffrutescent wallflower) plants as occurring within the Reserve (see previous surveys, above). Though these past surveys were floristic in nature, they are now considered outdated due to the amount of time that has since passed. In an effort to update previous efforts, a background information search was conducted by ICF International (ICFI) prior to these surveys to identify all potential rare plant species that may occur in the Reserve vicinity. Information concerning threatened,

endangered or other special-status species that may occur in the area was collected from several sources and reviewed by WRA biologists.

These sources included:

- CDFG's CNDDB (2010 & 2011),
- CNPS Online Inventory of Rare and Endangered Vascular Plants of California (CNPS 2010 & 2011),
- USFWS Quadrangle Search (USFWS 2010 & 2011),
- The Jepson Manual (Hickman 1993),
- Draft Jepson Manual II: Vascular Plants of California (Jepson 2011)
- A Flora of Southern California (Munz 1974)
- Manual of the Grasses of the United States (Hitchcock 1971),
- Miscellaneous information available through the USFWS, CDFG, and technical publications.

The specific habitat requirements and the locations of known occurrences of each special-status species were the principal criteria used for inclusion in the list of species potentially occurring on the site. WRA conducted a search of CNDDB Rarefind published accounts (CNDDB 2010 & 2011) for all special-status species within the Venice USGS 7.5-minute Topographic quadrangle map containing the Reserve. In addition, WRA queried the six surrounding 7.5-minute quadrangles, which include Redondo Beach, Torrance, Inglewood, Hollywood, Beverly Hills, and Topanga. WRA reviewed all species on current CNPS Lists 1A, 1B, 2, 3, and 4 occurring in one of the eight USGS 7.5-minute quadrangles listed above. Additionally, WRA considered all plants occurring within Los Angeles County, as quadrangle-level records are not kept for CNPS list 4 species.

Accounting for all lists, WRA arrived at a preliminary total of 197 special-status plant species that warranted consideration for their potential to occur on the Reserve. All but 30 of the 197 species were eliminated from consideration due to absence of suitable known habitat types, the lack of specific soil characteristics, or a lack of commonly associated plant species. In addition, many of these species are not known to be particularly tolerant of high levels of disturbance or intense competition from ruderal or weedy species as would be required to persist on this site. Due to the highly disturbed nature of large portions of this site (see history of the site, above), only the most robust, disturbance-tolerant native species are expected to occur, and most species associated with native grassland or high-quality wetland vegetation are assumed to be absent from the site.

Based on a review of the literature and databases described above, it was determined that these surveys would focus on the 30 species believed to have potential to occur on the site and that have been documented blooming in the area during July, October, and April. A table of these species, including their protection and habitat requirements, is provided in Appendix 1. List 4 species not known from coastal sites were not discussed in this table. A floristic list of all plant species observed on the site by WRA in October and April is included as Appendix 2.

2.2 Field Survey

Summer surveys were conducted on 7 to 10 July 2010, fall surveys were conducted on 4 to 6 October 2010, and spring surveys were conducted on 5 to 8 April 2011. These surveys corresponded to peak blooming periods for observing and accurately identifying the special-status plant species that have the potential to occur within the Reserve that bloom in July, October, and April. The July field surveys were conducted by botanists Amanda McCarthy and

Bianca Dailey, the October surveys were conducted by botanists Aaron Arthur and Bianca Dailey, and the April surveys were conducted by botanists Aaron Arthur, Bianca Dailey, and Morgan Trieger. All three surveys followed the protocol for plant surveys described by Nelson (1987). This protocol complies with recommended resource agency guidelines (CNPS 2001, CDFG 2009, CDFG 2000, USFWS 2000). All plants were identified using the Jepson Manual (Hickman 1993) and A Flora of Southern California (Munz 1974) to the taxonomic level necessary to determine rarity. Names given follow Hickman (1993), although the Jepson Interchange (2011) names are listed in Appendix 2, as applicable. A list of observed plant species in April and October is provided in Appendix 2.

Individual rare plant species were counted at each occurrence. When individuals were too numerous to count, a 5-foot-wide by 5-foot-wide plot was established and the total number of individuals within the established plot were estimated. This estimate was then extrapolated out to the total area covered by the plant species for an estimate of the total number of rare plant individuals present. In addition, all populations of coast buckwheat that may support the Quino checkerspot (*Euphydryas editha quino*) and/or El Segundo blue (*Euphilotes battoides alluni*) butterflies were mapped (Figure 4).

2.2.1 July 2010 Surveys

In July 2010, WRA conducted a focused, protocol-level rare plant survey in the Reserve, and therefore did not record or report a list of all plant species observed; however, rare plant species observed were recorded and reported. The entire Reserve was surveyed by foot within suitable habitat for special-status plant species along 25 to 100-foot transects over the course of 3.5 days, for a total of 32 hours spent surveying the area. Areas that were densely vegetated with coyote brush, mulefat, or mustard did not support any understory vegetation; therefore, these areas were selectively surveyed. A small portion in the western region of Area B near the levee of Ballona Creek was spot-checked due to dense acacia, lollipop tree (*Myoporum laetum*) and willow trees; these areas did not support understory vegetation. Dense patches of sea fig were also present throughout Area B. Areas of at least 1-acre size that consisted of 100 percent sea fig were selectively surveyed due to the improbability of any other species' co-existing within these dense stands, due to lack of available sunlight. However, smaller patches of sea fig were traversed to check for the presence of special-status species. In addition, homeless encampments within Areas B and C had high levels of disturbance and did not provide suitable habitat for special-status plant species as they consisted of debris and bare ground. We provide detailed survey methods for each Area of the site, below.

<u>Area A</u>

Area A was surveyed during the morning and afternoon of 8 July 2010. Transects were walked approximately east to west throughout low-stature vegetation at 20 to 30-foot-wide transects within Area A. Areas with dense coyote brush, large saltbush, or mulefat were selectively surveyed by spot checking openings within the vegetation. In addition, the southern portion of Area A contained thick stands of lodged mustard vegetation with no understory and was selectively surveyed.

<u>Area B</u>

Area B was surveyed on 9 (above Jefferson Boulevard/Culver Avenue) and 10 July 2010. Transects within Area B were walked primarily in a north to south direction within areas subdivided by large slough channels. Transects were 15 to 20-feet-wide to ensure detection of sensitive vegetation with thick stands of pickleweed and jaumea (*Jaumea carnosa*). The portions of Area B that contain monocultures of iceplant or dense stands of mustard with no

understory were selectively surveyed. In addition, the grove, willow thickets, and pampas grass habitat in the southern portion of Area B were selectively surveyed as transect surveys were not possible in these habitat types.

Area C

The portion of Area C located south of Culver Avenue (near the baseball fields) was surveyed on 7 July 2010. Within the baseball field parcel of Area C, surveys began by the field furthest east in the ditch that runs along the perimeter of the parcel. The upward slope next to the ditch was selectively surveyed due to the dominance of invasive mustard with no understory present, while the remaining areas of the parcel were walked with 20 to 25-foot-wide transects. Transects were walked approximately east to west throughout the site. Several large homeless encampments were encountered within the willow thickets located at the eastern boundary of the parcel. The developed baseball field and parking lot areas were selectively surveyed, but no suitable habitat for sensitive plant species was observed. The detention basin located near the western boundary of the baseball field parcel was walked using north to south, circular transects of approximately 20-foot width.

The portion of Area C location north of Culver Avenue was surveyed during the morning of 8 July 2010. As within the lower portion of Area C, all suitable habitat was walked using transects of approximately 20 to 30-foot-wide running east to west; however, dense thickets of coyote brush and large saltbush prohibited surveying using transects. Areas with dense coyote brush or large saltbush were selectively surveyed by spot checking openings within the vegetation. In addition, west of the ditch that bisects this portion of Area C, thick mustard stands with no understory were selectively surveyed, as these areas did not provide habitat for any other plant species. Lastly, a homeless encampment within the dune habitat located at the southwestern boundary of this portion of Area C was devoid of vegetation and covered with debris; this area was visually surveyed from approximately 50-feet away to avoid disturbance of the inhabitant(s).

Ballona Creek

The levees along Ballona Creek were surveyed on 9 July 2010 by walking and riding a bicycle along the levee. All areas of vegetation were checked visually from the top of the levee where access to the bottom of the levee was not possible.

2.2.2 October 2010 Surveys

In October 2010, WRA conducted a floristic, protocol-level rare plant survey in the Reserve, and therefore recorded and reported a list of all plant species observed, including observed rare plant species (Appendix 2). Survey methods for October surveys followed the same methodology as described for July surveys. In general, all of Area's A and B and Ballona Creek were surveyed by foot within suitable habitat for special-status plant species along 25 to 100-foot transects or meandering over the course of 2.5 days, for a total of 24 hours spent surveying the area. Area C was eliminated as a survey area due to a lack of suitable habitat present for the targeted species of this survey. Areas that were densely vegetated with coyote brush, mulefat, or mustard did not support understory vegetation; therefore, these areas were selectively surveyed or spot checked only. A small portion in the western region of Area B near the levee of Ballona Creek was spot checked due to dense acacia, lollipop tree and willow trees; these areas did not support understory vegetation. Dense patches of sea fig were also present throughout Area B. Areas of at least 1-acre size that consisted of 100 percent sea fig were selectively surveyed due to the improbability of any other species' co-existing within these dense stands due to lack of available sunlight. However, smaller patches of sea fig were walked to check for the presence of special-status species. In addition, homeless

encampments within Area B had high levels of disturbance and did not provide suitable habitat for special-status plant species as they consisted of debris and bare ground. Detailed survey methods for each Area of the site are described below.

Area A

Area A was surveyed during the afternoon of 4 October 2010 by traversing all pickleweed habitat and spot checking all low-stature vegetation areas. Areas with dense coyote brush, large saltbush, or mulefat were selectively surveyed by spot checking openings within the vegetation. In addition, the southern portion of Area A contained thick stands of mustard vegetation with no understory and was selectively surveyed. The Fiji Ditch located in the northeastern portion of Area A was surveyed by sight from the top-of-bank for sensitive plant species. Numerous, large homeless encampments were encountered within the coyote brush and large saltbush habitat located throughout the parcel and were primarily devoid of vegetation or contained only ruderal grassland species.

Area B

Area B was surveyed on 5 and 6 October 2010. Transects within Area B were walked primarily in a north to south direction within areas subdivided by large slough channels. Transects were 15 to 20-feet-wide to ensure detection of sensitive vegetation with thick stands of pickleweed and jaumea. Islands of pickleweed that resided in between transects were individually inspected to ensure all suitable habitat areas were surveyed. The portions of Area B that contain monocultures of iceplant or lodged mustard with no understory were selectively surveyed. In addition, the sand dune habitat in the western and southern portion of Area B was selectively surveyed as transect surveys were not possible in this habitat type.

Ballona Creek

The southern levee along Ballona Creek was surveyed on 6 October 2010 by walking along the levee. All vegetated areas were checked visually from the top of the levee where access to the bottom of the levee was not possible.

2.2.3 April 2011 Surveys

In April 2011, WRA conducted a floristic, protocol-level rare plant survey in the Reserve, and therefore recorded and reported a list of all plant species observed, including observed rare plant species. Survey methods for April surveys followed the same methodology as described for July and October surveys. In general, the entire Reserve was surveyed by foot within suitable habitat for special-status plant species along 25 to 100-foot transects over the course of 3.5 days, for a total of 32 hours spent surveying the area. Areas that were densely vegetated with coyote brush, mulefat, or mustard did not support any understory vegetation; therefore, these areas were selectively surveyed or spot checked only. A small portion in the western region of Area B near the levee of Ballona Creek was spot-checked due to dense acacia, lollipop tree, and willow trees; these areas did not support understory vegetation. Dense patches of sea fig were also present throughout Area B. Areas of at least 1-acre size that consisted of 100 percent sea fig were selectively surveyed due to the improbability of any other species' co-existing within these dense stands due to lack of available sunlight. However, smaller patches of sea fig were walked to check for the presence of special-status species. In addition, homeless encampments within Areas B and C had high levels of disturbance and did not provide suitable habitat for special-status plant species as they consisted of debris and bare ground. We provide detailed survey methods for each Area of the site, below.

Area A

Area A was surveyed during the afternoon of 5 April 2011. Transects were walked approximately east to west throughout low-stature vegetation at 10 to 20-foot-wide transects within Area A. Areas with dense coyote brush, large saltbush, or mulefat were selectively surveyed by spot checking openings within the vegetation. In addition, the southern portion of Area A contained thick stands of mustard vegetation with no understory and was surveyed by selectively surveying. The ditch located in the northeastern portion of Area A was surveyed by sight from the top-of-bank for sensitive plant species. Numerous, large homeless encampments were encountered within the coyote brush and large saltbush habitat located throughout the parcel and were primarily devoid of vegetation or contained only ruderal grassland species.

Area B

Area B was surveyed on 6 and 7, and briefly in the morning 8 April 2011. Transects within Area B were walked primarily in a north to south direction within areas subdivided by large slough channels. Transects were 10 to 15-feet-wide to ensure detection of sensitive vegetation with thick stands of pickleweed and jaumea. The portions of Area B that contain monocultures of iceplant or thick stands of mustard with no understory were selectively surveyed. In addition, the grove, willow thickets, and pampas grass habitat in the southern portion of Area B were selectively surveyed as transect surveys were not possible in these habitat types. Dune habitat in the western portion of Area B was intensely surveyed, with WRA botanists frequently overlapping their survey view.

Area C

The portion of Area C located south of Culver Avenue (near the baseball fields) was surveyed in the morning of 5 April 2011. Within the baseball field parcel of Area C, surveys began by the field furthest west and proceeded east. The upward slope next to the ditch was selectively surveyed due to the dominance of invasive mustard with no understory present, while the remaining areas of the parcel were walked with 10 to 20-foot-wide transects. Transects were walked approximately west to east throughout the site. The developed baseball field and parking lot areas were selectively surveyed, but no suitable habitat for sensitive plant species was observed. The detention basin located near the western boundary of the baseball field parcel was walked using north to south, circular transects of approximately 20-foot width.

The portion of Area C location north of Culver Avenue was surveyed during the morning to midday 5 April 2011. As within the lower portion of Area C, all suitable habitat was walked using transects of approximately 10 to 20-foot-wide running east to west; however, dense thickets of coyote brush and large saltbush prohibited surveying using transects. Areas with dense coyote brush or large saltbush were selectively surveyed by spot checking openings within the vegetation. In addition, west of the ditch that bisects this portion of Area C, thick mustard stands with no understory were selectively surveyed, as these areas did not provide habitat for any other plant species.

Ballona Creek

The levees along Ballona Creek were surveyed on 8 April 2011 by walking along the levee. All areas of vegetation were checked visually from the top of the levee where access to the bottom of the levee was not possible.

3.0 RESULTS

3.1 Background Data Search Results

A review of literature and databases, as described above, and referencing a preliminary list provided by ICFI, yielded a total of 30 plant species that have the potential to occur in the Reserve (Appendix A). Species that have been documented within the greater vicinity of the Reserve are illustrated in Figure 2. All 30 targeted species for these surveys are detailed below and were the focus of protocol-level special-status plant surveys conducted in July 2010, October 2010, and April 2011.

Red sand verbena (*Abronia maritima*). CNPS List 4 – Red sand verbena is a perennial herb in the four o'clock family (Nyctaginaceae) that blooms from February to November. It typically occurs on sandy substrate in coastal dune habitats at elevations ranging from 0 to 325 feet (CNPS 2010). Observed associated species include pink sand verbena (*Abronia umbellata*), silver beach weed (*Ambrosia chamissonis*), sea rocket (*Cakile maritima*), beach primrose (*Camissoniopsis cheiranthifolia*), California buckwheat (*Eriogonum fasciculatum*), coast buckwheat, dune bush lupine, and wire lettuce (*Stephanomeria virgata*) (CNDDB 2010).

This species is reported from 26 USGS 7.5-minute quadrangles in Los Angeles, Orange, Santa Barbara, San Diego, San Luis Obispo, and Ventura counties (CNPS 2011). There are no CNDDB (2011) records in the greater vicinity of the Reserve, and 58 CCH (2011) records Los Angeles County. The nearest documented occurrence is from April 1901 at Ballona Harbor, Los Angeles County, less than one mile north of the Reserve (CCH 2011). The most recent documented occurrence is from March 1997 on Santa Catalina Island, approximately 38 miles south of the Reserve (CCH 2011). Red sand verbena has a moderate potential to occur within the coastal dune habitats of the Ballona Wetlands due to the presence of associated species and suitable soil conditions. This species was not observed during the July, October, or April surveys.

Ventura Marsh milk-vetch (*Astragalus pycnostachyus* var. *lanosissimus*). Federally Endangered; State Endangered; CNPS List 1B – Ventura Marsh milk-vetch is a perennial herb in the pea family (Fabaceae) that blooms from June to October. It typically occurs near sandy bluff seeps, behind barrier beaches, and near high tide zone in coastal dune, coastal scrub, and coastal salt marsh habitats at elevations ranging from 0 to 115 feet (CNPS 2010, CNDDB 2010). Observed associated species include coyote brush, mulefat, arroyo willow, sea fig, lollypop tree, and rabbit's-foot grass (*Polypogon monspeliensis*) (CNDDB 2010).

This species is reported from six USGS 7.5-minute quadrangles in Los Angeles, Orange, Santa Barbara, and Ventura counties; however, it is believed to be extirpated from five of the six quadrangles in Los Angeles and Orange counties (CNPS 2010). There are two CNDDB (2011) records in the greater vicinity of the Reserve, and twelve CCH (2011) records from Los Angeles County. The nearest and most recent CNDDB (2010) or CCH (2010) documented occurrence is from July 1951 within the historic Ballona wetlands. No other recent occurrences within the greater vicinity of the Reserve have been documented for this species. Occurrences for Ventura marsh milk-vetch have been recorded in 2009 from Mandalay Beach in Ventura County, an area outside of the greater vicinity of the Reserve. Ventura Marsh milk-vetch has a moderate potential to occur within the coastal dune, coastal scrub, and the margins of the coastal salt marsh habitat found within the Reserve due to the presence of associated species and suitable soil conditions. This species was not observed during the July or October surveys, and was not expected to be identifiable during the April surveys.

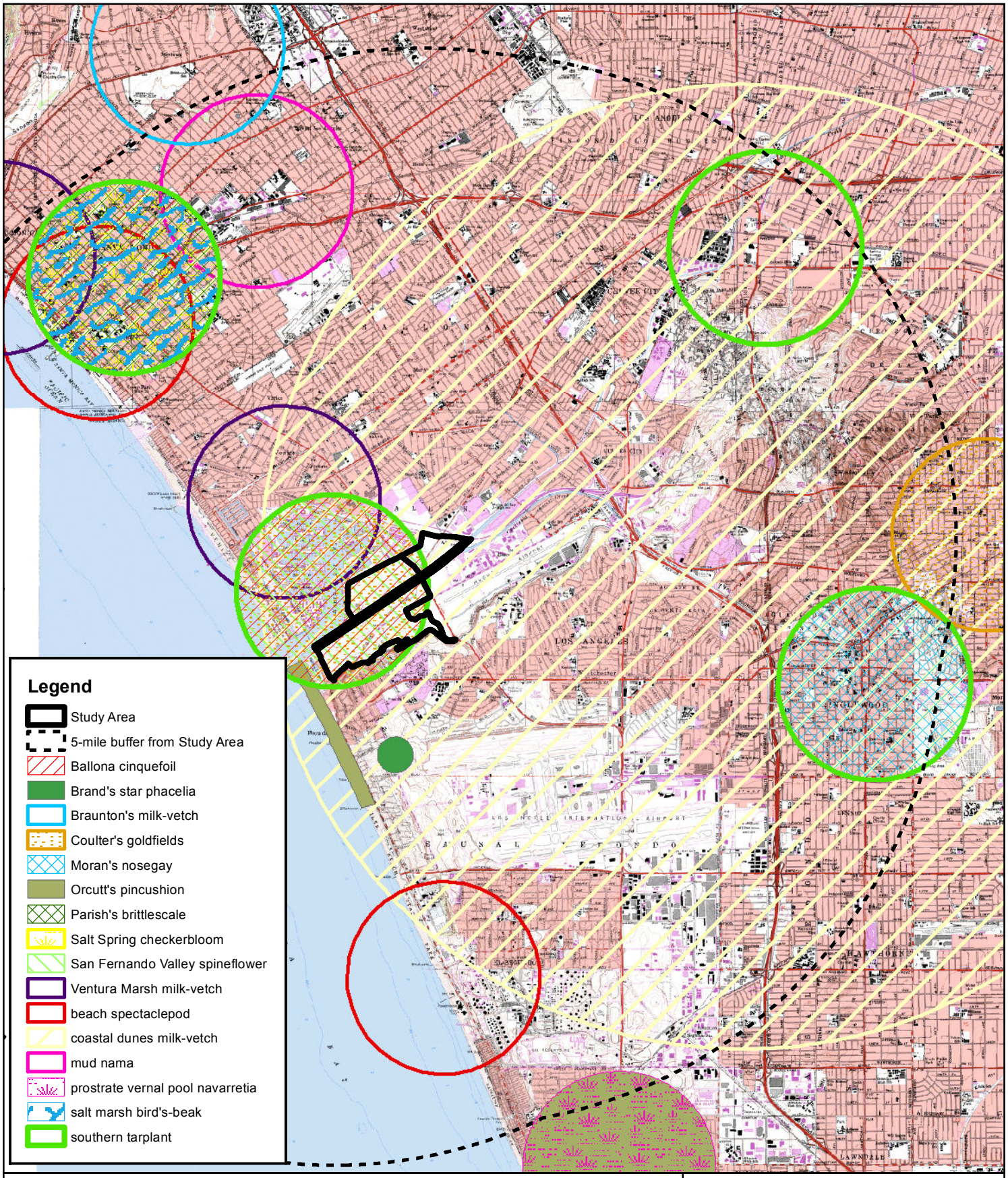

Figure 2. Special Status Plant Species Recorded in the CNDDB in the Greater Vicinity of the Study Area

Ballona Creek Wetlands Ecological Reserve
Marina Del Rey, California

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Miles

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ENVIRONMENTAL CONSULTANTS

Map Date: July 2010
Map By: Derek Chan
Base Source: CNDDB
Filepath: L:\Acad 2000 Files\00000\00016-3\gis\arcmap\CNDDBPlants_20100714.mxd

Coastal dunes milk-vetch (*Astragalus tener* var. *titi*). Federally Endangered; State Endangered; CNPS List 1B – Coastal dunes milk-vetch is an annual herb in the pea family (Fabaceae) that blooms from March to May. It typically occurs on moist, sandy depressions in bluffs and dunes near the ocean in coastal bluff scrub, coastal dune, and coastal prairie habitats at elevations ranging from 1 to 165 feet (CNPS 2010, CNDDB 2010). Observed associated species include grasses, sedges (*Carex* spp.), sea fig, varied lupine (*Lupinus variicolor*), cut leaf plantain (*Plantago coronopus*), and Pacific Grove clover (*Trifolium polyodon*) (CNDDB 2010).

This species is known from seven USGS 7.5-minute quadrangles in Los Angeles, Monterey, and San Diego counties; however, it is believed to be extirpated from five of the seven quadrangles in Los Angeles County (CNPS 2010). There are two CNDDB (2011) records in the greater vicinity of the Reserve, and three CCH (2011) records from Los Angeles County. The nearest documented occurrence is from April 1903 at Hyde Park, Los Angeles County, approximately three miles east of the Reserve (CNDDB 2011). The most recent documented occurrence is from 1930 in the Santa Monica region, Los Angeles County, approximately four miles northwest of the Reserve (CCH 2011, CNDDB 2011). Coastal dunes milk-vetch has a moderate potential to occur in wet, depressional areas in the coastal dune habitat within the Ballona Wetlands. Although these areas do not contain the reported associated species, the relative location of the nearest occurrence is less than four miles to the north of the Reserve. This species was not observed during the April surveys, and was not expected to be identifiable during the July and October surveys.

South Coast saltscale (*Atriplex pacifica*). CNPS List 1B – South Coast saltscale is an annual herb in the goosefoot family (Chenopodiaceae) that blooms from March to October. It typically occurs on alkali soils in coastal bluff scrub, coastal dunes, coastal scrub, playa, and the margins of coastal salt marsh habitats at elevations ranging from 0 to 460 feet (CNPS 2010). Observed associated species include coastal goldenbush (*Isocoma menziesii*), American wild carrot (*Daucus pusillus*), pygmy weed (*Crassula connata*), Australian saltbush (*Atriplex semibaccata*), alkali heath, toad rush, inkweed (*Suaeda torreyana*), Parish's pickleweed (*Salicornia subterminalis*), royal goldfields (*Lasthenia coronaria*), alkali pepperweed (*Lepidium dictyotum*), coastal prickly pear (*Opuntia littoralis*), and lemonade berry (CNDDB 2010).

This species is known from 26 USGS 7.5-minute quadrangles in Los Angeles, Orange, Riverside, Santa Barbara, San Diego and Ventura counties; however, it is believed to be extirpated from five of the 26 quadrangles (CNPS 2010). There is one CNDDB (2011) record in the greater vicinity of the Reserve, and 17 CCH (2011) records from Los Angeles County. The nearest documented occurrence is from October 1903 at Redondo Beach, Los Angeles County, approximately ten miles south of the Reserve (CNDDB 2011). The most recent documented occurrence is from May 1992 in Rancho Palos Verdes, a sub-region in the Los Angeles Basin, approximately 12 miles south of the Reserve. South Coast saltscale has a moderate potential to occur within the coastal dune and playa habitats of the Ballona Wetlands due to the presence of suitable soil conditions and associated species. This species was not observed during the April, July, or October surveys.

Parish's brittlescale (*Atriplex parishii*). CNPS List 1B – Parish's brittlescale is an annual herb in the goosefoot family (Chenopodiaceae) that blooms from June to October. It typically occurs on fine soils of alkali flats in the dry season in chenopod scrub, playa, and alkaline vernal pool habitats at elevations ranging from 80 to 6,160 feet (CNPS 2010, CNDDB 2010). Observed associated species include San Jacinto Valley crownscale (*Atriplex coronata* var. *notatior*), alkali pepperweed, San Diego pepperweed (*Lepidium latipes*), alkali barley (*Hordeum depressum*), inkweed, southern tarplant, and salt grass (CNDDB 2010).

This species is known from 15 USGS 7.5-minute quadrangles in Riverside and San Diego counties; however, it is believed to be extirpated from 10 of the 15 quadrangles (CNPS 2010). There are two CNDDB (2011) records in the greater vicinity of the Reserve, and one CCH (2011) record from Los Angeles County. The nearest CNDDB (2010) documented occurrence is undated from Santa Monica, Los Angeles, approximately four miles north of the Reserve (CNDDB 2011). The most recent occurrence is from October 1881 at Costa Station, Los Angeles County, greater than 20 miles southeast of the Reserve (CCH 2011). Parish's brittlescale has a moderate potential to occur within the Ballona Wetlands due to the presence of alkali substrates and associated species. This species was not observed during the July or October surveys, and was not expected to be identifiable during the April Surveys.

David's saltscale (*Atriplex serenana var. davidsonii*). CNPS List 1B – David's saltscale is an annual herb within the goosefoot family (Chenopodiaceae) that blooms from April to October. It typically occurs on alkaline soils in coastal bluff scrub and coastal scrub habitats at elevations ranging from 30 to 650 feet (CNPS 2010). Known associated species include several pickleweed (*Salicornia* spp.) and saltscale (*Atriplex* spp.) species (CNDDB 2010).

This species is known 26 USGS 7.5-minute quadrangles in Orange, Riverside, San Diego, San Luis Obispo, and Ventura counties; however, it is believed to be extirpated from four of the 26 quadrangles (CNPS 2010). There are no CNDDB (2011) records in the greater vicinity of the Reserve, and eight CCH (2011) records from Los Angeles County. The nearest and most recent documented occurrence is from April 1974 in Malibu Canyon, Los Angeles County, approximately 20 miles northwest of the Reserve. David's saltscale has a moderate potential to occur within coastal scrub habitat in the Ballona Wetlands due to the presence of suitable soil conditions and associated species. This species was not observed during the April, July, or October surveys.

Santa Barbara morning-glory (*Calystegia sepium* ssp. *binghamiae*). CNPS List 1A – Santa Barbara morning-glory is a perennial forb in the morning-glory family (Convolvulaceae) that blooms from April to May. It typically occurs in coastal marsh habitat at elevations ranging from 0 to 65 feet (CNDDB 2011, CNPS 2011). Observed associated species are unreported, but presumably include common coastal marsh species such as pickleweed, salt grass, fleshy jaumea, and others.

This species is known from 5 USGS 7.5-minute quadrangles in Los Angeles, Orange, Santa Barbara, and Ventura counties; however, it is believed to be extirpated from 5 quadrangles (CNPS 2010). There is one CNDDB (2011) record in the greater vicinity of the Reserve, and two CCH (2011) records from Los Angeles County. The nearest and most recent documented occurrence is from May 1902 Santa Monica, Los Angeles, approximately four to six miles north of the Reserve (CCH 2011). Santa Barbara morning-glory has a moderate potential to occur in the coastal marsh habitat in the Reserve due to the presumed presence of associated species and suitable hydrologic and soil conditions. This species was not observed during the April surveys.

Lewis' evening primrose (*Camissoniopsis lewisii*). CNPS List 3 – Lewis' evening primrose is an annual forb within the evening primrose family (Onagraceae) that blooms from March to May. It typically occurs on sand or clay substrate in coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland habitat at elevations ranging from 0 to 975 feet (CNPS 2011). Observed associated species are not reported in the literature; however, observations by WRA include coyote brush, black mustard (*Brassica nigra*), crown daisy (*Chrysanthemum coronarium*), California suncup (*Camissoniopsis bistorta*), miniature suncup (*C. micrantha*), long-beak filaree (*Erodium cicutarium*), common Mediterranean grass (*Schismus barbatus*), and large saltbush.

This species is known from 15 USGS 7.5-minuite quadrangles in Los Angeles, Orange, and San Diego counties; however, it is presumed extirpated from one of 15 quadrangles (CNPS 2011). There are no CNDDB (2011) records in the greater vicinity of the Reserve, and 14 CCH (2011) records from Los Angeles County. The nearest documented occurrence is from april 1901 at Ballona Harbor, Los Angeles County, within one mile of the Reserve (CCH 2011). The most recent documented occurrence is from March 2011 at Palos Verdes Peninsula, Los Angeles County approximately 12 miles south of the Reserve (CCH 2011). Additionally, Lewis' evening primrose was observed during floristic surveys of the site in 1990 within Area B of the Reserve (Henrickson1991). Lewis' primrose has a high potential to occur in the Reserve due to historic observations, the presence of associated species, and suitable soil conditions. Approximately 12,300 individuals of Lewis' evening primrose were observed in the coastal dune habitat in the southern edge of Area B, the eastern edge of coastal scrub habitat of Area A, and coastal scrub habitat in Area C of the Reserve (see Section 3.2).

Southern tarplant (*Centromadia parryi* ssp. *australis*). CNPS List 1B – Southern tarplant is an annual forb within the sunflower family (Asteraceae) that blooms from May to November. It typically occurs in coastal salt marsh, valley and foothill grasslands, and vernal pools at elevations ranging from 0 to 1,385 feet (CNPS 2010). Observed associated species include pickleweed, Pacific cordgrass (*Spartina foliosa*), bromes (*Bromus* spp.), and wild oats (*Avena* spp.) (CNDDB 2010).

This species is known from 29 USGS 7.5-minute quadrangles in Los Angeles, Orange, Santa Barbara, San Diego, and Ventura counties; however, it is believed to be extirpated from 10 of the 29 quadrangles (CNPS 2010). There are four CNDDB (2011) records in the greater vicinity of the Reserve, and 30 CCH (2011) records from Los Angeles County. The nearest documented occurrence is from October 1997 at Ballona Wetlands (CNDDB 2011); however, the CCH and CNNDB do not contain updated records for the Ballona Wetlands. The most recent documented occurrence is from May 2009 in the San Gabriel Valley, Los Angeles County (CCH 2011). Additionally, southern tarplant was observed during floristic surveys of the site in 1995 (Psomas 1995) within Area C near the baseball fields. This species has a high potential to occur within moist, alkaline grassland areas of the Reserve due to historic observations, the presence of associated species, and suitable soil conditions. This species was not observed during the July or October surveys, including focused searches in Area C, and was not expected to be identifiable during the April survey.

Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana*). CNPS List 1B – Orcutt's pinchusion is an annual herb within the sunflower family (Asteraceae) that blooms from January to August. It typically occurs on sandy sites in coastal bluff scrub and coastal dune habitats at elevations ranging from 10 to 330 feet (CNPS 2011). Observed associated species include California buckwheat, beach primrose, silver beach weed, wire lettuce, dune bush lupine, and sand verbena species (*Abronia* spp.) (CNDDB 2011).

This species is known from 15 USGS 7.5-minute quadrangles in Los Angeles, San Diego, and Ventura counties; however, it is believed to be extirpated from three of the 15 quadrangles, and from Orange County (CNPS 2011). There are two CNDDB (2011) records in the greater vicinity of the Reserve, and seven CCH (2011) records from Los Angeles County. The nearest and most recent documented occurrence is from March 2010 in the Ballona Wetlands along the western boundary of Area B (CNDDB 2010). Orcutt's pincushion has a high potential to occur along the coastal dune habitats in the Reserve due to historic observations, the presence associated species and suitable soil conditions. Approximately 350 individuals of Orcutt's pincushion were observed in the restored coastal dune habitat in the western edge of Area B of the Reserve (see Section 3.2).

Coastal goosefoot (*Chenopodium littoreum*). CNPS List 1B – Coastal goosefoot is an annual forb within the goosefoot family (Chenopodiaceae) that blooms from April to August. It typically occurs on sandy substrate in coastal dune habitat (CNPS 2011). Observed associated species are unreported.

This species was initially believed to be a non-native goosefoot from South America; however, recently it was determined to be a previously undescribed native species. It is known from five USGS 7.5-minute quadrangles in Los Angeles, San Luis Obispo, and Santa Barbara County. There are no CNDDB (2011) records in the greater vicinity of the Reserve, and no CCH (2011) records from Los Angeles County. Coastal goosefoot has a moderate potential to occur in the coastal dune habitat in the Reserve due to suitable substrate and a lack of specific habitat information for this species. This species was not observed during the April or July surveys, and was not expected to be identifiable during the October survey.

San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*). State Endangered and Federal Candidate; CNPS List 1B – San Fernando Valley spineflower is an annual herb within the buckwheat family (Polygonaceae) that blooms from April to July. It typically occurs on sandy soils in coastal scrub, and valley and foothill grassland habitats at elevations ranging from 490 to 4,000 feet (CNPS 2010). Observed associated species include California sage brush, California buckwheat, longstem buckwheat (*Eriogonum elongatum*), slender buckwheat (*E. gracile*), purple sage (*Salvia leucophylla*), goldenbush (*Ericameria* spp.), four o'clock species (*Mirabilis* sp.), and Madrid brome (*Bromus madritensis*) (CNDDB 2010).

This species is known from 14 USGS 7.5-minute quadrangles in Los Angeles and Ventura counties; however, it is believed to be extirpated from nine of the 14 quadrangles, and from Orange County (CNPS 2010). There is one CNDDB (2011) record in the greater vicinity of the Reserve, and 32 CCH (2011) records from Los Angeles County. The nearest documented occurrence is from April 1901 at Ballona Harbor, Los Angeles County, less than one mile north of the Reserve (CNDDB 2011). The most recent occurrence is from August 2003 at Newhall Ranch, Long Valley, Los Angeles County, approximately 30 miles north of the Reserve (CCH 2011). San Fernando Valley spineflower has a moderate potential to occur in the coastal scrub in the Reserve due to the presence associated species and the relative location of historic observations. This species was not observed during the July or April surveys, and was not expected to be identifiable during the October survey.

Salt marsh bird's-beak (*Cordylanthus maritimus* ssp. *maritimus*). State and Federally Endangered; CNPS List 1B – Salt marsh bird's beak is an annual herb in the figwort family (Scrophulariaceae) that blooms from May to October. It typically occurs in coastal dune and the higher zones of coastal salt marsh habitats at elevations ranging from 0 to 100 feet (CNPS 2010). Observed associated species include salt grass, sea lavender (*Limonium californicum*), salt marsh dodder (*Cuscuta salina*), alkali weed (*Cressa truxillensis*), saltwort (*Batis maritima*), fleshy jaumea, and pickleweed (CNDDB 2010).

This species is known from 16 USGS 7.5-minute quadrangles in Los Angeles, Orange, Santa Barbara, San Bernardino, San Diego, San Luis Obispo, and Ventura counties; however it is believed to be extirpated from three of the 16 quadrangles (CNPS 2011). There are two CNDDB (2011) records in the greater vicinity of the Reserve, and nine CCH (2011) records from Los Angeles County. The nearest and most recent documented occurrence is from 1981 in Santa Monica, Los Angeles County, less than four miles to the north of the Reserve (CNDDB 2011). Salt marsh bird's beak has a moderate potential to occur within the pickleweed habitats of the Ballona Wetlands due to the presence of associated species and suitable hydrologic and soil conditions. This species was not observed during the July or October surveys, and was not expected to be identifiable during the April survey.

Paniculate tarplant (*Deinandra paniculata*). CNPS List 4 – Paniculate tarplant is an annual herb in the sunflower family (Asteraceae) that blooms from April to November. It typically occurs in coastal scrub, valley and foothill grasslands, and vernally mesic vernal pool habitats at elevations ranging from 85 to 3,085 feet (CNPS 2010). Observed associated species are unreported.

This species is known from Orange, Riverside, San Bernardino, and San Diego counties; however, specific USGS 7.5-minute quadrangle information is still being compiled within the CNPS database (2010). There is one documented occurrence from Los Angeles County from 1935 in Bouquet Canyon, approximately 35 miles northwest of the Reserve. No known occurrences are reported within the CNDDB (2010). Paniculate tarplant has a moderate potential to occur within the coastal scrub habitats of the Reserve. This species was not observed during the April, July, or October surveys.

Western pony's-foot (*Dichondra occidentalis*). CNPS List 4 – Western pony's-foot is a perennial forb in the morning-glory family (Convolvulaceae) that blooms from March to July, and sometimes as early as January. It typically occurs in chaparral, cismontane woodland, valley and foothill grassland, and coastal scrub habitat at elevations ranging from 160 to 1625 feet (CNDDB 2011, CNPS 2011). Observed associated species are unreported.

This species is known from ten USGS 7.5-minute quadrangles in Los Angeles, Marin, Orange, Santa Barbara, San Diego, and Ventura counties (CNPS 2011). There are no CNDDB (2011) records in the greater vicinity of the Reserve, and 21 CCH (2011) records from Los Angeles County. The nearest and most recent documented occurrence is from June 1998 on Santa Catalina Island, approximately 35 miles south of the Reserve (CCH 2011). Additionally, previous studies suggest this species is present in the Reserve (Existing Conditions citing Henrickson 1991 EIR). Western pony's-foot has a moderate potential to occur in the coastal scrub in the Reserve due to historic observations. This species was not observed during the April or July, and was not expected to be identifiable during the October survey.

Beach spectaclepod (*Dithyrea maritima*). State Threatened; CNPS List 1B – Beach spectaclepod is a perennial forb in mustard family (Brassicaceae) that blooms from March to May. It typically occurs on sea shores on sand dunes and sandy places near the shore in coastal dune and coastal scrub habitat at elevations ranging from 10 to 165 feet (CNDDB 2011, CNPS 2011). Observed associated species include sand verbenas (*Abronia* spp.), beach primrose, Trask's milk-vetch (*Astragalus traskiae*), coastal golenbush, silver beach weed, iceplant, sea rocket, silver bird's-foot trefoil (*Lotus argophyllus*), silver bush lupine (*Lupinus albifrons*), and wire lettuce (CNDDB 2011).

This species is known from 17 USGS 7.5-minute quadrangles in Los Angeles, Santa Barbara, San Luis Obispo, and Ventura counties; however it is presumed to be extirpated from four of the 17 quadrangles (CNPS 2011). There are four CNDDB (2011) records in the greater vicinity of the Reserve, and ten CCH (2011) records from Los Angeles County. The nearest documented occurrence is from April 1903 at the vicinity of Ballona Marshes, less than one mile from the Reserve (CNDDB 2011). The most recent documented occurrence is from April 1932 at El Segundo, Los Angeles County, approximately four miles south of the Reserve (CCH 2011, CNDDB 2011). Beach spectaclepod has a moderate to occur in the coastal dune and coastal scrub habitat due to the presence of associated species and suitable soil conditions. This species was not observed during the April survey, and was not expected to be identifiable during the July or October surveys.

Many-stemmed dudleya (*Dudleya multicaulis*). CNPS List 1B – Many-stemmed dudleya is a perennial herb in the stonecrop family (Crassulaceae) that blooms from April to July. It typically occurs in Chaparral, coastal scrub, and valley and foothill grasslands on clay soils at elevations ranging from 45 to 2,560 feet (CNPS 2010). Reported associated species include Bigelow's moss fern (*Selaginella bigelovii*), sumac species (*Rhus* and *Malosma* sp.), California buckwheat, and annual grasses such as purple needle grass (*Nassella pulchra*) (CNDDB 2010).

This species is known from 32 USGS 7.5-minute quadrangles in Los Angeles, Orange, Riverside, San Bernardino and San Diego counties; however, it is believed to be extirpated from four of the 32 quadrangles (CNPS 2010). There is one CNDDB (2011) record in the greater vicinity of the Reserve, and 27 CCH (2011) records from Los Angeles County. The nearest documented occurrence is from June 1925 in the Hollywood Hills region, Los Angeles County, approximately 12 miles northeast of the Reserve (CNDDB 2011). The most recent documented occurrence is from June 1991 in the San Bernardino Basin, Los Angeles County, greater than 20 miles east of the Reserve (CCH 2011). Many-stemmed dudleya has a moderate potential to occur since the Reserve contains coastal scrub habitat that may support this species. This species was not observed during April or July surveys, and was not expected to be identifiable during the October survey.

Suffrutescent wallflower (*Erysimum insulare* ssp. *suffrutescens*). CNPS List 4 – Suffrutescent wallflower is a perennial herb in the mustard family (Brassicaceae) that blooms from January to July. It typically occurs on sandy substrate in coastal bluff scrub, maritime chaparral, coastal dunes, and coastal scrub habitats at elevations ranging from 0 to 490 feet (CNPS 2011). Observed associated species are not reported in the literature; however, observations by WRA include dune bush lupine (*Lupinus chamissonis*), beach primrose, coastal goldenbush, wire lettuce, silver beach weed, and pink sand verbena.

This species is known Los Angeles, Santa Barbara, San Luis Obispo, and Ventura counties. No known occurrences within USGS 7.5-minute quadrangles maps are available (CNPS 2010). There are no CNDDB (2010) records in the greater vicinity of the Reserve, and 45 CCH (2011) records from Los Angeles County. The documented occurrence is from February 1981 at Ballona Wetlands, Los Angeles County (CCH 2011). The most recent documented occurrence is from April 1986 at El Segundo Dunes, Los Angeles County, approximately four miles south of the Reserve (CCH 2011). Additionally, there is an additional documented occurrence within the coastal dune areas located in Area B of the Ballona Wetlands (Psomas 1995). Suffrutescent wallflower has a high potential to occur in the Reserve due to historic observations, the presence of associated species, and suitable soil conditions. Approximately 29 individuals were observed in the coastal dune habitat in the western portion of Area B during the July and April surveys (see Section 3.2).

Los Angeles sunflower (*Helianthus nuttallii* ssp. *parishii*). CNPS List 1A – Los Angeles sunflower is a perennial rhizomatous herb in the sunflower family (Asteraceae) that blooms from August to October. It typically occurs in coastal salt and freshwater marsh habitats at elevations ranging from 30 to 5,445 feet (CNPS 2010). Observed associated species include various bulrush species (*Scirpus* sp.), desert wild grape (*Vitis girdiana*), and stinging nettle (*Urtica dioica*) (CNDDB 2010).

This species is known from ten USGS 7.5-minute quadrangles in Los Angeles, Orange, and San Bernardino counties; however it is believed to be extirpated from seven of the ten quadrangles (CNPS 2010). There is one CNDDB (2011) record in the greater vicinity of the Reserve, and 12 CCH (2011) records from Los Angeles County. The nearest documented occurrence is from 1903 at Cienaga, Los Angeles County, approximately seven miles northeast of the Reserve (CNDDB 2011). The most recent documented occurrence is from August 2002

at Newhall Ranch, Long Valley, Los Angeles County, approximately 30 miles north of the Reserve (CCH 2011). Los Angeles sunflower has a moderate potential to occur within the coastal marsh habitats of the Reserve. This species was not observed during the October survey, and was not expected to be identifiable during the April or July surveys.

Vernal barley (*Hordeum intercedens*). CNPS List 3 – Vernal barley is an annual graminoid in the grass family (Poaceae) that blooms from March to June, with remnant identifiable floral and vegetative structures likely present in July. It typically is located on saline flats and depressions in coastal dune, coastal scrub, and valley and foothill grassland habitat at elevations ranging from 15 to 3240 feet (CNDDB 2011, CNPS 2011). Observed associated species are unreported.

This species is known from 32 USGS 7.5-minute quadrangles in Fresno, Kings, Los Angeles, Mono, Orange, Riverside, Santa Barbara, San Benito, San Diego,, San Mateo, and Ventura counties; however it is presumed extirpated from two of 32 quadrangles (CNPS 2011). There are no CNDDB (2011) records in the greater vicinity of the Reserve, and 39 CCH (2011) records from Los Angeles County. The nearest documented occurrence is from May 1901 at Ballona Harbor, Los Angeles County, within one mile of the Reserve (CCH 2011). The most recent documented occurrence is from May 2001 on Santa Catalina Island, approximately 35 miles south of the Reserve (CCH 2011). Detailed habitat descriptions for documented occurrences are unreported, but are presumably similar to species description habitat and vegetation community types. Vernal barley has a moderate potential to occur in the coastal scrub and coastal dune habitat in the Reserve due to the relatively close proximity of historic observations and suitable habitat conditions. This species was not observed during the April survey, and was not expected during the July or October surveys.

Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*). CNPS List 4 – Southwestern spiny rush is a perennial graminoid in the rush family (Juncaceae) that blooms from May to June, with readily identifiable floral and vegetative structures persisting through summer. It is typically located in mesic, alkali sites in coastal dune, meadow, seep, and coastal salt marsh habitat at elevations ranging from 10 to 2925 feet (CNPS 2011). Observed associated species are unreported in the literature.

This species is known from nine USGS 7.5-minute quadrangles in Imperial, Los Angeles, Orange, Santa Barbara, San Diego, San Luis Obispo, and Ventura counties (CNPS 2011). There are no CNDDB (2011) records in the greater vicinity of the Reserve, and 30 CCH (2011) records from Los Angeles County. The nearest documented occurrence is from April 1901, in Redondo, Los Angeles County, approximately eight miles south of the Reserve. The most recent documented occurrence is from August 2003 at Newhall Ranch, Long Valley, Los Angeles County, approximately 30 miles north of the Reserve (CCH 2011). Detailed habitat descriptions for documented occurrences are unreported, but are presumably similar to species description habitat and vegetation community types. Southwestern spiny rush has a moderate potential to occur in the coastal dune, coastal salt marsh, and alkali grassy sites in the Reserve due to the presence of suitable habitat and hydrologic conditions. This species was not observed during the April or July surveys, and was not expected to be identifiable during the October survey.

Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*). CNPS List 1B – Coulter's goldfields is an annual forb in sunflower family (Asteraceae) that blooms from February to June. It typically occurs on sandy soils in coastal salt marsh, playa, valley and foothill grassland, and vernal pool habitat at elevations ranging from 1 to 3955 feet (CNDDB 2011, CNPS 2011). Observed associated species include Olney's bulrush (*Scirpus maritimus*), alkali popcornflower (*Plagiobothrys leptocladus*), Mojave seablite (*Suaeda torreyana*), brass buttons, alkali weed

(*Cressa truxillensis*), rabbit's-foot grass, toad rush, Italian rye grass, alkali heath, five hook (*Bassia hyssopifolia*), prairie plantain (*Plantago elongata*), yellow sweet clover (*Melilotus indicus*), and salt sandspurry (*Spergularia salina*) (CNDDB 2011).

This species is known from 67 USGS 7.5-minute quadrangles in Colusa, Kern, Los Angeles, Merced, Orange, Riverside, Santa Barbara, San Bernardino, San Diego, San Luis Obispo, Tehama, Tulare, Ventura, and Yolo counties; however, it is presumed extirpated from 15 of 67 quadrangles (CNPS 2011). There are three CNDDB (2011) records in the greater vicinity of the Reserve, and 17 CCH (2011) records from Los Angeles County. The nearest documented occurrence is from April 1934 at Ballona Marshes, Los Angeles County, within one mile of the Reserve (CNDDB 2011). The most recent documented occurrence is from April 2003, Newhall Ranch, Long Valley, Los Angeles County, approximately 30 miles north of the Reserve (CCH 2011). Coulter's goldfields has a high potential to occur in the coastal salt marsh, playa-like areas, and alkali grassy sites in the Reserve due to the relative proximity of historic occurrences, the presence of associated species, and suitable soil conditions. This species was not observed during the April surveys, and was not expected to be identifiable during the July or October surveys.

California spineflower (*Mucronea californica*). CNPS List 4 – California spineflower is an annual forb in the buckwheat family (Polygonaceae) that blooms from March to July, and sometimes as late as August. It typically occurs on sandy soils in chaparral, cismontane woodland, coastal dune, coastal scrub, and valley and foothill grassland habitat at elevations ranging from 0 to 4550 feet (CNPS 2011). Observed associated species are unreported in the literature.

This species is known from three USGS 7.5-minute quadrangles in Kern, Los Angeles, Monterey, Riverside, Santa Barbara, San Bernardino, San Diego, San Luis Obispo, and Ventura counties (CNPS 2011). There are no CNDDB (2011) records in the greater vicinity of the Reserve, and 32 CCH (2011) records from Los Angeles County. The nearest documented occurrence is from June 1911 at Playa del Rey, Los Angeles County, within one mile of the Reserve (CCH 2011). The most recent documented occurrence is from May 1998 in the San Gabriel Mountains, Los Angeles County, approximately 30 miles northeast of the Reserve (CCH 2011). Detailed habitat descriptions for documented occurrences are unreported, but are presumably similar to species description habitat and vegetation community types. California spineflower has a high potential to occur in the coastal dune and coastal scrub habitat in the Reserve due to the relative proximity of historic observations and suitable soil conditions. This species was not observed during the April or July surveys, and not expected to be identifiable during the October survey.

Mud Nama (*Nama stenocarpum*). CNPS List 2 – Mud nama is an annual to perennial herb in the waterleaf family (Hydrophyllaceae) that blooms from January to July. It typically occurs in marshes, lake margins and riverbanks of swamps at elevations ranging from 15 to 1,650 feet (CNPS 2010). Observed associated species include mule fat, willow (*Salix* spp.), western yellow cress (*Rorippa curvisiliqua*), California loosestrife (*Lythrum californicum*), hyssop loosestrife (*L. hyssopifolium*), wild petunia (*Petunia parviflorum*), broadleaf cattail, slender oat grass (*Avena barbata*), alkali weed (*Malvella leprosa*), bracted verbena (*Verbena bracteata*), Mexican tea (*Chenopodium ambrosioides*), iris-leaf rush (*Juncus xiphioides*), and toad rush (CNDDB 2010).

This species is known from 13 USGS 7.5-minute quadrangles in Orange, Riverside, and San Diego counties; however it is presumed extirpated from three of the 13 quadrangles (CNPS 2010). There are two CNDDB (2011) records in the greater vicinity of the Reserve, and six CCH (2011) records from Los Angeles County. The nearest documented occurrence is from

October 1889, Santa Monica, Los Angeles County, approximately 4 miles north of the Reserve (CNDDB 2011). The most recent documented occurrence is from June 1992, San Clemente Island, approximately 65 miles south of the Reserve (CCH 2011). Mud nama has a moderate potential to occur within the freshwater marsh boundaries of Area B due the presence of suitable hydrologic conditions and the relative proximity of historic observations. This species was not observed during the April or July surveys, and not expected to be identifiable during the October survey.

South Coast branching phacelia (*Phacelia ramosissima* var. *austrolitoralis*). CNPS List 4 – South Coast branching phacelia is a perennial forb in the waterleaf family (Hydrophyllaceae) that blooms from March to August. It typically occurs in sandy or well drained substrate in chaparral, coastal dune, coastal scrub, and coastal salt marsh habitat at elevations ranging from 20 to 975 feet (CNPS 2011). Observed associated species are not reported in the literature; however, observations by WRA include dune bush lupine, suffrutescent wallflower, pink sand verbena, California suncup, beach suncup, miniature suncup, and Madrid brome.

This species is known from 34 USGS 7.5-minute quadrangles in Los Angeles, Monterey, Orange, Santa Barbara, San Diego, San Luis Obispo, and Ventura counties; however, it is presumed extirpated from six of the 34 quadrangles (CNPS 2011). There are no CNDDB (2011) records in the greater vicinity of the Reserve, and 28 CCH (2011) records from Los Angeles County. The nearest documented occurrence is from July 1980 in the western portion of Area B at Ballona Wetlands within the Reserve (CCH 2011). The most recent documented occurrence is from May 1988 in the El Segundo dunes, Los Angeles County, approximately four miles south of the Reserve (CCH 2011). South Coast branching phacelia has a high potential to occur in the coastal dune, coastal scrub, and coastal salt marsh margin habitat in the Reserve due to suitable soil conditions and historic observations from the Reserve. Approximately 600 individuals of South Coast branching phacelia were observed in the coastal dune habitat in the western portion of Area B during the April surveys (Section 3.2).

Brand's star phacelia (*Phacelia stellaris*). Federal Candidate; CNPS List 1B – Brand's star phacelia is an annual forb in the waterleaf family (Hydrophyllaceae) that blooms from March to June. It typically occurs in open areas in coastal dune and coastal scrub habitat at elevations ranging from 1 to 1,300 feet (CNDDB 2011, CNPS 2011). Observed associated species include pink sand verbena, red sand verbena, beach primrose, silver beach weed, cottonheads (*Nemacaulis denudata*), California croton (*Croton californica*), and pygmy weed (CNDDB 2011).

This species is known from eight USGS 7.5-minute quadrangles in Los Angeles and San Diego counties; however, it is presumed extirpated from five of the eight quadrangles (CNPS 2011). There are three CNDDB (2011) records in the greater vicinity of the Reserve, and six CCH (2011) records from Los Angles County. The nearest and most recent documented occurrence is from March 1943 at Playa del Rey, Los Angeles County, within one mile of the Reserve (CNDDB 2011). Brand's star phacelia has a moderate potential to occur in the coastal dune habitat in the Reserve due to the presence of associated species, suitable soil conditions, and the relative proximity of historic observations. This species was not observed during the April surveys, and was not expected to be identifiable during the July or October surveys.

Ballona cinquefoil (*Potentilla multijuga*). CNPS List 1A – Ballona cinquefoil is a perennial herb in the rose family (Rosacea) that blooms from June to August. It typically occurs in coastal scrub, brackish meadows and seeps at elevations ranging from 0 to 10 feet (CNDDB 2011, CNPS 2011). Observed associated species are not reported in the literature.

This species is known from one USGS 7.5-minute quadrangle in Los Angeles County; however, it is presumed extirpated from the one quadrangle. There is one CNDDB (2011) record in the

greater vicinity of the Reserve, and two CCH (2011) records from Los Angeles County. The nearest and most recent documented occurrence is from August 1890, near Ballona, Los Angeles County within two miles of the Reserve (CNDDB 2011). Ballona cinquefoil has a moderate potential to occur in the coastal scrub and brackish grassy habitat in the Reserve due to the relative proximity of historic observations. This species was not observed during the July survey, and was not expected to be identifiable during the April or October surveys.

Salt Spring checkerbloom (*Sidalcea neomexicana*). CNPS List 2 – Salt Spring checkerbloom is a perennial forb in the mallow family (Malvaceae) that blooms from March to June. It typically occurs in springs and marshes underlain by alkali substrate in alkali playas, brackish marsh, chaparral, coastal scrub, lower montane coniferous forest, and Mojavean desert scrub at elevations ranging from 45 to 4960 feet (CNDDB 2011, CNPS 2011). Observed associated species include rushes (*Juncus* spp.), yerba mansa (*Anemopsis californica*), seaside heliotrope (*Heliotropium curassavicum*), and sticky sandspurry (*Spergularia macrotheca*) (CNDDB 2011).

This species is known from 17 USGS 7.5-minute quadrangles in Kern, Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties; however, it is presumed extirpated from three of the 17 quadrangles (CNPS 2011). There is one CNDDB (2011) record in the greater vicinity of the Reserve, and nine CCH (2011) records from Los Angeles County. The nearest documented occurrence is undated in Santa Monica, Los Angeles County, approximately four miles northwest of the Reserve (CNDDB 2011). The most recent documented occurrence is from April 1934 in Long Beach, Los Angeles County, approximately 20 miles southwest of the Reserve (CCH 2011). Salt Spring checkerbloom has a moderate potential to occur in the coastal scrub and marsh habitat in the Reserve due to the presence of suitable soil conditions and the presence of associated species. This species was not observed during the April survey, and was not expected to be identifiable during the July or October surveys.

Estuary seablite (*Suaeda esteroa*). CNPS List 1B – Estuary seablite is an evergreen shrub in the goosefoot family (Chenopodiaceae) that blooms from May to October. It typically occurs in marshes and swamps at elevations ranging from 0 to 15 feet (CNPS 2010). Observed associated species include California sage brush, alkali heath, alkali weed, pickleweed, coast buckwheat, and bladder pod (*Isomeris arborea*) (CNDDB 2010).

This species is known from 13 USGS 7.5-minute quadrangles in Los Angeles, Orange, Santa Barbara, San Diego, and Ventura counties, one of which is presumed extirpated (CNPS 2010). There is one CNDDB (2011) record in the greater vicinity of the Reserve, and four CCH (2011) records from Los Angeles County. The nearest and most recent documented occurrence is from January 2006, Long Beach, approximately 20 miles southwest of the Reserve (CCH 2011). Additionally, reported occurrences from previous studies suggest this species is present in the Reserve (Existing Conditions citing Henrickson 1991 EIR). Estuary seablite has a high potential to occur in the coastal marsh habitat in the Reserve due the presence of associated species, suitable soil and hydrologic conditions, and reported occurrences from the Reserve. This species was not observed during the July or October surveys, and was not expected to be identifiable during the April survey.

Woolly seablite (*Suaeda taxifolia*). CNPS List 4 – Woolly seablite is an evergreen shrub in the goosefoot family (Chenopodiaceae) that blooms from January to December. It typically occurs in coastal bluff scrub, coastal dunes and within the margins of coastal salt marshes and swamps at elevations ranging from 0 to 165 feet (CNPS 2011). Observed associated species are not reported in the literature; however, observations by WRA include pickleweed species, chrysanthemum, slender leaf iceplant, and acacias.

This species is known to occur in Los Angeles, Orange, Santa Barbara, San Diego, and San Luis Obispo Counties (CNPS 2010). No information is available regarding the number of USGS 7.5-minute quadrangles from which this species is documented. There are no CNDDB (2011) records in the greater vicinity of the Reserve, and 66 CCH (2011) records from Los Angeles County. The nearest documented occurrence is from September 1930 at Ballona Creek within one mile of the Reserve (CCH 2011). The most recent documented occurrence is from April 2005 at Palos Verdes Peninsula, Los Angeles County, approximately 12 miles south of the Reserve. Woolly seablite has a high potential to occur in the coastal dune and the margins of coastal marsh habitat in the Reserve due to the presence of associated species, suitable soil conditions, and the relative proximity of historic observations. Approximately 85 individuals of woolly seablite were observed on the edge of coastal brackish marsh habitat in the northwestern portion of Area B during the April surveys (Section 3.2).

3.2 Field Survey Results

Two hundred thirty plant species were observed within the Reserve during the October and April rare plant surveys; however, because July was a focused survey, plant species observations were not recorded for this period (Appendix 2). Henrickson reported a total of 334 plant species; however, these surveys included additional areas (Area D) not surveyed by WRA. Therefore, WRA assumes that the Reserve hosts additional plant species to the 230 observed in April and October, but also believes that the protocol-level rare plant surveys in July, October, and April were sufficient to observe the rare plant species with the potential to occur in the Reserve. July 2010 surveys coincided with peak blooming periods for 11 potentially occurring special-status plant species; October 2010 coincided with peak blooming periods for 6 special-status plant species; and April 2011 coincided with peak blooming periods for 13 special-status plant species

Although previously reported from the Reserve, no individuals of southern tarplant were observed. Despite thorough surveys of east of the baseball fields in Area C, only the common tarplant was observed. Likewise, no suitable moist, alkaline habitat was observed in this area. Southern tarplant appears to have been extirpated from the Reserve as this species was last observed in 1995 (Psomas 1995). Based upon conversations with staff familiar with the site (Pers. Comm. Sean Bergquist), site conditions in this area have changed since the species was found in 1995 (Psomas 1995). The area has become invaded by non-native species and appears to be less alkaline due to the leaching of the fill material soils by precipitation. In addition, the population observed during 1995 consisted of only 30 individuals. Such a small, isolated population could easily have become extirpated by maintenance of the field, particularly considering that subsequent years were not as wet. Visits were made to CCH (2010) listed local reference populations for southern tarplant. However, access to locations near South Coast Madrono Marsh in Torrance, California and near Crenshaw Boulevard near the DOW chemical facility were not possible due to park closure and private property access prohibitions. The survey was conducted at the appropriate blooming period as this species as observed at a reference population at Whittier Narrows. Several southern tarplant individuals were observed blooming during late June 2010 at this location.

Five special-status plant species, Lewis' evening primrose, Orcutt's pincushion, suffrutescent wallflower, South Coast branching phacelia, and woolly seablite, were observed in the Reserve.

Approximately 12,300 individuals of Lewis' evening primrose were observed within the Reserve and were concentrated in the northeast corner of Area A, in the dune habitat in the western and southern portion of Area B, and the northern portion of Area C (Figure 3). Observed associated plant species include California suncup, miniature suncup, and filarees (*Erodium* spp.). Most individuals were readily identified as Lewis's evening primrose; however, multiple individuals

appeared to intergrade with California suncup, with the stigma located at or barely exceeding the anthers. The substrate was stony sands and disturbed fill soils, and the slope and aspect neutral. Potential immediate threats include invasive species and trampling. Voucher specimens were collected of Lewis's evening primrose; however, due to the fragile nature of the specimens collected, the vouchers were obliterated. Photographs of this species were taken during the April 2011 surveys and are included in Appendix 3.

Approximately 350 individuals of Orcutt's pincushion were observed in the dune habitat in the western portion of Area B (Figures 3 and 4). Associated plant species included pink sand verbena, suffrutescent wallflower, silver beach weed, western ragweed, and Madrid brome. The substrate was composed of sands, the slope moderate to steep (10 to 50 percent), and the aspect east. Potential immediate threats appeared minor and composed of invasive species (e.g. Madrid brome, iceplant), erosion, and trampling (potential, not observed). One voucher specimen of Orcutt's pincushion was collected and pressed, and will be housed at the office of WRA. Photographs of this species were taken during the April 2011 survey and are included in Appendix 3.

Approximately 29 individuals of suffrutescent wallflower were observed within the Reserve and were concentrated in the western portion of Area B (Figures 3 and 4). Observed associated plant species with suffrutescent wallflower include South Coast branching phacelia, dune bush lupine, California brittlebush (*Encelia californica*), and iceplant. Potential immediate threats appeared minor and composed of invasive species (e.g. Madrid brome, iceplant), erosion, and trampling (potential, not observed). The substrate was sands, the slope neutral to very moderate (10 percent or less), and the aspect neutral. No voucher specimens were collected of suffrutescent wallflower due to the limited number of individuals observed on site. Photographs of this species were taken during the July 2010 and April 2011 surveys and are included in Appendix 3.

Approximately 600 individuals of South Coast branching phacelia were observed in the dune habitat in the western portion of Area B (Figures 3 and 4). Associated plant species included dune bush lupine, suffrutescent wallflower, silver beach weed, western ragweed, and Madrid brome. The substrate was composed of sands, the slope moderate to steep (10 to 50 percent), and the aspect east. Potential immediate threats appeared minor and composed of invasive species (e.g. Madrid brome, iceplant), erosion, and trampling (potential, not observed). One voucher specimen of South Coast branching phacelia was collected and pressed, and will be housed at the office of WRA. Photographs were taken during the October 2010 survey and are included in Appendix 3.

Approximately 85 individuals of woolly seablite were observed covering the approximately 605 acre site (Figure 3). All woolly seablite individuals were found at the northern edge of Area B along the levee (Figure 4). Associated plant species included Mediterranean barley, Italian ryegrass, common tarweed, common pickleweed and salt grass. The substrate appeared to be fill material from the Ballona Creek levee and native (disturbed) marsh soils, the slope was neutral to steep (50 percent or greater), and the aspect was neutral. Potential immediate threats include invasive species (e.g. chrysanthemum). Two voucher specimens of woolly seablite were collected and pressed and will be housed at the office of WRA. Photographs of this species were taken during the July and October 2010, and April 2011 surveys and are included in Appendix 3.

No individuals of the remaining 25 species (red sand verbena, Ventura marsh milk-vetch, coastal dunes milk-vetch, south coast saltscale, Parish's brittlescale, David's saltscale, Bingham's false bindweed, southern tarplant, coastal goosefoot, San Fernando Valley spineflower, salt marsh bird's-beak, paninulate tarplant, western ponysfoot, Beach

spectaclepod, many stemmed dudleya, Los Angeles sunflower, bobtail barley, Southwestern spiny rush, Coulter's goldfield, California spineflower, mud nama, Brand's Phacelia, Ballona cinquefoil, salt spring checkerbloom, and estuary seablite) were observed within the Reserve, although marginally suitable habitat occurs for all of these species. No recent, local reference populations were recorded for any of these species within the CNDDB (2010, 2011) or the CCH (2010, 2011). However, no genera of these species were observed within the Reserve that were unidentifiable during the July, October or April surveys; therefore, WRA assumes that no further surveys for these 25 species are warranted.

Additionally, 26 discreet coast buckwheat stands were observed within the western portion of Area B of the Reserve along with four individuals found immediately adjacent to the outer western boundary of Area B for a total of 0.24 acres (Figure 4).

4.0 CONCLUSIONS

The Reserve has the potential to support 30 special-status plant species based on a review of literature and site assessments. Focused protocol-level surveys were conducted in July 2010, and floristic protocol-level surveys were conducted in October 2010 and April 2011 at the peak blooming period for all plant species with the potential to occur in the Reserve. Two hundred thirty plant species were observed by WRA in the Reserve during the October and April surveys including populations of five special-status species: 12,300 individuals Lewis' evening primrose, 350 individuals of Orcutt's pincushion, 29 individuals of suffrutescent wallflower, 600 individuals of South Coast branching phacelia, and 85 individuals of woolly seablite. Southern tarplant was not observed during July surveys. Lastly, 26 discreet coast buckwheat patches and four individuals were mapped within and directly adjacent to the Reserve totaling 0.24 acres.

Based upon guidelines provided by the CDFG (2009), these surveys are considered to be valid for a period of 1 year within grassland habitat types and 5 years within shrub habitat types, assuming that existing conditions remain constant (i.e., there is no fire, major earthwork, flooding, or other changes to the existing conditions of the Reserve as described in this report).

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Figure 3

Special Status Plant Species Known Occurrences within the Study Area

Legend

- Study Area
- Orcutt's pincushion *(Chaenactis glabriuscula* var. *orcuttiana)* (x350)
- South Coast branching phacelia *Phacelia ramosissima* var. *austrolitoralis* (x600)
- Lewis' evening primrose *Camissonia lewisii* (x12,200)
- Lewis' evening primrose *Camissonia lewisii* (x100)
- suffrutescent wallflower *Erysimum insulare* ssp. *suffrutescens* (x29)
- wooly seablite *Suaeda taxifolia* (x85)

N
W
E
S

0 250 500 1,000
Feet

Map Date: July 2010
Map By: Derek Chan
Base Source: Los Angeles County
Filepath: L:\Acad 2000 Files\00000\00016-3\gis\arcmap\RarePlants.mxd

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Figure 4

Special Status Plant Species Known Occurrences within Southwestern Area B

Legend

- Study Area
- Orcutt's pincushion *(Chaenactis glabriuscula* var. *orcuttiana)* (x350)
- South Coast branching phacelia *Phacelia ramosissima* var. *austrolitoralis* (x600)
- Lewis' evening primrose *Camissonia lewisii* (x12,200)
- Lewis' evening primrose *Camissonia lewisii* (x100)
- suffrutescent wallflower *Erysimum insulare* ssp. *suffrutescens* (x29)
- wooly seablite *Suaeda taxifolia* (x85)

N W E S

0 100 200 400

Feet

Map Date: July 2010
Map By: Derek Chan
Base Source: Los Angeles County
Filepath: L:\Acad 2000 Files\00000\00016-3\gis\arcmap\RarePlants.mxd

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Figure 5

Coast Buckwheat (*Eriogonum parviflorum*) Habitat Map within the Study Area

Legend

- Study Area
- *Eriogonum parviflorum*: (0.24 acres)

N
W
E
S

0 75 150 300
Feet

Map Date: July 2010
Map By: Derek Chan
Base Source: Los Angeles County
Filepath: L:\Acad 2000 Files\00000\00016-3\gis\arcmap\HabitatMap.mxd

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APPENDIX 1 – PLANT SPECIES WITH THE POTENTIAL TO OCCUR IN THE RESERVE

Appendix 1. Special status plant species that may occur, or are known to occur in habitats similar to those found in the Ballona Wetlands Ecological Reserve. List compiled from the U.S. Fish and Wildlife Service (USFWS) Species Lists (September 2010), California Native Plant Society (CNPS) Electronic Inventory (September 2010) and CNDDB (September 2010) searches of the Venice, Redondo Beach, Beverly Hills, and Topanga USGS 7.5 minute quadrangles.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RESULTS AND RECOMMENDATIONS
PLANTS				
Red sand verbena *Abronia maritima*	List 4	Coastal dunes. Elevation range: 0 – 325 feet. Blooms: February – November.	**Moderate Potential.** The Reserve contains restored coastal dune habitat that may support this species.	**Not Observed.** Focused rare plant survey in October did not observe this species in the Reserve.
Aphanisma *Aphanisma blitoides*	List 1B	Coastal bluff scrub, coastal dunes, coastal scrub. Typically located on bluffs and slopes near the ocean on sandy or clay soils. Elevation range: 1 – 990 feet. Blooms: March – June.	**Unlikely.** Although the Reserve contains restored coastal dune and coastal scrub habitat, this species is known primarily from the Channel Islands and drier, steeper bluff sites not present in the Reserve.	No further actions are recommended for this species.
Marsh sandwort *Arenaria paludicola*	FE, SE, List 1B	Marshes and swamps. Typically located in dense mats of emergent marsh vegetation. Elevation range: 485 – 3965 feet. Blooms: May – August.	**Unlikely.** Although the Reserve contains coastal salt marsh habitat, this species is closely associated with freshwater wetland habitat.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RESULTS AND RECOMMENDATIONS
Braunton's milk-vetch *Astragalus brauntonii*	FE, List 1B	Closed-cone coniferous forest, chaparral, coastal scrub, valley and foothill grassland. Often in recent burns or disturbed areas on gravelly clay soils overlying granite or limestone. Elevation range: 10 – 2075 feet. Blooms: January – August.	**Unlikely.** Although the Reserve contains coastal scrub habitat, this species is known from more inland sites.	No further actions are recommended for this species.
Ventura milk-vetch *Astragalus pycnostachyus* var. *lanosissimus*	FE, SE, List 1B	Coastal salt marsh, coastal dune, coastal scrub. Typically located within reach of high tide protected by barrier beaches and near seeps on sandy bluffs. Elevation range: 1 – 115 feet. Blooms: June – October.	**Moderate Potential.** The Reserve contains coastal salt marsh, restored coastal dune, and coastal scrub habitat that may support this species. Nearest known occurrence is less than 1.5 miles to the north.	**Not Observed.** Focused rare plant surveys in July and October did not observe this species in the Reserve.
Coastal dunes milk-vetch *Astragalus tener* var. *titi*	FE, SE, List 1B	Coastal bluff scrub, coastal dunes. Located on moist, sandy depressions of bluffs and dunes along or near the ocean. Elevation range: 1 – 165 feet. Blooms: March – May.	**Moderate Potential.** The Reserve contains restored coastal dune habitat that may support this species.	**Not Observed.** Focused rare plant surveys in April did not observe this species in the Reserve.
South Coast saltscale *Atriplex pacifica*	List 1B	Coastal scrub, coastal bluff scrub, playas, chenopod scrub. Located on alkali soils. Elevation range: 0 – 460 feet. Blooms: March – October.	**Moderate Potential.** The Reserve contains coastal scrub habitat that may support this species.	**Not Observed.** Focused rare plant surveys in April, July, and October did not observe this species in the Reserve.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RESULTS AND RECOMMENDATIONS
Parish's brittlescale *Atriplex parishii*	List 1B	Alkali meadows, vernal pools, chenopod scrub, playas. Typically located on alkali flats with finely textured soils. Elevation range: 80 – 6160 feet. Blooms: June – October.	**Moderate Potential.** The Reserve contains playa-like and alkali meadow habitat that may support this species.	**Not Observed.** Focused rare plant surveys in July and October did not observe this species in the Reserve.
Davidson's saltscale *Atriplex serenana* var. *davidsonii*	List 1B	Coastal bluff scrub, coastal scrub. Located on alkaline soils. Elevation range: 30 – 650 feet. Blooms: April – October.	**Moderate Potential.** The Reserve contains coastal scrub habitat underlain by alkaline substrate that may support this species.	**Not Observed.** Focused rare plant survey in October did not observe this species in the Reserve.
Brewer's red maids *Calandrinia breweri*	List 4	Chaparral, coastal scrub. Located on sandy or loamy soils, often in disturbed areas. Elevation range: 30 – 3695 feet. Blooms: March – June.	**Unlikely.** Although the Reserve contains coastal scrub habitat, this species is known from more inland sites at higher elevations.	No further actions are recommended for this species.
Seaside red maids *Calandrinia maritima*	List 4	Coastal bluff scrub, coastal scrub, valley and foothill grassland. Elevation range: 15 – 975 feet. Blooms: sometimes February, March – June, sometimes August.	**Unlikely.** Although the Reserve contains coastal scrub habitat, this species is known from the Channel Islands.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RESULTS AND RECOMMENDATIONS
Plummer's mariposa-lily *Calochortus plummerae*	List 1B	Coastal scrub, chaparral, valley and foothill grassland, cismontane woodland, lower montane coniferous forest. Located on rocky and sandy sites derived from granitic or alluvial material; often occurs following fires. Elevation range: 320 – 5510 feet. Blooms: May – July.	**Unlikely.** Although the Reserve contains coastal scrub habitat, this species is known from sites with higher elevation and further inland.	No further actions are recommended for this species.
Santa Barbara morning-glory *Calystegia sepium* ssp. *binghamiae*	List 1A	Coastal marshes. Elevation range: 0 – 65 feet. Blooms: April – May.	**Moderate Potential.** The Reserve contains coastal salt marsh habitat that may support this species.	**Not Observed.** Focused rare plant survey in April did not observe this species in the Reserve.
Lewis' evening-primrose *Camissoniopsis lewisii* [*Camissonia lewisii*]	List 3	Coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub, valley and foothill grassland. Elevation range: 0 – 975 feet. Blooms: March – May, sometimes June.	**High Potential.** The Reserve contains restored coastal dune and coastal scrub habitat that may support this species. Known occurrence from previous studies suggest this species is present in the Reserve.	**Present.** Focused rare plant survey in April located this species in Areas A and C.
Southern tarplant *Centromadia parryi* ssp. *australis*	List 1B	Marshes and swamps margins, valley and foothill grassland. Often located on disturbed sites near the coast on alkali soils. Elevation range: 0 – 1385 feet. Blooms: May – November.	**High Potential.** The Reserve contains coastal salt marsh habitat that may support this species. Known occurrence from previous studies suggest this species is present in the Reserve.	**Not Observed.** Focused rare plant survey in July did not observe this species in the Reserve.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RESULTS AND RECOMMENDATIONS
Orcutt's pincushion *Chaenactis glabriuscula* var. *orcuttiana*	List 1B	Coastal bluff scrub, coastal dunes. Located on sandy soils. Elevation range: 10 – 330 feet. Blooms: January – August.	**High Potential.** The Reserve contains restored coastal dune habitat that may support this species. Known occurrence from previous studies suggest this species is present in the Reserve.	**Present.** Focused rare plant survey in April located this species in Area B.
Coastal goosefoot *Chenopodium littoreum*	List 1B	Coastal dunes. Located on sandy soils. Elevation range: 30 – 95 feet. Blooms: April – August.	**Moderate Potential**. The Reserve contains coastal dune habitat that may support this species.	**Not Observed.** Focused rare plant survey in April did not observe this species in the Reserve.
San Fernando Valley spineflower *Chorizanthe parryi* var. *fernandina*	FC, SE, List 1B	Coastal scrub. Located on sandy soils. Elevation range: 490 – 4000 feet. Blooms: April – July.	**Moderate Potential.** The Reserve contains coastal scrub habitat that may support this species. Known occurrence from Ballona Harbor less than 1 mile to the north.	**Not Observed.** Focused rare plant survey in July did not observe this species in the Reserve.
Small-flowered morning-glory *Convolvulus simulans*	List 4	Chaparral, coastal scrub, valley and foothill grassland. Located in openings on clay soils and serpentine seeps. Elevation range: 95 – 2275 feet. Blooms: March – July.	**Unlikely.** Although the Reserve contains coastal scrub habitat, this species is known from sites with higher elevation and further inland.	No further actions are recommended for this species.
Salt marsh bird's-beak *Cordylanthus maritimus* ssp. *maritimus*	FE, SE, List 1B	Coastal salt marsh, coastal dunes. Located on the higher zones of salt marshes. Elevation range: 0 – 100 feet. Blooms: May – October.	**Moderate Potential.** The Reserve contains coastal salt marsh habitat that may support this species.	**Not Observed.** Focused rare plant surveys in July and October did not observe this species in the Reserve.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RESULTS AND RECOMMENDATIONS
Paniculate tarplant *Deinandra paniculata*	List 4	Coastal scrub, valley and foothill grassland, vernal pools. Typically located on vernally mesic sites. Elevation range: 80 – 3055 feet. Blooms: April – November.	**Moderate Potential.** The Reserve contains coastal scrub habitat that may support this species.	**Not Observed.** Focused rare plant surveys in July and October did not observe this species in the Reserve.
Western pony's-foot *Dichondra occidentalis*	List 4	Chaparral, cismontane woodland, valley and foothill grassland, coastal scrub. Elevation range: 160 – 1625 feet. Blooms: sometimes January, March – July.	**High Potential.** The Reserve contains coastal scrub habitat that may support this species. Reported occurrences from previous studies suggest this species is present in the Reserve (Existing Conditions citing Hendrickson 1991 EIR).	**Not Observed.** Focused rare plant surveys in April and July did not observe this species in the Reserve.
Beach spectaclepod *Dithyrea maritima*	ST, List 1B	Coastal dunes, coastal scrub. Located at sea shores on sand dunes and sandy places near the shore. Elevation range: 10 – 165 feet. Blooms: March – May.	**Moderate Potential.** The Reserve contains restored coastal dune and coastal scrub habitat that may support this species. Additionally, the nearest known occurrence is from "vicinity of Ballona Marshes" (CNDDB 2010).	**Not Observed.** Focused rare plant survey in April did not observe this species in the Reserve.
Santa Monica dudleya *Dudleya cymosa* ssp. *ovatifolia*	FT, List 1B	Chaparral, coastal scrub. Located in canyons on sedimentary conglomerates on primarily north-facing slopes. Elevation range: 485 – 5430 feet. Blooms: March – June.	**Unlikely.** Although the Reserve contains coastal scrub habitat, this species is known from sites with higher elevation and further inland.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RESULTS AND RECOMMENDATIONS
Many-stemmed dudleya *Dudleya multicaulis*	List 1B	Chaparral, coastal scrub, valley and foothill grassland. Located on clay soils. Elevation range: 45 – 2560 feet. Blooms: April – July.	**Moderate Potential.** The Reserve contains coastal scrub habitat that may support this species.	**Not Observed.** Focused rare plant survey in July did not observe this species in the Reserve.
Island green dudleya *Dudleya virens* ssp. *insularis*	List 1B	Coastal bluff scrub, coastal scrub. Located on rocky sites. Elevation range: 15 – 975 feet. Blooms: April – June.	**Unlikely.** Although the Reserve contains coastal scrub habitat, this species typically is known from rocky, bluff sites in coastal scrub.	No further actions are recommended for this species.
Suffrutescent wallflower *Erysimum insulare* ssp. *suffrutescens*	List 4	Coastal bluff scrub, coastal scrub, valley and foothill grassland. Elevation range: 0 – 490 feet. Blooms: January – July.	**High Potential.** The Reserve contains coastal scrub habitat that may support this species. Known occurrence from previous studies suggest this species is present in the Reserve.	**Present.** Focused rare plant survey in July and April observed this species in the Area B.
Los Angeles sunflower *Helianthus nuttallii* ssp. *parishii*	List 1A	Coastal salt and freshwater marshes and swamps. Elevation range: 30 – 5445 feet. Blooms: August – October.	**Moderate Potential.** The Reserve contains coastal salt marsh habitat that may support this species.	**Not Observed.** Focused rare plant survey in October did not observe this species in the Reserve.
Vernal barley *Hordeum intercedens*	List 3	Coastal dunes, coastal scrub, valley and foothill grassland, vernal pools. Located on saline flats and depressions. Elevation range: 15 – 3240 feet. Blooms: March – June.	**Moderate Potential.** The Reserve contains coastal scrub and restored coastal dune habitat that may support this species.	**Not Observed.** Focused rare plant survey in April did not observe this species in the Reserve.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RESULTS AND RECOMMENDATIONS
Mesa horkelia *Horkelia cuneata* ssp. *puberula*	List 1B	Chaparral, cismontane woodland, coastal scrub. Elevation range: 225 – 2625 feet. Blooms: February – July, sometimes September.	**Unlikely.** Although the Reserve contains coastal scrub habitat, this species is known from sites with higher elevation and further inland.	No further actions are recommended for this species.
Southwestern spiny rush *Juncus acutus* ssp. *leopoldii*	List 4	Coastal dunes, meadows and seeps, coastal salt marshes. Located on mesic, alkali sites. Elevation range: 10 – 2925 feet. Blooms: May – June.	**Moderate Potential.** The Reserve contains coastal salt marsh and restored coastal dune habitat that may support this species.	**Not Observed.** Focused rare plant survey in April did not observe this species in the Reserve.
Coulter's goldfields *Lasthenia glabrata* ssp. *coulteri*	List 1B	Coastal salt marshes, playas, valley and foothill grassland, vernal pools. Typically located on alkaline soils in playas, sinks, and grasslands. Elevation range: 1 – 3955 feet. Blooms: February – June.	**High Potential.** The Reserve contains coastal salt marsh habitat that may support this species. Although last observed in 1934, the nearest known occurrence of this species is known from "Ballona Marshes".	**Not Observed.** Focused rare plant survey in April did not observe this species in the Reserve.
California spineflower *Mucronea californica*	List 4	Chaparral, cismontane woodland, coastal dunes, coastal scrub, valley and foothill grassland. Located on sandy soils. Elevation range: 0 – 4550 feet. Blooms: March – July, sometimes August.	**Moderate Potential.** The Reserve contains restored coastal dune and coastal scrub habitat underlain by sandy substrate that may support this species.	**Not Observed.** Focused rare plant surveys in April and July did not observe this species in the Reserve.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RESULTS AND RECOMMENDATIONS
Mud nama *Nama stenocarpum*	List 2	Marshes and swamps. Located on lake shores, streams banks, and intermittently wet areas. Elevation range: 15 – 1620 feet. Blooms: January – July.	**Moderate Potential.** The Reserve contains freshwater marsh margins that may support this species. Additionally, the nearest known occurrence of this species is from less than four miles to the north.	**Not Observed.** Focused rare plant survey in July did not observe this species in the Reserve.
Gambel's watercress *Nasturtium gambellii*	FE, ST, List 1B	Brackish and freshwater marshes and swamps. Located on lake and stream margins at or immediately above the water line. Elevation range: 15 – 1075 feet. Blooms: April – October.	**Unlikely.** Although the Reserve contains coastal salt marsh habitat, this species is known from freshwater and brackish marshes with lower salinity.	No further actions are recommended for this species.
Moran's nosegay *Navarretia fossalis*	FT, List 1B	Vernal pools, chenopod scrub, marshes and swamps, playas. Located on hardpan soils in swales, depressions, and pools. Elevation range: 95 – 4225 feet. April – June.	**Unlikely.** Although the Reserve contains marsh habitat, this species is known from more inland sites with lesser salinity and higher elevation.	No further actions are recommended for this species.
Prostrate vernal pool navarretia *Navarretia prostrata*	List 1B	Coastal scrub, valley and foothill grassland, vernal pools. Elevation range: 45 – 2270 feet. Blooms: April – July.	**Unlikely.** Although the Reserve contains coastal scrub, this species is requires freshwater vernal pool habitat not present in the Reserve.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RESULTS AND RECOMMENDATIONS
Coast woolly-heads *Nemacaulis denudata* var. *denudata*	List 1B	Coastal dunes. Elevation range: 0 – 325 feet. Blooms: April – September.	**Unlikely.** Although the Reserve contains restored dune habitat, this species is known only from south of Rancho Palos Verdes.	No further actions are recommended for this species.
California Orcutt grass *Orcuttia californica*	FE, SE, List 1B	Vernal pools. Elevation range: 45 – 2145 feet. Blooms: April – August.	**No Potential.** The Reserve does not contain vernal pool habitat.	No further actions are recommended for this species.
Lyon's Pentachaeta *Pentachaeta lyonii*	FE, SE, List 1B	Chaparral, valley and foothill grassland. Located on the edge of openings at the ecotone between chaparral and grassland. Elevation range: 95 – 2050 feet. Blooms: March – August.	**No Potential.** The Reserve does not contain chaparral or intact grassland habitat.	No further actions are recommended for this species.
South Coast branching phacelia *Phacelia ramosissima* var. *austrolitoralis*	List 4	Chaparral, coastal dunes, coastal scrub, coastal salt marshes. Located on sandy, often rocky soils. Elevation range: 20 – 975 feet. Blooms: March – August.	**High Potential.** The Reserve contains restored coastal dune, coastal scrub, and coastal salt marsh habitat that may support this species. Additionally, the nearest documented occurrence is from within the Reserve.	Focused rare plant surveys in July, October, and April located this species; however, recent taxanomic descriptions do not recognize varieties (Jepson 2011).
Brand's star phacelia *Phacelia stellaris*	FC, List 1B	Coastal scrub, coastal dunes. Located in open areas. Elevation range: 1 – 1300 feet. Blooms: March – June.	**Moderate Potential.** The Reserve contains coastal scrub and coastal dune habitat that may support this species. Additionally, the nearest known occurrence of this species from less than one mile to the south.	**Not Observed.** Focused rare plant survey in April did not observe this species in the Reserve.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RESULTS AND RECOMMENDATIONS
Ballona cinquefoil *Potentilla multijuga*	List 1A	Brackish meadows and seeps. Elevation range: 0 – 10 feet. Blooms: June – August.	**Moderate Potential.** The Reserve contains brackish grassland sites. The Reserve is the type locality of this species; however, it is presumed extinct.	**Not Observed.** Focused rare plant survey in July did not observe this species in the Reserve.
White rabbit-tobacco *Pseudognaphalium leucocephalum*	List 2	Riparian woodland, cismontane woodland, coastal scrub, chaparral. Elevation range: 0 – 6825 feet. Blooms: sometimes July, August – November, sometimes December.	**Unlikely.** Although the Reserve contains coastal scrub habitat, this species is known primarily from sites further inland.	No further actions are recommended for this species.
Salt Spring checkerbloom *Sidalcea neomexicana*	List 2	Alkali playas, brackish marshes, chaparral, coastal scrub, lower montane coniferous forest, Mojavean Desert scrub. Located on alkali springs and marshes. Elevation range: 45 – 4960 feet. Blooms: March – June.	**Moderate Potential.** The Reserve contains brackish marsh and coastal scrub habitat that may support this species.	**Not Observed.** Focused rare plant surveys in April did not observe this species in the Reserve.
Estuary seablite *Suaeda esteroa*	List 1B	Coastal salt marshes. Located on clay, silt, and sand substrates. Elevation range: 0 – 15 feet. Blooms: May – October.	**High Potential.** The Reserve contains coastal salt marsh habitat. Reported occurrences from previous studies suggest this species is present in the Reserve (Existing Conditions citing Hendrickson 1991 EIR).	**Not Observed.** Focused rare plant surveys in July and October did not observe this species in the Reserve.

SPECIES	STATUS*	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN PROJECT AREA	RESULTS AND RECOMMENDATIONS
Woolly seablite *Suaeda taxifolia*	List 4	Coastal bluff scrub, coastal dunes, margins of coastal salt marshes. Elevation range: 0 – 165 feet. Blooms: January – December.	**High Potential.** The Reserve contains coastal salt marsh and coastal dune habitat. Known occurrences from previous studies suggest this species is present in the Reserve.	**Present.** Focused rare plant surveys in April, July, and October located this species in Area B.
San Bernardino aster *Symphyotrichum defoliatum*	List 1B	Meadows and seeps, marshes and swamps, coastal scrub, cismontane woodland, lower montane coniferous forest, grassland. Located in mesic grassland near ditches, streams, and springs. Elevation range: 5 – 6630 feet. Blooms: July – November.	**Unlikely.** Although the Reserve contains coastal scrub habitat, this species is known from sites further inland.	No further actions are recommended for this species.
Greata's aster *Symphyotrichum greatae*	List 1B	Chaparral, cismontane woodland. Located in mesic canyons. Elevation range: 975 – 6535 feet. Blooms: June – October.	**No Potential.** The Reserve does not contain chaparral or woodland habitat 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) *[not special status]*
List 4	CNPS List 4: Plants of limited distribution (a watch list) *[not special status]*

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. CNDDB, other reports) on the site recently.

APPENDIX 2 – LIST OF PLANT SPECIES OBSERVED IN THE RESERVE

Appendix 2. Plant species observed in the Study Area in October 2010 and April 2011

Family	Scientific Name	Common Name	Life Form	Origin	Rarity Status[1]	Invasive Status[2]	Wetland Status[3]
Aizoaceae	*Aptenia cordifolia*	dew plant	perennial forb	non-native	N/A	N/A	NL
Aizoaceae	*Carpobrotus edulis*	sea fig	perennial forb	non-native	N/A	high	NL
Aizoaceae	*Drosanthemum floribundum*	rosy iceplant	perennial forb	non-native	N/A	N/A	NL
Aizoaceae	*Malephora crocea*	coppery mesemb	perennial forb	non-native	N/A	assessed	NL
Aizoaceae	*Mesembryanthemum crystallinum*	crystalline ice plant	annual forb	non-native	N/A	moderate	NL
Aizoaceae	*Mesembryanthemum nodiflorum*	slenderleaf ice plant	annual forb	non-native	N/A	N/A	FACU
Aizoaceae	*Tetragonia tetragonioides*	New Zealand spinach	annual forb	non-native	N/A	N/A	NL
Amaranthaceae	*Amaranthus californicus*	California pigweed	annual forb	native	N/A	N/A	FACW
Anacardiaceae	*Malosma laurina*	laurel sumac	evergreen shrub	native	N/A	N/A	NL
Anacardiaceae	*Rhus integrifolia*	lemonade berry	evergreen shrub	native	N/A	N/A	NL
Anacardiaceae	*Rhus ovata*	sugar bush	evergreen shrub	native	N/A	N/A	NL
Anacardiaceae	*Schinus molle*	Peruvian pepper tree	evergreen tree	non-native	N/A	limited	NL
Anacardiaceae	*Schinus terebinthifolius*	Brazilian pepper tree	evergreen tree	non-native	N/A	limited	NL
Apiaceae	*Apium graveolens*	wild celery	perennial forb	non-native	N/A	N/A	FACW
Apiaceae	*Conium maculatum*	poison hemlock	perennial forb	non-native	N/A	moderate	FACW
Apiaceae	*Daucus pusillus*	American wild carrot	annual forb	native	N/A	N/A	NL
Apiaceae	*Foeniculum vulgare*	fennel	perennial forb	non-native	N/A	high	FACU
Apocynaceae	*Nerium oleander*	oleander	shrub	non-native	N/A	assessed	NL
Araliaceae	*Hedera helix*	English ivy	perennial vine	non-native	N/A	high	NL
Arecaceae	*Phoenix canariensis*	Canary Island date palm	evergreen tree	non-native	N/A	limited	NL
Arecaceae	*Washingtonia robusta*	Washington fan palm	evergreen tree	non-native	N/A	moderate	NL
Asclepiadaceae	*Asclepias fascicularis*	narrow leaf milkweed	perennial forb	native	N/A	N/A	FAC
Asteraceae	*Acroptilon repens*	Russian knapweed	perennial forb	non-native	N/A	moderate	NL
Asteraceae	*Ambrosia chamissonis*	silver beach weed	perennial forb	native	N/A	N/A	NL
Asteraceae	*Ambrosia psilostachya*	western ragweed	perennial forb	native	N/A	N/A	FAC
Asteraceae	*Artemisia californica*	California sage brush	shrub	native	N/A	N/A	NL
Asteraceae	*Artemisia douglasiana*	mugwort	perennial forb	native	N/A	N/A	FACW
Asteraceae	*Artemisia dracunculus*	wild tarragon	perennial forb	native	N/A	N/A	NL
Asteraceae	*Aster subulatus*	annual water aster	annual forb	native	N/A	N/A	FACW
Asteraceae	*Baccharis pilularis*	coyote brush	shrub	native	N/A	N/A	NL

Family	Scientific Name	Common Name	Life Form	Origin	Rarity Status[1]	Invasive Status[2]	Wetland Status[3]
Asteraceae	*Baccharis salicifolia*	mule fat	shrub	native	N/A	N/A	FACW
Asteraceae	*Brickellia californica*	California bricklebush	evergreen shrub	native	N/A	N/A	FACU
Asteraceae	*Carduus pycnocephalus*	Italian thistle	annual forb	non-native	N/A	moderate	NL
Asteraceae	*Centaurea melitensis*	tocalote thistle	annual forb	non-native	N/A	moderate	NL
Asteraceae	*Chaenactis glabriuscula* var. *orcuttiana*	Orcutt's yellow pincushion	annual forb	native	List 1B	N/A	NL
Asteraceae	*Chrysanthemum coronarium*	crown daisy	annual forb	non-native	N/A	moderate	NL
Asteraceae	*Cichorium intybus*	chicory	perennial forb	non-native	N/A	N/A	NL
Asteraceae	*Cirsium vulgare*	bull thistle	annual forb	non-native	N/A	moderate	FACU
Asteraceae	*Conyza canadensis*	horseweed	annual forb	native	N/A	N/A	FAC
Asteraceae	*Cotula coronopifolia*	brass buttons	perennial forb	non-native	N/A	limited	FACW
Asteraceae	*Deinandra fasciculata*	fasciculate tarplant	annual forb	native	N/A	N/A	NL
Asteraceae	*Encelia californica*	California brittlebush	evergreen shrub	native	N/A	N/A	NL
Asteraceae	*Ericameria pinifolia*	pine bush	evergreen shrub	native	N/A	N/A	NL
Asteraceae	*Eriophyllum confertiflorum*	golden yarrow	evergreen shrub	native	N/A	N/A	NL
Asteraceae	*Euthamia occidentalis*	western goldenrod	perennial forb	native	N/A	N/A	OBL
Asteraceae	*Gnaphalium californicum*	California cudweed	annual, perennial forb	native	N/A	N/A	NL
Asteraceae	*Gnaphalium canescens* ssp. *beneolens*	cudweed	perennial forb	native	N/A	N/A	NL
Asteraceae	*Grindelia camporum*	valley gumweed	perennial forb	native	N/A	N/A	FACU
Asteraceae	*Hedypnois cretica*	Creten weed	annual forb	non-native	N/A	N/A	NL
Asteraceae	*Heterotheca grandiflora*	telegraph weed	annual, perennial forb	native	N/A	N/A	NL
Asteraceae	*Heterotheca villosa*	hairy telegraph weed	perennial forb	native	N/A	N/A	NL
Asteraceae	*Hypochaeris glabra*	smooth cat's-ear	annual forb	non-native	N/A	limited	NL
Asteraceae	*Hypochaeris radicata*	rough cat's-ear	perennial forb	non-native	N/A	moderate	NL
Asteraceae	*Isocoma menziesii* var. *vernonioides*	coastal goldenbush	shrub	native	N/A	N/A	FACW
Asteraceae	*Iva axillaris*	poverty weed	perennial forb	native	N/A	N/A	FAC
Asteraceae	*Jaumea carnosa*	fleshy jaumea	perennial forb	native	N/A	N/A	OBL
Asteraceae	*Lactuca serriola*	prickly lettuce	annual forb	non-native	N/A	assessed	FAC
Asteraceae	*Lasthenia californica*	California goldfields	annual forb	native	N/A	N/A	FACU

Family	Scientific Name	Common Name	Life Form	Origin	Rarity Status[1]	Invasive Status[2]	Wetland Status[3]
Asteraceae	*Lessingia filaginifolia* var. *filaginifolia*	common sandaster	perennial forb	native	N/A	N/A	NL
Asteraceae	*Malacothrix saxatilis*	cliff aster	perennial forb	native	N/A	N/A	NL
Asteraceae	*Matricaria matricarioides*	pineapple weed	annual forb	non-native	N/A	N/A	FACU
Asteraceae	*Osteospermum fruticosum*	bush daisy	perennial forb	non-native	N/A	N/A	NL
Asteraceae	*Picris echioides*	bristly ox-tongue	perennial forb	non-native	N/A	limited	FAC
Asteraceae	*Senecio vulgare*	old-man-of-spring	annual forb	non-native	N/A	N/A	NI
Asteraceae	*Silybum marianum*	milk thistle	perennial forb	non-native	N/A	limited	NL
Asteraceae	*Sonchus asper* ssp. *asper*	prickly sow thistle	annual forb	non-native	N/A	assessed	FAC
Asteraceae	*Sonchus oleraceus*	common sow thistle	annual forb	non-native	N/A	N/A	NI
Asteraceae	*Stephanomeria virgata*	wire lettuce	annual forb	native	N/A	N/A	NL
Asteraceae	*Taraxacum officinale*	common dandelion	perennial forb	non-native	N/A	assessed	FACU
Asteraceae	*Xanthium strumarium*	rough cocklebur	annual forb	native	N/A	N/A	FAC
Bataceae	*Batis maritima*	salt wort	shrub	native	N/A	N/A	OBL
Boraginaceae	*Amsinckia menziesii*	fiddleneck	annual forb	native	N/A	N/A	NL
Boraginaceae	*Cryptantha intermedia*	Clearwater cryptantha	annual forb	native	N/A	N/A	NL
Boraginaceae	*Heliotropium curassavicum*	seaside heliotrope	perennial forb	native	N/A	N/A	OBL
Brassicaceae	*Brassica nigra*	black mustard	annual forb	non-native	N/A	moderate	NL
Brassicaceae	*Brassica rapa*	field mustard	annual forb	non-native	N/A	limited	NL
Brassicaceae	*Cakile maritima*	European searocket	annual forb	non-native	N/A	limited	FACW
Brassicaceae	*Erysimum insulare* ssp. *suffrutescens*	suffrutescent wallflower	perennial forb	native	List 4	N/A	NL
Brassicaceae	*Hirschfeldia incana*	Mediterranean mustard	perennial forb	non-native	N/A	moderate	NL
Brassicaceae	*Lepidium* aff. *virginicum*	wild pepperweed	annual forb	native	N/A	N/A	FACU
Brassicaceae	*Lepidium latifolium*	perennial pepperweed	perennial forb	non-native	N/A	high	FACW
Brassicaceae	*Lobularia maritima*	sweet alyssum	perennial forb	non-native	N/A	limited	NL
Brassicaceae	*Raphanus sativus*	wild radish	annual forb	non-native	N/A	limited	NL
Brassicaceae	*Sinapis alba*	white mustard	annual forb	non-native	N/A	N/A	NL
Brassicaceae	*Sisymbrium irio*	London rocket	annual forb	non-native	N/A	moderate	NL
Cactaceae	*Opuntia* aff. *littoralis*	coastal prickly pear	perennial forb	native	N/A	N/A	NL
Cactaceae	*Opuntia ficus-indica*	mission cactus	evergreen shrub	non-native	N/A	N/A	NL
Capparaceae	*Isomeris arborea*	bladder pod	evergreen shrub	native	N/A	N/A	NL
Caprifoliaceae	*Sambucus nigra*	black elderberry	deciduous shrub	native	N/A	N/A	FAC
Caryophyllaceae	*Polycarpon tetraphyllum*	four-leaf many-seed	annual forb	non-native	N/A	N/A	NL

Family	Scientific Name	Common Name	Life Form	Origin	Rarity Status[1]	Invasive Status[2]	Wetland Status[3]
Caryophyllaceae	*Silene gallica*	windmill pink	annual forb	non-native	N/A	N/A	NL
Caryophyllaceae	*Spergularia marina*	salt spurry	perennial forb	native	N/A	N/A	OBL
Caryophyllaceae	*Spergularia rubra*	red sandspurry	perennial forb	non-native	N/A	N/A	FAC
Casuarinaceae	*Casuarina glauca*	grey sheoak	evergreen tree	non-native	N/A	N/A	NL
Chenopodiaceae	*Atriplex californica*	California saltbush	perennial forb	native	N/A	N/A	FAC
Chenopodiaceae	*Atriplex lentiformis*	large saltbush	shrub	native	N/A	N/A	FAC
Chenopodiaceae	*Atriplex patula*	fat hen	annual forb	native	N/A	N/A	FACW
Chenopodiaceae	*Atriplex prostrata*	fat hen	annual forb	non-native	N/A	N/A	NL
Chenopodiaceae	*Atriplex semibaccata*	Australian saltbush	perennial forb	non-native	N/A	moderate	FAC
Chenopodiaceae	*Atriplex triangularis*	fat hen	annual forb	native	N/A	N/A	FACW
Chenopodiaceae	*Bassia hyssopifolia*	five hook	annual forb	non-native	N/A	limited	FAC
Chenopodiaceae	*Beta vulgaris*	beet	perennial forb	non-native	N/A	N/A	FACU
Chenopodiaceae	*Chenopodium album*	lamb's quarters	annual forb	non-native	N/A	N/A	FAC
Chenopodiaceae	*Chenopodium ambrosioides*	Mexican tea	perennial forb	non-native	N/A	N/A	FAC
Chenopodiaceae	*Salicornia subterminalis*	Parish's pickleweed	perennial forb	native	N/A	N/A	OBL
Chenopodiaceae	*Salicornia virginica*	pickleweed	perennial forb	native	N/A	N/A	OBL
Chenopodiaceae	*Salsola tragus*	prickly Russian thistle	annual forb	non-native	N/A	limited	FACU
Chenopodiaceae	*Suaeda taxifolia*	woolly seablite	shrub	native	List 4	N/A	NL
Convolvulaceae	*Convolvulus arvensis*	field bindweed	perennial forb	non-native	N/A	assessed	NL
Convolvulaceae	*Cressa truxillensis*	alkali weed	perennial forb	native	N/A	N/A	FACW
Crassulaceae	*Crassula argentea*	jade plant	perennial forb	non-native	N/A	N/A	NL
Crassulaceae	*Crassula connata*	sand pygmy weed	annual forb	native	N/A	N/A	NL
Cucurbitaceae	*Marah macrocarpa*	southern wild cucumber	perennial vine	native	N/A	N/A	NL
Cupressaceae	*Cupressus arizonica*	Arizona cypress	evergreen tree	non-native	N/A	N/A	NL
Cupressaceae	*Juniperus chinensis*	Hollywood juniper	evergreen tree	non-native	N/A	N/A	NL
Cuscutaceae	*Cuscuta salina*	salt marsh dodder	annual forb	native	N/A	N/A	NL
Cyperaceae	*Bolboschoenus maritimus*	Olney's bulrush	perennial graminoid	native	N/A	N/A	OBL
Cyperaceae	*Cyperus eragrostis*	tall flatsedge	perennial graminoid	native	N/A	N/A	FACW
Cyperaceae	*Eleocharis macrostachya*	creeping spike rush	perennial graminoid	native	N/A	N/A	OBL
Cyperaceae	*Schoenoplectus californicus*	California tule	perennial graminoid	native	N/A	N/A	OBL

Family	Scientific Name	Common Name	Life Form	Origin	Rarity Status[1]	Invasive Status[2]	Wetland Status[3]
Euphorbiaceae	*Chamaesyce albomarginata*	rattlesnake weed	perennial forb	native	N/A	N/A	NL
Euphorbiaceae	*Chamaesyce maculata*	spotted spurge	annual forb	non-native	N/A	N/A	NL
Euphorbiaceae	*Croton californicus*	California croton	perennial forb	native	N/A	N/A	NL
Euphorbiaceae	*Euphorbia esula*	leafy spurge	perennial forb	non-native	N/A	high	NL
Euphorbiaceae	*Euphorbia peplus*	petty spurge	annual forb	non-native	N/A	N/A	NL
Euphorbiaceae	*Ricinus communis*	castor	shrub	non-native	N/A	limited	FACU
Fabaceae	*Acacia decurrens*	black wattle	tree	non-native	N/A	N/A	NL
Fabaceae	*Acacia longifolia*	golden wattle	evergreen tree	non-native	N/A	N/A	NL
Fabaceae	*Lotus scoparius*	deer vetch	perennial forb	native	N/A	N/A	NL
Fabaceae	*Lupinus bicolor*	miniature lupine	annual forb	native	N/A	N/A	NL
Fabaceae	*Lupinus chamissonis*	dune bush lupine	perennial shrub	native	N/A	N/A	NL
Fabaceae	*Lupinus succulentus*	succulent lupine	annual forb	native	N/A	N/A	NL
Fabaceae	*Medicago polymorpha*	bur weed	annual forb	non-native	N/A	limited	NL
Fabaceae	*Melilotus albus*	white sweetclover	annual forb	non-native	N/A	assessed	FACU
Fabaceae	*Melilotus indicus*	yellow sweetclover	annual forb	non-native	N/A	N/A	FAC
Fabaceae	*Robinia pseudoacacia*	black locust	tree	non-native	N/A	limited	FAC
Frankeniaceae	*Frankenia salina*	alkali heath	perennial forb	native	N/A	N/A	FACW
Geraniaceae	*Erodium botrys*	redstem filaree	annual forb	non-native	N/A	assessed	NL
Geraniaceae	*Erodium cicutarium*	long-beak filaree	annual forb	non-native	N/A	limited	NL
Geraniaceae	*Erodium moschatum*	whitestem filaree	annual forb	non-native	N/A	assessed	NL
Geraniaceae	*Geranium molle*	dove's-foot geranium	annual forb	non-native	N/A	assessed	NL
Geraniaceae	*Pelargonium zonale*	garden geranium	perennial forb	non-native	N/A	N/A	NL
Hamamelidaceae	*Liquidambar styraciflua*	gum	deciduous tree	non-native	N/A	N/A	NL
Hydrophyllaceae	*Nemophila menziesii*	baby blue eyes	annual forb	native (seeding)	N/A	N/A	NL
Hydrophyllaceae	*Phacelia ramosissima*	branching phacelia	perennial forb	native	N/A	N/A	NL
Iridaceae	*Iris* sp.	ornamental iris	perennial forb	non-native	N/A	unknown	?
Juncaceae	*Juncus balticus*	Baltic rush	perennial graminoid	native	N/A	N/A	OBL
Juncaceae	*Juncus bufonius*	toad rush	annual graminoid	native	N/A	N/A	FACW
Juncaceae	*Juncus mexicanus*	Mexican rush	perennial graminoid	native	N/A	N/A	FACW
Juncaginaceae	*Triglochin maritima*	seaside arrow grass	perennial graminoid	native	N/A	N/A	OBL

Family	Scientific Name	Common Name	Life Form	Origin	Rarity Status[1]	Invasive Status[2]	Wetland Status[3]
Lamiaceae	*Lamium amplexicaule*	henbit	annual forb	non-native	N/A	N/A	NL
Lamiaceae	*Marrubium vulgare*	horehound	perennial forb	non-native	N/A	limited	FAC
Liliaceae	*Agave americana*	century plant	shrub	non-native	N/A	N/A	NL
Lythraceae	*Lythrum hyssopifolium*	hyssop loosestrife	annual forb	non-native	N/A	moderate	FACW
Malvaceae	*Malva nicaeensis*	bull mallow	annual forb	non-native	N/A	N/A	NL
Malvaceae	*Malva parviflora*	cheeseweed	annual forb	non-native	N/A	N/A	NL
Malvaceae	*Malvella leprosa*	alkali mallow	perennial forb	native	N/A	N/A	FAC
Moraceae	*Ficus carica*	common fig	deciduous tree	non-native	N/A	moderate	NL
Moraceae	*Morus alba*	white mulberry	tree	non-native	N/A	N/A	NI
Myoporaceae	*Myoporum laetum*	lollypop tree	shrub	non-native	N/A	moderate	NL
Myrtaceae	*Callistemon citrinus*	crimson bottle brush	shrub	non-native	N/A	N/A	NL
Myrtaceae	*Eucalyptus camaldulensis*	red gum	tree	non-native	N/A	limited	NL
Myrtaceae	*Eucalyptus globulus*	blue gum	tree	non-native	N/A	moderate	NL
Nyctaginaceae	*Abronia umbellate*	pink sand verbena	perennial forb	native	N/A	N/A	NL
Oleaceae	*Fraxinus velutina*	Arizona ash	tree	native	N/A	N/A	FACW
Oleaceae	*Olea europaea*	European olive	evergreen tree	non-native	N/A	limited	NL
Onagraceae	*Camissonia strigulosa*	contorted suncup	annual forb	native	N/A	N/A	NL
Onagraceae	*Camissoniopsis bistorta* [*Camissonia b.*]	California suncup	annual forb	native	N/A	N/A	NL
Onagraceae	*Camissoniopsis cheiranthifolia* var. *suffruticosa* [*Camissonia c.* var. *s.*]	beach suncup	perennial forb	native	N/A	N/A	NL
Onagraceae	*Camissoniopsis lewisii* [*Camissonia l.*]	Lewis' suncup	annual forb	native	List 3	N/A	NL
Onagraceae	*Camissoniopsis micrantha* [*Camissonia m.*]	miniature suncup	annual forb	native	N/A	N/A	NL
Oxalidaceae	*Oxalis pes-caprae*	Bermuda buttercup	perennial forb	non-native	N/A	moderate	NL
Papaveraceae	*Eschscholzia californica*	California poppy	perennial forb	native	N/A	N/A	NL
Phrymaceae	*Mimulus aurantiacus* var. *puniceus*	red bush monkeyflower	evergreen shrub	native	N/A	N/A	NL
Pinaceae	*Pinus* aff. *canariensis*	Canary Island pine	tree	non-native	N/A	N/A	NL
Pinaceae	*Pinus muricata*	Bishop pine	evergreen tree	native (planted?)	N/A	N/A	NL

Family	Scientific Name	Common Name	Life Form	Origin	Rarity Status[1]	Invasive Status[2]	Wetland Status[3]
Plantaginaceae	*Plantago lanceolata*	English plantain	perennial forb	non-native	N/A	limited	FAC
Plantaginaceae	*Plantago major*	common plantain	perennial forb	non-native	N/A	N/A	FACW
Platanaceae	*Platanus racemosa*	western sycamore	deciduous tree	native	N/A	N/A	FACW
Poaceae	*Agrostis stolonifera*	creeping redtop	perennial graminoid	non-native	N/A	limited	FACW
Poaceae	*Arundo donax*	giant reed	perennial graminoid	non-native	N/A	high	FACW
Poaceae	*Avena barbata*	slender wild oat	annual forb	non-native	N/A	moderate	NL
Poaceae	*Avena fatua*	wild oat grass	annual graminoid	non-native	N/A	moderate	NL
Poaceae	*Bromus catharticus*	rescue grass	annual, perennial graminoid	non-native	N/A	N/A	NL
Poaceae	*Bromus diandrus*	ripgut brome	annual forb	non-native	N/A	moderate	NL
Poaceae	*Bromus hordeaceus*	soft chess	annual graminoid	non-native	N/A	limited	FACU
Poaceae	*Bromus madritensis* ssp. *rubens*	Madrid brome	annual graminoid	non-native	N/A	high	NI
Poaceae	*Cortaderia selloana*	Pampas grass	perennial graminoid	non-native	N/A	high	NL
Poaceae	*Cynodon dactylon*	Bermuda grass	perennial graminoid	non-native	N/A	moderate	FAC
Poaceae	*Distichlis spicata*	salt grass	perennial graminoid	native	N/A	N/A	FACW
Poaceae	*Ehrharta erecta*	Stebbins grass	perennial graminoid	non-native	N/A	moderate	NL
Poaceae	*Hainardia cylindrica*	thin tail	annual graminoid	non-native	N/A	N/A	FACW
Poaceae	*Hordeum brachyantherum*	meadow barley	annual forb	native	N/A	N/A	FACW
Poaceae	*Hordeum murinum* ssp. *leporinum*	Mediterranean barley	annual graminoid	non-native	N/A	moderate	NI
Poaceae	*Leymus triticoides*	creeping wild rye	perennial graminoid	native	N/A	N/A	FAC
Poaceae	*Lolium multiflorum*	Italian rye grass	annual graminoid	non-native	N/A	moderate	FAC
Poaceae	*Lolium perenne*	perennial rye grass	perennial graminoid	non-native	N/A	N/A	FAC
Poaceae	*Melica imperfecta*	small-flower onion grass	perennial graminoid	native	N/A	N/A	NL

Family	Scientific Name	Common Name	Life Form	Origin	Rarity Status[1]	Invasive Status[2]	Wetland Status[3]
Poaceae	*Nassella cernua*	nodding needlegrass	perennial graminoid	native	N/A	N/A	NL
Poaceae	*Parapholis incurva*	sickle grass	annual graminoid	non-native	N/A	N/A	OBL
Poaceae	*Paspalum dilatatum*	dallis grass	perennial graminoid	non-native	N/A	N/A	FAC
Poaceae	*Phalaris minor*	little seed canary grass	annual graminoid	non-native	N/A	N/A	NL
Poaceae	*Piptatherum miliaceum*	smilo grass	perennial graminoid	non-native	N/A	limited	NL
Poaceae	*Polypogon monspeliensis*	rabbit's-foot grass	annual forb	non-native	N/A	limited	FACW
Poaceae	*Schismus barbatus*	common Mediterranean grass	annual graminoid	non-native	N/A	limited	NL
Poaceae	*Vulpia myuros*	rattail fescue	annual graminoid	non-native	N/A	moderate	FACU
Polygonaceae	*Eriogonum fasciculatum*	California buckwheat	shrub	native	N/A	N/A	NL
Polygonaceae	*Eriogonum parvifolium*	coast buckwheat	shrub	native	N/A	N/A	NL
Polygonaceae	*Polygonum arenastrum*	dooryard knotweed	perennial forb	non-native	N/A	N/A	FAC
Polygonaceae	*Rumex crispus*	curly dock	perennial forb	non-native	N/A	limited	FACW
Polygonaceae	*Rumex pulcher*	fiddle dock	perennial forb	non-native	N/A	N/A	FAC
Polygonaceae	*Rumex salicifolius*	willow dock	perennial forb	native	N/A	N/A	OBL
Primulaceae	*Anagallis arvensis*	scarlet pimpernel	annual forb	non-native	N/A	N/A	FAC
Rosaceae	*Heteromeles arbutifolia*	toyon	shrub	native	N/A	N/A	NL
Rosaceae	*Pyrus communis*	pear	deciduous shrub	non-native	N/A	N/A	NL
Rosaceae	*Rosa californica*	California rose	shrub	native	N/A	N/A	FAC
Salicaceae	*Populus fremontii*	Fremont cottonwood	deciduous tree	native	N/A	N/A	FACW
Salicaceae	*Salix exigua*	narrow leaf willow	deciduous tree	native	N/A	N/A	OBL
Salicaceae	*Salix lasiolepis*	arroyo willow	deciduous tree	native	N/A	N/A	FACW
Saururaceae	*Anemopsis californica*	yerba mansa	perennial forb	native	N/A	N/A	OBL
Solanaceae	*Datura wrightii*	jimsonweed	perennial forb	native	N/A	N/A	NL
Solanaceae	*Lycium* aff. *ferocissimum*	African boxthorn	evergreen shrub	non-native	N/A	N/A	NL
Solanaceae	*Nicotiana glauca*	tree tobacco	shrub	non-native	N/A	moderate	FAC
Solanaceae	*Solanum americanum*	American nightshade	perennial forb	native	N/A	N/A	FAC
Solanaceae	*Solanum nigrum*	black nightshade	perennial forb	non-native	N/A	N/A	FACU
Typhaceae	*Typha angustifolia*	narrow-leaf cattail	perennial graminoid	native	N/A	N/A	OBL

Family	Scientific Name	Common Name	Life Form	Origin	Rarity Status[1]	Invasive Status[2]	Wetland Status[3]
Typhaceae	*Typha domingensis*	southern cattail	perennial graminoid	native	N/A	N/A	OBL
Ulmaceae	*Ulmus parviflora*	Chinese elm	tree	non-native	N/A	N/A	NL
Urticaceae	*Urtica dioica*	stinging nettle	perennial forb	native	N/A	N/A	FACW
Urticaceae	*Urtica urens*	dwarf nettle	annual forb	non-native	N/A	N/A	NL

All plant species identified from the Jepson Manual (Hickman 1993) and A Flora of Southern California (Munz 1974); nomenclature follows Hickman (1993) or Jepson Interchange (2011)

[1]Rare Status: The CNPS Inventory of Rare and Endangered Plants (CNPS 2011)

[2]Invasive Status: California Invasive Plant Inventory (Cal-IPC 2006)

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

APPENDIX 3 – REPRESENTATIVE PHOTOGRAPHS OF THE RESERVE

Top Left: Lewis's evening primrose close-up; note: stigma surrounded by anthers

Bottom Left: Lewis's evening primrose close-up; note: stigma below the anthers

Photographs taken: April 5, 2011

Top Right: Lewis's evening primrose habitat; note: bare gravelly sand substrate

Bottom Right: Lewis's evening primrose habitat in Area C

Photographs taken: April 5, 2011

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Top Left: Orcutt's pincushion close-up of flowers in western Area B

Bottom Left: Orcutt's pincushion close-up of stem and hairs in western Area B

Photographs taken: April 8, 2011

Top Right: Orcutt's pincushion habitat in western Area B

Bottom Right: Orcutt's pincushion close-up of leaves in western Area B

Photographs taken: April 8, 2011

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ENVIRONMENTAL CONSULTANTS

Top Left: suffrutescent wallflower close-up of flowers in western Area B

Bottom Left: suffrutescent wallflower habitat in western Area B

Photographs taken: April 7, 2011

Top Right: suffrutescent wallflower close-up of fruits in western Area B

Bottom Right: suffrutescent wallflower close-up of leaves in western Area B

Photographs taken: April 7, 2011

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Top Left: woolly seablite habitat in northwest Area B

Bottom Left: woolly seablite close-up in northwest Area B

Photographs taken: October 5 and July 8, 2010

Top Right: woolly seablite close-up in northwest Area B

Bottom Right: woolly seablite close-up in northwest Area B

Photographs taken: October 5, 2010

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ENVIRONMENTAL CONSULTANTS

Top Left: coast buckwheat close-up in Area B

Bottom Left: coast buckwheat habitat in western portion of Area B

Photographs taken: October 5 and July 8, 2010

Top Right: coast buckwheat in Area B

Bottom Right: coast buckwheat in Area B

Photographs taken: October 5 and July 8, 2010

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