



Biological Resources Assessment

Meadow Creek Lagoon



Prepared for:

San Luis Obispo County
Flood Control and Water Conservation District
County Government Center, Room 207
San Luis Obispo, California 93408

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“As a County-approved biologists, we hereby certify that this Biological Resources Assessment was prepared according to the Guidelines established by the County of San Luis Obispo Department of Planning and Building and that the statements furnished in the report and associated maps are true and correct to the best of my knowledge and belief; and we further certify that a senior biologist was present throughout the site visit(s) associated with this report.”

A handwritten signature in black ink, appearing to be "B. M. Am", written over a horizontal line.

Signature line

27 September 2012

Date

A handwritten signature in black ink, appearing to be "Brooke Jung", written over a horizontal line.

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27 September 2012

Date



EXECUTIVE SUMMARY

This biological resources assessment was prepared at the request of the San Luis Obispo County Flood Control and Water Conservation District (District) for the Meadow Creek Lagoon and surrounding riparian, wetland, and coastal dune habitat. The lagoon is located in the community of Oceano, on the south coast of San Luis Obispo County, California. A survey area of approximately 49.02 acres was defined in order to address all potential environmental constraints during the planning process.

The survey area is mostly undeveloped, with the exception of a few private residences and established trails that occur within the survey boundary. However, the survey area is immediately surrounded by commercial, residential, and recreational uses, including the County-owned-and-operated Oceano Airport, and, thus, experiences a high level of human disturbance.

Terra Verde Environmental Consulting, LLC (Terra Verde) staff conducted a total of 13 field surveys between May 9 and September 21, 2012, including vegetation community mapping, botanical surveys, a fisheries assessment, protocol-level surveys for California red-legged frog (*Rana draytonii*), water quality analysis, wildlife inventory, and wetlands delineation. Ten natural vegetation communities were observed within the survey area, as well as anthropogenic and ruderal areas. Additionally, a large portion of the survey area is covered by open water.

Four sensitive plants were observed within the survey area; Blochman's leafy daisy (*Erigeron blochmaniae*), California spineflower (*Mucronea californica*), Blochman's ragwort (*Senecio blochmaniae*), and southwestern spiny rush (*Juncus acutus* subsp. *leopoldii*). Additionally, three sensitive habitat communities were observed: Central dune scrub, Central foredunes, and Coastal and valley freshwater marsh. The survey area also has the potential to support twenty-eight sensitive wildlife species. Of these, Terra Verde staff observed the following within the survey area: tidewater goby (*Eucyclogobius newberryi*), California red-legged frog, Pacific pond turtle (*Actinemys marmorata*), white-tailed kite (*Elanus leucurus*), and monarch butterfly (*Danaus plexippus*).



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INTRODUCTION

This biological resources assessment summarizes the results of a series of surveys conducted by Terra Verde of the Meadow Creek Lagoon and adjacent coastal and riparian habitat features in Oceano, California (see Appendix A, Figure 1: Location Map). This report is intended to provide a comprehensive review of the existing biological resources within the Meadow Creek Lagoon, as well as along the surrounding habitat areas. This assessment may be utilized to assist the District in designing and implementing future flood control and drainage projects within the area.

Existing Site Conditions

The survey area is located in the coastal community of Oceano in southern San Luis Obispo County, where Meadow Creek merges into Arroyo Grande Creek before flowing into the Pacific Ocean. Development and flood control infrastructure near the confluence of Meadow Creek and Arroyo Grande Creek have contributed to the creation of Meadow Creek Lagoon. Elevations within the survey area range from approximately 0 to 25 feet (0 to 7.62 m) above mean sea level (msl). The survey area consists primarily of the open water of the Meadow Creek Lagoon and surrounding riparian and coastal dune habitat, as well as a small portion of the Arroyo Grande Creek corridor. A portion of the northeastern extent of the survey area consists of a maintained public park. The survey area wraps around the northwest-southeast axis of the Oceano Airport in an approximately horseshoe shape. It is bordered by Pier Avenue and residential housing to the north, Arroyo Grande Creek to the south, and a mix of residential housing, recreational facilities, and the Oceano Airport along the east and west boundaries. Lakeside Avenue roughly bisects the approximately horseshoe-shaped survey area (see Figure 2: Survey Area).

The climate within San Luis Obispo County is highly variable and ranges from a cool, coastal climate in the west to a hotter, more typical Mediterranean climate in the east. The survey area is situated within the historic and current floodplain of Meadow Creek and Arroyo Grande Creek. Due to its proximity to the coast, the survey area receives regular coastal fog and experiences a strong maritime influence.

The survey area is located within the Oceano U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle adjacent to the Oceano Airport, west of Highway 1, between Pier Avenue and Arroyo Grande Creek in Oceano, California. The riparian corridor of Arroyo Grande Creek and associated flood control levee comprise the southern boundary of the survey area and Pismo Beach borders the survey area to the west (see Figure 2 and Figure 3: Topographic Map). The purpose of this biological resources assessment is to report the results of the biological surveys conducted within the project area, which includes the following:

- Review existing relevant scientific literature and other pertinent information related to the survey area, including recent reports regarding field work conducted by others in the area;
- creation of a list of regionally occurring special-status species determined to have the potential to occur within the habitat communities identified within the survey area;



- evaluation of the potential for the occurrence of special-status plant and wildlife species within the survey area;
- characterization of the vegetation communities present within the survey area;
- determination of the presence/absence of special-status plant species within the survey area, based on the list of potentially occurring species;
- assess the potential for proposed activities to adversely impact existing biological resources; and
- recommend mitigation measures designed to avoid or minimize any potential impacts to biological resources.

This biological resources assessment was prepared according to the guidance provided by San Luis Obispo County (County) for biologists that are pre-approved for environmental work within San Luis Obispo County and meets all of the associated County requirements.

METHODOLOGY

For purposes of this report, the survey area covers an approximately 49.02-acre area including the entire Meadow Creek Lagoon, surrounding riparian and coastal dune habitat features, and the western-most extent of the Arroyo Grande Creek corridor. The survey area extends from the traffic bridge over Meadow Creek along Pier Avenue in the north, downstream to the flap gates at the southern extent of the lagoon where it merges with Arroyo Grande Creek. The undeveloped dune habitat on the eastern side of the Oceano Airport was also included in the survey area (see Figure 2). To the extent that access was feasible, all undeveloped areas surrounding Meadow Creek Lagoon were included in the survey efforts. A comprehensive biological resources assessment was conducted within the survey area, which included:

- Botanical surveys and vegetation community mapping
- Fisheries assessment and water quality analysis
- United States Fish and Wildlife Service (USFWS) protocol-level California red-legged frog (CRLF) surveys
- Avian surveys
- Wildlife inventory

Details regarding the methodology used for each of the focused surveys are summarized below. A total of 13 surveys were conducted between May 9 and September 21, 2012. Refer to Table 1 below for all survey dates, times, surveyors, and site conditions. All plant and wildlife species encountered during survey efforts were noted to the lowest possible taxonomic level, which is required for accurate identification and reporting.



Table 1. Field Survey Schedule

Date	Survey Type	Biologists	Site Conditions	Areas Surveyed
May 9, 2012	Focused botanical and wildlife	Brian Dugas Jessica Adinolfi	Partly cloudy to sunny. Temperatures in the mid 60s F. Light NW winds.	Coastal foredune habitat areas located east and west of the Meadow Creek Lagoon
May 25, 2012	Focused botanical and wetlands	Brian Dugas Brooke Langle Jessica Peak Jessica Adinolfi	Partly cloudy to sunny. Temperatures in the low 60s F. Light NW winds.	Meadow Creek Lagoon and wetland complex located east of Oceano Airport
May 29, 2012	Focused botanical and wetlands	Brian Dugas Brooke Langle Jessica Peak Jessica Adinolfi	Partly cloudy to sunny. Temperatures in the mid 60s F. Light NW winds.	Meadow Creek Lagoon and wetland complex located east of Oceano Airport
May 30, 2012	California red-legged frog daytime	Brian Dugas Rhett Blanton	Clear. Air temperature 71° F, water temperature 65° F. Light W winds.	Meadow Creek Lagoon & Arroyo Grande Creek mouth
May 30, 2012	California red-legged frog eyeshine	Brian Dugas Brooke Langle Rhett Blanton Peter Giles Halden Peterson Jessica Adinolfi	Clear. Air temperature 60° F, water temperature 69° F. No wind.	Meadow Creek Lagoon & Arroyo Grande Creek mouth
June 15, 2012	Fisheries inventory	Brian Dugas Nick Fernella Peter Giles Rhett Blanton	Clearing fog. Air temperature 54° F, water temperature 68° F. 2 - 3 mph winds.	Shoreline to 40 feet off shore from the northeastern portion of Meadow Creek Lagoon (Oceano Memorial Park)
June 18, 2012	Fisheries inventory	Brian Dugas Nick Fernella Peter Giles Rhett Blanton	Clearing fog. Air temperature 66° F, water temperature 68° F. 0 - 2 mph winds.	Location 1: 10 to 40 feet off shore from the northern channel bank, behind trailer park. Location 2: 500 feet west of Location 1.
June 19, 2012	Fisheries inventory	Brian Dugas Nick Fernella Peter Giles Rhett Blanton	Clearing fog. Air temperature 66° F, water temperature 59 °F. 0 - 1 mph winds.	Location 1: north side of Meadow Creek Lagoon flap gates. Location 2: Arroyo Grande Creek side of flap gates.
July 6, 2012	Rare plant survey and vegetation community mapping, and avian survey	Theo Fitanides Jessica Adinolfi	Clearing fog. Air temperature 58 - 61° F. 0 - 9 mph winds.	Meadow Creek Lagoon & Arroyo Grande Creek mouth



Date	Survey Type	Biologists	Site Conditions	Areas Surveyed
July 27, 2012	Rare plant survey and vegetation community mapping	Jessica Adinolfi Kristen Nelson	High marine layer, good survey visibility, Air temperature 55° F, 0 – 3 mph winds.	Meadow Creek Lagoon vicinity, Arroyo Grande Creek mouth
August 1, 2012	California red-legged frog eyeshine	Brian Dugas Peter Giles Rhett Blanton Halden Peterson	High marine layer, good survey visibility, Air temperature 61.5° F, water temperature 62 °F. 0 – 1.5 mph winds.	Arroyo Grande Creek mouth and upstream, Meadow Creek Lagoon vicinity, Meadow Creek, downstream pool below footbridge in Meadow Creek.
August 16, 2012	Water quality assessment and wildlife surveys	Brian Dugas Peter Giles	Temperature: 65° F Wind: 9 mph NW	Meadow Creek Lagoon & Arroyo Grande Creek mouth
September 21, 2012	Final rare plant and wetlands mapping	Brian Dugas Jessica Adinolfi	Clearing fog. Air temperature 60-70° F. 0 – 10 mph winds	Coastal foredune habitat areas located east and west of the Meadow Creek Lagoon and wetland features bordering lagoon

Soils Assessment and Wetland Delineation

General information about soil profiles within the survey area was determined using the United States Department of Agriculture (USDA) Web Soil Survey (see Figure 4: Soils Map). Additional analysis was conducted as part of the wetland delineation conducted within the survey area. Details of the survey methodology and results for the wetland delineation are summarized in a separate document.

Botanical Surveys and Vegetation Community Mapping

Five botanical surveys were conducted within the survey area on May 9, 25, 29, and July 6 and 27, 2012. Field surveys were pedestrian in nature and lasted between three and seven hours each day. During the surveys, the vegetation communities on site were classified, mapped, and further evaluated for the occurrence of and the overall potential to support special-status plant and wildlife species (see Figure 5: Vegetation Communities). Vegetation community characterization was based on the classification systems presented in *A Manual of California Vegetation* (MCV) (Sawyer, Keeler-Wolf, and Evens 2008). Survey conditions and timing were suitable for detection of all potentially occurring sensitive plant species. Given the comprehensive and floristic methods that were used, any special-status plant species not previously identified within a five-mile radius of the survey area would be identified, with the exception of the lower channel of Arroyo Grande Creek which not included in the survey area. Plant species identification, nomenclature, and taxonomy followed *The Jepson Manual: Vascular Plants of California* (Baldwin et al 2012).



Fisheries Assessment

A fisheries assessment was conducted within the Meadow Creek Lagoon, which included all accessible, open water areas within the survey area. The lagoon was sampled by a team of four biologists over the course of three days on June 15, 18, and 19, 2012. These efforts consisted of two and a half days of seine fishing and a half-day of snorkel surveys. One narrow channel of water in the southern extent of the survey area with restricted access was sampled by hand-netting; another larger channel of water in the southern extent of the survey area was not surveyed due to inaccessibility for seine fishing, and lack of visibility for snorkel surveys (see Figure 6: Fisheries Assessment and Water Quality Analysis). A beach seine 22 meters (m) long by 1.8 m deep and with a mesh size of approximately 3 millimeters was the primary sampling tool used to capture fish. A 1-foot by 1-foot hand net with similar mesh size was used when the seine was not applicable. In most cases, the seine was deployed by two to four biologists that utilized traditional seining tactics. The large seine allowed for the potential capture of benthic, semi-pelagic, and pelagic species. A two-man canoe was also utilized to deploy the seine in areas of deep water (greater than five feet deep).

Netting began at the northeast end of Meadow Creek Lagoon and continued south towards the floodgate at the lagoon's historic confluence with the Arroyo Grande Estuary. Locations of each seine drag were selected to attain sampling coverage throughout the spatial spectrum of the lagoon. Each seine location was selected with the criterion of adequate space to deploy and retrieve the seine, accessibility to open water with minimal bank vegetation disruption, and limited aquatic vegetation to minimize seine drag and improve overall capture rates.

In addition to the seining effort, a half-day of sampling via underwater observation for species presence was conducted. The crew was able to access portions of the lagoon that were not feasible to sample using the beach seine. Crew members entered these areas in groups of two and proceeded in an upstream direction (see Figure 6), concentrating efforts on the outer margins of the lagoon. Each surveyor used a dive light that was used to inspect areas of dense cover with reduced ambient light.

The final component of the fisheries survey included a hand-netting effort in the narrow channel near the Oceano Sewer Treatment Plant. This aquatic feature was too small for either seine fishing or snorkel surveys. The hand net was used to pull through the water in various areas of the channel.

Individuals of each species caught were temporarily contained in an aerated live bait container, identified, enumerated as quickly as possible, and returned to the water. *A Field Guide to Freshwater Fishes of California* (McGinnis 2006) was used as a reference guide, when needed.

Water Quality Analysis

In order to gain a better understanding of the fisheries composition and overall health of Meadow Creek Lagoon, water quality samples were taken at each seine-pull location. The survey was conducted by a two-person team working from the shoreline on August 16, 2012. The following attributes were measured at each location using an YSI/556-02 Multiparameter Water Sampling



Unit: temperature, conductivity, percent dissolved oxygen (DO), dissolved oxygen (milligrams per liter [mg/L]), and pH. The aforementioned attributes are critical factors when determining fish habitat suitability in freshwater systems, particularly temperature and percent DO.

USFWS Protocol-level California Red-legged Frog Surveys

Terra Verde conducted USFWS protocol-level surveys to determine the presence or absence of CRLF within the survey area. Survey methods followed the USFWS *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* (USFWS 2005) and consisted of three main components: 1) background research, 2) habitat assessment, and 3) field surveys.

Prior to initiating field surveys, a desktop analysis was completed utilizing the California Department of Fish and Game (CDFG) California Natural Diversity Database (CNDDDB) to identify known CRLF occurrences within a five-mile radius of the survey area (see Figure 7: Five-mile CNDDDB – CRLF). Scientific literature and past studies of the area were also utilized to gather information regarding CRLF occurrences in the vicinity of the survey area. Following background research, a habitat assessment was performed on May 30, 2012 to identify suitable habitat areas within the survey boundary. All accessible aquatic habitat, shorelines, and immediately surrounding riparian habitat areas were included within the CRLF survey area. Aquatic habitat up to one mile was not surveyed due to the known occurrences of CRLF in Arroyo Grande Creek and lack of access to private property. Identification, nomenclature, and taxonomic notes were referenced using the *Field Guide to Western Reptiles and Amphibians* (Stebbins 2003).

Field surveys were timed appropriately to allow for one daytime survey and two nighttime surveys during the breeding season. The day survey was completed within a 24-hour period of the first night survey on May 30. Timing was such that night surveys were initiated in excess of one hour after sunset, and planned to avoid periods of full lunar illumination. Wind speed was noted during all surveys and did not exceed five miles per hour. Visibility and temperature conditions were also noted during the survey efforts and remained acceptable throughout all surveys.

Per USFWS survey protocol, surveyors listened for CRLF vocalizations before initiating pedestrian or watercraft surveys. Specifically, surveyors spent approximately 10 to 15 minutes listening to and documenting all detectable amphibian vocalizations. Watercraft and pedestrian surveys were initiated shortly thereafter and were conducted in teams of two. Each team was led by an individual trained and with experience identifying CRLF. In general, eyeshine surveys were completed holding an approximately 32,000-candela flashlight held at eye level with the aid of binoculars ranging from 8x42 to 10x42. Each team carried a digital camera to document any CRLF observations.

Although presence of CRLF was confirmed during the first nighttime survey of May 30, 2012, a supplemental survey was conducted in areas not covered by previous CRLF survey efforts and deemed suitable habitat for CRLF per the request of the District. The additional eyeshine survey took place on August 1, 2012 and was performed via watercraft and on foot. Areas surveyed



included the downstream pools along the southern extent of the lagoon, Arroyo Grande Creek banks upstream of the creek outlet and adjacent to the levee, and other isolated habitat features surrounding the lagoon. Prior to and following surveys, gear was sterilized of potential pathogens using the procedures recommended by USFWS in Appendix B of *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* (USFWS 2005).

Avian Survey

A focused avian survey was conducted on July 6, 2012 by a team of two, which covered the entire survey area. This survey was pedestrian in nature, and timed appropriately to coincide with the peak avian migration season for the area (generally considered to be March through September). In addition to field survey efforts, California State Parks was contacted to acquire recent survey data regarding nesting birds in the coastal dune habitat, immediately adjacent to the survey area. Identification, nomenclature, and taxonomy followed the *Sibley Field Guide to Birds of Western North America* (Sibley 2003).

Wildlife Inventory

All tracks, scat, and sign of wildlife observed on-site were noted during all survey efforts. Wildlife identification, nomenclature, and taxonomy followed standard reference texts including: *Field Guide to Western Reptiles and Amphibians* (Stebbins 2003) and *Mammals of California* (Jameson and Peeters 2004). See Appendix B for a complete species list of all wildlife observed within the survey area.

A desktop analysis including review of existing literature and available technical reports was conducted prior to commencing field surveys to determine which of these regionally occurring special-status species has potential to occur within the survey area (refer to Appendix C). In summary, Terra Verde staff reviewed the following resources:

- Aerial imagery of the survey area;
- USGS Oceano, California 7.5-minute topographic quadrangle;
- Online Soil Survey of San Luis Obispo County, California – Oceano area (Natural Resources Conservation Service [NRCS] 2012);
- A USFWS list of federally protected special-status species with potential to occur within the County (USFWS 2012);
- A California Natural Diversity Database (CNDDDB) list of state and federally protected special-status species with potential to occur within the Oceano, California 7.5-minute quadrangle and the surrounding seven quadrangles (Arroyo Grande NE, Guadalupe, Nipomo, Pismo Beach, Point Sal, Santa Maria, and Tar Spring Ridge) (CDFG 2012);
- A CNDDDB map of state and federally listed special-status species that have been documented within a five-mile radius of the survey area (CDFG 2012) (see Figure 8: One-mile CNDDDB Map);
- A California Native Plant Society (CNPS) list of special-status plant species with potential to occur within the Oceano, California 7.5-minute quadrangle and the surrounding seven quadrangles (CNPS 2012);



- The Lower Arroyo Grande Creek and Lagoon Fishery and Aquatic Resources Summary Monitoring Reports for 2004, 2005, and 2010 by Douglas Rischbieter;
- The *Draft Arroyo Grande Creek Channel Waterway Management Program Environmental Impact Report* prepared by SWCA Environmental Consultants, 2010;
- *Aquatic Survey: Arroyo Grande Creek and Lagoon* by Douglas Rischbieter, 2011 (California State Parks); and;
- *The Natural Resources of the Nipomo Dunes and Wetlands* by Kent A. Smith, 1976 (CDFG).

A complete list of all of the regionally occurring special-status species reported in the scientific database queries was compiled for the survey area (see Appendix C). An analysis to determine which of these special-status species have the potential to occur within the survey area was conducted. The habitat requirements for each regionally occurring special-status species were assessed and compared to the type and quality of habitats observed on site during the field surveys. Several regionally occurring special-status species were eliminated due to a lack of suitable habitat within the survey area, elevation, range, lack of soils/substrate, and/or distribution. As previously mentioned, the analysis was also based on a review of resource agency materials, pertinent scientific literature, aerial photography of the survey area, topographic maps of the survey area, surveyors personal knowledge of the area, and other local information. Special-status species determined to have the potential to occur within the survey area are discussed below. Special-status species that were not determined to have the potential to occur within the survey area are not discussed further in this report.

Sufficiency of Biological Data

The field surveys that Terra Verde staff conducted are of sufficient technical detail and biological and botanical expertise. The survey efforts occurred during the appropriate bloom periods for the target sensitive plant species and the survey efforts are both adequate and satisfactory for the purpose of determining the presence/absence of potentially occurring sensitive plant and animal species within the survey area.

RESULTS

This section summarizes the results of the surveys and provides further analysis of the data collected in the field. Discussions regarding the existing site conditions, soils on site, terrestrial, and aquatic habitat types identified on site, the potentially occurring special-status species, and special-status species observed are presented below.

Soils

According to the NRCS online soil survey of San Luis Obispo County, four soil units occur within the survey area (NRCS 2012). These include: Dune land; Mocho fine sandy loam; Oceano sand, 0-9 percent slopes; and Psamments and fluvents, wet and are discussed in greater detail below. Although these soil units do not have any listed hydric components or inclusions that



meet the hydric soils criteria, open water covers a significant portion of the survey area (see Figure 4).

134 – Dune land (6.93 acres)

Dune Land soils tend to occur in the toeslope and tread of dunes. Within the survey area, this soil type occurs in the foredunes and stabilized sand dunes.

173 – Mocho fine sandy loam, 0-2 percent slopes (12.70 acres)

The parent material of this soil type is alluvium derived from sedimentary rock. The drainage class of this soil type is well drained, and it is composed of fine sandy loam, silty clay loam, and stratified gravelly sand. Mocho Fine Sandy Loam usually occurs in alluvial flats and fans. This soil type occurs in the middle of the survey area where wetland features are present, such as willow thickets and cattail marsh.

184 – Oceano sand, 0-9 percent slopes (4.77 acres)

The parent material of this soil type is Eolian deposits. The drainage class of this soil type is excessively drained. Oceano Sand usually occurs within the toeslope and tread of dunes. Within the survey area, this soil occurs in a stabilized dune area isolated from the rest of the dune system on site.

193 – Psamments and fluvents, wet, 0-5 percent slopes (3.81 acres)

The parent material of this soil type is alluvium, and it is composed of loamy sand. The drainage class of this soil type is very poorly drained. Psamments and fluvents, Wet soils usually occur within the toeslope and tal of basin floors. Within the survey area, this soil type occurs in the northernmost part of the lagoon.

Vegetation Communities

Ten distinct vegetation communities were observed within the survey area, as well as anthropogenic and ruderal areas. Vegetation communities identified include: Arroyo willow thicket, California bulrush marsh, cattail marshes, coastal brambles, Pacific silverweed marshes, ice plant mat, silver dune lupine-mock heather scrub, dune mat, European beach grass swards, and sea lyme grass patch. A total of 155 vascular plant species were identified within the survey area during appropriately timed surveys. Plants observed consisted of 82 (53 percent) native taxa and 73 (47 percent) non-native taxa. The percentage of non-native taxa is nearly equal to that of native taxa, reflecting a high level of disturbance on site.

Six sensitive vegetation communities were identified in the CNDDDB as potentially occurring on site. Three of the communities occur within the survey area: central dune scrub, central foredunes, and coastal and valley freshwater marsh.

A map illustrating the extent of the vegetation on site is included for reference (see Figure 5). Representative photographs of the survey area are presented in Appendix D.



Arroyo willow thicket

Growing as shrubs and trees, the dominant canopy cover throughout the site is Arroyo willow (*Salix lasiolepis*). It is commonly found in dense stands with other native species such as California wax myrtle (*Morella californica*), bulrush (*Schoenoplectus* spp.), twin berry (*Lonicera involucrata*), coast live oak (*Quercus agrifolia*), and California blackberry (*Rubus ursinus*) along the water's edge and in the upland dune complexes and surrounding areas. The canopy and shrub layer is dense, limiting the understory, which is variable and typically composed of horsetail (*Equisetum* spp.), rush (*Juncus* spp.), poison oak (*Toxicodendron diversilobum*), non-native grasses, bare ground, or water.

This species composition was used in determining the community classification, which most closely corresponds with the *Salix lasiolepis/Rubus* spp. Association of the *Salix lasiolepis* Shrubland Alliance, Arroyo willow thickets, in *A Manual of California Vegetation* (MCV) classification system (Sawyer, Keeler-Wolf, and Evens 2008).

California bulrush marsh

Immediately adjacent to open waters and forming dense mats, southern bulrush (*Schoenoplectus californicus*) is dominant throughout much of the site. This species is tolerant of brackish water and fluctuating water levels, and soils typically have high organic content and are poorly aerated. It is found growing with other native species such as Olney's three-square bulrush (*Schoenoplectus americanus*), broad-leaved cattail (*Typha latifolia*), and Arroyo willow. Giant reed (*Arundo donax*) eradication has been implemented throughout the site; however, a small island in the northern part of the lagoon (near Memorial Park) supports dense bulrush and giant reed.

This species composition was used in determining the community classification, which most closely corresponds with the *Schoenoplectus californicus* Herbaceous Alliance, California bulrush marsh, in the MCV classification system (Sawyer, Keeler-Wolf, and Evens 2008).

Cattail marshes

A wetland in the easternmost part of the survey area, with less coastal influence, supports a slightly different species composition than the California bulrush marsh. Broad-leaved cattail is dominant with southern bulrush as co-dominant; however, lower growing herbaceous species such as tall flat sedge (*Cyperus eragrostis*), broadfruit bur-reed (*Sparganium eurycarpum*), horsetail, brown-headed rush (*Juncus phaeocephalus*), Pacific silverweed (*Potentilla anserina* subsp. *pacifica*), and hedge nettle (*Stachys ajugoides*) are abundant. Arroyo willow surrounds the marsh forming a thicket. Broad-leaved cattail is common and less tolerant of deep water and high salinity; stands are common in local coastal marshes and lagoons.

This species composition was used in determining the community classification, which most closely corresponds with the *Typha (angustifolia, domingensis, latifolia)* Herbaceous Alliance, Cattail marshes, in the MCV classification system (Sawyer, Keeler-Wolf, and Evens 2008).



Of the wetland-riparian communities, the California bulrush marsh and cattail marsh communities correspond with the sensitive vegetation community, coastal and valley freshwater marsh, from the CNDDDB.

Coastal brambles

A small area at the southern part of the survey area is brambles, dominated by California blackberry (*Rubus ursinus*), which occur between dense Arroyo willow stands. This community likely has a seral relationship with the neighboring community composed of Arroyo willow, with California wax myrtle (*Morella californica*) and California blackberry as understory.

This species composition was used in determining the community classification, which most closely corresponds with the *Rubus (parviflorus, spectabilis, ursinus)* Shrubland Alliance, Coastal brambles, in the MCV classification system (Sawyer, Keeler-Wolf, and Evens 2008).

Pacific silverweed marshes

This community occupies small areas near the lagoon margin that flood seasonally. The dominant species in the herbaceous layer is Pacific silverweed, which occurs with densely growing sand dune sedge (*Carex pansa*), salt grass (*Distichlis spicata*), and marsh baccharis (*Baccharis glutinosa*). Other species characteristic of this community identified on site include common velvet grass (*Holcus lanatus*), water parsley (*Oenanthe sarmentosa*), and bulrush (*Schoenoplectus* spp.). The herbaceous layer is continuous, and emergent shrubs and trees are sparse to absent. One area on private property in the middle of the site that is characterized as Pacific silverweed marsh showed evidence of recent mowing to be used as a driveway; however, based on personal communication, it does pond during years of typical rainfall.

This species composition was used in determining the community classification, which most closely corresponds with the *Argentina egedii* Herbaceous Alliance, Pacific silverweed marshes, in the MCV classification system (Sawyer, Keeler-Wolf, and Evens 2008).

Ice plant mat

Several species collectively called ice plant are present on site, and small parts of the sand dunes are dominated by freeway iceplant (*Carpobrotus edulis*) and sea fig (*C. chilensis*), which hybridize. Freeway iceplant has high invasivity, as does the hybrid formed with sea fig. Ice plant outcompetes native plants for water, nutrients, and habitat, and is tolerant of a wide range of soil moisture and nutrient conditions. Emergent shrubs such as coyote brush (*Baccharis pilularis*) are present in low cover, and due to the density of the mat, the herbaceous layer beyond the iceplant is nearly absent with some annual grasses occurring occasionally. This community provides habitat for nesting birds, small mammals, and other wildlife.

This species composition was used in determining the community classification, which most closely corresponds with the *Carpobrotus edulis* Semi-Natural Herbaceous Stands, Ice plant mats, in the MCV classification system (Sawyer, Keeler-Wolf, and Evens 2008).



Silver dune lupine – mock heather scrub

This community occurs in the stabilized dunes on site and is composed of emergent shrubs with an intermittent herbaceous understory. Dominant shrubs include silver dune lupine (*Lupinus chamissonis*) and mock heather, with coyote brush as a common to abundant component. The herbaceous layer is composed of both native and non-native species such as telegraph weed (*Heterotheca grandiflora*), ice plant, and annual grasses such as the non-native invasive veldt grass (*Ehrharta calycina*). Several patches of Blochman's leafy daisy (*Erigeron blochmaniae*), which has a California Rare Plant Rank (CRPR) of 1B.2, one population of Blochmans' ragwort (*Senecio blochmaniae*), CRPR 4.2, and California spineflower (*Mucronea californica*), CRPR 4.2, occur within this community.

This species composition was used in determining the community classification, which most closely corresponds with the *Lupinus chamissonis*-*Ericameria ericoides* Shrubland Alliance, Silver dune lupine-mock heather scrub, in the MCV classification system (Sawyer, Keeler-Wolf, and Evens 2008).

Dune mat

This community occurs along the western and eastern boundary of the survey area and is surrounded by willow thicket and dune scrub. The area has sandy soils and shows evidence of disturbance with both native and non-native species present. Vegetation within this community is mostly herbaceous with native shrubs such as silver dune lupine and coyote brush occurring sparsely to occasionally as it transitions into silver dune lupine scrub. Native herbaceous species such as common sand verbena (*Abronia umbellata*), beach-bur (*Ambrosia chamissonis*), and California croton (*Croton californicus*), and non-native species such as veldt grass are dominant and form a sparse herbaceous layer with exposed ground.

This species composition was used in determining the community classification, which most closely corresponds with the *Abronia latifolia*-*Ambrosia chamissonis* Herbaceous Alliance, Dune mat, in the MCV classification system (Sawyer, Keeler-Wolf, and Evens 2008).

Of the coastal sand dune scrub communities, the silver dune lupine – mock heather scrub and dune mat communities correspond with the sensitive vegetation community, central dune scrub, from the CNDDDB.

European beach grass swards

European beach grass (*Ammophila arenaria*) is a large, perennial grass that dominates parts of the sand dunes found along the western dunes of the survey area. It grows in dense, monotypic stands and with both native and non-native species, which are typically found on the fringe of this community. Shrubs such as mock heather and coyote brush are present, and poison oak grows as a vine-like shrub within and on other plants in this community. The herbaceous layer is limited or absent due to the density of the beach grass. Successful vegetative reproduction by rhizomes allows this grass to outcompete other species in the shifting sand of the dunes, which, in turn, reduces suitable habitat for many wildlife species. However, this community does provide habitat for nesting birds and other wildlife.



This species composition was used in determining the community classification, which most closely corresponds with the *Ammophila arenaria* Semi-Natural Herbaceous Stands, European beach grass swards, in the MCV classification system (Sawyer, Keeler-Wolf, and Evens 2008).

Sea lyme grass patch

The foredunes bordering the Arroyo Grande Estuary and shoreline in the western-most part of the survey area are transitional and currently support American dune grass (*Elymus mollis* subsp. *mollis*) with sea rocket (*Cakile maritima*), ice plant (*Carpobrotus spp.*), beach-bur, and other species tolerant to changing and extreme coastal conditions. Commonly referred to as a pioneer dune community, the plants are able to colonize and stabilize the sand carried in from shore. This community is vulnerable to colonization by European beach grass, which is abundant throughout the dunes on site. Vegetation in this community is sparse with low cover and large areas of exposed sand. This community provides habitat for wildlife and nesting birds, including the federally listed western snowy plover (*Charadrius alexandrinus nivosus*) and California least tern (*Sternula antillarum browni*).

This species composition was used in determining the community classification, which most closely corresponds with the *Leymus mollis* Herbaceous Alliance, Sea lyme grass patches, in the MCV classification system (Sawyer, Keeler-Wolf, and Evens 2008).

Of the vegetation communities identified on site, the sea lyme grass patch corresponds with the central foredune community from the CNDDDB.

Anthropogenic

Within and adjacent to the survey area are residences, a public park, an airport, and various structural elements. Typically these areas are dominated by non-native vegetation/horticultural species or are not vegetated. Cultivated species such as baby sun-rose (*Aptenia cordifolia*), umbrella plant (*Cyperus involucratus*), and calla lily (*Zantedeschia aethiopica*) are found throughout the area. Additionally, there is an active dune restoration project in the western part of the site. Although this community is not natural, it provides habitat for wildlife, such as nesting birds.

Ruderal

The walking trails and roadsides throughout the site are dominated by non-native species with high tolerance to regular disturbances. Herbaceous species such as bur clover (*Medicago polymorpha*), Italian thistle (*Carduus pycnocephalus*), and non-native annual grasses are common weeds found in this community.

Wildlife

Terra Verde conducted focused field surveys within the entire survey area for fisheries, California red-legged frog, and avifauna. Additionally, general wildlife species observed on site during the 13 combined field surveys were documented and are discussed below. Wildlife observed during the field studies included both invertebrate and vertebrate species. This includes those species seen or detected by tracks, scat, skeletal remains, burrows and/or vocalization



during the field surveys. Complications in the quantitative assessment of both terrestrial vertebrate and invertebrate populations include:

- Many species may occur in the area only for short periods during migrations;
- many species of amphibians and reptiles become inactive during one or more seasons; and
- seasonal or annual fluctuations in climate or weather patterns may confound observations.

Invertebrates

Terrestrial invertebrates observed within the survey area included orb-weaver spiders (family Araneidae) common pillbug (*Armadillidium vulgare*), honeybee (*Apis mellifera*), common termite (Order Blattodea) European garden snail (*Helix aspersa*), grasshopper (*Melanoplus* sp.), and monarch butterfly (*Danaus plexippus*).

Aquatic invertebrates observed within Meadow Creek Lagoon and associated wetland habitat areas included but were not limited to dragonfly (Order Odonata), mosquito larvae (Order Diptera), common water striders (*Gerris* sp.), water boatman (*Corixa* sp.), crayfish (*Pacifastacus* sp.) and freshwater snail (*Physa* sp.).

Fisheries/Water Quality

Given the historical connectivity with upstream tributaries and convergence with Arroyo Grande Creek, the Meadow Creek Lagoon has the potential to harbor marine, freshwater, and estuarine fishes. The survey efforts resulted in the capture and release of ten distinct fish species of varying abundance and size classes. Fish species identified during surveys included largemouth bass (*Micropterus salmoides*), western mosquitofish (*Gambusia affinis*), golden shiner (*Notemigonus crysoleucas*), tidewater goby (*Eucyclogobius newberryi*), Sacramento sucker (*Catostomus occidentalis*), Pacific staghorn sculpin (*Leptocottus armatus*), bluegill (*Lepomis macrochirus*), prickly sculpin (*Cottus asper*), and three-spine stickleback (*Gasterosteus aculeatus*). An abundance of crayfish (*Pacifastacus* spp.) and bullfrogs (*Lithobates catesbiana*) were also observed during the fisheries assessment. The presence of non-native fish is thought to be a result of local fishing including past largemouth bass and bluegill stocking events and release of bait fish (Smith 1976).

Species diversity was greatest at the northern-most extent of the lagoon, just south of Pier Avenue. Species more common in coastal lagoon habitats, rather than freshwater lagoons, were observed in the pool just south of the levee flap gate, where the lagoon merges with Arroyo Grande Creek.

Sampling in the northern extent of the survey area (Memorial Park) resulted with catch being dominated by golden shiner and non-native centrarchids including largemouth bass and bluegill. Given the lack of overhanging perimeter canopy at this location, centrarchids appear to be occupying the deeper, open water habitat and the golden shiner are prevalent along lagoon margins where some protection from predation is afforded by stands of bulrush. Also notable at



this location was the highest abundance of bull frog captured during the course of the surveys, (see Photo 20 in Appendix D).

Just south of Memorial Park, fish capture continued to be dominated by non-native centrarchids (i.e., large-mouth bass and bluegill). As the Meadow Creek Lagoon becomes more “channelized” moving downstream, golden shiner become sparse and a moderate prevalence of three-spine stickleback emerges. Prickly sculpin and Sacramento sucker were found throughout this area in limited numbers.

The final sampling efforts included locations at the southwest most portions of the Meadow Creek Lagoon. These locations were in close proximity to the levee flap gates. Species assemblage on the north side of the gates was dominated by three-spine stickleback, but in relatively low numbers. No other fish species was noted at this location. Observations during snorkel surveys of the southern reaches of Meadow Creek yielded minimal numbers of individuals and low species diversity. The limited species diversity in this section of the Meadow Creek Lagoon is likely due to several abiotic factors such as temperature, salinity, and dissolved oxygen levels. A lack of visibility (only two-four feet), and extremely turbid substrate may have also attributed to low numbers of species observed.

Surveys on the south side of the levee flap gates resulted in the identification of Pacific staghorn sculpin, three-spine stickleback, and tidewater goby (federally endangered), fish more characteristic of a coastal lagoon. One Sacramento sucker was also detected at this location. The survey effort south of the floodgates was singular in nature, performed with caution to limit the amount of substrate accumulated during seining, and constituents quickly released upon identification. The purpose of this singular effort was to provide a snapshot of comparison between the two semi-isolated habitats on either side of the levee and associated flap gates.

A brief effort was made using netting to observe fish within the narrow concrete drainage channel adjacent to the Oceano Water Treatment Facility. Depth of the drainage ranged from one to three feet. Western mosquito fish were moderately abundant in the net samples. Based on anecdotal information, these fish were most likely introduced by the County as a means to control the local mosquito population. Bullfrog tadpoles were also present in the net on multiple passes.

The results of the water quality analysis closely correlate with the fisheries assessment data, which shows a greater population density and species diversity in areas of the upper lagoon with a higher percent of dissolved oxygen. Factors that determine the percent dissolved oxygen in an aquatic system include diffusion from the air, wind, and other factors that create turbulence at the surface, and photosynthesis (Horne 1994). The greatest percent of dissolved oxygen was observed in the open water habitat of the upper portion of the lagoon. This is likely due to the wind turbulence observed at this location during surveys and the amount of available sunlight to execute photosynthesis. As the lagoon transitions from deep, open water to a shallow, densely vegetated freshwater marsh, the percent of dissolved oxygen declines, along with the overall density of fish populations. Table 2 below summarizes the data collected during the water quality analysis. See Figure 6 for a review of water quality sampling locations.

Table 2. Water Quality Analysis Data Summary

Sample Point	Temperature (°F)	Conductivity (Siemens per meter [S/m])	Percent Dissolved Oxygen	Dissolved Oxygen (mg/L)	pH
1	71.34	0.931	119.60	10.43	7.96
2	71.82	0.937	116.30	10.11	8.02
3	71.46	0.936	119.80	10.48	8.08
4	71.02	0.933	77.60	6.78	7.82
5	70.69	0.943	43.70	3.83	7.74
6	69.82	0.947	47.70	4.24	7.79
7	69.63	0.953	36.00	3.18	7.67
8	63.23	0.919	13.80	1.32	7.35
9	63.65	0.929	19.00	1.79	7.42
10	62.02	1.026	34.90	3.35	7.21
11	64.21	2.190	45.08	4.38	7.47

Amphibians

Generally, amphibians are concentrated in areas near perennial fresh water, inundated soils, and moist understories of decomposing organic material or low-lying herbaceous vegetation. Such habitat requirements are often found adjacent to riparian corridors, marshes, wet meadows, and springs. Juveniles may disperse beyond the aquatic or bank zones utilizing burrows for refugia in the upland and dispersal habitat. Amphibian species observed in the survey area include a federally protected species, CRLF, American bullfrog, and Sierran treefrog (*Pseudacris sierra*). During the first protocol-level survey, an adult CRLF was identified near a footbridge just south of the intersection of Aloha Place and Security Court. A second eyeshine survey conducted on August 1, 2012 resulted in the identification of an adult CRLF along the northern bank of Arroyo Grande Creek, downslope of the levee (see Figure 9: Special Status Species Observations). American bullfrog and Sierran treefrog were found throughout the survey area with the highest densities observed along the lagoon margins at the northeast extent of the survey area (i.e., Memorial Park).

Reptiles

During survey efforts, Pacific pond turtle (*Actinemys marmorata*) was observed at various locations throughout the lagoon (see Figure 9). Non-native red-eared sliders (*Trachemys scripta elegans*) were also documented below the two traffic bridges spanning over Meadow Creek Lagoon at the northern extent of the survey area. Striped racer (*Masticophis lateralis*) and western fence lizard (*Sceloporus occidentalis*) were also observed on site.

Avian Species

The margins of the lagoon provide contiguous canopy coverage supporting riparian avifauna such as Pacific-slope flycatcher (*Empidonax difficilis*), Wilson's warbler (*Cardellina pusilla*), and common yellowthroat (*Geothlypis trichas*). Due to its proximity to the Pacific Ocean, Meadow Creek Lagoon provides refuge and feeding grounds for migratory marine birds in



addition to resident species. In addition to those listed above, avifauna identified in the vicinity of the survey area included, but were not limited to, osprey (*Pandion haliaetus*) white-tailed kite (*Elanus leucurus*; state fully protected), Caspian tern (*Hydroprogne caspia*), Swainson's thrush (*Catharus ustulatus*), song sparrow (*Melospiza melodia*), and purple finch (*Carpodacus purpureus*). Western snowy plover (*Charadrius alexandrinus nivosus*; federally threatened) and California least tern (*Sterna antillarum browni*; federally endangered) were not noted during field surveys, but have the potential to occur on site. Known breeding populations of western snowy plover and California least tern have been identified during surveys performed by California State Parks two miles south of the survey area within coastal dune habitat, similar to habitat features that occur on site (Personal communication, Ronnie Glick, September 6, 2012). A complete list of all avifauna observed during field surveys is located in Appendix C.

Mammals

Understories and margins of riparian corridors can provide mammals with opportunity to forage, access to water, and daytime cover. Passageways such as the Arroyo Grande Creek levee and pedestrian trails throughout the study area allow mammal movement between multiple forage locations. Additionally, thick stands of bulrush on the fringe of open waters and within shallow inundated areas, supply cover for small mammals to seek refuge from predation. American beaver (*Castor canadensis*) dams were observed throughout the Meadow Creek Lagoon and Arroyo Grande Creek during the surveys. Further, beaver were encountered in the open waters of the lagoon during both night surveys. North American river otter (*Lontra canadensis*) were observed on several occasions during daytime surveys and numerous access points (i.e., slides) and tracks were observed along the levee into Arroyo Grande Creek. The existing habitat features within the lagoon as well as the abundance of centrarchid fish and crayfish provide a large prey base for river otters within the lagoon area. Other mammals observed during surveys included Audubon's cottontail (*Sylvilagus audubonii*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), and red fox (*Vulpes vulpes*). Potential exists for a variety of small rodents to be present. One bat night roost was discovered under the four-lane traffic bridge along Pier Avenue (see Appendix D: Site Photographs). The species occupying the bridge deck were not identified, but based on size and features that could be observed without capturing the bats, appear to be Mexican free-tailed (*Tadarida brasiliensis*). A complete list of all mammals observed during field surveys is located in Appendix B.

Sensitive Species

For the purposes of this biological resources assessment, a sensitive species is defined as a species that is of management concern to state and/or federal resource agencies and includes those species that are:

- Listed as endangered, threatened, or candidate for listing under the Federal Endangered Species Act (FESA);
- Listed as rare, endangered, threatened, or proposed for listing under the California Endangered Species Act (CESA);



- Designated as endangered or rare, pursuant to the California Fish and Game Code (Section 1901, Chapter 10 – Native Plant Protection Act);
- Designated as fully protected, pursuant to the California Fish and Game Code (Section 3511, Section 4700, or Section 5050);
- Designated as a species of special concern by CDFG; and
- Plants that meet the definitions of rare, threatened, or endangered under the California Environmental Quality Act (CEQA), including plants listed by CNPS to be “rare, threatened, or endangered in California” (CRPR Lists 1A, 1B, and 2). Local or regional agencies (e.g., County, City) may consider plant species that CNPS believes require additional information (i.e., CRPR List 3) and plant species that have been placed on a watch list (i.e., CRPR List 4) by CNPS.

All occurrences of special-status species and sensitive habitat types previously documented from the CNDDDB within a one-mile radius of the survey area were plotted on a map using geographic information systems (GIS) software (see Figure 8).

Terra Verde staff determined that the project area contains or has the potential to support 19 sensitive plants, three sensitive amphibians, four sensitive reptiles, two sensitive mammals, twelve sensitive bird species, and eight sensitive invertebrates. Detailed descriptions of several of these sensitive species are provided below.

Sensitive Plant Species

Blochman’s leafy daisy (*Erigeron blochmaniae*), California Rare Plant Rank 1B.2

Blochman’s leafy daisy is a perennial herb that occupies sand dunes and hills along the coast of central California. It has a California Rare Plant Rank (CRPR) of 1B.2: rare, threatened or endangered in California and elsewhere, and it is endemic to California. This species was identified throughout the sand dune scrub habitat of the survey area. The largest stand occurs in the western part of the site with a variety of native and non-native species including silver dune lupine, mock heather, and ice plant (see Figure 9). This species co-occurs with two other sensitive species: California spineflower and Blochman’s ragwort.

California spineflower (*Mucronea californica*), California Rare Plant Rank 4.2

California spineflower is an annual herb that occurs on sandy soils below 1,000 m. It is listed as CRPR 4.2; limited distribution and is endemic to California. This species was identified on the slopes of the sand dunes in the western part of the site (see Figure 9). It occurs with a variety of native and non-native species including mock heather, European beachgrass, and ice plant. This species co-occurs with Blochman’s leafy daisy.

Blochman’s ragwort (*Senecio blochmaniae*), California Rare Plant Rank 4.2

Blochman’s ragwort is a subshrub that occupies coastal sand dunes and sandy floodplains along the coast of central California. It is listed as CRPR 4.2; limited distribution and is endemic to California. This species was identified in the dune scrub in the eastern part of the site (see Figure 9). It occurs with other native shrubs including silver dune lupine, mock heather, and coyote



brush, with veldt grass abundant in the herbaceous layer. This species co-occurs with Blochman's leafy daisy.

Southwestern spiny rush (*Juncus acutus* subsp. *leopoldii*), California Rare Plant Rank 4.2
Southwestern spiny rush is a perennial herb that occupies moist saline wetlands, salt marshes, and alkaline seeps at low elevations in central and southern California. It is listed as CRPR 4.2; limited distribution. This species was identified along the transition from dune scrub to wetland vegetation in the western and southwestern parts of the site (see Figure 9). It occurs with native and non-native vegetation including California blackberry, dock, Arroyo willow, Pacific silverweed, and European beachgrass.

La Graciosa thistle (*Cirsium scariosum* var. *loncholepis*) CRPR 1B.1, California Threatened, Federally Endangered
La Graciosa thistle is a biennial or short-lived perennial herb that occupies coastal marshes and dune wetlands in southwestern San Luis Obispo County and northwestern Santa Barbara County. It is localized in the lower valley of the Santa Maria River approximately 10 miles south of the survey area and is known from fewer than 20 occurrences; it is listed as CRPR 1B.1 rare, threatened, or endangered in California and elsewhere.

Although suitable habitat does occur on site, this species was not observed during appropriately timed surveys.

Marsh sandwort (*Arenaria paludicola*) CRPR 1B.1, California Endangered, Federally Endangered
Marsh sandwort is a perennial herb that occupies wet meadows and marshes at elevations below 300 meters. It is known to occur naturally in Black Lake Canyon and at Oso Flaco Lake, which are approximately 5 miles southwest and south of Meadow Creek Lagoon, respectively. It is listed as CRPR 1B.1; rare, threatened, or endangered in California and elsewhere.

Although there are known occurrences within approximately five miles of the survey area, due to the high level of disturbance and abundance of non-native species, this species is not expected to occur on site. Further, this species was not observed on site during appropriately timed surveys.

Gambel's water cress (*Nasturtium gambelii*) CRPR 1B.1, California Threatened, Federally Endangered
Gambel's water cress is a perennial herb that occupies marshes, streambanks, and lake margins at elevations less than 350 m. It is known in California from only four occurrences, and is considered nearly extinct; however, intermediates with the common water cress species (*N. officinale*) are known.

Common water cress was observed during appropriately timed surveys downstream of the flap gate at Arroyo Grande Creek and within flood channels around the site; however, Gambel's water cress was not identified during the surveys. This species is not expected to occur within the Meadow Creek Lagoon area, however it has a low potential to occur within the Arroyo Grande Creek channel.



Sensitive Fish Species

South-central California Coast Steelhead (*Oncorhynchus mykiss irideus*), State Status – Species of Special Concern, Federal Status – Threatened

As an anadromous form of rainbow trout, steelhead rear in freshwater for one to three years before migrating to the ocean. Often, immature steelhead remain in coastal lagoons or estuaries for several weeks prior to entering the Pacific Ocean. These crucial nursery areas allow time for necessary physiological changes to occur in developing steelhead prior to entering the saline-rich environment of the ocean. This species reaches maturity between the ages of two and four while in the ocean before migrating upstream to natal spawning grounds. Steelhead migration ranges from several miles to several hundred miles up fresh water streams. In San Luis Obispo County, adult steelhead enter streams between December and March for spawning, where eggs are laid for fertilization in gravel beds. Suitable water depth, velocity, and adequately sized gravel substrate are dominant factors for successful spawning however suitable temperature, pH, dissolved oxygen concentration, and turbidity are also critical for embryonic development and survival (NMFS 2011). Hatching time varies from three weeks to two months. The south-central California coast steelhead occupies rivers from Santa Cruz County south to Santa Barbara County, excluding the Santa Maria River. Steelhead occurrences are documented throughout Arroyo Grande Creek up to the base of Lopez Dam and throughout Pismo Creek (CNDDDB 2012). Critical habitat has been designated within Arroyo Grande Creek for protection of this species, which overlaps with the southern-most extent of the survey area. Population declines for this species may be attributed to degraded water quality, often a result of increased surface runoff from commercial and residential development, man-made structural barriers such as box culverts resulting in downstream erosive events, and the spread of non-native vegetation, which can outcompete native vegetation that provides overhead canopy and temperature regulation.

This species has been well documented as occurring within Arroyo Grande Creek and tributary channels (Central Coast Salmon Enhancement 2009, Rischbeiter 2004 and 2007). Further, the Arroyo Grande Creek corridor is located within designated critical habitat for this species. However, no steelhead were observed during survey efforts. Further, fisheries surveys revealed that the northern extent of Meadow Creek Lagoon has unsuitable substrate for steelhead spawning. Specifically, steelhead require riffle habitat areas with clean, coarse gravels for the purposes of spawning. The lagoon substrate is comprised almost entirely of accumulated fine silts and sediments which is unsuitable for steelhead. Moreover, the abundance of centrarchids and other non-native fish species within Meadow Creek Lagoon further decreases the quality of habitat to support steelhead.

However, due to documented annual occurrences of steelhead in Arroyo Grande Creek, there is a low potential for steelhead to occur within the survey area. Although structural barriers, such as the existing levee flap gates, likely hinder anadromous fish migration up into the Meadow Creek watershed, the potential exists for steelhead to enter the lagoon complex during periods of higher flows in Meadow Creek when the flap gates remain open.



Tidewater Goby (*Eucyclogobius newberryi*), State Status – Species of Special Concern, Federal Status – Endangered

Tidewater goby generally inhabits lagoons, estuaries, marshes, and coastal streams that are protected from the Pacific Ocean by sand bars creating cool, brackish water conditions, preferably with nearby emergent vegetation. Salinities under 10 parts per thousand (ppt) are favorable although this species has been found in the upper reaches of streams which are tributaries to brackish water. Tidewater goby is known to occur from the mouth of the Smith River in Del Norte County, south to Agua Hedionda Lagoon in San Diego County. This species may occur in groups under a dozen or in large aggregations of several hundred. Habitat with sandy bottom substrate is preferred to allow subsurface burrowing by males prior to mate selection. Tidewater goby complete life cycles annually with adults rarely exceeding two inches in length. Threats to the goby include sand bar breaching for tidal flushing, wetland draining, and pollutant accumulation in lagoons. Currently, critical habitat is designated for tidewater goby and new critical habitat is proposed to include state lands within San Luis Obispo County (USFWS 2011). The survey area is not included in designated critical habitat for this species.

A query of the CNDDDB located occurrences of tidewater goby within the Arroyo Grande Creek Estuary and Pismo Creek, two miles north of the survey area (CNDDDB 2012). Conditions within Meadow Creek Lagoon present suitable habitat for tidewater goby. This species was identified within the survey area immediately downstream of the flap gates during a single seining event (see Figure 9). Furthermore, extensive surveys by California State Parks have revealed tidewater goby to have successfully spawned in the Arroyo Grande Creek Estuary in 2010 and to be present in multiple years over the last decade (Rischbieter 2010). Therefore, the potential exists, however low, for tidewater goby to enter the lagoon complex during periods when the flap gates are open.

Sensitive Amphibian Species

California Red-legged Frog (*Rana draytonii*), State Status – Species of Special Concern, Federal Status – Threatened

CRLF are generally found along marshes, streams, ponds, and other permanent sources of water where dense scrubby vegetation such as willows, cattails, and bulrushes dominate and water quality is suitable. Breeding sites occur along watercourses with pools that persist long enough for breeding and larval development. Breeding time depends on winter rains but is usually between late November and late April (Jennings 1986).

This species range currently occurs from Mills Creek in Mendocino County, where it overlaps with the range of the Northern red-legged frog (*Rana aurora*) to Big Creek in Mendocino County, southward along the coast and Coast Ranges to the southernmost extent in Northern Baja California. The CRLF range extends eastward through northern Sacramento Valley where it's northernmost population occurs in Shasta County, then southward along the Sierra Nevada foothills and into Fresno County. CRLF are found widespread throughout drainages in Monterey County and San Luis Obispo County, while populations are found to be most dense in San Mateo, Marin, and Monterey Counties. The survey area is located within the current and historic range of CRLF (Stebbins 2003, USFWS 2005).



Population declines have been attributed to loss of habitat and an increase in predator densities. Habitat loss may stem from a variety of land use practices such as urbanization, agriculture, farming, and livestock grazing (USFWS 2005). Urbanization directly reduces available aquatic and terrestrial habitat through conversion of natural habitat areas to impermeable surfaces (i.e., asphalt and concrete) and imposes impassible movement barriers (e.g., roads, fences, walls, and structures). Impassible barriers to movement tend to isolate breeding populations and alter historic migration patterns. Agricultural operations also present threats to CRLF through direct habitat loss and by decreasing watershed area. CRLF populations have also declined due to the introduction of predators such as American bullfrog, centrarchid fish species (e.g., sunfish, blue gill, largemouth bass, etc.), and crayfish.

There are twelve occurrences of CRLF documented throughout the Arroyo Grande Creek watershed (CNDDDB 2012). The Arroyo Grande Creek corridor borders the survey area on the south, and has high habitat suitability for CRLF. Two CRLF were identified at separate locations within the survey area during eyesight surveys (see Figure 9). Thus, there is a high potential for CRLF to occur within the Meadow Creek Lagoon and surrounding wetland areas and associated flood channels. Although American bullfrog and centrarchid fish populations may limit CRLF distribution throughout the survey area, confirmed presence of CRLF and suitable habitat on site make it highly likely that CRLF will be present.

Coast Range Newt (*Taricha torosa*), State Status – Species of Special Concern

Coast Range newts occupy a variety of terrestrial habitats during non-breeding months, such as wet forests, oak forests, chaparral, rolling grasslands and abandoned animal burrows. Newts may be found underneath areas of woody debris, moist leaf litter, or rock crevices. Adults enter water for reproduction. Breeding sites include ponds, reservoirs, or slow-moving pools within creeks and streams with suitable water quality. Newts have been documented as far as two miles away from suitable breeding habitat and have been noted as being instinctual by returning to the same breeding pools year after year. Breeding typically occurs from December to February, but may extend past February during years of late or extended annual rainfall. Females lay egg masses just below the surface of the water under the protection of submerged rocks, vegetation, and branches. Incubation lasts anywhere from 14 to 52 days with the larval development extending into the summer or fall. Sub-adults leave the water and return to terrestrial environments, where they feed on worms, snails, slugs, and insects. Endemic to California, Coast Range newts are found along the coast and Coast Range Mountains from Mendocino County south to San Diego County. Predators such as crayfish, mosquito fish, and bullfrog prey on the non-poisonous larvae and egg masses.

This species has not been documented within five miles of the survey area (CNDDDB 2012), and it was not observed during survey efforts. The closest known occurrence of Coast Range newt is in the upper watershed of Arroyo Grande Creek at the base of Lopez Dam, approximately 15 miles from the survey area. Much of the waters in the survey area support dense populations of centrarchids and predatory mammal species, significantly reducing the potential for survivorship. Shallow, inundated portions of the survey area with emergent vegetation are likely to be unsuitable for Coast Range newt due to impaired water quality. Due to impaired water quality



and extreme threat of predation, this species has low potential of occurring within the survey area.

Western Spadefoot Toad (*Spea hammondi*), State Status – Species of Special Concern
Western spadefoot toads generally require grassland, open chaparral, or valley foothill woodland habitats for feeding and aestivation. It also requires aquatic habitats including permanent or temporary wetlands, rivers, creeks, pools in intermittent streams, or stock ponds for breeding. Western spadefoot toad is a predominantly terrestrial species and enters water only for reproduction. It breeds from January through March, but the breeding season can extend through May in wetter years. Further research is required to determine the dispersal distance of western spadefoot toads from aquatic habitats to upland refugia. Some studies suggest that the dispersal distance can be nearly a quarter mile (368 m). This species occurs throughout the Central Valley from Shasta County south through western Kern County. In the Coast Ranges it occurs from northern San Benito County, south through Monterey and San Luis Obispo counties to the Mexican border. It is known to occur at elevations that range from approximately 0 to 4,470 feet (1,363) m above msl. Population declines for this species are primarily the result of habitat loss. Specifically, conversion of native habitat to urban or agricultural land eliminates temporary rain pools used for breeding and juvenile development (Californiaherps.com).

This species is often difficult to detect due to extended periods of its life cycle being spent underground. This species has not been previously documented within a five-mile radius of the survey area (CNDDB 2012), and was not observed during field surveys. The survey area contains suitable habitat for spadefoot toad, however potential for occurrence is considered low due to historic site disturbance, abundance of potential predators, and the lack of nearby occurrences.

Sensitive Reptilian Species

Coast Horned Lizard (*Phrynosoma blainvillii*), State Status – Species of Special Concern
Coast horned lizard typically inhabits areas of loose sands or soils with patchy vegetation. Habitat types can vary from grasslands and foothills at sea level to coniferous forest and chaparral communities up to 8,000 feet (2,438 m) above msl. The primary food source for Coast horned lizard is harvester ants (*Pogonomyrmex barbatus*), but they will also prey on other small invertebrates. This species can often be found near ant mounds where loose, friable soil conditions exist. Non-native ants, such as Argentine ants (*Iridomyrmex humilis*), displacing native harvester ants contributes to the decline in food sources for this species. Coast horned lizard occurs along the Pacific coast from the San Francisco Bay to Baja California, but is threatened by land development throughout its historic range (Californiaherps.com).

One occurrence of coast horned lizard is documented within five miles of the survey area along margins of coastal dune habitat near Oso Flaco Lake (CNDDB 2012). No coast horned lizards were observed within the survey area. However, existing dune habitat along the western boundary of the survey area presents suitable habitat. Thus, there is moderate potential for coast horned lizard to occur within the survey area.



Pacific Pond Turtle (*Actinemys marmorata*), State Status – Species of Special Concern

Pacific pond turtles are commonly found in a variety of freshwater aquatic habitats including ponds, lakes, rivers, streams, and marshes. Preferentially, this species utilizes deeper pools with abundant vegetation and muddy bottoms where it can burrow in the mud to hibernate during winter months or aestivate during summer droughts. Pond turtles are omnivorous, utilizing food sources such as aquatic plants, invertebrates, frog eggs, crayfish, and occasionally fish. Historically, this turtle was distributed along the entire west coast from British Columbia to Baja California, but has become extirpated in much of its southern range as well as highly fragmented north of California (Californiaherps.com).

Pacific pond turtle has been documented in numerous locations within a five-mile radius of the survey area in both naturally-occurring and artificial water bodies (CNDDDB 2012). This species was also observed in open water of Meadow Creek Lagoon and basking along bank margins during survey efforts (see Figure 9).

Silvery Legless Lizard (*Anniella pulchra pulchra*), State Status – Species of Special Concern
Silvery legless lizard requires sandy or loose loamy soils within coastal dune scrub, coastal sage scrub, chaparral, woodland, riparian, or forest habitats. It requires cover such as logs, leaf litter, or rocks and will cover itself with loose soil. Relatively little is known about the specific behavior and ecology of this species, but it is thought to be a diurnal species that breeds between the months of March and July. It gives live birth to young in the early fall. This species occurs from Antioch in Contra Costa County south through the Coast, Transverse, and Peninsular Ranges, along the western edge of the Sierra Nevada, and in parts of the San Joaquin Valley and Mojave Desert to El Consuelo in Baja. Silvery legless lizard is known to occur at elevations that range from approximately 0 to 5,904 feet (1,800 m) above msl. Population declines have been attributed to agricultural development, sand mining, use of off-road recreational vehicles, and habitat loss through spread of invasive, non-native vegetation such as freeway iceplant (*Carpobrotus edulis*).

This species has been documented approximately 4.5 miles south of the survey area near Oso Flaco Lake (CNDDDB 2012). No silvery legless lizard were observed during field efforts, although detection of this species is difficult without disruption of understory duff or excavation within dune habitat. There is a high potential for this species to occur within the survey area due to the presence of suitable habitat (i.e., dune scrub, riparian understory litter, and decomposing matter).

Two-striped Gartersnake (*Thamnophis hammondi*), State Status – Species of Special Concern

This highly aquatic species forages primarily in and along stream corridors, preying on fish and amphibians, especially trout and sculpins. The preferred nocturnal retreats of this active diurnal snake include mammal burrows, crevices, and surface objects (Rathburn et al. 1993). During the day, it will often bask on streamside rocks or on densely vegetated stream banks. When disturbed it usually retreats rapidly to water. In milder climates, mammal burrows and surface objects such as rocks and rotting logs serve as winter refuges. Courtship and mating normally occur soon after spring emergence. Live birth occurs in late summer, usually in secluded locations such as under



the loose bark of rotting logs or in dense vegetation near pond or stream margins (Cunningham 1959, Rossman et al. 1996).

Two-striped gartersnake occurs from the southeastern slope of the Diablo Range and the Salinas Valley south along the South Coast and Transverse ranges to the Mexican border, and on Santa Catalina Island (Jennings and Hayes 1994). Historically common, it is associated with permanent or semi-permanent bodies of water in a variety of habitats from sea level to 7,872 feet (2,400 m). It is now extirpated from about 40 percent of its historical range (Jennings and Hayes 1994).

This species has not previously been documented within five miles of the survey area (CNDDDB 2012). Habitat suitability is moderate to high throughout the survey area. This species was not observed within the survey area, however, potential for occurrence is considered high due to habitat suitability and available prey species.

Sensitive Avian Species

California Black Rail (*Laterallus jamaicensis coturniculus*), State Status – Threatened

The California black rail is found in limited habitat, primarily tidal marshes bordering large bays where it occupies a narrow section between ordinary high tide line and upland habitat where topography is plateaued or gently sloped (Evans 2000). Resident to California, these tidal emergent wetlands where rails can be found are dominated by pickleweed (*Salicornia pacifica*) or in brackish marshes supporting bulrushes (*Schoenoplectis* spp.) with pickleweed and salt grass. These “high wetlands” are near the upper limits of tidal flooding, not in low wetland areas (Zeiner et. al. 1990). Prey of the California black rail includes isopods, insects, and other arthropods from the surface of mud or other vegetation. Currently, populations are found in San Francisco Bay, the Sacramento-San Joaquin River Delta, and Morro Bay. Historically, California black rails occurred in coastal wetlands from Santa Barbara County to San Diego County, but breeding populations have been extirpated from these areas due to land conversions including construction of levees, dikes, salt ponds, sewage treatment plants, and agricultural operations. Declines in populations have also been attributed to predators such as domestic cat (*Felis catus*) and herons (*Ardea* spp. and *Egretta* spp.).

A search of the CNDDDB revealed documented occurrences of California black rail at Oso Flaco Lake, five miles south of the survey area and in the vicinity of Morro Bay Estuary (CNDDDB 2012). Locally, breeding populations appear to be restricted in distribution and are known to occur in Los Osos Creek, Chorro Creek, Sweet Springs, Shark Inlet, and Morro Bay State Park. Although suitable marsh habitat exists in the survey area, frequent disturbance and a lack of past detection indicate there is a low potential for this species to occur within the survey area.

California Least Tern (*Sternula antillarum browni*), State Status – Endangered, Federal Status – Endangered

Locally, California least tern is a migratory visitor that utilizes marine and estuarine shores from San Francisco Bay south to Baja California during the breeding season (Natural Resources Agency 2010). This species establishes loose colonies on sandy soils with little vegetation along oceans, lagoons, creek mouths, and bays. Arrival at breeding sites begins in early April and lasts



into September (Zeiner et. al. 1990). Generally, this bird prefers nest sites on open, sandy or gravelly shores near unpolluted, shallow water in estuaries or lagoons where small fish are abundant. Feeding can also occur near shore in open ocean habitat. Nests are formed from shallow depressions lined with shells or other debris. This species will readily abandon nests if disturbed by humans or predators such as domestic cat, herons, crows, or falcons.

One occurrence of California least tern is documented near Oso Flaco Lake, roughly five miles south of the survey area (CNDDDB 2012). Personal communication with California State Parks revealed that this species nested two miles south of the survey area in 2012 (pers. comm. R. Glick, 2012). This species was not observed within the survey area. Nesting potential within the survey area is considered low due to a high level of human disturbance and the presence of multiple known predator species.

Cooper's Hawk (*Accipiter cooperii*), State Status – Species of Special Concern while nesting. Nesting habitat for this species is primarily in dense stands of coast live oak (*Quercus agrifolia*), riparian deciduous, or other forests near streams. This species nests and forages in close proximity to open water or riparian vegetation (Zeiner et. al. 1990). Prey for Cooper's hawk consists of birds, small mammals, amphibians, and reptiles. This species is present in the southern United States and Mexico, from coast to coast. Tolerant to human activity, Cooper's hawk will nest in relatively close contact to humans and within suburban areas. Declines in California populations can be attributed to loss of habitat through urbanization and development (Reeser 2006).

Cooper's hawk was not reported within a five-mile radius of the survey area (CNDDDB 2012), and was not observed during field surveys. Suitable nesting and foraging habitat are present in the riparian habitat surrounding Meadow Creek Lagoon, therefore, there is a high potential for this species to occur within the survey area.

Least Bell's Vireo (*Vireo bellii pusillus*), State Status – Endangered, Federal Status – Endangered

The least Bell's vireo is a summer resident of southern California (Zeiner et al., 1990). This species primarily occurs in association with low, dense riparian growth in the vicinity of water or dry river bottoms. Nesting usually occurs in shrubs, including low-growing species of willow. Breeding and nesting for this species primarily occurs in May and June (Zeiner et al., 1990). The historic distribution of least Bell's vireo ranged from central-northern California through the Sacramento and San Joaquin valleys and Sierra Nevada foothills and from the south Coast Ranges (including the Santa Clara River watershed) to Baja California (Kus 2002, USWFS 1998). Historic populations have also been documented in Owens Valley, Death Valley, and scattered locations in the Mojave Desert (USFWS 1998, Kus 2002).

Locally, individuals of this species have been reported in the vicinity of Camp Roberts, north of Paso Robles. Potential nesting habitat for this species occurs primarily in association with portions of the Salinas River riparian corridor, in northern San Luis Obispo County. One individual was documented in Los Osos in 2009 (SWCA 2010).



Least Bell's vireo has not been documented within a five-mile radius of the survey area (CNDDDB 2012) and was not observed during any survey efforts. Although suitable riparian habitat exists in the survey area, frequent disturbance and a lack of past detection indicate there is a low potential for this species to occur within the survey area.

Prairie Falcon (*Falco mexicanus*), State Status – Species of Special Concern

Prairie falcons inhabit grasslands, shrub lands, savannahs, deserts, and other open habitats at elevations up to 10,000 feet (3,048 m) in the western United States. During winter months, prairie falcons may be found in cultivated fields, along lake shores, or in feed lots with large populations of European starlings (*Sturnus vulgaris*), which serve as a food source. Mating takes place between February and April with incubation lasting roughly a month. Prairie falcons preferentially nest on cliffs up to 500 feet, but may also utilize trees, telephone poles, or buildings. Females are extremely protective and territorial of nests and are often identified by their screech before sightings occur.

This species has not been previously documented within a five-mile radius of the survey area (CNDDDB 2012) and was not observed within or adjacent to the survey area. Due to lack of suitable foraging or nesting habitat, there is a low potential for this species to occur within the survey area.

Purple Martin (*Progne subis*), State Status – Species of Special Concern

This uncommon species occurs in a variety of habitats including riparian, valley-foothill, hardwood-conifer, and redwood forests during the breeding season. It arrives from South America in late spring and is a resident of California during the summer and sometimes fall. Generally, nesting occurs in tall, multi-layered open forests, and often within old woodpecker cavities. During winter migration, purple martins may be observed foraging in grasslands, wet meadows, or fresh water wetlands (Zeiner et. al. 1990). Threats to purple martin may be attributed to loss of riparian habitat and competition with European starlings for nesting cavities (Remsen 1978).

Purple martin has not been documented within a five-mile radius of the survey area (CNDDDB 2012) and was not observed during survey efforts. Due to a lack of suitable nesting habitat on site, there is low potential for this species to occur within the survey area.

Sharp-shinned Hawk (*Accipiter striatus*), State Status – Species of Special Concern during nesting periods

The sharp-shinned hawk inhabits a variety of natural and urban habitat communities, including aspen, pine, and fir forests and urban, rural, and agricultural areas. This species typically nests in conifer trees, 20 to 60 feet above the ground where there is sufficient overhead shading. Peak nesting season for this species is from March to June, but often extends through the summer. Breeding range for this species typically occurs in colder areas, including high elevation forests in the Rocky Mountains, large areas of Canada, Alaska, and much of the northeastern United States. Breeding grounds also extend into portions of northern California, Nevada, and Washington.



This species has not been documented within a five-mile radius of the survey area (CNDDDB 2012) and was not observed within or adjacent to the survey area. Suitable forage and nesting habitat for this species is not present within the survey area and, therefore, is unlikely to occur on site.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*), State Status – Endangered
The southwestern willow flycatcher is a summer resident, requiring dense riparian habitats with nearby standing water, streams, pools, or saturated soils. This species eats primarily flying insects. Nest territories are set up for breeding, and there is some site fidelity to nest territories. Southwestern willow flycatchers arrive at breeding grounds in late April and stay as late as September. Degradation and loss of dense riparian habitat is the primary threat to the flycatcher, as well as human disturbance, which may result in nest abandonment at nesting sites (USFWS 2011). Critical habitat has been designated for this species but does not occur within or within the vicinity of the survey area.

This species has not been previously documented within a five-mile radius of the survey area (CNDDDB 2012) and there are no documented occurrences of this species breeding within San Luis Obispo County (SWCA 2010). Although riparian vegetation is prevalent throughout the survey area, human-related disturbance in this area is high. Based on the threat of disturbance and the lack of previous documentation of this species breeding in the County, it is unlikely for this species to occur within the survey area.

Western Snowy Plover (*Charadrius alexandrinus nivosus*), Federal Status – Threatened
Western snowy plover is a year-round resident in coastal areas throughout California (Warriner, et al., 1986). Inland snowy plovers may migrate to locations along the coastline but are distinct from the western plover population. Historically, western snowy plover occurs on sandy, gravelly beaches along the coast. Nesting locations occur above the high tide lines in flat, open areas with sandy or saline substrates where vegetation and driftwood are sparse or absent (Widrig 1980, Stenzel *et. al.* 1981), within 100 m of water (Page and Stenzel 1981). The breeding period occurs from early March through late September, with a peak from mid-April to mid-June, and the wintering period is from late October through mid-February. This species forages on small invertebrates in the wet and dry beach sand within low foredune habitat. The historic range spans from coastal Washington to Baja California. However, habitat disturbance as a result of development and recreational activities has attributed to population declines and loss of suitable breeding locations. A 669-acre critical habitat area has been designated for this species, which spans along the wind-blown sand dunes between 0.4 mile north of Mussel Point and Arroyo Grande Creek (Federal Register 2012). The southwest end of the survey area overlaps with the critical habitat area for this species.

A search of the CNDDDB revealed documented occurrences of western snowy plover in the coastal dune habitat bordering the western limits of the survey area and extending southward (CNDDDB 2012). No western snowy plover were observed in the survey area during field surveys however, 2012 surveys performed by California State Parks located nesting sites approximately two miles south of Meadow Creek Lagoon along coastal foredune habitat (pers. comm., R. Glick, 2012). Surveys in 2010 found snowy plover nesting north of Grand Avenue (pers. comm.,



R. Glick, 2012). Further communication with Mr. Glick suggested western snowy plover may winter in foredune habitat directly adjacent to the survey area. Due to recent documented occurrences, there is a high potential for western snowy plover occurrence within the western, coastal foredune portion of the survey area bordering the Arroyo Grande Creek Estuary.

Western Yellow-billed Cuckoo (*Coccyzus americanus*), Federal Status – Candidate, State Status – Endangered

Habitat requirements for the western yellow-billed cuckoo include dense riparian woodland with well-developed understories for breeding. Roosting and nesting occurs in willows and other deciduous trees and shrubs. During the breeding months, this species is confined to humid microclimates such as river bottoms or along slow-moving creeks and streams (CDFG 2000). Nest sites are located in dense foliage of deciduous trees or shrubs, between 2 and 2.5 feet off the ground. This species is a rare summer resident in scattered locations in California. Formerly, Western yellow-billed cuckoo was much more common and widespread in lowland valleys of California but habitat loss has caused declines in populations. Current population estimates predict that there are only 50 breeding pairs left in California (Zeiner et. al 1990). Prey items for this species include grasshoppers, cicadas, caterpillars, and other large insects, as well as frogs, lizards, and fruits upon occasion (Bent 1940, Preble 1957).

No records of western yellow-billed cuckoo have been recorded in the CNDDDB within a five-mile radius of the survey area (CNDDDB 2012) and there are no known breeding locations within San Luis Obispo County for this species (SWCA 2010). This species was not observed during field surveys. Suitable nesting and foraging habitat exists within the survey area, but there is a low potential for this species to occur in the survey area due to its extreme rarity and lack of any recent documented occurrences in San Luis Obispo County.

White-tailed Kite (*Elanus leucurus*), State Status – Fully Protected

The white-tailed kite is a resident to coastal valleys and lowlands of California where it inhabits herbaceous and open stands of various habitats near agricultural operations. Typical prey items include voles and other small diurnal mammals, but it will occasionally feed on birds, insects, reptiles, and amphibians (Zeiner et. al. 1990). Nesting occurs within thick, upper canopies of oaks, willows, or other tree stands in close proximity to open foraging area.

White-tailed kite has not been previously reported within five miles of the survey area (CNDDDB 2012). This species was observed foraging over dune habitat along the western boundary of the survey area during field surveys, but suitable nesting habitat does not occur within the survey area. Thus, there is low potential for this species to be impacted during any future flood control maintenance activities within Meadow Creek Lagoon.

Yellow Warbler (*Dendroica petechia brewsteri*), State Status – Species of Special Concern during nesting periods

This migratory species is widely distributed throughout North America. In California, populations are predominately in the northern and coastal portions of the State. Yellow warblers generally occupy riparian vegetation in close proximity to water and commonly nest in riparian



habitats in San Luis Obispo and Santa Barbara counties (Lawther et al. 1999). Nesting season is typically from mid-April to late August.

No record of this species has been recorded within five miles of the survey area (CNDDDB 2012) and it was not observed during survey efforts. However, there is a high potential for this species to occur in the survey area due to the presence of suitable nesting and foraging habitat.

Migratory Nesting Birds

The federal Migratory Bird Treaty Act (MBTA) and the Convention for the Protection of Migratory Birds and Animals, agreements between the United States and Canada and the United States and Mexico, respectively, afford protection for migratory birds by making it unlawful to collect, sell, pursue, hunt, or kill native migratory birds, their eggs, nests or any parts thereof. Certain game birds have been omitted from this protection. The laws were adopted to eliminate the commercial market for migratory bird feathers and parts, especially those of larger raptors and other birds of prey.

Riparian corridors offer protection from predation for smaller migratory birds, ample foraging grounds, and provide temperature regulation. During avian surveys and other field efforts, numerous migratory birds were observed within the survey area. Although no active nests were observed, there is a high potential for migratory birds to nest in the thick riparian corridors surrounding Meadow Creek, Arroyo Grande Creek, and the Meadow Creek Lagoon.

Sensitive Mammal Species

American Badger (*Taxidea taxus*), State Status – Species of Special Concern

American badger is a non-migratory species that occurs throughout most of California. It occurs in open and arid habitats including grasslands, meadows, savannahs, open-canopy desert scrub, and open chaparrals. It requires friable soils in areas with low to moderate slopes. American badger is known to occur in nearly every region of California except for the North Coast region which includes Del Norte, Humboldt, Mendocino, Sonoma, and Marin counties. This species occurs at elevations that range from approximately 0 to nearly 12,000 feet (3,600 m) above msl. American badger typically breeds from May through September, but it may not breed every year.

Suitable habitat and typical climate conditions where American badger is found are not present within the survey area. Although this species has been previously documented within a five-mile radius of the survey area (CNDDDB 2012), it was not observed within the survey area nor were any potentially active or remnant burrows for this species observed. Potential for American badger occurrence within the survey area is considered low.

Sensitive Bat Species

Bats in California occur at elevations ranging from below sea level to almost 11,000 feet. Bats, like other mammals, have hair, nurse their young, and produce body heat internally. Unlike all other mammals, bats fly, using wings formed by a flexible, leathery skin membrane stretched between highly modified elongated fingers and forearms, leg bones, and the tail. But unlike most small mammals, bats are long-lived (up to 30 years or more for some species), and most species



produce only one young per year (CDFG 2010). Despite myths about bats being blind, most bats locate food and orient themselves using well-developed eyes and a strong sense of smell. All of California's bat species are insect eaters except the Mexican long-tongued bat (*Choeronycteris mexicana*), which occurs in the extreme southwestern part of California.

Only 4 of California's 24 bat species regularly tolerate human presence and are commonly found in buildings: the Mexican free-tailed bat (*Tadarida brasiliensis*), the Yuma myotis (*Myotis yumanensis*, CDFG special animal), the little brown bat (*Myotis lucifugus*), and the big brown bat (*Eptesicus fuscus*). Six additional species are occasionally found in buildings: the western mastiff bat (*Eumops perotis californicus*, California species of special concern (CSC)), the pallid bat (*Antrozous pallidus*, CSC), Townsend's big eared bat (*Corynorhinus townsendii*, CSC), the long-eared myotis (*Myotis evotis*, CDFG special animal), the fringed myotis (*Myotis thysanodes*, CDFG special animal), and the long-legged myotis (*Myotis volans*, CDFG special animal).

Suitable night roosting habitat exists for these ten disturbance-tolerant species along the underside of each of the three bridges spanning Meadow Creek Lagoon. An unidentified bat species was observed from watercraft roosting under the traffic bridge along Pier Avenue during nighttime amphibian surveys. Suitable day roosts or maternity roost sites (i.e., large hollow snags or suitable cavities within cottonwood (*Populus fremontii*) or similarly structured trees) were not observed within the survey area. Although no record of sensitive bat species has been documented within a five-mile radius of the survey area (CNDDDB 2012), roosting bats were detected on site during surveys and have the potential to occur within the survey area.

Sensitive Invertebrate Species

Monarch Butterfly (*Danaus plexippus*), State Status – Special Animal

This species is not formally listed as an endangered or threatened species; however, over-wintering monarch butterflies are considered to be a "special animal" by CDFG. Monarch butterfly wintering sites are classified as rare and of restricted range within California. Monarch butterfly will begin migrating to over-wintering sites in early November and December where there are warmer climates in southern California and Mexico. They will fly north for breeding as the milkweed plants come into bloom in the spring. Wintering aggregations of monarch butterflies in California can primarily be found on Monterey pines (*Pinus radiata*) and in eucalyptus (*Eucalyptus* sp.) groves (Sakai and Calvert, 1991). Wintering habitat components frequently include sources of moisture such as streams, ponds or abundant morning dew. Other habitat preferences include little direct sunlight, minimal wind, and moist ambient conditions. There are ten documented occurrences of wintering monarch butterflies within five miles of the survey area, the closest one being less than 0.25 mile north, adjacent to the Meadow Creek corridor (CNDDDB, 2012). However, there are no large groves of pine and/or eucalyptus within the survey area, therefore, the likelihood of monarch butterfly wintering within survey area is considered low.



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APPENDIX A: MAPS



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Morro Bay

San Luis Obispo

San Luis Obispo County

Santa Barbara County



Project Location



County Line



Oceano Lagoon Biological Assessment
Figure 1: Project Location



01 Oct 2012





Memorial Park

Pier Avenue

Security Court

Alpha Place

Fountain Avenue

Arroyo Grande Creek

Oceanoo Lagoon Biological Assessment
Figure 2: Survey Area

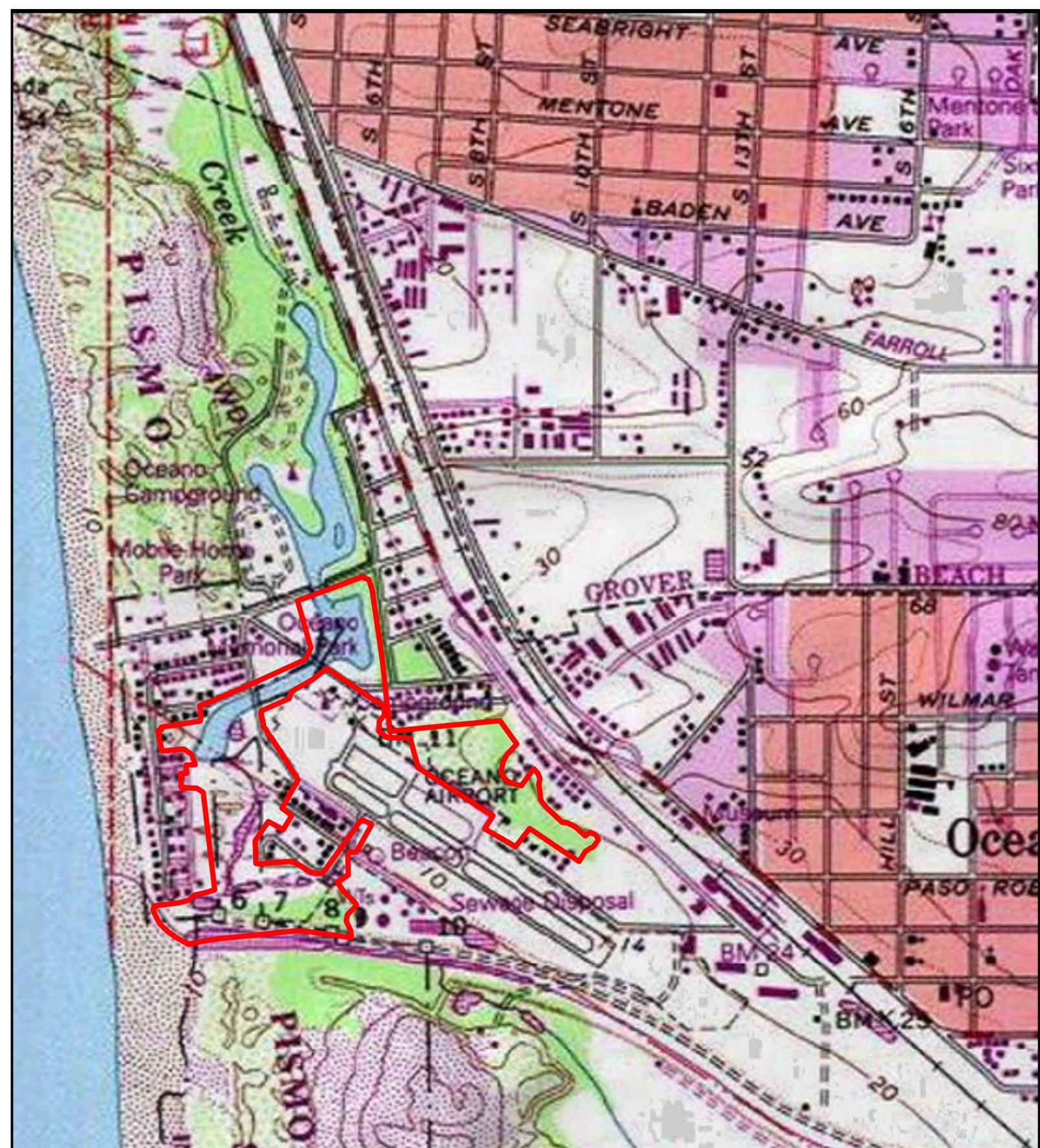
 Survey Area

0 250 500 Feet

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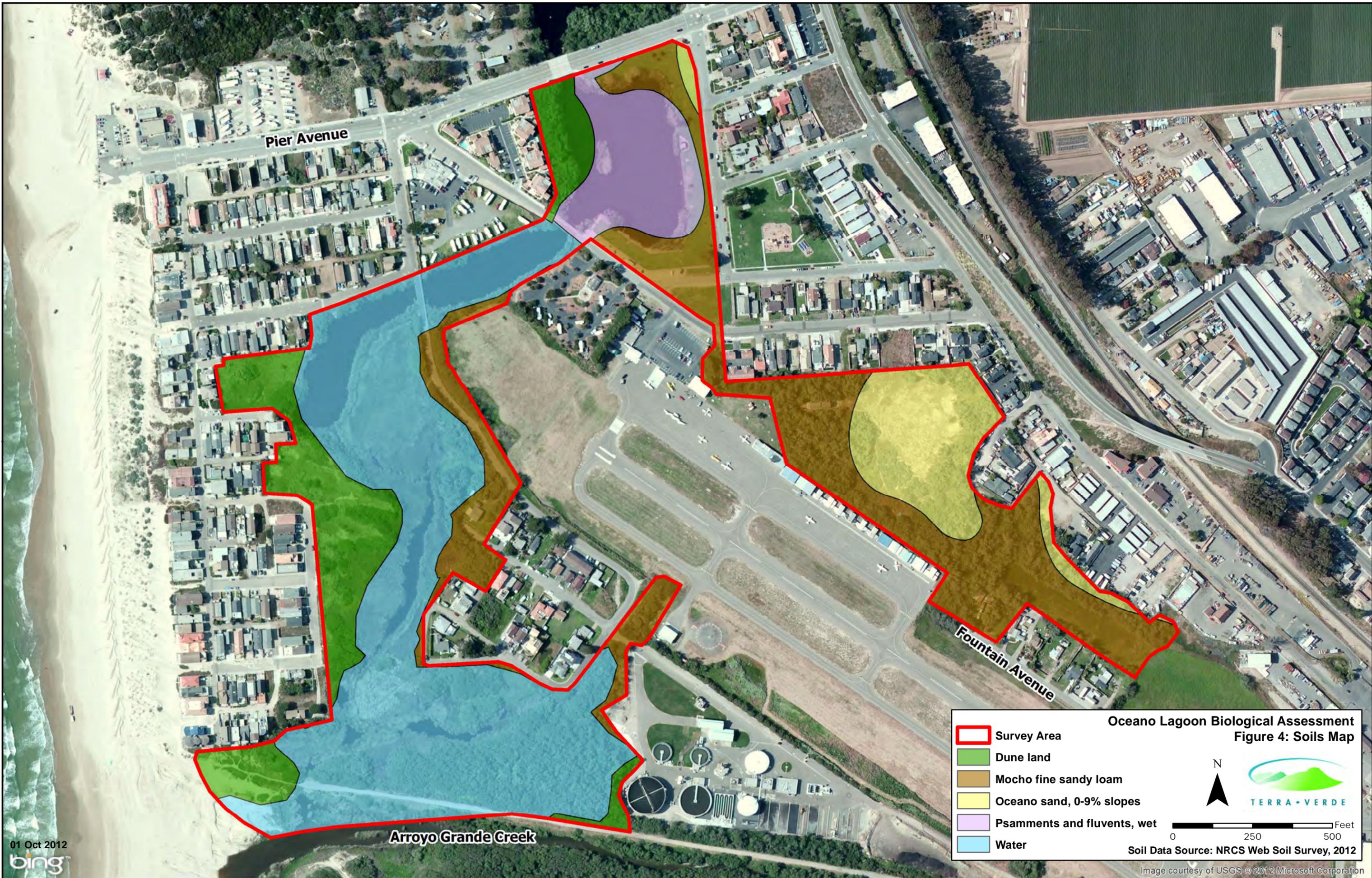
TERRA • VERDE

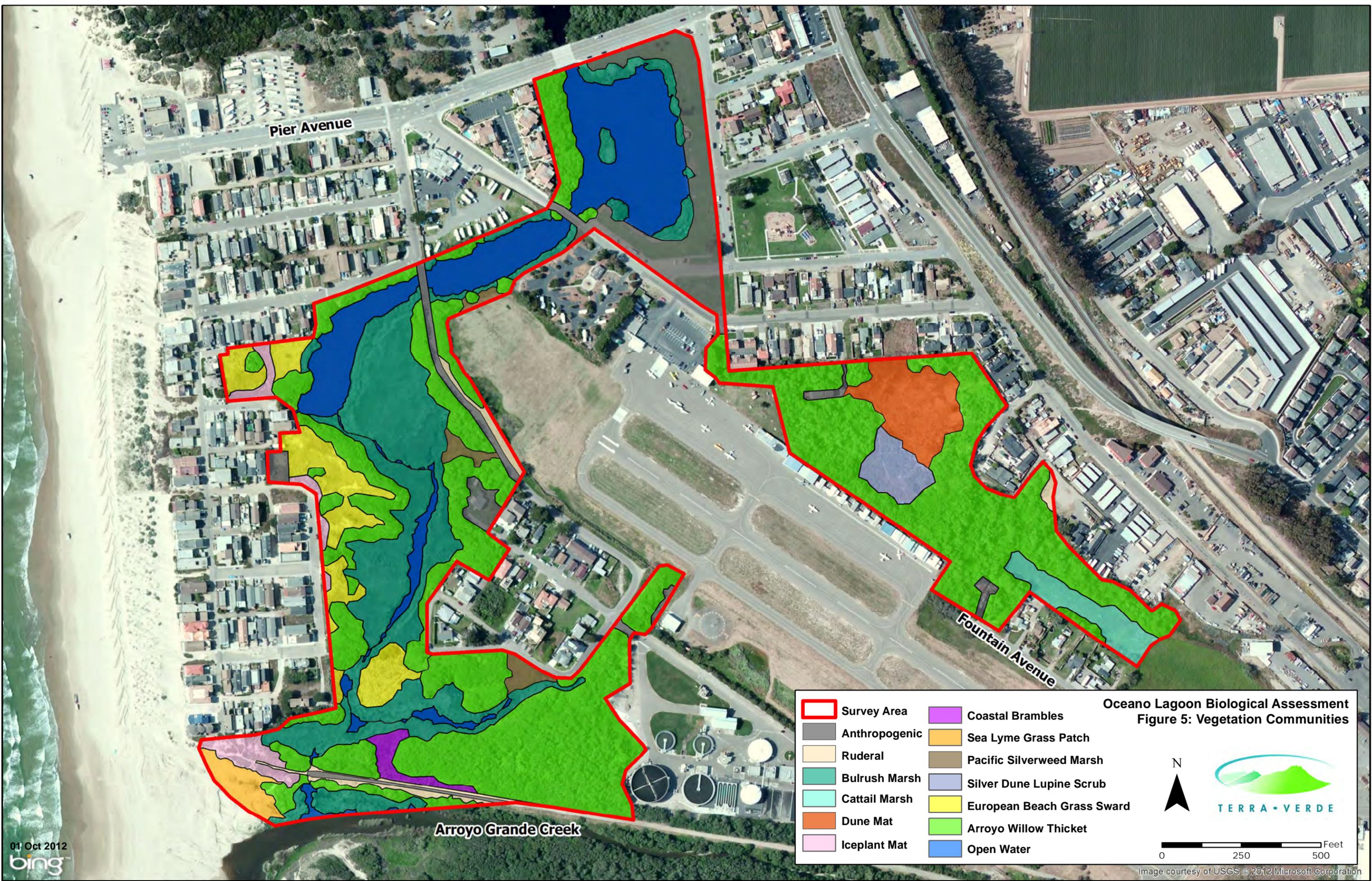


 Survey Area

Oceano Lagoon Biological Assessment
Figure 3: Topographic Map







Pier Avenue

Fountain Avenue

Arroyo Grande Creek

Oceano Lagoon Biological Assessment
Figure 5: Vegetation Communities

Survey Area	Coastal Brambles
Anthropogenic	Sea Lyme Grass Patch
Ruderal	Pacific Silverweed Marsh
Bulrush Marsh	Silver Dune Lupine Scrub
Cattail Marsh	European Beach Grass Sward
Dune Mat	Arroyo Willow Thicket
Iceplant Mat	Open Water

N

0 250 500 Feet



Memorial Park

Pier Avenue

Pulls 10-13

Pulls 1-8

Pull 9

Pulls 14-17

Pulls 18-20

Pulls 21-22

Pull 23

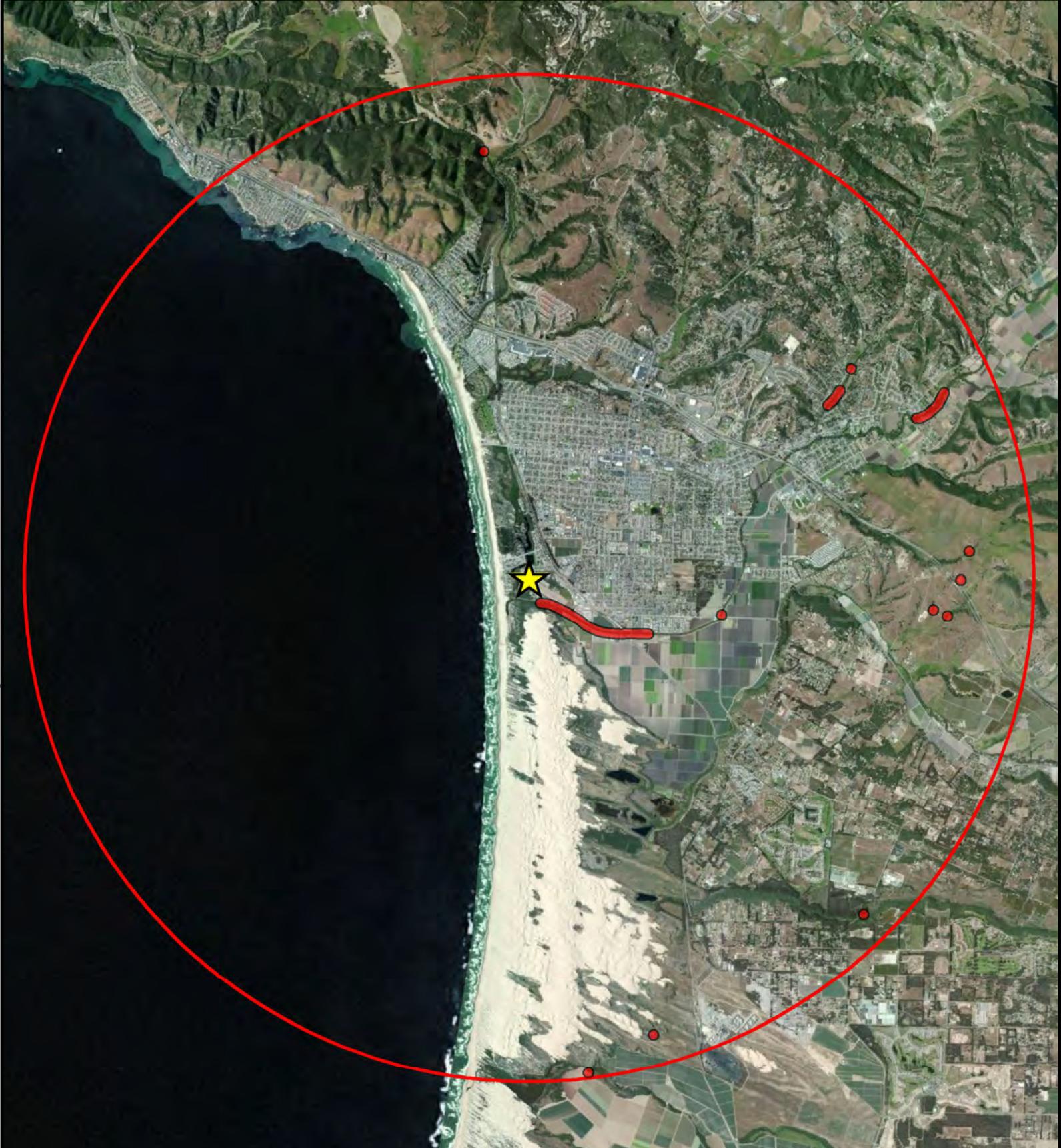
Pulls 24-25

Pull 26

Arroyo Grande Creek

This pond was inaccessible for seine fishing and too turbulent for snorkel surveys; no surveys occurred in this pond.

<ul style="list-style-type: none"> Survey Area Seine Pull Locations Hand-Netting Locations Unsurveyed Pond → Snorkel Survey Route ● Water Quality Sample Locations ● Tidewater Goby Observed 	Fisheries Survey Data	Oceano Lagoon Biological Assessment	
	June 15, 2012 (Day 1): Seine Pulls 1 - 13	June 18, 2012 (Day 2): Seine Pulls 14 - 23	June 19, 2012 (Day 3): Seine Pulls 24 - 26 Snorkel Surveys Hand Netting *Tidewater Goby Observed
			
			

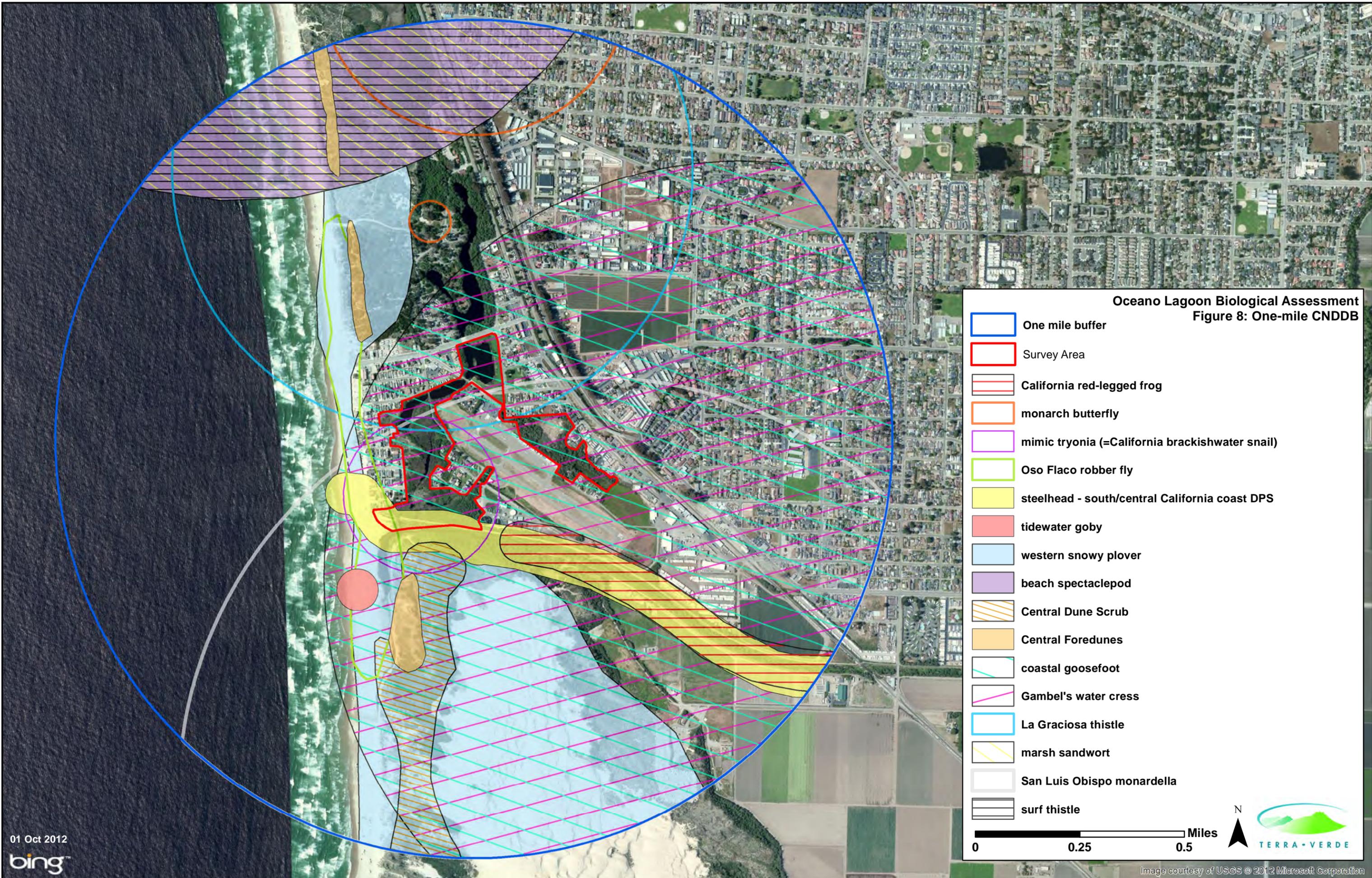


Oceano Lagoon Biological Assessment
Figure 7: Five-mile CNDDDB - CRLF

 5-mile Buffer
 California red-legged frog (CRLF)

0 0.5 1 2 3 4 5 Miles

N  TERRA-VERDE



Oceano Lagoon Biological Assessment
Figure 8: One-mile CNDDB

- One mile buffer
- Survey Area
- California red-legged frog
- monarch butterfly
- mimic tryonia (=California brackishwater snail)
- Oso Flaco robber fly
- steelhead - south/central California coast DPS
- tidewater goby
- western snowy plover
- beach spectaclepod
- Central Dune Scrub
- Central Foredunes
- coastal goosefoot
- Gambel's water cress
- La Graciosa thistle
- marsh sandwort
- San Luis Obispo monardella
- surf thistle

01 Oct 2012

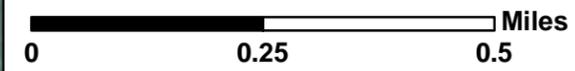
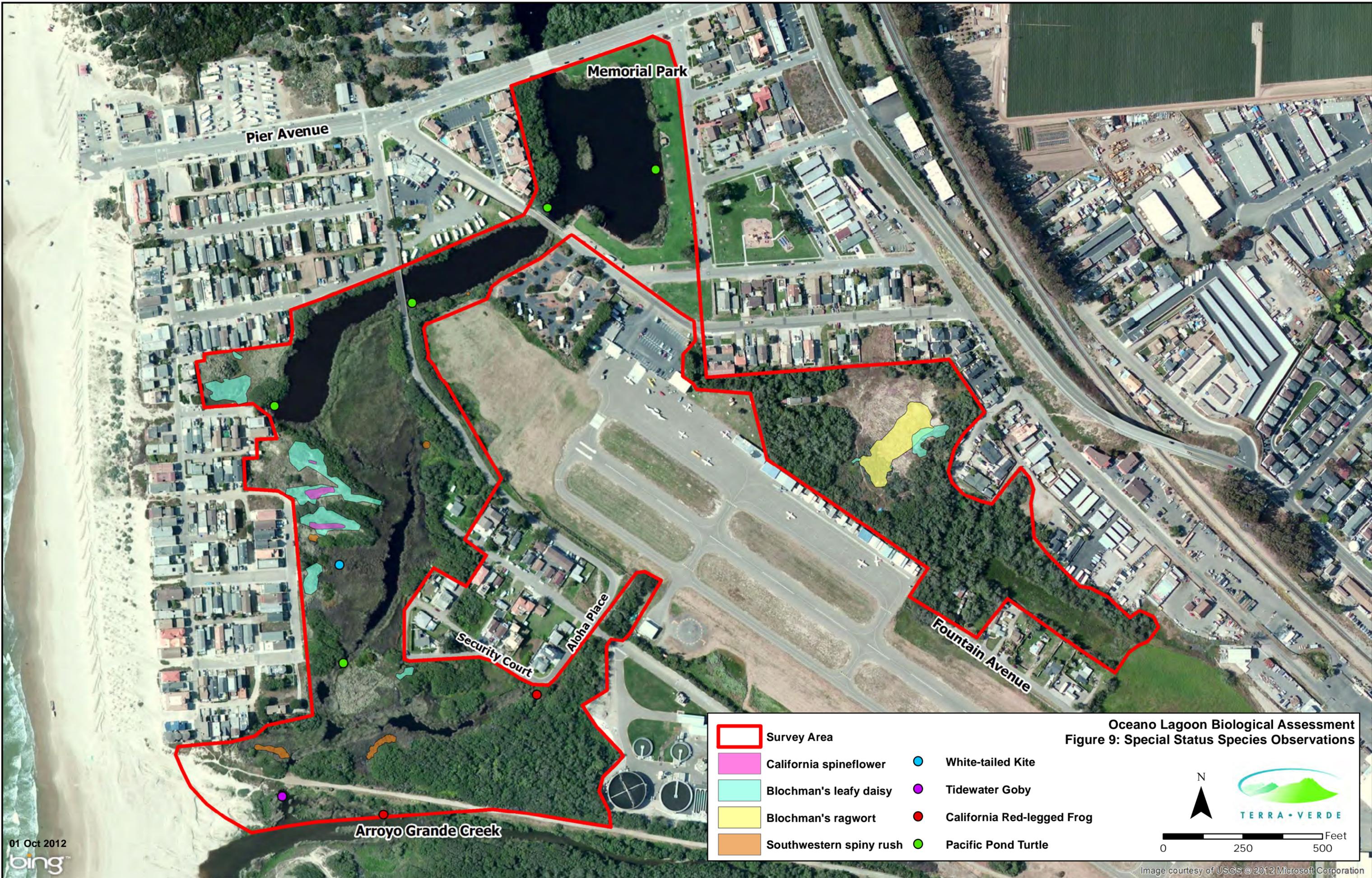


Image courtesy of USGS © 2012 Microsoft Corporation



Oceano Lagoon Biological Assessment
 Figure 9: Special Status Species Observations

- | | | | |
|---|-------------------------|---|----------------------------|
|  | Survey Area |  | White-tailed Kite |
|  | California spineflower |  | Tidewater Goby |
|  | Blochman's leafy daisy |  | California Red-legged Frog |
|  | Blochman's ragwort |  | Pacific Pond Turtle |
|  | Southwestern spiny rush | | |

N




0 250 500 Feet



APPENDIX B: OBSERVED PLANT AND WILDLIFE SPECIES LISTS



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Meadow Creek Lagoon Plant Species Observed On-Site

May 9, 25, and 29, and July 06, and 27, 2012

Scientific Name	Common Name
AIZOACEAE	FIG-MARIGOLD OR ICEPLANT FAMILY
<i>Aptenia cordifolia</i> *	Baby sun-rose
<i>Carpobrotus chilensis</i> *	Sea fig
<i>Carpobrotus edulis</i> *	Freeway ice plant)
<i>Conicosia pugioniformis</i> *	Narrow-leaved ice plant
<i>Lampranthus sp.</i> *	Miniature ice plant
<i>Tetragonia tetragonioides</i>	New Zealand spinach
ANACARDIACEAE	SUMAC OR CASHEW FAMILY
<i>Toxicodendron diversilobum</i>	Poison oak
APIACEAE	CARROT FAMILY
<i>Apium graveolens</i> *	Celery
<i>Conium maculatum</i> *	Poison hemlock
<i>Foeniculum vulgare</i>	Fennel
<i>Oenanthe sarmentosa</i>	Water parsley
APOCYNACEAE	DOGBANE FAMILY
<i>Vinca major</i> *	Greater periwinkle
ARACEAE	ARUM FAMILY
<i>Lemna sp.</i>	Duckweed
<i>Zantedeschia aethiopica</i> *	Calla lily
ARALIACEAE	GINSENG FAMILY
<i>Hedera helix</i> *	English ivy
<i>Hydrocotyle verticillata</i>	Whorled marsh pennywort
ASPARAGACEAE	ASPARAGUS FAMILY
<i>Dracaena sp.</i> **	Dragon tree
ASTERACEAE	SUNFLOWER FAMILY
<i>Achillea millefolium</i>	Yarrow
<i>Ambrosia chamissonis</i>	Beach-bur
<i>Ambrosia psilostachya</i>	Western ragweed
<i>Artemisia douglasiana</i>	Mugwort
<i>Baccharis glutinosa (B. douglasii)</i>	Marsh baccharis
<i>Baccharis pilularis</i>	Coyote brush
<i>Carduus pycnocephalus</i> *	Italian thistle
<i>Centaurea melitensis</i>	Tocalote
<i>Cirsium vulgare</i> *	Bull thistle



Scientific Name	Common Name
<i>Corethrogyne filaginifolia</i> (<i>Lessingia f.</i> var. <i>filaginifolia</i>)	Cudweed aster
<i>Delairea odorata</i> * (<i>Senecio milkanoides</i>)	German Ivy
<i>Dimorphotheca sinuata</i> *	African daisy
<i>Ericameria ericoides</i>	Mock heather
<i>Erigeron blochmaniae</i> +	Blochman's leafy daisy
<i>Erigeron bonariensis</i> * (<i>Conyza b.</i>)	Flax-leaved horseweed
<i>Helminthotheca echioides</i> * (<i>Picris e.</i>)	Bristly ox-tongue
<i>Heterotheca grandiflora</i>	Telegraph weed
<i>Hypochaeris glabra</i> *	Cat's-ear
<i>Isocoma menziesii</i>	Menzies' goldenbush
<i>Jaumea carnosa</i>	Fleshy jaumea
<i>Lactuca serriola</i> *	Prickly wild lettuce
<i>Malacothrix clevelandii</i>	Cleveland's dandelion
<i>Matricaria discoidea</i> * (<i>Chamomilla suaveolens</i>)	Pineapple weed
<i>Psuedognaphalium californicum</i> (<i>Gnaphalium c.</i>)	Green everlasting
<i>Senecio blochmaniae</i> +	Blochman's ragwort
<i>Senecio vulgaris</i>	Common groundsel
<i>Sonchus asper</i>	Spiny sowthistle
<i>Sonchus oleraceus</i> *	Prickly sow thistle
<i>Tragopogon porrifolius</i> *	Salsify, Oyster plant
BORAGINACEAE	BORAGE FAMILY
<i>Cryptantha leiocarpa</i>	Coast cryptantha
<i>Heliotropium curassavicum</i>	Salt heliotrope
<i>Phacelia distans</i>	Common phacelia
BRASSICACEAE	MUSTARD FAMILY
<i>Brassica nigra</i> *	Black mustard
<i>Cakile maritima</i>	Sea rocket
<i>Hirschfeldia incana</i>	Wild mustard
<i>Lobularia maritima</i> *	Sweet alyssum
<i>Raphanus sativus</i>	Radish
CAPRIFOLIACEAE	HONEYSUCKLE FAMILY
<i>Lonicera involucrata</i>	Twinberry
<i>Lonicera japonica</i> *	Japanese honeysuckle
CARYOPHYLLACEAE	PINK FAMILY
<i>Stellaria media</i> *	Common chickweed
CHENOPODIACEAE	GOOSEFOOT FAMILY
<i>Chenopodium californicum</i>	Goosefoot
<i>Salicornia pacifica</i> (<i>S. virginica</i>)	Pickleweed

Scientific Name	Common Name
CONVOLVULAECEAE	MORNING-GLORY FAMILY
<i>Convolvulus arvensis</i> *	Bindweed
<i>Ipomoea cairica</i> *	Morning glory
CUPRESSACEAE	CYPRESS FAMILY
<i>Cupressus macrocarpa</i> **	Monterey cypress
CYPERACEAE	SEDGE FAMILY
<i>Carex pansa</i>	Sanddune sedge
<i>Cyperus eragrostis</i>	Tall flat sedge
<i>Cyperus involucratus</i>	Umbrella sedge
<i>Isolepis cernua</i> (<i>Scirpus cernuus</i>)	Low bulrush
<i>Schoenoplectus americanus</i> (<i>Scirpus a.</i>)	Olney's three-square bulrush
<i>Schoenoplectus californicus</i> (<i>Scirpus c.</i>)	Southern bulrush
<i>Scirpus microcarpus</i>	Panicled bulrush
EQUISETACEAE	HORSETAIL FAMILY
<i>Equisetum arvense</i>	Common horsetail
<i>Equisetum laevigatum</i>	Smooth horsetail
<i>Equisetum telmateia</i> subsp. <i>braunii</i>	Giant horsetail
EUPHORBACEAE	SPURGE FAMILY
<i>Croton californicus</i>	California croton
FABACEAE	LEGUME FAMILY
<i>Acacia longifolia</i> **	Sydney golden wattle
<i>Hoita orbicularis</i>	Round-leaved leather root
<i>Lotus corniculatus</i> *	Bird's-foot trefoil
<i>Lupinus arboreus</i>	Yellow bush lupine
<i>Lupinus chamissonis</i>	Silver dune lupine
<i>Lupinus nanus</i>	Sky lupine
<i>Medicago polymorpha</i> *	Bur clover
<i>Melilotus indicus</i> *	Sourclover
<i>Trifolium hirtum</i> *	Rose clover
<i>Vicia sativa</i> var. <i>sativa</i>	Spring vetch
<i>Vicia villosa</i>	Hairy vetch
FAGACEAE	OAK FAMILY
<i>Quercus agrifolia</i>	Coast live oak
<i>Quercus lobata</i>	Valley oak
FRANKENIACEAE	FRANKENIA FAMILY
<i>Frankenia salina</i>	Alkali heath
GERANIACEAE	GERANIUM FAMILY
<i>Geranium dissectum</i> *	Cut-leaf geranium
IRIDACEAE	IRIS FAMILY
<i>Chasmanthe floribunda</i> **	African cornflag
<i>Iris pseudacorus</i> *	Iris

Scientific Name	Common Name
JUNCACEAE	RUSH FAMILY
<i>Juncus acutus</i> subsp. <i>leopoldii</i> +	Spiny rush
<i>Juncus breweri</i>	Salt/Brewer's rush
<i>Juncus bufonius</i>	Toad rush
<i>Juncus phaeocephalus</i>	Brown-head rush
LAMIACEAE	MINT FAMILY
<i>Stachys ajugoides</i>	Hedge nettle
MALVACEAE	MALLOW FAMILY
<i>Malva arborea</i> * (<i>Lavatera a.</i>)	Tree mallow
<i>Malva parviflora</i> *	Cheese weed
MONTIACEAE	MINER'S LETTUCE FAMILY
<i>Claytonia parviflora</i> subsp. <i>parviflora</i>	Streambank spring beauty
MYRICACEAE	WAX MYRTLE FAMILY
<i>Morella californica</i> (<i>Myrica c.</i>)	Wax myrtle
MYRTACEAE	MYRTLE FAMILY
<i>Eucalyptus globulus</i> *	Blue gum
NYCTAGINACEAE	FOUR O'CLOCK FAMILY
<i>Abronia umbellata</i>	Common sand-verbena
ONAGRACEAE	EVENING PRIMROSE FAMILY
<i>Camissoniopsis cheiranthifolia</i> (<i>Camissonia c.</i>)	Mustard primrose
<i>Camissoniopsis micrantha</i> (<i>Camissonia m.</i>)	Miniature suncup
<i>Epilobium ciliatum</i>	Fringed willowherb
<i>Oenothera elata</i> ssp. <i>hookeri</i>	Hooker's evening primrose
PAPAVERACEAE	POPPY FAMILY
<i>Eschscholzia californica</i>	California poppy
PINACEAE	PINE FAMILY
<i>Pinus attenuata</i> **	Knobcone pine
<i>Pinus radiata</i> **	Monterey pine
PLANTAGINACEAE	PLANTAIN FAMILY
<i>Plantago coronopus</i> *	Buckhorn plantain
<i>Plantago lanceolata</i> *	Narrowleaf or English plantain
<i>Plantago major</i> *	Common plantain
POACEAE	GRASS FAMILY
<i>Agrostis exarata</i>	Spike bentgrass
<i>Ammophila arenaria</i> *	European beachgrass
<i>Arundo donax</i> *	Giant reed
<i>Avena barbata</i> *	Slender wild oat
<i>Bromus arenarius</i>	Australian brome
<i>Bromus catharticus</i>	Rescue grass
<i>Bromus diandrus</i> *	Ripgut grass
<i>Cortaderia selloana</i>	Pampas grass

Scientific Name	Common Name
<i>Cynodon dactylon</i>	Bermuda grass
<i>Dactylis glomerata</i>	Orchard grass
<i>Digitaria sanguinalis</i>	Crab grass
<i>Distichlis spicata</i>	Salt grass
<i>Ehrharta calycina</i> *	Veldt grass
<i>Elymus mollis</i> subsp. <i>mollis</i>	American dune grass
<i>Elymus triticoides</i> (<i>Leymus t.</i>)	Creeping wild-rye
<i>Festuca myuros</i> (<i>Vulpia m.</i>)	Rattail fescue
<i>Festuca perennis</i> * (<i>Lolium multiflorum</i>)	Italian ryegrass
<i>Holcus lanatus</i>	Common velvet grass
<i>Hordeum marinum</i>	Seaside barley
<i>Hordeum murinum</i> subsp. <i>leporinum</i> *	Hare barley
<i>Pennisetum clandestinum</i>	Kikuyu grass
<i>Poa annua</i>	Annual bluegrass
<i>Polypogon monspeliensis</i> *	Rabbits-foot grass
<i>Schismus arabicus</i>	Mediterranean grass
<i>Stipa miliacea</i> var. <i>miliacea</i> (<i>Piptatherum miliaceum</i>)	Smilo grass
POLYGONACEAE	BUCKWHEAT FAMILY
<i>Mucrona californica</i> +	California spineflower
<i>Rumex conglomeratus</i>	Clustered dock
<i>Rumex crispus</i> *	Curly dock
<i>Rumex salicifolius</i>	Willow dock
PRIMULACEAE	PRIMROSE FAMILY
<i>Anagallis arvensis</i> *	Scarlet pimpernel
RANUNCULACEAE	BUTTERCUP FAMILY
<i>Clematis ligusticifolia</i>	Virgin's bower
ROSACEAE	ROSE FAMILY
<i>Potentilla anserina</i> subsp. <i>pacifica</i>	Pacific silverweed
<i>Rubus ursinus</i>	California blackberry
RUBIACEAE	MADDER FAMILY
<i>Galium aparine</i>	Goose grass
SALICACEAE	WILLOW FAMILY
<i>Salix lasiolepis</i>	Arroyo willow
SCROPHULARIACEAE	FIGWORT FAMILY
<i>Myoporum laetum</i> *	Myoporum
<i>Veronica anagallis-aquatica</i> *	Water speedwell
SOLANACEAE	NIGHTSHADE FAMILY
<i>Solanum douglasii</i>	Douglas' nightshade
TYPHACEAE	CATTAIL FAMILY
<i>Sparganium eurycarpum</i>	Broadfruit bur-reed



Scientific Name	Common Name
<i>Typha latifolia</i>	Broad-leaved cattail
URTICACEAE	NETTLE FAMILY
<i>Urtica dioica</i>	Stinging nettle

* Indicates non-native species.

+ Indicates special-status species.



Meadow Creek Lagoon Wildlife Species Observed and Potentially Occurring On-Site

May 9, 25, 29, and 30, June 15, 18, and 19, July 6 and 27, August 1 and 16, and
September 21, 2012

Common Name	Scientific Name	Observed On Site	Listing Status
Fish			
Bluegill	<i>Lepomis macrochirus</i>	X	-
Blue catfish	<i>Ictalurus furcatus</i>	-	-
Bullhead catfish	<i>Ictalurus natalis</i>	-	-
Channel catfish	<i>Ictalurus punctatus</i>	-	-
Coastal prickly sculpin	<i>Cottus asper</i>	X	-
Pacific staghorn sculpin	<i>Leptocottus armataus</i>	X	-
Common carp	<i>Cyprinus carpio</i>	-	-
Large-mouth bass	<i>Micropterus salmoides</i>	X	-
Mosquito fish	<i>Gambusia affinis</i>	X	-
Small-mouth bass	<i>Micropterus dolomieu</i>	-	-
South-central California coast steelhead	<i>Oncorhynchus mykiss irideus</i>	-	FT, CSC
Speckled dace	<i>Rhinichthys osculus</i>	-	-
Spotted bass	<i>Micropterus punctulatus</i>	-	-
Striped bass	<i>Morone saxatilis</i>	-	-
Threespine stickleback	<i>Gasterosteus aculeatus</i>	X	-
Tidewater goby	<i>Eucyclogobius newberryi</i>	X	FE, SE
White bass	<i>Morone chrysops</i>	-	-
Golden Shiner	<i>Notemigonous crysoleucas</i>	X	-
Sacramento sucker	<i>Catostomus occidentalis</i>	X	-
Amphibians			
Black-bellied slender salamander	<i>Batrachoseps attenuatus</i>	-	-
Bullfrog	<i>Lithobates catesbeiana</i>	X	-
California red-legged frog	<i>Rana draytonii</i>	X	FT, CSC
California tiger salamander	<i>Ambystoma californiense</i>	-	FT, CSC
California toad	<i>Anaxyrus boreas halophilus</i>	-	-
Coast Range newt	<i>Taricha torosa</i> subsp. <i>torosa</i>	-	CSC
Sierran treefrog	<i>Pseudacris sierra</i>	X	-
Western spadefoot	<i>Spea hammondi</i>	-	CSC
Western toad	<i>Anaxyrus boreas</i>	-	-
Reptiles			
Aquatic garter snake	<i>Thamnophis aquaticus</i>	-	-
Black legless lizard	<i>Anniella pulchra nigra</i>	-	-
California kingsnake	<i>Lampropeltis getula californiae</i>	-	-



Common Name	Scientific Name	Observed On Site	Listing Status
Coast garter snake	<i>Thamnophis elegans terrestris</i>	-	-
Striped racer	<i>Masticophis lateralis</i>	X	-
Coast horned lizard	<i>Phrynosoma blainvillii</i>	-	-
Common garter snake	<i>Thamnophis sirtalis</i>	-	-
Eastern snapping turtle	<i>Chelydra serpentina serpentina</i>	-	-
Gopher snake	<i>Pituophis catenifer</i>	-	-
Pacific pond turtle	<i>Actinemys marmorata</i>	X	CSC
Red-eared slider	<i>Trachemys scripta elegans</i>	X	-
Side-blotched lizard	<i>Uta stansburiana elegans</i>	-	-
Silvery legless lizard	<i>Anniella pulchra pulchra</i>	-	CSC
Southern alligator lizard	<i>Elgaria multicarinata</i>	-	-
Striped racer	<i>Coluber constrictor</i>	-	-
Western fence lizard	<i>Sceloporus occidentalis</i>	X	-
Western rattlesnake	<i>Crotalus viridis</i>	-	-
Western skink	<i>Eumeces skiltonianus</i>	-	-
Western whiptail	<i>Cnemidophorus tigris</i>	-	-
Birds			
Allen's hummingbird	<i>Selasphorus sasin</i>	-	M
American coot	<i>Fulica americana</i>	X	M
American crow	<i>Corvus brachyrhynchos</i>	X	M
American goldfinch	<i>Carduelis tristis</i>	X	M
American kestrel	<i>Falco sparverius</i>	-	M
American robin	<i>Turdus migratorius</i>	-	M
American wigeon	<i>Anas americana</i>	-	M
Anna's hummingbird	<i>Calypte anna</i>	X	M
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>	-	M
Band-tailed pigeon	<i>Columbia fasciata</i>	-	M
Barn owl	<i>Tyto alba</i>	-	M
Barn swallow	<i>Hirundo rustica</i>	X	M
Belted kingfisher	<i>Ceryle alcyon</i>	-	M
Bewick's wren	<i>Thryomanes bewickii</i>	-	M
Black-chinned hummingbird	<i>Archilochus alexandri</i>	-	M
Black-crowned night heron	<i>Nycticorax nycticorax</i>	X	M
Black-headed grosbeak	<i>Pheucticus melanocephalus</i>	-	M
Black phoebe	<i>Sayornis nigricans</i>	X	M
Blue-gray gnatcatcher	<i>Poliptila caerulea</i>	-	M
Blue grosbeak	<i>Guiraca caerulea</i>	-	M
Blue-winged teal	<i>Anas crecca</i>	-	M
Brewer's blackbird	<i>Euphagus cyanocephalus</i>	X	M
Brown-headed cowbird	<i>Molothrus ater</i>	-	M
Brown pelican	<i>Pelecanus occidentalis</i>	X	-
Bullock's oriole	<i>Icterus bullockii</i>	-	M
Bushtit	<i>Psaltriparus minimus</i>	X	M

Common Name	Scientific Name	Observed On Site	Listing Status
Cackling goose	<i>Branta hutchinsii</i>	X	M
California black rail	<i>Laterallus jamaicensis</i>	-	ST, FP, M
California gull	<i>Larus californicus</i>	X	M
California horned lark	<i>Eremophila alpestris</i>	-	M, CSC
California least tern	<i>Sterna antillarum browni</i>	-	M, SE, FT
California quail	<i>Callipepla californica</i>	-	-
California thrasher	<i>Toxostoma redivivum</i>	-	M
California towhee	<i>Pipilo crissalis</i>	X	M
Caspian tern	<i>Hydroprogne caspia</i>	X	M
Cassin's kingbird	<i>Tyrannus vociferans</i>	-	M
Cedar waxwing	<i>Bombycilla cedrorum</i>	-	M
Chestnut-backed chickadee	<i>Poecile rufescens</i>	X	-
Cinnamon teal	<i>Anas cyanoptera</i>	-	M
Cliff swallow	<i>Hirundo pyrrhonota</i>	X	M
Common raven	<i>Corvus corax</i>	-	M
Common snipe	<i>Gallinago gallinago</i>	-	M
Common yellowthroat	<i>Geothlypis trichas</i>	X	M
Cooper's hawk	<i>Accipiter cooperii</i>	-	M, CSC (nesting)
Costa's hummingbird	<i>Calypte costae</i>	-	M, CSC (nesting)
Dark-eyed junco	<i>Junco hyemalis</i>	X	M
Double-crested cormorant	<i>Phalacrocorax auritis</i>	X	M
Elegant tern	<i>Thalasseus elegans</i>	X	M
Eurasian collared-dove	<i>Streptopelia decaocto</i>	X	M
European starling	<i>Sturnus vulgaris</i>	X	-
Golden crowned sparrow	<i>Zonotrichia atricapilla</i>	-	M
Golden eagle	<i>Aquila chrysaetos</i>	-	BE & GEPA
Great blue heron	<i>Ardea herodias</i>	X	M
Great egret	<i>Ardea alba</i>	X	M
Great horned owl	<i>Bubo virginianus</i>	X	M
Great-tailed grackle	<i>Quiscalus mexicanus</i>	X	M
Heermann's gull	<i>Larus heermanni</i>	X	M
Hermit thrush	<i>Catharus guttatus</i>	-	M
Hooded oriole	<i>Icterus cucullatus</i>	X	M
House finch	<i>Carpodacus mexicanus</i>	X	M
House sparrow	<i>Passer domesticus</i>	X	-
House wren	<i>Troglodytes aedon</i>	-	M
Hutton's vireo	<i>Vireo huttoni</i>	-	M
Killdeer	<i>Charadrius vociferus</i>	-	M
Lark sparrow	<i>Chondestes grammacus</i>	-	M
Lazuli bunting	<i>Passerina amoena</i>	-	M
Lesser goldfinch	<i>Carduelis psaltria</i>	X	M
Loggerhead shrike	<i>Lanius ludovicianus</i>	-	M, CSC (nesting)
Mallard	<i>Anas platyrhynchos</i>	X	M
Marsh wren	<i>Cistothorus palustris</i>	X	M
Mourning dove	<i>Zenaida macroura</i>	X	M



Common Name	Scientific Name	Observed On Site	Listing Status
Northern flicker	<i>Colaptes auratus</i>	-	M
Northern harrier	<i>Circus cyaneus</i>	-	M, CSC (nesting)
Northern mockingbird	<i>Mimus polyglottos</i>	X	M
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	X	M
Northern shoveler	<i>Anas clypeata</i>	-	M
Nuttall's woodpecker	<i>Picoides nuttallii</i>	X	M
Oak titmouse	<i>Baeolophus inornatus</i>	-	M
Orange-crowned warbler	<i>Vermivora celata</i>	-	M
Osprey	<i>Pandion haliaetus</i>	X	M
Pacific-slope flycatcher	<i>Empidonax difficilis</i>	X	M
Pied-billed grebe	<i>Podilymbus podiceps</i>	X	M
Prairie falcon	<i>Falco mexicanus</i>	-	M
Purple finch	<i>Carpodacus purpureus</i>	X	M
Red-shouldered hawk	<i>Buteo lineatus</i>	X	M
Red-tailed hawk	<i>Buteo jamaicensis</i>	X	M
Red-winged blackbird	<i>Agelaius phoeniceus</i>	X	M
Ring-billed gull	<i>Larus delawarensis</i>	X	M
Rock pigeon	<i>Columba livia</i>	X	-
Ruby-crowned kinglet	<i>Regulus calendula</i>	-	M
Ruddy duck	<i>Oxyura jamaicensis</i>	X	M
Rufous-crowned sparrow	<i>Aimophila ruficeps</i>	-	M
Savannah sparrow	<i>Passerculus sandwichensis</i>	-	M
Say's phoebe	<i>Sayornis saya</i>	-	M
Sharp-shinned hawk	<i>Accipiter striatus</i>	-	M, CSC (nesting)
Short-billed dowitcher	<i>Limnodromus griseus</i>	-	M
Snow goose	<i>Chen caerulescens</i>	X	M
Song sparrow	<i>Melospiza melodia</i>	X	M
Spotted towhee	<i>Pipilo maculatus</i>	X	M
Swainson's thrush	<i>Catharus ustulatus</i>	X	M
Tree swallow	<i>Tachycineta bicolor</i>	X	M
Tri-colored blackbird	<i>Agelaius tricolor</i>	-	M, CSC (nesting)
Turkey vulture	<i>Cathartes aura</i>	X	M
Violet-green swallow	<i>Tachycineta thalassina</i>	-	M
Warbling vireo	<i>Vireo gilvus</i>	-	M
Western bluebird	<i>Sialia mexicana</i>	-	M
Western gull	<i>Larus occidentalis</i>	X	M
Western meadowlark	<i>Sturnella neglecta</i>	-	M
Western scrub-jay	<i>Aphelocoma californica</i>	X	M
Western wood-pewee	<i>Contopus sordidulus</i>	-	M
Western snowy plover	<i>Charadrius nivosus</i>	-	M, FT
Western tanager	<i>Piranga ludoviciana</i>	X	M
White-crowned sparrow	<i>Zonotrichia leucophrys</i>	X	M
White-tailed kite	<i>Elanus leucurus</i>	X	M, FP
Wilson's warbler	<i>Cardellina pusilla</i>	X	M
Wood duck	<i>Aix sponsa</i>	-	M



Common Name	Scientific Name	Observed On Site	Listing Status
Wrentit	<i>Chamaea fasciata</i>	X	M
Yellow-rumped warbler	<i>Setophaga coronata</i>	-	M
Mammals			
Audubon's cottontail	<i>Sylvilagus audubonii</i>	X	-
Big brown bat	<i>Eptesicus fuscus</i>	-	-
Black rat	<i>Rattus rattus</i>	-	-
Black-tailed deer	<i>Odocoileus hemionus</i>	-	-
Black-tailed jackrabbit	<i>Lepus californicus</i>	-	-
Bobcat	<i>Lynx rufus</i>	-	-
Botta's pocket gopher	<i>Thomomys bottae</i>	-	-
California ground squirrel	<i>Spermophilus beecheyi</i>	-	-
California myotis	<i>Myotis californicus</i>	-	-
California pocket mouse	<i>Perognathus californicus</i>	-	CSC
California vole	<i>Microtus californicus</i>	-	-
Coyote	<i>Canis latrans</i>	-	-
Cow	<i>Bos taurus</i>	-	-
Deer mouse	<i>Peromyscus maniculatus</i>	-	-
Dusky-footed woodrat	<i>Neotoma fuscipes</i>	-	CSC
Feral cat	<i>Felis catus</i>	-	-
Feral pig	<i>Sus scrofa</i>	-	-
Fringed myotis	<i>Myotis thysanodes</i>	-	SA
Gray fox	<i>Urocyon cinereoargenteus</i>	-	-
House mouse	<i>Mus musculus</i>	-	-
Hoary bat	<i>Lasiurus cinereus</i>	-	-
Little brown bat	<i>Myotis lucifugus</i>	-	-
Long-eared myotis	<i>Myotis evotis</i>	-	SA
Long-legged myotis	<i>Myotis volans</i>	-	SA
Long-tailed weasel	<i>Mustela frenata</i>	-	-
Mexican free-tailed bat	<i>Tadarida brasiliensis</i>	-	-
Muskrat	<i>Ondatra zibethica</i>	-	-
North American beaver	<i>Castor canadensis</i>	X	-
North American river otter	<i>Lontra canadensis</i>	X	-
Pacific kangaroo rat	<i>Dipodomys agilis</i>	-	-
Pallid bat	<i>Antrozous pallidus</i>	-	CSC
Raccoon	<i>Procyon lotor</i>	X	-
Red bat	<i>Lasiurus borealis</i>	-	-
Red fox	<i>Vulpes vulpes</i>	X	-
Ringtail	<i>Bassariscus astutus</i>	-	-
Striped skunk	<i>Mephitis mephitis</i>	-	-
Townsend's big eared bat	<i>Corynorhinus townsendii</i>	-	CSC
Virginia opossum	<i>Didelphis virginiana</i>	X	-
Western harvest mouse	<i>Reithrodontomys megalotis</i>	-	-
Western gray squirrel	<i>Sciurus griseus</i>	-	-
Western mastiff bat	<i>Eumops perotis californicus</i>	-	CSC



Common Name	Scientific Name	Observed On Site	Listing Status
Yuma myotis	<i>Myotis yumanensis</i>	-	SA
Invertebrates			
Crayfish	<i>Pacifastacus</i> spp.	X	-
Mimic tryonia (CA brackishwater snail)	<i>Tryonia imitator</i>	-	SA
Monarch butterfly	<i>Danaus plexippus</i>	X	SA
Morro Bay blue butterfly	<i>Plebejus icarioides moroensis</i>	-	SA
Oso Flaco flightless moth	<i>Areniscythris brachypteris</i>	-	SA
Oso Flaco patch butterfly	<i>Chlosyne leanira elegans</i>	-	SA
Oso Flaco robber fly	<i>Ablautus schlingeri</i>	-	SA
Sandy beach tiger beetle	<i>Cicindela hirticollis grvida</i>	-	SA
White sand bear scarab beetle	<i>Lichnanthe albipilosa</i>	-	SA

Protected Status

- FE – Federal-listed Endangered Species
- FT – Federal-listed Threatened Species
- FPT - Federal-listed Candidate Species
- FPT - Federal-listed Candidate Species
- SE – State-listed Endangered Species
- ST – State-listed Threatened Species
- CP – Protected under California Fish and Game Code
- CSC – California Species of Special Concern
- SA – California Special Animal
- BE & GEPA – Bald Eagle & Golden Eagle Protection Act
- M – Migratory Bird Treaty Act Species



APPENDIX C: POTENTIAL SENSITIVE SPECIES LIST



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Potential Sensitive Species for Oceano and surrounding 7.5 quadrangles: Arroyo Grande NE, Guadalupe, Nipomo, Pismo Beach, Point Sal, Santa Maria, and Tar Spring Ridge (CNDDDB 2012).

VEGETATION COMMUNITIES			
Community Name	Description	Observed on Site?	Comments
Central Dune Scrub	Restricted to coastal areas with stabilized back dunes, slopes, ridges, and flats. Vegetation consists of shrubs, subshrubs, and herbs less than one meter tall. Indicator species include <i>Lupinus chamissonis</i> .	Yes	Coastal sand dunes as described observed on site. <i>Lupinus chamissonis</i> occurs as a dominant species and as co-dominant in the shrub layer with <i>Ericameria ericoides</i> .
Central Foredunes	Adjacent to shoreline with harsh environmental conditions such as strong, salt-laden breezes and salt water inundation. Characterized by plants that are prostrate; with deep taproots; fleshy roots, stems, and leaves; and leaves covered with thick mats of gray hairs. Often referred to as pioneer dune community or coastal strand.	Yes	The southwestern part of the site is adjacent to bare sand and exposed to harsh coastal conditions and marine influence, such as wind and salt. Species present within this community include <i>Elymus mollis</i> subsp. <i>mollis</i> , <i>Cakile maritima</i> , <i>Ambrosia chamissonis</i> , and <i>Carpobrotus</i> spp.
Central Maritime Chaparral	Associated with well drained/dry soils. Exposed upland location with moderate to high cover. Typically dominated by <i>Arctostaphylos</i> species that develop into dense patches of vegetation.	No	This community was not observed, and no <i>Arctostaphylos</i> species were identified on site.

VEGETATION COMMUNITIES

Community Name	Description	Observed on Site?	Comments
Coastal and Valley Freshwater Marsh	Dominated by perennial, emergent, and tall monocots that often form closed canopies. Tend to be <i>Typha</i> -dominated and permanently flooded with fresh water which result in deep peaty soils.	Yes	This community is present on site and typically occurs adjacent to the open water. Both <i>Schoenoplectus</i> -dominated and <i>Typha</i> -dominated marshes are present.
Southern Vernal Pool	Seasonal, depressional wetlands with impermeable soils that support a diverse array of plant and wildlife species. During the wet season, plants generally grow in concentric rings and die or go dormant when conditions are dry.	No	This community was not observed; soils on site are typically well-drained and sandy.
Valley Needlegrass Grassland	Associated with fine textured/clay soils or moist, water logged soils. Vegetation dominated by bunches of <i>Stipa pulchra</i> with other natives and introduced annuals. Often associated with oak woodlands.	No	This community was not observed; no clay soils are present, and no <i>Stipa pulchra</i> was identified on site.

PLANTS

Scientific/Common Name	Listing Status	Blooming Period	Habitat Type	Observed on Site?	Comments
<i>Agrostis hooveri</i> Hoover's bent grass	CRPR 1B.2	April - July	Closed-cone coniferous forest, chaparral, cismontane woodland, valley and foothill grassland/usually sandy. Elevation; < 600 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Aphanisma blitoides</i> Aphanisma	CRPR 1B.2	March - June	Coastal bluff scrub, coastal dunes, and coastal scrub, with sandy soils. Elevation; < 100 m.	No	Suitable habitat on site. Not observed during appropriately timed surveys.
<i>Arctostaphylos luciana</i> Santa Lucia manzanita	CRPR 1B.2	December - March	Chaparral, cismontane woodlands with shale outcrops. Elevation; 500 - 700 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Arctostaphylos morroensis</i> Morro manzanita	CRPR 1B.1	December - March	Chaparral (maritime), cismontane woodland, coastal dunes, coastal scrub/sandy loam soils. Elevation; < 200 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Arctostaphylos pechoensis</i> Pecho manzanita	CRPR 1B.2	November - March	Shale outcrops, chaparral, coniferous forest. Elevation; <850 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Arctostaphylos pilosula</i> Santa Margarita manzanita	CRPR 1B.2	December - March	Shale outcrops, slopes, chaparral. Elevation; 300 - 1,100 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.

PLANTS					
<i>Arctostaphylos rudis</i> Sand mesa manzanita	CRPR 1B.2	November - February	Chaparral (maritime), coastal scrub/sandy soils. Elevation; < 150 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Arenaria paludicola</i> Marsh sandwort	Fed: Endangered State: Endangered CRPR 1B.1	May - August	Marshes and swamps (freshwater or brackish), and meadows. Elevation; > 300 m.	No	Suitable habitat on site. Not observed during appropriately timed surveys.
<i>Astragalus didymocarpus</i> var. <i>milesianus</i> Miles's milk-vetch	CRPR 1B.2	March - June	Clay or serpentine soils in coastal scrub, grassy areas near coast. Elevation; 0 - 90 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Atriplex serenana</i> var. <i> davidsonii</i> Davidson's saltscale	CRPR 1B.2	April - October	Coastal scrub, coastal bluff scrub, alkaline soils. Elevation; < 200 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Calochortus obispoensis</i> San Luis mariposa lily	CRPR 1B.2	May - July	Dry serpentine soils or chaparral environments. Elevation; 100 - 500 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Calochortus simulans</i> San Luis Obispo mariposa lily	CRPR 1B.3	April - May	Grassland, oak woodland, pine forest, on sand, granite or serpentine. Elevation; < 1100 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Calystegia subacaulis</i> ssp. <i>episcopalis</i> Cambria morning glory	CRPR 4.2	April - June	Dry, open scrub, woodland, foothill or grasslands. Elevation; 0 - 1,640 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Castilleja densiflora</i> ssp. <i>obispoensis</i> San Luis Obispo owl's clover	CRPR 1B.2	March - May	Meadows and seeps, valley and foothill grassland/sometimes serpentine. Elevation; 0 - 328 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.

PLANTS					
<i>Centromadia parryi</i> ssp. <i>congdonii</i> Congdon's tarplant	CRPR 1B.2	May - October	Valley and foothill grasslands (alkaline). Elevation; 0 - 230 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Chenopodium littoreum</i> Coastal goosefoot	CRPR 1B.2	April - August	Coastal dunes, sandy soil. Elevation; < 200 m.	No	Suitable habitat on site. Not observed during appropriately timed surveys.
<i>Chorizanthe breweri</i> Brewer's spineflower	CRPR 1B.3	April - August	Chaparral, foothill woodland on serpentine. Elevation; < 800 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Chorizanthe rectispina</i> Straight-awned spineflower	CRPR 1B.3	April - July	Chaparral, dry woodland in sandy soil. Elevation; 200-600 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Cirsium fontinale</i> var. <i>obispoense</i> Chorro Creek bog thistle	Fed: Endangered State: Endangered CRPR 1B.2	February - July	Serpentine seeps and streams. Elevation; < 300 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Cirsium rhothophilum</i> Surf thistle	State: Threatened CRPR 1B.2	April - June	Coastal bluff scrub, coastal dunes. Elevation; < 60 m.	No	Suitable habitat on site. Not observed during appropriately timed surveys.
<i>Cirsium scariosum</i> var. <i>loncholepis</i> La Graciosa thistle	Fed: Endangered State: Threatened CRPR 1B.1	May - August	Coastal dune, scrub, cismontane woodland, valley and foothill grasslands with mesic/sandy soils. Elevation; 0 - 220 m.	No	Suitable habitat on site. Not observed during appropriately timed surveys.
<i>Cladium californicum</i> California sawgrass	CRPR 2.2	June - September	Freshwater marsh, swamps, alkaline sink, wetland riparian. Elevation; 0 - 600 m.	No	Suitable habitat on site. Not observed during appropriately timed surveys.

PLANTS

<i>Clarkia speciosa</i> ssp. <i>immaculata</i> Pismo clarkia	Fed: Endangered State: Rare List 1B.1	May - July	Chaparral (margins, openings), cismontane woodland, valley and foothill grasslands with sandy soils. Elevation; < 100 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Deinandra increscens</i> ssp. <i>foliosa</i> Leafy tarplant	CRPR 1B.2	June - September	Foothill and valley grasslands/sandy. Elevation; 300 – 500 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Deinandra increscens</i> ssp. <i>villosa</i> Gaviota tarplant	Fed: Endangered State: Endangered CRPR 1B.1	May - October	Coastal scrub, coastal bluff scrub, coastal fields, valley and foothill grassland. Elevation; < 50 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Delphinium parryi</i> ssp. <i>blochmaniae</i> Dune larkspur	CRPR 1B.2	April - May	Chaparral and coastal dunes. Elevation; 0 - 200 m.	No	Suitable habitat on site. Not observed during appropriately timed surveys.
<i>Delphinium parryi</i> ssp. <i>eastwoodiae</i> Eastwood's larkspur	CRPR 1B.2	February - May	Coastal, chaparral (openings), valley and foothill grassland, ultramafic, serpentinite. Elevation; 75 – 500 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Delphinium umbraculorum</i> Umbrella larkspur	CRPR 1B.3	April - June	Cismontane woodland, moist oak forest. Elevation; 400-1,600 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Dithyrea maritima</i> Beach spectaclepod	State: Threatened CRPR 1B.1	March - May	Coastal dunes, coastal scrub (sandy). Elevation; 0 - 50 m.	No	Suitable habitat on site. Not observed during appropriately timed surveys.

PLANTS					
<i>Dudleya abramsii</i> ssp. <i>murina</i> Mouse-gray dudleya	CRPR 1B.3	May - June	Chaparral, cismontane woodland, valley and foothill grassland/serpentine. Elevation; 90 - 400 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Dudleya blochmaniae</i> ssp. <i>blochmaniae</i> Blochman's dudleya	CRPR 1B.1	April - June	Open, rocky slopes, often serpentine or clay soils. Elevation; 450 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Erigeron blochmaniae</i> Blochman's leafy daisy	CRPR 1B.2	July - October	Sand dunes and hills. Elevation; < 30 m.	Yes	Observed within coastal dune scrub communities.
<i>Eriodictyon altissimum</i> Indian Knob mountainbalm	Fed: Endangered State: Endangered CRPR 1B.1	March - June	Chaparral (maritime), foothill woodland, cismontane woodland, coastal scrub/sandstone. Elevation; 80 - 270 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Eryngium aristulatum</i> var. <i>hooveri</i> Hoover's button-celery	CRPR 1B.1	July - August	Freshwater wetland, wetland- riparian, Vernal pools. Elevation; 3 - 45 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Horkelia cuneata</i> ssp. <i>puberula</i> Mesa horkelia	CRPR 1B.1	February - July (September)	Dry, sandy coastal chaparral. Elevation; 70 - 810 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Horkelia cuneata</i> ssp. <i>sericea</i> Kellog's horkelia	CRPR 1B.1	April - September	Closed cone conifer forests, chaparral (maritime), coastal dune and scrub with sandy/gravelly openings. Elevation; 10 - 200 m.	No	Marginally suitable habitat on site. Not observed during appropriately timed surveys.
<i>Layia jonesii</i> Jones's layia	CRPR 1B.2	March - May	Open serpentine or clay slopes. Elevation; < 400 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.

PLANTS					
<i>Lupinus ludovicianus</i> San Luis Obispo County lupine	CRPR 1B.2	April - June	Chaparral, cismontane woodland/sandstone or sandy. Elevation; 50 - 525 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Lupinus nipomensis</i> Nipomo Mesa lupine	Fed: Endangered State: Endangered CRPR 1B.1	December - May	Coastal dunes. Elevation; 10 - 50 m.	No	Suitable habitat on site. Not observed during appropriately timed surveys.
<i>Monardella frutescens</i> San Luis Obispo monardella	CRPR 1B.2	May - September	Coastal dunes, coastal scrub (sandy). Elevation; 10 - 200 m.	No	Suitable habitat on site. Not observed during appropriately timed surveys.
<i>Monardella undulata</i> ssp. <i>crispa</i> Crisp monardella	CRPR 1B.2	April - August	Coastal dunes, coastal scrub. Elevation; 10 - 120 m.	No	Suitable habitat on site. Not observed during appropriately timed surveys.
<i>Nasturtium gambelii</i> Gambel's water cress	Fed: Endangered State: Threatened CRPR 1B.1	April - October	Freshwater or brackish marshes. Elevation; 5 - 330 m.	No	Suitable habitat on site. Not observed during appropriately timed surveys.
<i>Nemacaulis denudata</i> var. <i>denudata</i> Coast woolly-heads	CRPR 1B.2	April - September	Coastal dunes, beaches. Elevation; < 100 m.	No	Suitable habitat on site. Not observed during appropriately timed surveys.
<i>Nemacladus secundiflorus</i> var. <i>robbinsii</i> Robbins' nemacladus	CRPR 1B.2	April - June	Openings in chaparral and valley and foothill grassland, dry, gravelly slopes. Elevation; 200 - 2,000 m.	No	No suitable habitat on site. Not observed during appropriately timed surveys.
<i>Orobanche parishii</i> ssp. <i>brachyloba</i> Short-lobed broom-rape	CRPR 4.2	April - October	Coastal dunes, coastal scrub, coastal bluff scrub, sandy soil near ocean. Parasitic on shrubs such as <i>Isocoma menziesii</i> . Elevation; < 300 m.	No	Suitable habitat on site. Not observed during appropriately timed surveys.

PLANTS

<p><i>Scrophularia atrata</i> Black-flowered figwort</p>	<p>CRPR 1B.2</p>	<p>March - July</p>	<p>Closed cone coniferous forest, coastal dunes, coastal scrub, and riparian scrub. Calcareous (sometimes diatomaceous) soils. Elevation; < 500 m.</p>	<p>No</p>	<p>Marginally suitable habitat on site. Not observed during appropriately timed surveys.</p>
<p><i>Symphotrichum defoliatum</i> San Bernardino aster</p>	<p>CRPR 1B.2</p>	<p>July - November</p>	<p>Cismontane woodlands, meadows, seeps, coastal scrub, foothill/valley grasslands near streams, ditches or springs. Elevation; < 2,040 m.</p>	<p>No</p>	<p>No suitable habitat on site. Not observed during appropriately timed surveys.</p>

WILDLIFE

Scientific/Common Name	Listing Status	Nesting/ Breeding Period	Habitat Type	Observed on Site?	Comments
<i>Ablautus schlingeri</i> Oso Flaco robber fly	Special animal	Unknown	Occurs on sand dunes in the vicinity of Oso Flaco Lake.	No	Suitable habitat on site; not observed during surveys.
<i>Accipiter striatus</i> Sharp-shinned hawk	Special animal Watch List	March - June	Nests in forests, usually with conifers. Winters in a variety of habitats, including urban and suburban areas.	No	No suitable nesting habitat on site; not observed during surveys.
<i>Actinemys marmorata</i> Pacific pond turtle	State: CSC	April - August	Permanent or semi-permanent streams, ponds, and lakes, logs, rocks, and mats for basking. May enter brackish water.	Yes	Individuals observed at multiple locations throughout survey area.
<i>Ambystoma californiense</i> California tiger salamander	Fed: Threatened State: Threatened State: CSC	December - February	Found in grasslands, oak savannah, and edges of mixed woodland and lower elevation coniferous forest.	No	No suitable habitat on site; not observed during surveys.
<i>Anniella pulchra pulchra</i> Silvery legless lizard	State: CSC	May - September	Moist loose soil with plant cover and under leaf litter. Found in beach dunes, chaparral, foothill woodlands, desert scrub, sandy washes, and stream terraces.	No	Suitable habitat on site; not observed during surveys.
<i>Areniscythis brachypteris</i> Oso Flaco flightless moth	Special animal	Unknown	Dunes along the Central Coast of San Luis Obispo. Larvae eat and are reared on a variety of dune vegetation.	No	Suitable habitat on site; not observed during surveys.

WILDLIFE

Scientific/Common Name	Listing Status	Nesting/ Breeding Period	Habitat Type	Observed on Site?	Comments
<i>Athene cunicularia</i> Burrowing owl	State: CSC	March - July	Open, dry grasslands, often short grasses without trees. Relies on ground burrowing animals for terrestrial habitat.	No	No suitable nesting habitat on site; not observed during surveys.
<i>Branchinecta lynchi</i> Vernal pool fairy shrimp	Fed: Threatened	Rainy season	Vernal pools, depressions, in grasslands.	No	No suitable habitat on site; not observed during surveys.
<i>Charadrius alexandrinus nivosus</i> Western snowy plover	Fed: Threatened State: CSC Watch List	March - August	Sandy beaches, salt pond levees, shorelines of large alkali lakes. Needs friable soil for nesting.	No	Suitable nesting habitat on site; not observed during surveys; CA State Parks reported seeing nest sites within 2 miles of project site this year.
<i>Chlosyne leanira elegans</i> Oso Flaco patch butterfly	Special animal	Unknown	Dunes within the Oso Flaco Lake system.	No	Suitable habitat on site; not observed during surveys.
<i>Cicindela hirticollis gravida</i> Sandy beach tiger beetle	Special animal	Unknown	Found in moist sand near the ocean, for example in swales behind dunes or upper beaches beyond normal high tides. Adjacent to non-brackish water near the coast. Clean, dry light colored sand in the upper zone.	No	Suitable habitat on site; not observed during surveys.

WILDLIFE

Scientific/Common Name	Listing Status	Nesting/ Breeding Period	Habitat Type	Observed on Site?	Comments
<i>Danaus plexippus</i> Monarch butterfly	Special animal	Spring	Rely on milkweed and need protected stands of trees for roosting. Found in fields, meadows, weedy areas, marshes, and along roadsides.	Yes	Marginally suitable habitat on site; observed during surveys.
<i>Eucyclogobius newberryi</i> Tidewater goby	Fed: Endangered State: CSC	Year - round (April - November)	Found in shallow water lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	Yes	One individual observed within lagoon during survey efforts.
<i>Falco mexicanus</i> Prairie falcon	Watch List	February - April	Primarily inhabits dry grasslands, woodlands, savannahs, cultivated fields, lake shores, and rangelands. Nests on cliffs, canyons, and rock outcrops.	No	No suitable nesting habitat on site; not observed during surveys.
<i>Gila orcuttii</i> Arroyo chub	State: CSC	Unknown	Inhabits sandy and muddy bottoms of flowing pools and headwaters of small to medium freshwater streams; often found in intermittent streams.	No	Marginally suitable habitat on site; not observed during surveys.
<i>Gymnogyps californianus</i> California condor	Fed: Endangered State: Endangered Watch List	Early Spring - Summer	Rocky scrubland, montane coniferous forest, valley and foothill grasslands, oak savannah, chaparral, woodland/ forest habitats. Nesting on cliffs and trees.	No	No suitable nesting habitat on site; not observed during surveys.

WILDLIFE

Scientific/Common Name	Listing Status	Nesting/ Breeding Period	Habitat Type	Observed on Site?	Comments
<i>Laterallus jamaicensis coturniculus</i> California black rail	Fully Protected State: Threatened Watch List	February - June	Saltwater, brackish, and freshwater marshes.	No	Suitable nesting habitat on site; not observed during surveys.
<i>Lichnanthe albipilosa</i> White sand bear scarab beetle	Special animal	Unknown	Inhabits coastal dunes of San Luis Obispo County, in the vicinity of dune lakes.	No	Suitable habitat on site; not observed during surveys.
<i>Oncorhynchus mykiss irideus</i> Steelhead – South/Central California Coast DPS	Fed: Threatened State: CSC	February - April	Federal listing refers to runs in coastal basins from Pajaro River south to, but not including, the Santa Maria River.	No	Suitable habitat on site; not observed during surveys.
<i>Phrynosoma blainvillii</i> Coast horned lizard	State: CSC	May - September	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes.	No	Suitable habitat on site; not observed during surveys.
<i>Plebejus icarioides moroensis</i> Morro Bay blue butterfly	Special animal	March - July	Found on the immediate coast of San Luis Obispo and Santa Barbara Counties. Host plant is <i>Lupinus chamissonis</i> .	No	Host plant present on site, but habitat is fragmented, subject to disturbance, and not suitable for roosting; not observed during surveys.

WILDLIFE

Scientific/Common Name	Listing Status	Nesting/ Breeding Period	Habitat Type	Observed on Site?	Comments
<i>Rana draytonii</i> California red-legged frog	Fed: Threatened State: CSC	January - March	Lowlands and foothills in or near sources of deep water with dense, shrubby or emergent riparian vegetation. Breed in permanent or ephemeral water sources.	Yes	Individual observed in southern part of site.
<i>Spea hammondi</i> Western spadefoot toad	State: CSC	January - August	Seasonal/vernal pools in grassland, coastal scrub, chaparral, woodland habitat, and open areas with sandy or gravelly soils.	No	Suitable habitat on site; not observed during surveys.
<i>Sternula antillarum browni</i> California least tern	Fed: Endangered State: Endangered Fully Protected Watch List	April - June	Coastal areas, nests on beach in loose sandy soils.	No	Suitable nesting habitat on site; not observed during surveys.
<i>Taricha torosa</i> Coast Range newt	State: CSC	December - May	Slow moving streams, ponds, and lakes with surrounding evergreen and oak forests, chaparral, and grasslands along coast.	No	No suitable habitat on site; not observed during surveys.
<i>Taxidea taxus</i> American badger	State: CSC	February - May	Needs friable soils in open ground with abundant food source such as California ground squirrels.	No	No suitable habitat on site; not observed during surveys.

WILDLIFE

Scientific/Common Name	Listing Status	Nesting/ Breeding Period	Habitat Type	Observed on Site?	Comments
<i>Thamnophis hammondi</i> Two-striped gartersnake	State: CSC	April - November	Typically found near pools, creeks, cattle tanks, and other water sources, often in rocky areas, in oak woodland, chaparral, brush land, and coniferous forest.	No	Suitable habitat on site; not observed during surveys.
<i>Tryonia imitator</i> Mimic tryonia (California brackishwater snail)	Special animal	Unknown	Found in brackish salt marshes, coastal lagoons and estuaries; able to withstand a wide range of salinities.	No	Suitable habitat on site; not observed during surveys.



APPENDIX D: SITE PHOTOGRAPHS



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Photo 1. View southwest of roadside drainage ditch that flows into the Lagoon (May 25, 2012).



Photo 2. View northwest of wetland behind residences off Fountain Avenue (May 25, 2012).



Photo 3. View south of main lagoon, island, and wetland vegetation (May 29, 2012).



Photo 4. View northwest of main lagoon, island, and waterfowl (June 15, 2012).



Photo 5. View east of northern part of Memorial Park from Pier Avenue (May 29, 2012).



Photo 6. View southwest of wetland vegetation near Security Court and Aloha Place neighborhood.
(May 29, 2012)



Photo 7. View northeast of roadside drainage ditch along Aloha Place. (May 29, 2012)



Photo 8. View south of wetland and dune vegetation characteristic of the site (May 29, 2012).



Photo 9. View south of foredunes and Arroyo Grande Creek mouth (May 09, 2012).



Photo 10. View of trail within dense wetland-riparian vegetation in the southeastern part of the site (May 09, 2012).



Photo 11. View east of ponded water adjacent to the trail in the southeastern part of the site (September 21, 2012).



Photo 12. View north of cleared paths to flap gate near Arroyo Grande Creek mouth (May 09, 2012).



Photo 13. View east of wetland and dune vegetation characteristic of the site (May 09, 2012).



Photo 14. View southeast of dune mat community in the eastern part of the site (May 9, 2012).



Photo 15. View east of dune scrub adjacent to Laguna Drive (May 9, 2012).



Photo 16. View southwest of dune colonized by dense European dune grass (May 9, 2012).



Photo 17. View northwest of wetland feature that occurs in a residence driveway off of Lakeside Avenue (May 9, 2012).



Photo 18. Individual California red-legged frog observed near footbridge during night eyeshine survey (May 30, 2012).



Photo 19. View of bats observed under Pier Avenue bridge during night eyeshine survey (May 30, 2012).



Photo 20. American bullfrog tadpoles caught in seine net (June 15, 2012).



Photo 21. Seining along the eastern perimeter of Memorial Park (June 15, 2012).



Photo 22. Largemouth bass captured during seining efforts at Memorial Park (June 15, 2012).



Photo 23. California spineflower, a special-status species, was observed in the dune scrub community (May 9, 2012).



Photo 24. Blochman's leafy daisy, a special-status plant, was found in several areas throughout the site (July 6, 2012).



Photo 25. Blochman's ragwort, a special-status plant, was observed in the stabilized dunes in the eastern part of the site (September 21, 2012).



Photo 26. Southwestern spiny rush, a special-status plant, was observed growing among bulrush and other wetland species in several areas throughout the site (September 21, 2012).



APPENDIX E: CNDDDB CALIFORNIA NATIVE SPECIES FIELD SURVEY FORMS



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Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811

Fax: (916) 324-0475 email: CNDDDB@dfg.ca.gov

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 05/30/2012

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: Rana draytonii

Common Name: California red-legged frog

Species Found? Yes No _____
If not, why?

Total No. Individuals 1 Subsequent Visit? yes no

Is this an existing NDDDB occurrence? no unk.
Yes, Occ. # _____

Collection? If yes: _____
Number _____ Museum / Herbarium _____

Reporter: Brian Dugas, Terra Verde Environmental

Address: 3765 South Higuera, Suite 102
San Luis Obispo, CA 93401

E-mail Address: bdugas@terraverdeweb.com

Phone: (805) 701-4648

Plant Information

Phenology: _____% vegetative _____% flowering _____% fruiting

Animal Information

adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown _____
 wintering breeding nesting rookery burrow site other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Along the margin of the lagoon, adjacent to a foot bridge in the southeast portion of the Oceano lagoon.

County: San Luis Obispo

Landowner / Mgr.: County of San Luis Obispo

Quad Name: Oceano

Elevation: _____

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H M S

Source of Coordinates (GPS, topo. map & type): ArcMap 10.1

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H M S

GPS Make & Model _____

DATUM: NAD27 NAD83 WGS84

Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 UTM Zone 11 OR

Geographic (Latitude & Longitude)

Coordinates: 35°6'3.886" N
120°37'33.339" W

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Observed foraging along shoreline among wetland species *Schoenoplectus* spp., *Hedera helix*, *Rubus ursinus*, and *Potentilla anserina*.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor

Immediate AND surrounding land use: Residential, industrial, recreational

Visible disturbances: None

Threats: Development, invasive predators (e.g., *Rana catesbeiana*, *Procyon lotor*, etc.)

Comments:

Determination: (check one or more, and fill in blanks)

- Keyed (cite reference): _____
 Compared with specimen housed at: _____
 Compared with photo / drawing in: _____
 By another person (name): Brooke Langle, Jessica Adinolfi
 Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

May we obtain duplicates at our expense? yes no

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California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811

Fax: (916) 324-0475 email: CNDDDB@dfg.ca.gov

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Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 08/01/2012

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Rana draytonii*

Common Name: California red-legged frog

Species Found? Yes No If not, why? _____

Total No. Individuals _____ Subsequent Visit? yes no

Is this an existing NDDDB occurrence? _____ no unk.
Yes, Occ. # _____

Collection? if yes: _____
Number _____ Museum / Herbarium _____

Reporter: Brian Dugas, Terra Verde Environmental

Address: 3765 South Higuera, Suite 102
San Luis Obispo, CA 93401

E-mail Address: bdugas@terraverdeweb.com

Phone: (805) 701-4648

Plant Information

Phenology: _____% vegetative _____% flowering _____% fruiting

Animal Information

adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown _____
 wintering breeding nesting rookery burrow site other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

On the bank of Arroyo Grande Creek, just east where the lagoon drains through a culvert into Arroyo Grande Creek.

County: San Luis Obispo

Landowner / Mgr.: County of San Luis Obispo

Quad Name: Oceano

Elevation: _____

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H M S

Source of Coordinates (GPS, topo. map & type): ArcMap 10.1

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H M S

GPS Make & Model _____

DATUM: NAD27 NAD83 WGS84

Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 UTM Zone 11 OR

Geographic (Latitude & Longitude)

Coordinates: 35°6'0.03" N
120°37'38.938" W

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Observed foraging along the bank of Arroyo Grande Creek near the creek mouth. Dominant vegetation is Salix lasiolepis with other wetland-riparian vegetation.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor

Immediate AND surrounding land use: Residential and industrial

Visible disturbances: None

Threats: Development, invasive predators (e.g., Rana catesbeiana, Procyon lotor, etc.)

Comments:

Determination: (check one or more, and fill in blanks)

- Keyed (cite reference): _____
 Compared with specimen housed at: _____
 Compared with photo / drawing in: _____
 By another person (name): Brooke Langele, Eric Blagden
 Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

May we obtain duplicates at our expense? yes no

Mail to:
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Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDDB@dfg.ca.gov

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Source Code _____ Quad Code _____
EIm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 07/06/2012

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Erigeron blochmaniae*

Common Name: Blochman's leafy daisy

Species Found? Yes No If not, why? _____

Total No. Individuals 150 Subsequent Visit? yes no

Is this an existing NDDDB occurrence? no unk.
Yes, Occ. # _____

Collection? If yes: _____
Number Museum / Herbarium

Reporter: Jessica Adinolfi, Terra Verde Environmental

Address: 3765 South Higuera, Suite 102

San Luis Obispo, CA 93401

E-mail Address: jadinolfi@terraverdeweb.com

Phone: (714) 478-8765

Plant Information

Phenology: 2% vegetative 97% flowering 1% fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown
 wintering breeding nesting rookery burrow site other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Several patches throughout dune system around Oceano Lagoon.

County: San Luis Obispo

Landowner / Mgr.: County of San Luis Obispo

Quad Name: Oceano

Elevation: 14 ft.

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H M S

Source of Coordinates (GPS, topo, map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H M S

GPS Make & Model Trimble GeoExplorer 6000

DATUM: NAD27 NAD83 WGS84

Horizontal Accuracy 1 m. _____ meters/feet

Coordinate System: UTM Zone 10 UTM Zone 11 OR

Geographic (Latitude & Longitude)

Coordinates:

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Several patches in stabilized coastal dune system, growing with *Ericameria ericoides*, *Carpobrotus* spp., *Ammophila arenaria*, and *Ehrharta calycina*. Found on various aspects in sandy soils.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor

Immediate AND surrounding land use: Residential, industrial, recreational

Visible disturbances: hiking trails/walking paths

Threats: Development, recreation, invasive plants

Comments:

Determination: (check one or more, and fill in blanks)

- Keyed (cite reference): The Jepson Manual, Vascular Plants of California
 Compared with specimen housed at: _____
 Compared with photo / drawing in: CalFlora database
 By another person (name): Brian Dumas
 Other: _____

Photographs: (check one or more)

Slide Print Digital
Plant / animal
Habitat
Diagnostic feature

May we obtain duplicates at our expense? yes no

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Fax: (916) 324-0475 email: CNDDDB@dfg.ca.gov

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Elm Code _____ Occ. No. _____

EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 07/06/2012

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Erigeron blochmaniae*

Common Name: Blochman's leafy daisy

Species Found? Yes No If not, why? _____

Total No. Individuals 50 Subsequent Visit? yes no

Is this an existing NDDDB occurrence? no unk.
Yes, Occ. # _____

Collection? If yes: _____
Number Museum / Herbarium

Reporter: Jessica Adinolfi, Terra Verde Environmental

Address: 3765 South Higuera, Suite 102
San Luis Obispo, CA 93401

E-mail Address: jadinolfi@terraverdeweb.com

Phone: (714) 478-8765

Plant Information

Phenology: 1% vegetative 99% flowering 0% fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown
 wintering breeding nesting rookery burrow site other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

A disjointed stabilized coastal sand dune within a residential neighborhood and surrounded by dense Arroyo willow thicket off of Air Park Drive in Oceano.

County: San Luis Obispo

Landowner / Mgr.: County of San Luis Obispo

Quad Name: Oceano

Elevation: 14 ft

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H M S

Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H M S

GPS Make & Model Trimble GeoExplorer 6000

DATUM: NAD27 NAD83 WGS84

Horizontal Accuracy 1 m _____ meters/feet

Coordinate System: UTM Zone 10 UTM Zone 11 OR Geographic (Latitude & Longitude)

Coordinates: See attached map

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna)

Locally abundant in stabilized coastal dune scrub habitat, growing with *Senecio blochmaniae*, *Ericameria ericoides*, *Lupinus chamissonis*, and *Baccharis pilularis*. The site is relatively flat with sandy soils.

Please fill out separate form for other rare taxa seen at this site. *Senecio blochmaniae*

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor

Immediate AND surrounding land use: Residential and industrial

Visible disturbances: Signs of vehicle use nearby (driveway), signs of vagrant habitation and fire use

Threats: Development, recreation, vagrant habitat and associated activities

Comments:

Determination: (check one or more, and fill in blanks)

- Keyed (cite reference): The Jepson Manual, Vascular Plants of California
- Compared with specimen housed at: _____
- Compared with photo / drawing in: CalFlora database
- By another person (name): Brian Dugas
- Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? yes no

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 Sacramento, CA 95811
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 Elm Code _____ Occ. No. _____
 EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 09/21/2012

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Juncus acutus ssp. leopoldii*

Common Name: Southwestern spiny rush

Species Found? Yes No If not, why? _____
 Total No. Individuals 20 Subsequent Visit? yes no
 Is this an existing NODD occurrence? yes, Occ. # _____ no unk.
 Collection? If yes: _____
 Number _____ Museum / Herbarium _____

Reporter: Jessica Adinolfi, Terra Verde Environmental
 Address: 3765 South Higuera, Suite 102
San Luis Obispo, CA 93401
 E-mail Address: jadinolfi@terraverdeweb.com
 Phone: (714) 478-8765

Plant Information

Phenology: _____% vegetative _____% flowering 100% fruiting

Animal Information

adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown _____
 wintering breeding nesting rookery burrow site other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Coastal dune wetland system of Oceano Lagoon.

County: San Luis Obispo Landowner / Mgr.: County of San Luis Obispo
 Quad Name: Oceano Elevation: 14 ft.
 T _____ R _____ Sec _____, _____ ¼ of _____ ¼, Meridian: H M S Source of Coordinates (GPS, topo. map & type): GPS
 T _____ R _____ Sec _____, _____ ¼ of _____ ¼, Meridian: H M S GPS Make & Model Trimble GeoExplorer 6000
DATUM: NAD27 NAD83 WGS84 Horizontal Accuracy 1 m. _____ meters/feet
 Coordinate System: UTM Zone 10 UTM Zone 11 OR Geographic (Latitude & Longitude)
 Coordinates: _____

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Edge of bulrush marsh community and Arroyo willow thickets, with *Ammophila arenaria*, *Rubus ursinus*, *Schoenoplectus* spp., *Potentilla anserina*, *Rumex* spp., and *Salix lasiolepis*

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor

Immediate AND surrounding land use: Residential and industrial

Visible disturbances: hiking trails/walking paths

Threats: Development, recreation

Comments:

Determination: (check one or more, and fill in blanks)

- Keyed (cite reference): The Jepson Manual, Vascular Plants of California
- Compared with specimen housed at: _____
- Compared with photo / drawing in: CalFlora database
- By another person (name): Brian Dugas
- Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? yes no

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California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811

Fax: (916) 324-0475 email: CNDDDB@dfg.ca.gov

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 05/09/2012

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Mucronea californica*

Common Name: California spineflower

Species Found? Yes No If not, why? _____

Total No. Individuals 50 Subsequent Visit? yes no

Is this an existing NDDDB occurrence? no unk.
Yes, Occ. # _____

Collection? If yes: _____
Number _____ Museum / Herbarium _____

Reporter: Jessica Adinolfi, Terra Verde Environmental

Address: 3765 South Higuera, Suite 102
San Luis Obispo, CA 93401

E-mail Address: jadinolfi@terraverdeweb.com

Phone: (714) 478-8765

Plant Information

Phenology: 40 % 60 % 0 %
vegetative flowering fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown
 winterring breeding nesting rookery burrow site other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Observed within stabilized dune system near Oceano Lagoon off of Laguna Drive.

County: San Luis Obispo

Landowner / Mgr.: County of San Luis Obispo

Quad Name: Oceano Elevation: 14 ft.

T _____ R _____ Sec _____, _____ % of _____ %, Meridian: H M S Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ % of _____ %, Meridian: H M S GPS Make & Model Trimble GeoExplorer 6000

DATUM: NAD27 NAD83 WGS84 Horizontal Accuracy 1 m. _____ meters/feet

Coordinate System: UTM Zone 10 UTM Zone 11 OR Geographic (Latitude & Longitude)

Coordinates: (1) 35°6'10.907" N / 120°37'41.967" W (2) 35°6'10.004" N / 120°37'41.645" W (3) 35°6'8.823" N / 120°37'41.441" W

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Stabilized coastal dune scrub habitat, growing with *Juncus breweri*, *Carex pansa*, *Ericameria ericoides*, and *Erigeron blochmaniae*.
Observed mostly on north-facing slopes of sand dunes.

Please fill out separate form for other rare taxa seen at this site. Erigeron blochmaniae

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor

Immediate AND surrounding land use: Residential and industrial

Visible disturbances: hiking trails/walking paths

Threats: Development, recreation

Comments:

Determination: (check one or more, and fill in blanks)

- Keyed (cite reference): The Jepson Manual, Vascular Plants of California
 Compared with specimen housed at: _____
 Compared with photo / drawing in: CalFlora database
 By another person (name): Brian Davis
 Other: _____

Photographs: (check one or more) Slide Print Digital
Plant / animal
Habitat
Diagnostic feature

May we obtain duplicates at our expense? yes no

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDDB@dfg.ca.gov

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 09/21/2012

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Senecio blochmaniae*

Common Name: Blochman's ragwort

Species Found? Yes No If not, why? _____

Total No. Individuals 50 Subsequent Visit? yes no

Is this an existing NDDDB occurrence? no unk.
Yes, Occ. # _____

Collection? If yes: _____
Number Museum / Herbarium

Reporter: Jessica Adinolfi, Terra Verde Environmental

Address: 3765 South Higuera, Suite 102
San Luis Obispo, CA 93401

E-mail Address: jadinolfi@terraverdeweb.com

Phone: (714) 478-8765

Plant Information

Phenology: 2% vegetative 98% flowering 0% fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown
 wintering breeding nesting rookery burrow site other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

A disjointed stabilized coastal sand dune within a residential neighborhood and surrounded by dense Arroyo willow thicket off of Air Park Drive in Oceano.

County: San Luis Obispo

Landowner / Mgr.: County of San Luis Obispo

Quad Name: Oceano

Elevation: 14 ft

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H M S D

Source of Coordinates (GPS, topo. map & type): GPS

T _____ R _____ Sec _____, _____ 1/4 of _____ 1/4, Meridian: H M S D

GPS Make & Model Trimble GeoExplorer 6000

DATUM: NAD27 NAD83 WGS84

Horizontal Accuracy 1 m _____ meters/feet

Coordinate System: UTM Zone 10 UTM Zone 11 OR

Geographic (Latitude & Longitude)

Coordinates: See attached map

Habitat Description (plants & animals) plant communities, dominants, associates, substrates/soils, aspects/slope:

Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Locally abundant in stabilized coastal dune scrub habitat, growing with *Erigeron blochmaniae*, *Ericameria ericoides*, *Lupinus chamissonis*, and *Baccharis pilularis*. The site is relatively flat with sandy soils.

Please fill out separate form for other rare taxa seen at this site. *Erigeron blochmaniae*

Site Information Overall site/occurrence quality/viability (site + population): Excellent Good Fair Poor

Immediate AND surrounding land use: Residential and industrial

Visible disturbances: Signs of vehicle use nearby (driveway), signs of vagrant habitation and fire use

Threats: Development, recreation, vagrant habitat and associated activities

Comments:

Determination: (check one or more, and fill in blanks)

- Keyed (cite reference): The Jepson Manual, Vascular Plants of California
 Compared with specimen housed at: _____
 Compared with photo / drawing in: CalFlora database
 By another person (name): Brian Douglas
 Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? yes no



APPENDIX F: FIELD SURVEY FORMS



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AQUATIC SURVEY DATA FORM

DATE: 05/30/2012		PROJECT: Oceano Lagoon	
SURVEY BIOLOGIST(S): Halden Peterson, Brian Dugas			
Time Start: <u>2030</u>	Time End: <u>2330</u>	Survey Duration: <u>3 hours</u>	Unit-Effort: <u>Lagoon team</u>

LOCATION

City/County Oceano/San Luis Obispo; _____ ¼; _____ -¼ Section _____ Township _____ Range _____
 Latitude 35°6'27"N Longitude 120°37'36"; Quadrangle _____; Elevation 12 feet
 ATTACH MAP (include habitat types, important features, and species locations)

TYPE OF SURVEY

Day Night; Breeding Non-Breeding; Survey Number: ① 2 3 4 5 6 7 8
 Brand name/model of light used: MagLite LED Brand/model/power of binoculars used: Nikon 10x40

WEATHER CONDITIONS AT START OF SURVEY

Air Temperature 60.6 °F (3"); Water Temperature 69 °F; Wind Speed: 0 mph; Wind Direction NA; Cloud Cover 0 %
 Precipitation 0 in.; Humidity 60 %; Moon Phase waxing gibbous (60%); Visibility Conditions clear

AQUATIC HABITAT TYPE

River Stream Swale Ditch Lake Natural Pond Stock Pond Impoundment Vernal Pool Marsh/Wetland
 Hydrogeomorphology Class: Depression Slope Riverine

HYDROPERIOD

Permanent Intermittent Ephemeral

STREAM MORPHOMETRY/FEATURES

River/Creek Name _____ River Mile _____ Stream Order _____
 Hydroperiod: Permanent Intermittent Ephemeral Reach Length _____ Right Bank Height _____ Left Bank Height _____
 Top Bank Width _____ Stream Width _____ Channel Width @ OHWM _____ Right Bank Slope _____ Left Bank Slope _____
 Water Depth _____ Sinuosity Index _____ Stream Gradient _____ Flow Velocity _____ Wetted Perimeter _____
 Water Clarity: Clear Turbid Water Color: Clear Stained (Color __ __)
 Instream Structure: Riffles Pools (max. depth _____) Glides Undercut Banks LOD (jams/snags) Other __ __
 Channel Condition: Terracing Bank or Bed Degradation

LAKE/POND MORPHOMETRY/FEATURES

Pond/Lake Name: Oceano Lagoon and unnamed associated wetland features Hydroperiod: Permanent Seasonal
 Area: **See map Maximum Width _____ Maximum Length _____ Maximum Depth _____
 Shore Line _____ Shoreline Development _____ Width of Drawdown Zone _____
 Water Clarity: Clear Turbid Water Color: Clear Stained (Color green/brown)
 Instream Structure: Shoals Undercut Banks LOD (jams/snags) Other vegetation, footbridge



AQUATIC SURVEY DATA FORM

SUBSTRATE (Percent)

Silt
 Sand
 Gravel
 Cobble
 Boulder
 Bedrock
 Other:

STREAM/POND VEGETATION

Canopy Cover(mid-day): 10%; Emergent Vegetation: 40%; Floating Vegetation 3%; Open Water 50%
 Dominant Species: Schoenoplectus spp., Typha latifolia, Salix lasiolepis, herbs along shore and in understory

ADJACENT COVER TYPE(S)

Woodland
 Shrub
 Savanna
 Grassland
 Wetland
 Agriculture
 Developed
 Other

SPECIES AND NUMBERS OBSERVED

Species	Egg Masses	Larvae	Metamorphs (w/legs)	Juvenile	Adult	Detection Method
<i>Rana draytonii</i>					1	<input checked="" type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
						<input type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
						<input type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
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Describe potential threats to California red-legged frogs observed, including non-native and native fish predators such as fish, bullfrogs, and raccoons:

bullfrogs observed near survey area

DIAGRAM

NOTES

Survey was conducted on foot with chest waders within and along the main lagoon and associated wetland features

AQUATIC SURVEY DATA FORM

DATE: <u>5/30/2012</u>	PROJECT: <u>Oceano Lagoon (Biological Assessment)</u>		
SURVEY BIOLOGIST(S): <u>Brian O'gala / Rhett Blanton</u>			
Time Start: <u>1300</u>	Time End: <u>1515</u>	Survey Duration: <u>2.25 hr</u>	Unit-Effort: _____

LOCATION

City/County Oceano, San Luis Obispo; _____ %; _____ -% Section _____ Township _____ Range _____
 Latitude 35° 16' 27" N Longitude 120° 37' 36" W; Quadrangle _____; Elevation _____
 ATTACH MAP (include habitat types, important features, and species locations)

TYPE OF SURVEY

Day Night; Breeding Non-Breeding; Survey Number: 0 2 3 4 5 6 7 8
 Brand name/model of light used: _____ Brand/model/power of binoculars used: _____

WEATHER CONDITIONS AT START OF SURVEY

Air Temperature 71.2 °F (3"); Water Temperature 65 °F; Wind Speed: 1.6 mph; Wind Direction W; Cloud Cover 0 %
 Precipitation 0 in.; Humidity _____ %; Moon Phase N/A; Visibility Conditions clear/no obstruction

AQUATIC HABITAT TYPE

River Stream Swale Ditch Lake Natural Pond Stock Pond Impoundment Vernal Pool Marsh/Wetland
 Hydrogeomorphology Class: Depression Slope Riverine

HYDROPERIOD

Permanent Intermittent Ephemeral

STREAM MORPHOMETRY/FEATURES

River/Creek Name Oceano Lagoon, Arroyo Grande Creek River Mile _____ Stream Order _____
 Hydroperiod: Permanent Intermittent Ephemeral Reach Length _____ Right Bank Height _____ Left Bank Height _____
 Top Bank Width _____ Stream Width _____ Channel Width @ OHWM _____ Right Bank Slope _____ Left Bank Slope _____
 Water Depth _____ Sinuosity Index _____ Stream Gradient _____ Flow Velocity _____ Wetted Perimeter _____
 Water Clarity: Clear Turbid Water Color: Clear Stained (Color brown)
 Instream Structure: Riffles Pools (max. depth 4') Glides Undercut Banks LOD (jams/snags) Other _____
 Channel Condition: Terracing Bank or Bed Degradation

LAKE/POND MORPHOMETRY/FEATURES

Pond/Lake Name: _____ Hydroperiod: Permanent Seasonal
 Area: _____ Maximum Width _____ Maximum Length _____ Maximum Depth _____
 Shore Line _____ Shoreline Development _____ Width of Drawdown Zone _____
 Water Clarity: Clear Turbid Water Color: Clear Stained (Color _____)
 Instream Structure: Shoals Undercut Banks LOD (jams/snags) Other _____

AQUATIC SURVEY DATA FORM

SUBSTRATE (Percent)

Silt
 Sand
 Gravel
 Cobble
 Boulder
 Bedrock
 Other: *small amounts sand/gravel at A.V. Creek outfall, (Lagoon infiltrated w/ fine sediment)*

STREAM/POND VEGETATION

Canopy Cover (mid-day) *10-50%*; Emergent Vegetation: ; Floating Vegetation ; Open Water
 Dominant Species: *Typha*

ADJACENT COVER TYPE(S)

Woodland
 Shrub
 Savanna
 Grassland
 Wetland
 Agriculture
 Developed
 Other
mostly riparian (Salix) ad. some areas border res. property

SPECIES AND NUMBERS OBSERVED

Species	Egg Masses	Larvae	Metamorphs (w/legs)	Juvenile	Adult	Detection Method
<i>Red-earr'd Sider (1)</i>					1	<input checked="" type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
<i>Rana (texasiana) (1)</i>			1			<input checked="" type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
						<input type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
						<input type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
						<input type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
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						<input type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight

Describe potential threats to California red-legged frogs observed, including non-native and native fish predators such as fish, bullfrogs, and raccoons:

evidence of raccoon at edge of riverine hub, Bullfrog present throughout.

DIAGRAM

NOTES



AQUATIC SURVEY DATA FORM

DATE: 05/30/2012		PROJECT: Oceano Lagoon	
SURVEY BIOLOGIST(S): Brooke Langle, Jessica Adinolfi			
Time Start: <u>2030</u>	Time End: <u>2330</u>	Survey Duration: <u>3 hours</u>	Unit-Effort: <u>AG Creek team</u>

LOCATION

City/County Oceano/San Luis Obispo; _____ ¼; _____ -¼ Section _____ Township _____ Range _____
 Latitude 35°6'27"N Longitude 120°37'36"; Quadrangle _____; Elevation 12 feet
 ATTACH MAP (include habitat types, important features, and species locations)

TYPE OF SURVEY

Day Night; Breeding Non-Breeding; Survey Number: 1 2 3 4 5 6 7 8
 Brand name/model of light used: MagLite LED Brand/model/power of binoculars used: Alpen Shasta Ridge 10x42

WEATHER CONDITIONS AT START OF SURVEY

Air Temperature 60.6 °F (3"); Water Temperature 69 °F; Wind Speed: 0 mph; Wind Direction NA; Cloud Cover 0 %
 Precipitation 0 in.; Humidity 60 %; Moon Phase waxing gibbous (60%); Visibility Conditions clear

AQUATIC HABITAT TYPE

River Stream Swale Ditch Lake Natural Pond Stock Pond Impoundment Vernal Pool Marsh/Wetland
 Hydrogeomorphology Class: Depression Slope Riverine

HYDROPERIOD

Permanent Intermittent Ephemeral

STREAM MORPHOMETRY/FEATURES

River/Creek Name Arroyo Grande Creek River Mile 0.5 – 0.75 Stream Order 1°
 Hydroperiod: Permanent Intermittent Ephemeral Reach Length 700 ft Right Bank Height 6 ft Left Bank Height 8 ft
 Top Bank Width _____ Stream Width 60 ft Channel Width @ OHWM _____ Right Bank Slope _____ Left Bank Slope _____
 Water Depth ≤ 5 feet Sinuosity Index _____ Stream Gradient _____ Flow Velocity _____ Wetted Perimeter _____
 Water Clarity: Clear Turbid Water Color: Clear Stained (Color green - brown)
 Instream Structure: Riffles Pools (max. depth _____) Glides Undercut Banks LOD (jams/snags) Other beaver dam
 Channel Condition: Terracing Bank or Bed Degradation



AQUATIC SURVEY DATA FORM

LAKE/POND MORPHOMETRY/FEATURES

Pond/Lake Name: _____ Hydroperiod: Permanent Seasonal
 Area: _____ Maximum Width _____ Maximum Length _____ Maximum Depth _____
 Shore Line _____ Shoreline Development _____ Width of Drawdown Zone _____
 Water Clarity: Clear Turbid Water Color: Clear Stained (Color _____)
 Instream Structure: Shoals Undercut Banks LOD (jams/snags Other _____

SUBSTRATE (Percent)

Silt Sand Gravel Cobble Boulder Bedrock Other:

STREAM/POND VEGETATION

Canopy Cover(mid-day): 10%; Emergent Vegetation: 2%; Floating Vegetation 3%; Open Water 85%
 Dominant Species: Arroyo willow (*Salix lasiolepis*), mostly open water with majority of veg along bank

ADJACENT COVER TYPE(S)

Woodland Shrub Savanna Grassland Wetland Agriculture Developed Other

SPECIES AND NUMBERS OBSERVED

Species	Egg Masses	Larvae	Metamorphs (w/legs)	Juvenile	Adult	Detection Method
<i>Pseudacris sierra</i>					X	<input type="checkbox"/> Visual <input checked="" type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
						<input type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
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Describe potential threats to California red-legged frogs observed, including non-native and native fish predators such as fish, bullfrogs, and raccoons:
 Raccoon observed during survey, bullfrogs observed near survey area



AQUATIC SURVEY DATA FORM

DIAGRAM

NOTES

Survey was conducted on foot with chest waders along stream bank and within channel

AQUATIC SURVEY DATA FORM

DATE: <u>5/30/2012</u>	PROJECT: <u>Oceano Lagoon (Biological Assessment)</u>		
SURVEY BIOLOGIST(S): <u>Rhett Blanton / Peter Giles</u>			
Time Start: <u>2030</u>	Time End: <u>2330</u>	Survey Duration: <u>3hr</u>	Unit-Effort: <u>open water team</u>

LOCATION

City/County Oceano / San Luis Obispo County; _____ %; _____ -1/4 Section _____ Township _____ Range _____
 Latitude 35°6'27"N Longitude 120°37'36"W; Quadrangle _____; Elevation _____
 ATTACH MAP (include habitat types, important features, and species locations)

TYPE OF SURVEY

Day Night; Breeding Non-Breeding; Survey Number: 1 (2) 3 4 5 6 7 8
 Brand name/model of light used: maglight Brand/model/power of binoculars used: Nikon ¹⁰ 10/40

WEATHER CONDITIONS AT START OF SURVEY

Air Temperature 60.0 °F (3"); Water Temperature 69 °F; Wind Speed 8 mph; Wind Direction 8; Cloud Cover 8 %
 Precipitation 0 in.; Humidity _____%; Moon Phase 60% (waxing gibbous); Visibility Conditions clear, no obstruction

AQUATIC HABITAT TYPE

River Stream Swale Ditch Lake Natural Pond Stock Pond Impoundment Vernal Pool Marsh/Wetland
 Hydrogeomorphology Class: Depression Slope Riverine

HYDROPERIOD

Permanent Intermittent Ephemeral

STREAM MORPHOMETRY/FEATURES

River/Creek Name Upper Oceano Lagoon River Mile _____ Stream Order _____
 Hydroperiod: Permanent Intermittent Ephemeral Reach Length _____ Right Bank Height _____ Left Bank Height _____
 Top Bank Width _____ Stream Width _____ Channel Width @ OHWM _____ Right Bank Slope _____ Left Bank Slope _____
 Water Depth _____ Sinuosity Index _____ Stream Gradient _____ Flow Velocity _____ Wetted Perimeter _____
 Water Clarity: Clear Turbid Water Color: Clear Stained (Color _____)
 Instream Structure: Riffles Pools (max. depth _____) Glides Undercut Banks LOD (jams/snags) Other _____
 Channel Condition: Terracing Bank or Bed Degradation

LAKE/POND MORPHOMETRY/FEATURES

Pond/Lake Name: Upper Oceano Lagoon Hydroperiod: Permanent Seasonal
 Area: ~4 ac. Maximum Width 300' Maximum Length 600' Maximum Depth 8'
 Shore Line _____ Shoreline Development _____ Width of Drawdown Zone _____
 Water Clarity: Clear Turbid Water Color: Clear Stained (Color brown/green)
 Instream Structure: Shoals Undercut Banks LOD (jams/snags) Other Some overhanging wet veg, thick stands of typha



TERRA-VERDE
Environmental Consulting

AQUATIC SURVEY DATA FORM

SUBSTRATE (Percent)

Silt Sand Gravel Cobble Boulder Bedrock Other:

STREAM/POND VEGETATION

Canopy Cover(mid-day): 5% ; Emergent Vegetation: X ; Floating Vegetation _____ ; Open Water X

Dominant Species: Typha, cover only at perimeter, mostly open water habitat

ADJACENT COVER TYPE(S)

Woodland Shrub Savanna Grassland Wetland Agriculture Developed Other

developed rec. park, wetland/riparian as well as riparian (SUEIX) along periphery

SPECIES AND NUMBERS OBSERVED

Species	Egg Masses	Larvae	Metamorphs (w/legs)	Juvenile	Adult	Detection Method
<u>Pana Cateblama</u>			<u>20+</u>			<input checked="" type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
<u>"</u>				1	<u>3</u>	<input checked="" type="checkbox"/> Visual <input type="checkbox"/> Call <input checked="" type="checkbox"/> Capture <input checked="" type="checkbox"/> Spotlight
<u>"</u>					<u>2</u>	<input type="checkbox"/> Visual <input checked="" type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
<u>Carp</u>					<u>1</u>	<input checked="" type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
<u>Beaver</u>					<u>1</u>	<input checked="" type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
<u>Crayfish 30+(stage unk)</u>						<input checked="" type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
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Describe potential threats to California red-legged frogs observed, including non-native and native fish predators such as fish, bullfrogs, and raccoons:

Open water dominated by largemouth bass (periphery has extremely large bullfrog pops).

DIAGRAM

Survey done in canoe along interior edge of open-water habitat.

NOTES

* Supplemental Survey



AQUATIC SURVEY DATA FORM

DATE: <u>8/1/2012</u>	PROJECT: <u>Oceano Lagoon</u>		
SURVEY BIOLOGIST(S): <u>Brian Dwyer, Rhet Blanker, Peter Gilen, Holden Peterson</u>			
Time Start: <u>2100</u>	Time End: <u>0030 (8/2/12)</u>	Survey Duration: <u>3.5 hrs</u>	Unit-Effort: <u>14 hrs</u>

LOCATION

City/County Oceano San Luis Obispo; _____ %; _____ -1/4 Section _____ Township _____ Range _____
Latitude 35° 16' 27" N Longitude 120° 57' 30" W; Quadrangle _____; Elevation _____
ATTACH MAP (include habitat types, important features, and species locations)

TYPE OF SURVEY

Day Night; Breeding Non-Breeding; Survey Number: 1 2 3 4 5 6 7 8
Brand name/model of light used: Maglight 3200 candle Brand/model/power of binoculars used: Nikon 10x40

WEATHER CONDITIONS AT START OF SURVEY

Air Temperature 61.5 °F (3"); Water Temperature 62 °F; Wind Speed: 0-1.5 mph; Wind Direction W; Cloud Cover _____ %
Precipitation 0 in.; Humidity 77 %; Moon Phase nearly full; Visibility Conditions good ↓
high marine layer ≈ 80%

AQUATIC HABITAT TYPE

River Stream Swale Ditch Lake Natural Pond Stock Pond Impoundment Vernal Pool Marsh/Wetland
Hydrogeomorphology Class: Depression Slope Riverine

HYDROPERIOD

Permanent Intermittent Ephemeral

STREAM MORPHOMETRY/FEATURES

River/Creek Name A. F. Creek, Oceano Lagoon, meadow Creek River Mile _____ Stream Order _____
Hydroperiod: Permanent Intermittent Ephemeral Reach Length _____ Right Bank Height _____ Left Bank Height _____
Top Bank Width _____ Stream Width _____ Channel Width @ OHWM _____ Right Bank Slope _____ Left Bank Slope _____
Water Depth 1-4' Sinuosity Index _____ Stream Gradient _____ Flow Velocity _____ Wetted Perimeter _____
Water Clarity: Clear Turbid Water Color: Clear Stained (Color _____)
Instream Structure: Riffles Pools (max. depth _____) Glides Undercut Banks LOD (jams/snags) Other _____
Channel Condition: Terracing Bank or Bed Degradation

LAKE/POND MORPHOMETRY/FEATURES

Pond/Lake Name: _____ Hydroperiod: Permanent Seasonal
Area: _____ Maximum Width _____ Maximum Length _____ Maximum Depth _____
Shore Line _____ Shoreline Development _____ Width of Drawdown Zone _____
Water Clarity: Clear Turbid Water Color: Clear Stained (Color _____)
Instream Structure: Shoals Undercut Banks LOD (jams/snags) Other _____



AQUATIC SURVEY DATA FORM

SUBSTRATE (Percent)

Silt
 Sand
 Gravel
 Cobble
 Boulder
 Bedrock
 Other:

STREAM/POND VEGETATION

Canopy Cover(mid-day): 10%; Emergent Vegetation: 30%; Floating Vegetation: _____; Open Water: 60%
 Dominant Species: varies, mostly (perimeter) Salix, sphenocallis

ADJACENT COVER TYPE(S)

Woodland riparian wetland
 Shrub
 Savanna
 Grassland Dune
 Wetland
 Agriculture
 Developed
 Other

SPECIES AND NUMBERS OBSERVED

Species	Egg Masses	Larvae	Metamorphs (w/legs)	Juvenile (Sub-adult)	Adult	Detection Method
Bullfrog (Lagoon)				3		<input checked="" type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
Bullfrog (Lagoon)						<input type="checkbox"/> Visual <input checked="" type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
Red Legged frog (Ag Creek)				1		<input checked="" type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
" (at bridge at corner)				1		<input checked="" type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
by bridge: Honolulu				1		<input checked="" type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
						<input type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
Chorus frog					1	<input checked="" type="checkbox"/> Visual <input checked="" type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
crayfish (all areas)					many	<input checked="" type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
						<input type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight
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						<input type="checkbox"/> Visual <input type="checkbox"/> Call <input type="checkbox"/> Capture <input type="checkbox"/> Spotlight

Describe potential threats to California red-legged frogs observed, including non-native and native fish predators such as fish, bullfrogs, and raccoons:
Juvenile centrarchids present as well as bullfrogs within the aquatic riparian habitat. Bullfrogs present present in wetlands as well.

DIAGRAM

NOTES



REPORT OF FIELD OBSERVATIONS

Project: Oceano Lagoon Bio Assessment	Date: 6/15/2012	M	T	W	T	F	S	S
Client: SLO County	Activity: Fisheries Inventory							
Location: Oceano, CA	Weather: Water-68F, Wind 2-3mph, Air-54F, low fog cover early, fog lifted as temps increased							
Observer: Brian Dugas, Nick Fernella, Pete Giles, Rhett Blanton	Observation Period	Start: 0930	Stop: 1530					

Description: 13 sampling attempts were performed from the shoreline to approximately 40 feet off shore along the eastern bank of the lagoon at Oceano Memorial Park. Results of the sampling were as follows:

Pull #	Large-mouth bass	Mosquito fish	Roach	Tidewater goby	Sacramento sucker	Pacific staghorn sculpin	Bluegill	Golden Shiner	Surf Perch	Prickly Sculpin	Crayfish	3-spine stickleback	Bullfrog (tad/meta)
1	43	1	-	-	-	-	-	-	-	-	1	-	-
2	28	-	-	-	-	-	-	95	-	-	-	-	-
3	34	-	-	-	-	-	-	-	1	2	-	-	-
4	8	-	-	-	-	-	-	1	1	-	-	-	-
5	64	-	--	-	-	-	-	121	4	-	-	-	-
6	12	-	-	-	-	-	-	300+	5	-	-	-	-
7	6	-	-	-	-	-	-	86	18	-	-	-	-
8	15	-	-	-	-	-	-	-	-	1	-	-	-
9	24	-	-	-	-	-	-	-	4	-	12	1	50+
10	5	-	-	-	-	-	-	-	67	-	-	-	-
11	2	-	-	-	-	-	-	-	30	-	-	-	-
12	-	-	-	-	-	-	-	-	20	-	-	-	-
13	4	-	-	-	-	-	-	-	9	1	-	-	-
Total	244	1		0		1		603	159	4	12	1	50+



REPORT OF FIELD OBSERVATIONS

Project: Oceano Lagoon Bio Assessment	Date: 6/18/2012	M	T	W	T	F	S	S
Client: SLO County	Activity: Fisheries Inventory							
Location: Oceano, CA	Weather: Water-68F, Wind 0-2 mph, Air-66F, high fog present early							
Observer: Brian Dugas, Nick Fernella, Pete Giles, Rhett Blanton	Observation Period	Start: 0945	Stop: 1545					

Description: 10 sampling attempts were performed from the shoreline to approximately 40 feet off shore from the northern channel bank located at the back of the trailer park, the second location (pulls 18-23) were approximately 500 feet west of location 1. Results of the sampling were as follows:

Pull #	Large-mouth bass	Mosquito fish	Roach	Tidewater goby	Sacramento sucker	Pacific staghorn sculpin	Bluegill	Golden Shiner	Surf Perch	Prickly Sculpin	Crayfish	3-spine stickleback	Bullfrog (tad/meta)
14	12	-	-	-	-	-	1	-	-	-	1	-	-
15	6	-	-	-	-	-	11	-	-	-	-	-	2
16	1	-	-	-	1	-	44	3	-	1	-	-	-
17	5	-	-	-	-	-	12	1	-	-	-	-	-
18	-	-	-	-	-	-	1	-	-	-	-	-	-
19	12	-	-	-	1	-	2	-	-	1	-	-	-
20	-	-	-	-	-	-	-	1	-	-	-	-	-
21	6	-	-	-	-	-	7	-	-	-	-	-	-
22	8	-	-	-	-	-	10	1	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-	23	-
Total	50	0	0	0	2	0	88	6	0	2	1	23	2



REPORT OF FIELD OBSERVATIONS

Project: Oceano Lagoon Bio Assessment	Date: 6/19/2012	M	T	W	T	F	S	S
Client: SLO County	Activity: Fisheries Inventory							
Location: Oceano, CA	Weather: Water-59F, Wind 0-1 mph, Air-66F, high fog present early, cleared by 1130							
Observer: Brian Dugas, Nick Fernella, Pete Giles, Rhett Blanton	Observation Period	Start: 0930	Stop: 1330					

Description: 3 sampling attempts were performed of the lagoon at the flap gates. Pull 24 and 25 were from the north east side while pull 26 was done on the backside of the gates (Arroyo Grande Creek side). Results of the sampling were as follows:

Pull #	Large-mouth bass	Mosquito fish	Roach	Tidewater goby	Sacramento sucker	Pacific staghorn sculpin	Bluegill	Golden Shiner	Surf Perch	Prickly Sculpin	Crayfish	3-spine stickleback	Bullfrog (tad/meta)
24	-	-	-	-	-	-	-	-	-	-	-	11	-
25	-	-	-	-	-	-	-	-	-	-	-	4	-
26	-	-	-	1	1	4	-	-	-	-	-	9	-
Total	0	0	0	1	1	4	0	0	0	0	0	24	0

A hand held net was used to sample the drainage swale in front of the water treatment facility and 300 feet downstream, 2 mosquito fish and 3 bullfrog tadpoles were observed during this effort. During snorkel surveys numerous crayfish and one Pacific pond turtle was observed.