



August 30, 2013
(20252)

Russ Boudreau, P.E.
Moffatt & Nichol
3780 Kilroy Airport Way, Suite 600
Long Beach, CA 90806

SUBJECT: POTENTIAL IMPACTS TO TRANCAS LAGOON BY EQUIPMENT CROSSING FOR BROAD BEACH RESTORATION PROJECT

Dear Mr. Boudreau:

Broad Beach is located in the City of Malibu in the northwestern portion of Los Angeles County (Figure 1). Since the 1970s, Broad Beach has gradually narrowed, exposing beach front property to flooding and damage during winter storms and high tides, and materially impeding and often making lateral beach access and recreational activities along the beach all but impossible. (Moffatt & Nichol 2012). The Broad Beach Restoration Project (Project) proposes to restore sand to Broad Beach by trucking sand from inland quarry sources and placing it on the beach. During beach construction, equipment will be staged at the western end of the Los Angeles County Zuma Beach parking lot (Zuma lot 12). Equipment needs to cross the mouth of Trancas Creek to the west of the parking lot so that the construction crew can work on sand restoration at Broad Beach. During most times of the year, the mouth of Trancas Creek is closed by a wide sand bar. Equipment will access Broad Beach via this sand bar. However, during the winter, high flows in Trancas Creek and/or large winter waves may cause this sandbar to breach. In order to safely cross Trancas Lagoon when the sand bar is breached, a safe method for equipment to cross the creek is needed. In order to avoid delaying work when the lagoon is breached, it is proposed that a temporary bridge structure be installed during the wet season prior to the occurrence of predicted rainstorms to allow the lagoon to breach and connect to the ocean while construction could continue. This report presents the results of a biological reconnaissance survey of the lagoon and discusses the potential impact to biological resources of the proposed temporary bridge structure.

METHODS

This report is based on a literature survey and a one day field reconnaissance. Available literature sources included the California Natural Diversity Data Base (CNDDB) of reported occurrence of sensitive species in the Point Dume quadrangle (CDFW 2013) and other reports of sensitive species in the Point Dume/Zuma area (Ryan Ecological Consulting, Los Angeles Audubon, Santa Monica Bay Audubon, and Plegadis 2009, Dagit, Drill and Meyer 2005, USFWS 2008, 2012). In addition, aerial photos were consulted to determine the boundary of the lagoon during typical winter conditions.

A reconnaissance level biological field survey was conducted on August 14, 2013 between the hours of 0800 and 1100 by Chambers Group biologists Noel Davis, Ph.D., and Heather Clayton. Vegetation communities within the lagoon downstream of the Pacific Coast Highway (PCH) bridge and immediately upstream of the lagoon were mapped on a geo-referenced aerial photograph from the summer of 2011. The perimeter of the lagoon was mapped by walking the outer boundary of the area where visual evidence of water (drift

deposits, salt marsh vegetation) occurred. The boundary was delineated with a Trimble GeoXH 6000 sub-decimeter GPS unit using Arc GIS Mobile for the mapping. The boundary of open water on the day of the survey also was mapped. Observations were made of plant species and wildlife present at the time of the survey.

LAGOON PERIMETER

Figure 2 shows the perimeter of Trancas Lagoon mapped on August 14, 2013. The water level in the lagoon was very low probably because it was towards the end of summer in a very dry year. The base aerial photograph taken in summer 2011 shows more water in the lagoon probably because the winter of 2010/2011 was wetter.

Figures 3, 4, and 5 show the lagoon under typical winter conditions, when the lagoon is breached. Figure 3 is from January 2006, Figure 4 is from January 8, 2008, and Figure 5 is April 26, 2011.

VEGETATION

Figure 6 shows the plant communities mapped during the August 14, 2013 survey. Each of these communities is discussed below. Plant species observed during the reconnaissance survey are shown in Attachment A.

Dune Habitats

Southern Foredunes

Southern Foredunes do not typically contain the perennial grasses characteristic of Northern Foredunes and contain a higher proportion of suffrutescent plants up to one (1) foot in height. This community may intergrade with Southern Dune Scrub on more stabilized dunes away from the coast (Holland 1986).

A small amount of Southern Foredunes habitat has been mapped south of the PCH Bridge adjacent to a large patch of non-native hottentot-fig (*Carpobrotus edulis*). Native plant species found on the project site typical of this vegetation community include: beach sand verbena (*Abronia maritima*), beach evening primrose (*Camissoniopsis cheiranthifolia*), and beach-bur (*Ambrosia chamissonis*). There is less than 0.01 acre of Southern Foredune habitat within the mapped area onsite.

Wetland Habitats

Southern Coastal Salt Marsh

Southern Coastal Salt Marsh is described as a community containing highly productive, herbaceous, suffrutescent, salt-tolerant species forming moderate to dense cover and up to 3 feet in height. Most species are active in the summer and go dormant in winter. This community occurs along sheltered inland margins of bays, lagoons, and estuaries (Holland 1986).

Native species characteristic of this community found growing at Trancas Lagoon include fleshy jaumea (*Jaumea carnosa*) which was abundant in this area, saltgrass (*Distichlis spicata*), small

amounts of beach-bur, salt heliotrope (*Heliotropium curassavicum* var. *oculatum*), spearscale (*Atriplex prostrata*), small amounts of Parish's pickleweed (*Arthrocnemum subterminale*), and Utah arrow grass (*Triglochin concinna*). In addition, less than 10 percent cover of non-native sea rocket (*Cakile maritima*) and brass-buttons (*Cotula coronopifolia*) were observed. Southern Coastal Salt Marsh is the dominant plant community as mapped within the project area. There is 0.34 acre of Southern Coastal Salt Marsh within the mapped area onsite.

Coastal Brackish Marsh

Coastal Brackish Marsh is dominated by perennial, emergent, herbaceous monocots to 7 feet in height. Cover is often complete and dense. Most species are active in summer and dormant in winter. Hydrology is similar to Coastal Salt Marshes, but brackish from freshwater input. Salt content may increase at high tide or during seasons of low freshwater runoff or both and can be found at the interior edges of coastal bays and estuaries or in coastal lagoons (Holland 1986).

Species present onsite characteristic of this community include native California bulrush (*Schoenoplectus californicus*) and spearscale and non-native annual beard grass (*Polypogon monspeliensis*). Coastal Brackish Marsh is present within the project area south of the PCH Bridge. There is 0.02 acre of Coastal Brackish Marsh within the mapped area onsite.

Upland scrub and chaparral Habitats

Southern Willow Scrub

Southern Willow Scrub is a dense, broadleaved, winter-deciduous riparian thicket dominated by willow species (*Salix* sp.). Most stands are too dense to allow much understory development (Holland 1986).

Southern Willow Scrub has been mapped north of the PCH Bridge and contained native species such as arroyo willow (*Salix lasiolepis*) and sandbar willow (*Salix exigua*) with lesser amounts of mule fat (*Baccharis salicifolia* subsp. *salicifolia*). Non-native species including Mediterranean tamarisk (*Tamarix ramosissima*), giant reed (*Arundo donax*) and foxtail chess (*Bromus madritensis* subsp. *rubens*) were also found interspersed between the willows onsite. There is 0.12 acre of Southern Willow Scrub within the mapped area of the project site.

Disturbed Coastal Sage Scrub

Typical stands of Coastal Sage Scrub are open and dominated by California sagebrush (*Artemisia californica*) and other soft-woody, drought-deciduous sub-shrubs less than 3 feet in height (Holland 1986). This community usually occurs on low moisture-availability sites with steep, xeric slopes or clay-rich soils that release stored soil moisture slowly. Coastal Sage Scrub may intergrade with other southern California chaparrals at higher elevations.

Disturbed Coastal Sage Scrub contains greater than 25 percent of non-native vegetation. In addition to native California sagebrush, non-native species present within this community onsite include castor-bean (*Ricinus communis*), shortpod mustard (*Hirschfeldia incana*), garland daisy (*Glebionis coronaria*), and foxtail chess. Small patches of Disturbed Coastal Sage Scrub were found north of the

PCH Bridge, growing interspersed among the Rip Rap and on the upper bank of the channel. There is 0.02 acre of Disturbed Coastal Sage Scrub within the mapped area of the project site.

Other Areas

Ruderal

Areas classified as Ruderal tend to be dominated by pioneering herbaceous species that readily colonize disturbed ground and that are typically found in temporary, often frequently disturbed habitats (Barbour et al. 1999). The soils in ruderal areas are often characterized as heavily compacted or frequently disturbed. The vegetation in these areas is adapted to living in compact soils where water does not readily penetrate the soil. Areas with Ruderal vegetation have been mapped north of the PCH Bridge and were dominated by non-native foxtail chess and scattered, less common shortpod mustard. There is 0.27 acre of Ruderal vegetation within the mapped area of the project site.

Ornamental Landscaping

Ornamental Landscaping includes areas where the vegetation is dominated by non-native horticultural plants (Gray and Bramlet 1992). Typically, the species composition consists of introduced trees, shrubs, flowers and turf grass. Ornamental Landscaping is present within the project site along the western border south of the PCH bridge, and as scattered trees north of the Bridge. Plant species found within the mapped area on the project site within this community include: myoporum (*Myoporum laetum*), castor-bean, bird of paradise (*Strelitzia* sp.), and hottentot-fig. There is 0.09 acre of Ornamental Landscaping on the project site.

Hottentot-Fig

This community is a monoculture of hottentot-fig found growing south of the PCH bridge on the eastern edge of the project site as well as interspersed within the Ornamental Landscaping plants to the west of the lagoon. There is 0.06 acre of hottentot-fig mapped on the project site.

Open Water

Open Water often contains a number of phytoplankton species and filamentous blue-green and green algae (Gray and Bramlet 1992). The shallow Open Water areas mapped at the Trancas Lagoon contained ditch grass or beadfruit sea-tassel (*Ruppia maritima*). Open Water is present within the western portion of the project area. There is 0.01 acre of water south of the PCH bridge and an additional 0.02 acre upstream of the bridge. A total of 0.03 acre of Open Water is mapped within the project site.

Scoured

Barren areas, as described by Gray and Bramlet (1992), are devoid or mostly devoid of vegetation due to scouring by the river. Scoured areas are present within the project site north of the PCH Bridge and supported no vegetation. There is 0.05 acre of Scoured areas within the mapped area of the project site.

Developed

Developed areas are areas that have been altered by humans and now display man-made structures such as houses, paved roads, buildings, parks, and other maintained areas. The PCH Bridge above the lagoon has been mapped as Developed within the project area. There 0.52 acre of Developed areas within the mapped area of the project

WILDLIFE

Table 1 is a list of wildlife species observed during the August 14 reconnaissance survey.

Table 1: Wildlife Species Observed during August 14, 2013 Survey

Common Name	Scientific Name	Notes
American Crow	<i>Corvus brachyrhynchos</i>	
Annas Hummingbird	<i>Calypte anna</i>	
Black Phoebe	<i>Sayornis nigricans</i>	
California Brown Pelican	<i>Pelecanus occidentalis</i>	Flyover
Desert Cottontail	<i>Sylvilagus audubonii</i>	Tracks
Domestic Dog	<i>Canis familiaris</i>	Tracks
Great Egret	<i>Casmerodius albus</i>	Flyover
Heermann's Gull	<i>Larus heermanni</i>	
House Finch	<i>Carpodacus erythrinus</i>	
Raccoon	<i>Procyon lotor</i>	Tracks
Rock Dove	<i>Columbia livia</i>	
Snowy Egret	<i>Gretta thula</i>	Four foraging in lagoon
Song Sparrow	<i>Melospiza melodia</i>	
Western Gull	<i>Larus occidentalis</i>	

A total of 12 bird species and the tracks of three wildlife species were observed during the reconnaissance survey. Four snowy egrets were seen foraging in the lagoon seaward of the PCH Bridge during the survey. August is a time when many bird species are in their breeding areas. It would be expected that during the winter when shorebirds and waterfowl are wintering in the area, more species would be observed in and around the lagoon.

SENSITIVE SPECIES

Prior to conducting the field surveys, existing documentation relevant to the Trancas Lagoon was reviewed. The most recent records of the CDFW California Natural Diversity Database (CDFW 2013) and the California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS 2013) were reviewed for the quadrangle containing the Lagoon (Point Dume, California USGS 7.5-minute quadrangle). The databases contains records of reported occurrences of federal- and/or state-listed as endangered or threatened species, proposed endangered or threatened species, former Federal Species of Concern (FSC), California Species of Special Concern (CSC), or otherwise sensitive species or habitats that may occur within or in the vicinity of the Project site.

According to the literature review, 17 special status plant, 14 special status wildlife species, and one (1) sensitive vegetation community were documented to occur within the vicinity of the Project site.

Sensitive Plants

Of the 17 special status plant species compiled from the literature review, four are federal- and/or state-listed as endangered or threatened; however, only two of these listed species have a potential to occur within the mapped area of the Project site.

The following information is a list of abbreviations used to help determine the significance of biological sensitive resources potentially occurring on the Project sites.

Federal

FE =	Federally listed; Endangered
FT =	Federally listed; Threatened
FC =	Federal Candidate for listing
FPT =	Federal Proposed listing as Threatened

State

ST =	State listed; Threatened
SE =	State listed; Endangered
RARE =	State-listed; Rare (Listed "Rare" animals have been re-designated as Threatened, but Rare plants have retained the Rare designation.)
CSC =	California Species of Concern
WL =	California Department of Fish and Wildlife (CDFW) Watch List

CNPS California Rare Plant Rank (CRPR) Status Codes

CRPR 1A =	Plants presumed extinct in California.
CRPR 1B =	Plants rare and endangered in California and throughout their range.
CRPR 2 =	Plants rare, threatened, or endangered in California but more common elsewhere in their range.
CRPR 3 =	Plants about which we need more information; a review list.

CNPS Extensions

0.1 =	Seriously endangered in California (greater than 80 percent of occurrences threatened/high degree and immediacy of threat).
0.2 =	Fairly endangered in California (20 to 80 percent occurrences threatened).
0.3 =	Not very endangered in California (less than 20 percent of occurrences threatened).

The following 5 special status plant species are considered absent from the Project site because the site is situated well below the known elevational range of the species:

- slender mariposa-lily (*Calochortus clavatus* var. *gracilis*) – CRPR 1B.1;
- Parry's spineflower (*Chorizanthe parryi* var. *parryi*) – CRPR 1B.1;
- Santa Susana tarplant (*Deinandra minthornii*) – RARE, CRPR 1B.2;

- Norris' beard moss (*Didymodon norrisii*) – CRPR 2B.2; and
- Ojai navarretia (*Navarretia ojaiensis*) – CRPR 1B.1.

The following five special status plant species are considered absent from the Project site due to a lack of suitable habitat onsite. These species occur in Chaparral, Cismontane Woodland, Meadows and Seeps, or Valley and Foothill Grassland which were not present within the mapped area of the Project:

- Agoura Hills dudleya (*Dudleya cymosa subsp. agouensis*) – FT, CRPR 1B.2;
- marcescent dudleya (*Dudleya cymosa subsp. marcescens*) – FT, RARE, CRPR 1B.2;
- round-leaved filaree (*California macrophylla*) – CRPR 1B.1;
- Sonoran maiden fern (*Thelypteris puberula var. sonorensis*) – CRPR 2B.2; and
- California screw moss (*Tortula californica*) – CRPR 1B.2.

The following seven special status plant species have a low potential to occur in the Disturbed Coastal Sage Scrub habitat north of the PCH Bridge:

- Branton's milk-vetch (*Astragalus brauntonii*) – FE, CRPR 1B.1;
- Coulter's saltbush (*Atriplex coulteri*) – CRPR 1B.2;
- Malibu baccharis (*Baccharis malibuensis*) – CRPR 1B.1;
- Lewis' evening-primrose (*Camissoniopsis lewisii*) – CRPR 3;
- Blochman's dudleya (*Dudleya blochmaniae subsp. blochmaniae*) – CRPR 1B.1;
- Lyon's pentachaeta (*Pentachaeta lyonii*) – FE, SE, CRPR 1B.1; and
- south coast branching phacelia (*Phacelia ramosissima var. austrolitoralis*) – CRPR 3.2.

The following special status plant species is known to inhabit Riparian Woodlands and therefore has a moderate potential to occur in the Southern Willow Scrub habitat north of the PCH Bridge:

- Malibu baccharis (*Baccharis malibuensis*) – CRPR 1B.1.

The following three special status plant species have a moderate potential to occur in the small patch of Southern Foredune habitat south of the PCH Bridge:

- Coulter's saltbush (*Atriplex coulteri*) – CRPR 1B.2;
- Lewis' evening-primrose (*Camissoniopsis lewisii*) – CRPR 3; and
- south coast branching phacelia (*Phacelia ramosissima var. austrolitoralis*) – CRPR 3.2.

The following special status plant species has a moderate potential to occur in the Southern Coastal Salt Marsh and Coastal Brackish Marsh habitats both north and south of the PCH Bridge:

- south coast branching phacelia (*Phacelia ramosissima var. austrolitoralis*) – CRPR 3.2.

The south coast branching phacelia is the only sensitive plant species that could occur in the lagoon south of the PCH bridge. This perennial herb grows in chaparral, coastal dunes, coastal scrub, and within coastal salt marshes and swamps on sandy or sometimes rocky soils. This species flowers between March and August and would have been conspicuous and identifiable during the survey

conducted on August 14, 2013 by Chambers Group's botanist Heather Clayton. Neither South Coast branching phacelia nor any other sensitive plant species were observed during the survey and therefore they can be considered absent from the lagoon mouth. The area north of the bridge was not searched for sensitive plants and sensitive plant species could potentially occur upstream of PCH or in the small patch of southern foredunes on the beach near the lagoon.

Sensitive Communities

Southern Sycamore Alder Riparian Woodland is a sensitive vegetation community by the CDFW. However, this community was not identified within the mapped area onsite and is therefore considered absent from the Project area.

Sensitive Wildlife

Fourteen sensitive wildlife species were listed in the CNDDDB as being reported from the Point Dume quadrangle. However, all but one of these species is associated with terrestrial or freshwater habitats and would not have any potential to be affected by equipment crossing of Trancas Lagoon. One species, western pond turtle (*Emys marmorata*), was documented in Trancas Canyon well upstream of Trancas Lagoon but could occur in brackish habitats. Three species not documented in the Point Dume Quadrangle do have potential to occur in Trancas Lagoon. These are southern steelhead (*Oncorhynchus mykiss*), tidewater goby (*Eucyclogobius newberryi*) and western snowy plover (*Charadrius nivosus nivosus*). Each of these is discussed below.

Western Pond Turtle – California Species of Special Concern – The western pond turtle is an aquatic turtle that occurs in ponds, marshes, rivers, streams and irrigation ditches. Pond turtles have been reported from Trancas Creek (CDFW 2013) well upstream of the lagoon. This species would be highly unlikely in the lagoon seaward of the PCH Bridge but they can occur in brackish water and, thus, could occur just upstream of the bridge.

Southern Steelhead – Federal Endangered, California Species of Special Concern - This species occurs in the ocean and in rivers and streams. Adults require cool, well-oxygenated streams for spawning. Southern steelhead occurred historically in Trancas Creek as recently as the 1980's (Dagit, Drill and Meyer 2005). They have not been caught in Trancas Creek in recent surveys, and currently are impeded from spawning by passage barriers. However, they could enter the lagoon when the sand bar is breached. Restoration of Trancas Creek is being planned and with improved habitat and removal of passage impediments, Trancas Creek has high potential to support spawning (R. Dagit, Personal Communication, August 20, 2013).

Tidewater Goby – Federal Endangered, California Species of Special Concern – Tidewater gobies occur in shallow lagoons and lower stream reaches. This fish requires fairly still water but not stagnant water with high oxygen levels. Presently the only extant tidewater goby populations in Los Angeles County are in Malibu Lagoon and Topanga Creek (USFWS 2008). Therefore, tidewater gobies presently are absent from Trancas Lagoon. However, this species could be reestablished in Trancas Creek as part of restoration efforts for the creek.

Western Snowy Plover – Federal Threatened, California Species of Special Concern – Snowy plovers are found on sandy beaches, estuaries, salt pond levees, and shores of large alkali lakes. This species needs sandy, gravelly, or friable soils for nesting. Snowy plovers do not nest near Trancas Lagoon, but Zuma Beach is an important wintering area for this species. Zuma Beach, including the mouth of Trancas Creek, has been listed as Critical Habitat for the western snowy plover (USFWS 2012). The area was listed because it is an important wintering area with up to 213 western snowy plovers recorded during a single season over the last seven years. Zuma Beach supports the largest wintering population of snowy plovers in Los Angeles County (Ryan Ecological Consulting, Los Angeles Audubon, Santa Monica Bay Audubon and Plegadis 2009). During construction of the emergency revetment in 2010, biological monitors observed snowy plovers on the sand bar at the mouth of Trancas Lagoon.

ANALYSIS OF IMPACTS OF CROSSING ALTERNATIVES

Temporary Bridge Structure

A temporary bridge would be installed at the beginning of the wet season prior to the occurrence of predicted rainstorms and removed at the conclusion of construction. The purpose of the structure is to allow the lagoon to breach and construction to continue. The structure would be removed at the end of sand placement at Broad Beach. The temporary bridge would permit the lagoon to drain and to maintain its connection to the ocean for fish passage while the construction continues. The bridge most likely would be a large concrete box culvert that would be just wide enough to allow one truck to safely cross over the breach and would be deep enough to reach the channel breach lower limit. It would be deep enough to extend downward into the breach so the channel can scour unrestricted, and it would be wide enough for safe passage of a truck across the top. The structure could consist of multiple concrete boxes that, when placed together, may result in an opening that is approximately 20 feet wide across the channel and 20 feet long in the downstream direction to provide ample driving surface for the truck. The structure could be between 5 to 10 feet high from the driving surface to the bottom (creek bed lowest scour elevation).

The structure would be installed within the sand bar and none of the lagoon vegetation would be within its footprint. The structure would allow the lagoon to drain as it normally would during the breached condition. The bottom of the structure would sand in almost immediately. Because the structure would only be about 20 feet wide it would not be a long dark tunnel that might discourage fishes from entering the lagoon. The culvert would be a bridge with a soft bottom that should support normal fish passage in and out of the lagoon. At present, southern steelhead do not spawn in Trancas Lagoon but this bridge would allow them to enter the lagoon mouth. The bridge also would allow marine and estuarine fish species to move between the lagoon mouth and the ocean.

Another option for a bridge structure could be a railroad flat car laid on concrete blocks (as foundations) at the location of the anticipated breach. Both bridge options may need additional structural support for their foundations, and that could be provided by a flexible “mattress” of relatively small rock in a wire mesh that would be imbedded in the sand around the base of the structures to limit scour along their flanks during lagoon drainage.

Halt Construction During Period When Sand Bar is Breached

Under this alternative, no equipment would cross the lagoon mouth when the sand bar is breached. Equipment would remain in the staging area and construction would be halted until the sand bar reforms. This alternative would have no direct impacts to Trancas Lagoon. However, halting construction would delay the project and extend the period when equipment is the parking lot and the beach is in a disturbed condition. Halting construction would increase project costs and extend construction disturbance of the beach. If the project schedule is delayed for too long a period, construction may extend into the period of higher beach use, the grunion spawning season, and the invertebrate recruitment season. If construction extended into late spring, impacts on recreational use and biological resources would be more adverse than if construction were allowed to continue uninterrupted.

SUMMARY AND RECOMMENDATIONS

Trancas Lagoon south of the PCH bridge supports southern coastal salt marsh and coastal brackish marsh vegetation. In addition, a small patch of southern foredune is present adjacent to the lagoon on the east side. These native plant communities should be avoided by equipment moving between the Zuma Beach parking lot and Broad Beach. Final project plans and specifications need to show sensitive areas to be protected.

Federal threatened western snowy plovers winter at Zuma Beach and forage at the mouth of Trancas Lagoon. A biological monitor should be on site during construction when equipment is moving between the parking lot and Broad Beach to make sure equipment avoids areas where snowy plovers are resting or foraging.

Federal endangered southern steelhead may enter Trancas Lagoon when the sand bar is breached. Any methods to facilitate crossing the lagoon when the mouth is open should be designed not to impede fish passage. The proposed temporary bridge would allow construction to continue without impeding fish passage or interfering with drainage of the lagoon. This alternative is superior to delaying construction until the sand bar reforms, because construction delay runs the risk of extending construction impacts into the late spring when recreational beach use begins to accelerate and grunion spawning and sandy intertidal invertebrate recruitment begins.

Please don't hesitate to contact me if you have any questions or need additional information.

Sincerely,

CHAMBERS GROUP, INC.



Noel Davis, Ph.D.
Director of Marine Department

REFERENCES

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- 2010 *Endangered and Threatened Wildlife and Plants; Revised Designation of Critical habitat for the Pacific Coast Population of the Western snowy Plover; Final Rule*. Federal Register Vol. 77, No. 118: 36728-36869

FIGURES





★ Project Location



1:24,000

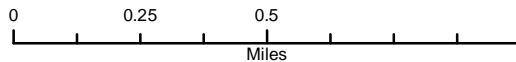


Figure 1
Trancas Lagoon
Project Location Map



Version Date: 8/27/2013

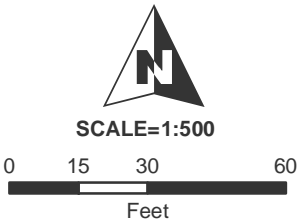


Figure 2
Trancas Lagoon
Lagoon Perimeter Map

Version Date: 8/29/2013

Trancas Lagoon

-  Perimeter on August 14, 2013
-  Open Water



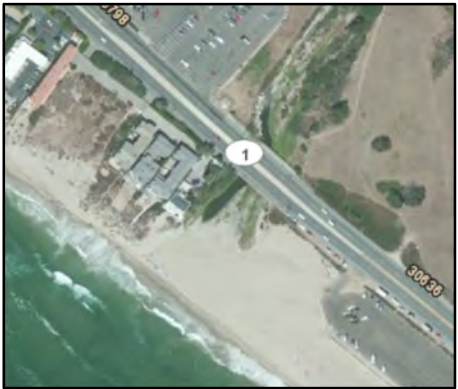
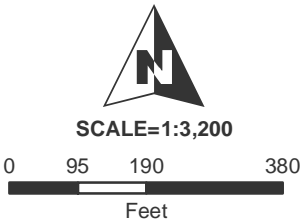
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Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User





Figure 3
Trancas Lagoon
Aerial From January 2006

Version Date: 8/27/2013



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User



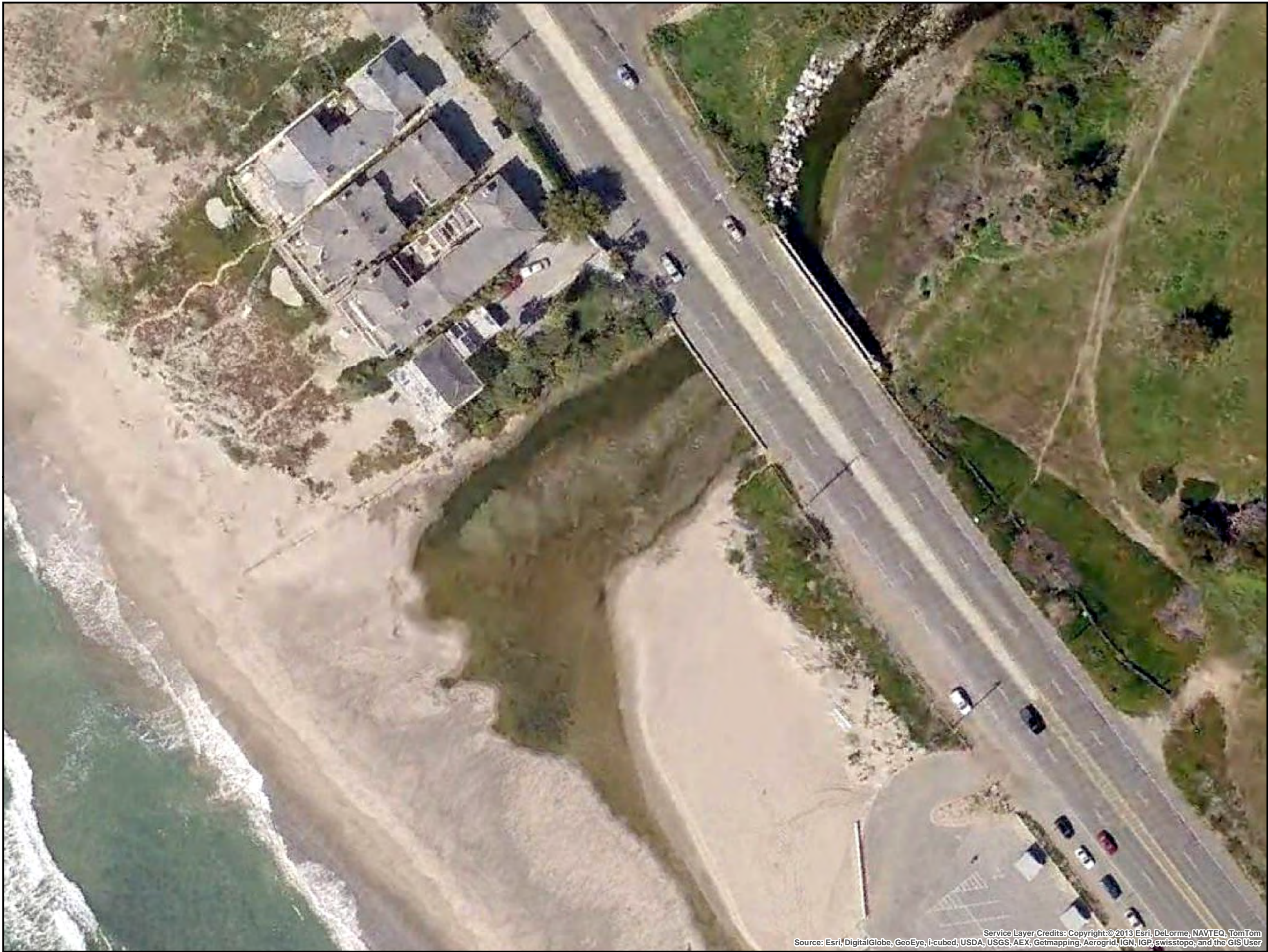
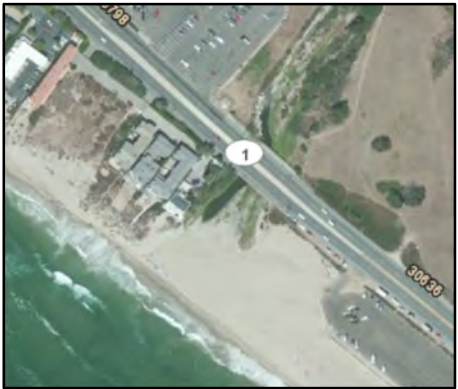
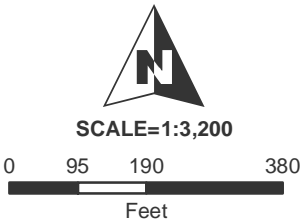


Figure 4
Trancas Lagoon
Aerial From January 2008

Version Date: 8/27/2013



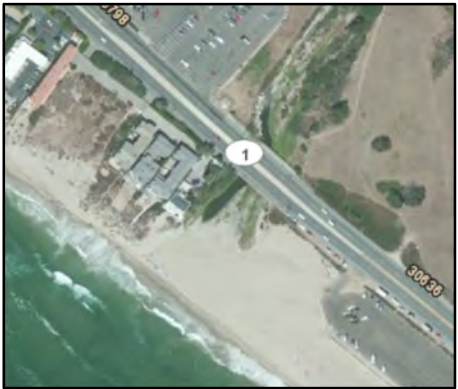
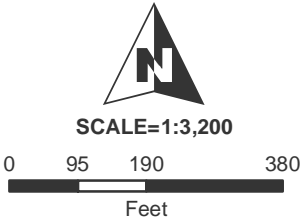
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Figure 5
Trancas Lagoon
Aerial From April 2011

Version Date: 8/27/2013



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User

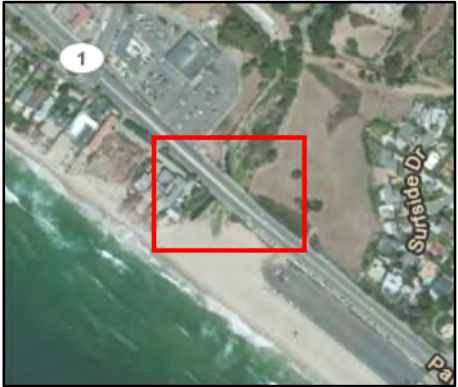
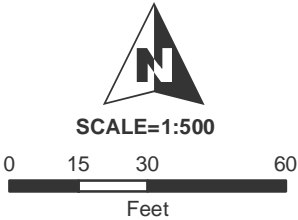


Figure 6
Trancas Lagoon
Vegetation Map

Version Date: 8/27/2013

Vegetation Communities

- 1. Developed
- 2. Hottentot Fig
- 3. Southern Foredunes
- 4. Southern Coastal Salt Marsh
- 5. Ornamental Landscaping
- 6. Southern Willow Scrub
- 7. Disturbed Coastal Sage Scrub
- 8. Coastal Brackish Marsh
- 9. Open Water
- 10. Scoured
- 11. Ruderal



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PLANT LIST



Plant Species Observed within the Mapped Area at Trancas Lagoon

Scientific Name	Common Name
ANGIOSPERMS (EUDICOTS)	
AIZOACEAE	FIG-MARIGOLD FAMILY
<i>Carpobrotus chilensis</i> *	sea-fig
<i>Carpobrotus edulis</i> *	hottentot-fig
ASTERACEAE	SUNFLOWER FAMILY
<i>Ambrosia chamissonis</i>	beach-bur
<i>Artemisia californica</i>	California sagebrush
<i>Baccharis salicifolia</i> subsp. <i>salicifolia</i>	mule fat
<i>Cotula coronopifolia</i> *	brass-buttons
<i>Erigeron canadensis</i>	horseweed
<i>Glebionis coronaria</i> *	garland daisy
<i>Heterotheca grandiflora</i>	telegraph weed
<i>Jaumea carnosa</i>	fleshy Jaumea
<i>Sonchus oleraceus</i> *	common sow thistle
BORAGINACEAE	BORAGE FAMILY
<i>Heliotropium curassavicum</i> var. <i>oculatum</i>	salt heliotrope
BRASSICACEAE	MUSTARD FAMILY
<i>Cakile maritima</i> *	sea rocket
<i>Hirschfeldia incana</i> *	shortpod mustard
CHENOPODIACEAE	GOOSEFOOT FAMILY
<i>Arthrocnemum subterminale</i>	Parish's pickleweed
<i>Atriplex prostrata</i>	spearscale
EUPHORBIACEAE	SPURGE FAMILY
<i>Ricinus communis</i> *	castor-bean
NYCTAGINACEAE	FOUR O'CLOCK FAMILY
<i>Abronia maritima</i>	beach sand verbena
ONAGRACEAE	EVENING PRIMROSE FAMILY
<i>Camissoniopsis cheiranthifolia</i>	beach evening primrose
SALICACEAE	WILLOW FAMILY
<i>Salix exigua</i>	narrow-leaved willow
<i>Salix lasiolepis</i>	arroyo willow
SCROPHULARIACEAE	FIGWORT FAMILY
<i>Myoporum laetum</i> *	myoporum
TAMARICACEAE	TAMARISK FAMILY
<i>Tamarix ramosissima</i> *	Mediterranean tamarisk
ANGIOSPERMS (MONOCOTS)	
CYPERACEAE	SEDGE FAMILY
<i>Schoenoplectus californicus</i>	California bulrush

Scientific Name	Common Name
POACEAE	GRASS FAMILY
<i>Arundo donax</i> *	giant reed
<i>Bromus madritensis</i> subsp. <i>rubens</i> *	red brome
<i>Distichlis spicata</i>	saltgrass
<i>Polypogon monspeliensis</i> *	annual beard grass
RUPPIACEAE	DITCH-GRASS FAMILY
<i>Ruppia maritima</i>	beadfruit sea-tassel
STRELITZIACEAE	BIRD OF PARADISE FAMILY
<i>Strelitzia</i> sp.*	bird of paradise
*Non-Native Species	