

APPENDIX E

Biological Resources Studies

BIOLOGICAL RESOURCES TECHNICAL REPORT

for the

CARLSBAD DESALINATION PLANT PROJECT

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SUMMARY OF FINDINGS

The Carlsbad Desalination Plant project consists of the construction and operation of an approximately 50 million gallon per day (mgd) Carlsbad Seawater Desalination Plant (desalination plant) and other appurtenant and ancillary water and support facilities to produce potable water. The proposed project would be located at the existing power plant (Encina Generating Station) immediately south of Agua Hedionda Lagoon, east of the Pacific Ocean and Carlsbad Boulevard, west of Interstate 5 and north of Cannon Road, within the City of Carlsbad, in northern San Diego County. The study area analyzed in this report is situated within the Cities of Carlsbad and Oceanside, California. The study area is within the boundaries of the Habitat Management Plan for Natural Communities in the City of Carlsbad (Draft HMP), the Carlsbad Local Coastal Program (LCP) and the Oceanside Subarea Habitat Conservation Plan/Natural Communities Conservation Plan. The study area consists of only those portions of the alignment that are not within existing developed roads or covered in other existing studies.

The desalination plant project includes pipelines and appurtenant facilities proposed offsite of the power plant to deliver the product water from the desalination plant to existing water distribution networks in Carlsbad and neighboring areas. Source water for the project will come from once-through, non-contact seawater in the existing cooling water discharge system at the power plant. Up to 104 mgd of seawater would be diverted from the combined outlet of the power station condensers and piped to the desalination facility. The source water will be pre-treated and filtered through reverse osmosis (RO) membranes to produce high quality drinking water. The product water would be stored temporarily in on-site facilities prior to transmission to local and/or regional storage and distribution systems. New offsite pipelines would be constructed for conveyance of the product water.

Concentrated seawater will be produced in the RO membrane separation process. Approximately one gallon of concentrated seawater will be created for every gallon of potable drinking water produced; therefore, for the proposed 50-mgd desalination plant, approximately 50 mgd of concentrated seawater will be generated. The salinity of the concentrate will be 67,000 parts per million (ppm), twice the concentration of the incoming seawater (33,500 ppm). The concentrated seawater will be conveyed to the power plant cooling water discharge canal using the desalination plant concentrate pipeline, and blended with the power plant cooling water prior to discharge of the blended stream into the ocean via the power plant discharge canal. The existing 15-foot wide, concrete discharge tunnel

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conveys the cooling water into an on-site discharge area by gravity before the cooling water travels through box culverts under Carlsbad Boulevard into a riprap-lined channel leading across the beach into the Pacific Ocean. Impacts to Marine biological resources associated with the discharge are analyzed separately from this report.

Based on species composition and general physiognomy, 10 native plant communities and six non-native, non-natural or unvegetated land covers were identified within the project study area: chamise chaparral (0.27 acre), coastal sage scrub (1.12 acres disturbed and 5.27 acres undisturbed), coyote brush scrub (0.03 acre), herbaceous wetland (0.05 acre disturbed and 0.01 acre undisturbed), disturbed mule fat scrub (0.14 acre), open channel (0.07 acre), scrub oak chaparral (0.13 acre), southern willow scrub (0.55 acre), annual non-native grassland (10.71 acres), agriculture (6.85 acres), developed (23.67 acres), disturbed habitat (8.48 acres), ornamental (7.88 acres) and ruderal habitat (1.24 acre).

No plant species listed as rare, threatened, or endangered by the U.S. Fish and Wildlife Service (USFWS) or the California Department of Fish and Game (CDFG) were detected in the study area. One plant species designated as sensitive by the California Native Plant Society (CNPS) were detected in the project area: San Diego County viguiera (*Viguiera laciniata*), a CNPS List 4 species.

Focused surveys resulted in observation of one federally-listed threatened wildlife species: coastal California gnatcatcher (*Poliophtila californica californica*). One individual gnatcatcher was detected within the study area near the Maerkle Reservoir. The California gnatcatcher is a City of Carlsbad Draft Habitat Management Plan (Draft HMP) covered species. Two non-listed wildlife species considered California State Species of Special Concern, the northern harrier (*Circus cyaneus*) and Cooper's hawk (*Accipiter cooperii*), also were observed near the Maerkle Reservoir.

Implementation of the proposed project would result in the temporary direct loss of 3.84 acre of coastal sage scrub, 0.66 acre of disturbed coastal sage scrub, 0.03 acre of coyote brush scrub, 0.01 acre of herbaceous wetland, 0.05 acre of disturbed herbaceous wetland, 0.07 acre of open channel, 0.44 acre of southern willow scrub, 4.39 acres of annual non-native grassland, 2.12 acres of agricultural land, 7.95 acres of developed land, 4.71 acres of disturbed habitat, 3.03 acres of ornamental landscaping and 0.82 acre of ruderal habitat. Losses would occur as the result of trench construction and horizontal directional drilling techniques.

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Because all upland project impacts are considered temporary, proposed mitigation includes a combination of 1:1 revegetation of in-kind habitats at the location of impact, purchase of mitigation bank credits and/or offsite acquisition of habitat for sensitive communities requiring higher than a 1:1 ratio and payment of a fee for Group F habitats. Habitats designated as Group F by the HMP (*i.e.*, disturbed lands, eucalyptus and agricultural lands) are non-native and expected to recover on their own and therefore temporary impacts do not require revegetation efforts.

As previously noted, impacts to the marine environment are not addressed in this report.

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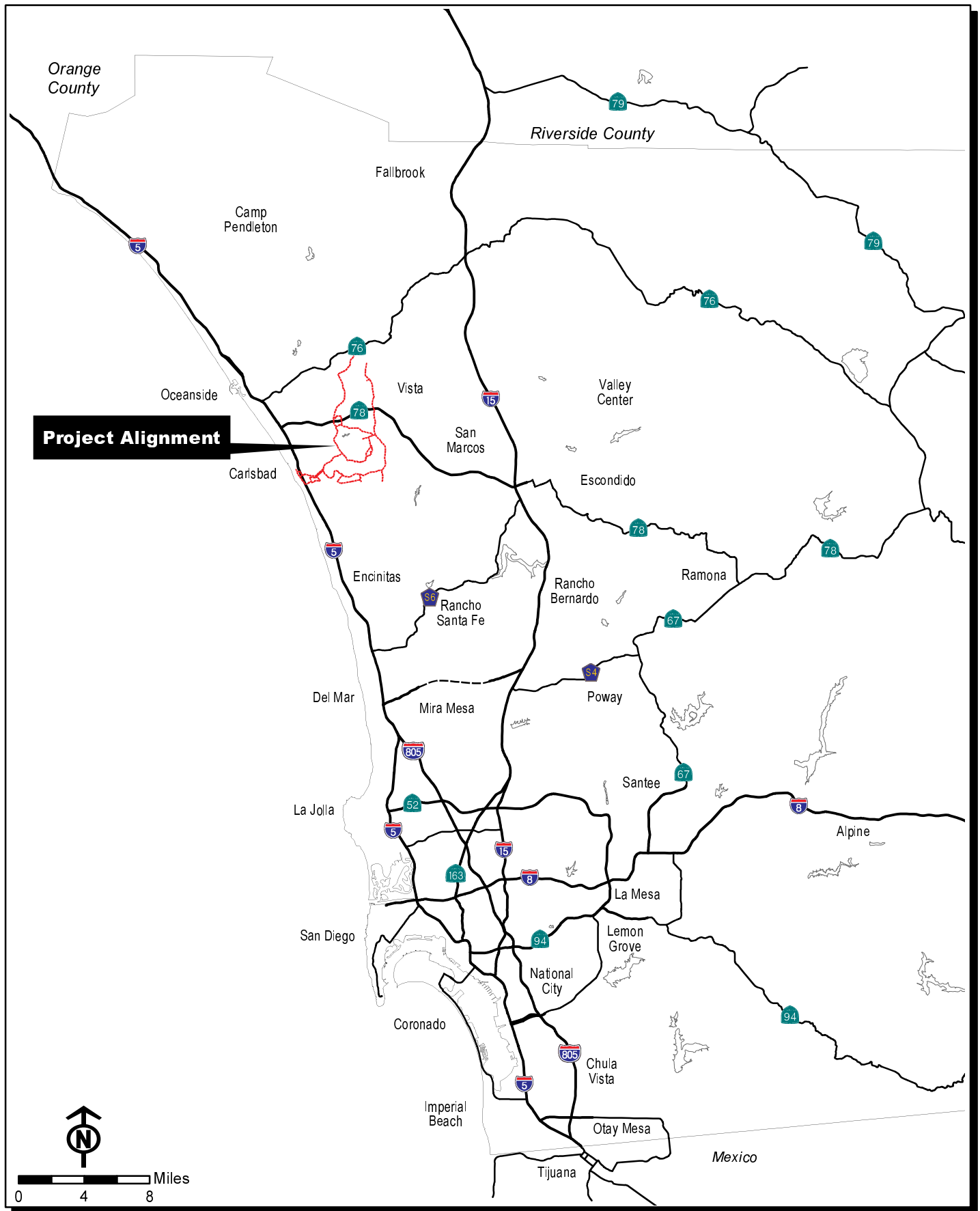
1.0 INTRODUCTION

The Carlsbad Desalination Plant project proposes the construction and operation of an approximately 50 million gallon per day (mgd) Carlsbad Seawater Desalination Plant (desalination plant) and other appurtenant and ancillary water and support facilities to produce potable water. The proposed project would be co-located at the existing Encina power plant located immediately south of the Agua Hedionda Lagoon, east of the Pacific Ocean and Carlsbad Boulevard, west of Interstate 5 and north of Cannon Road, within the City of Carlsbad, in northern San Diego County. The regional context of the site is shown in *Figure 1*, and *Figure 2* provides the local context for the project site.

The desalination plant project includes pipelines and appurtenant facilities proposed offsite of the power plant to deliver the product water from the desalination plant to existing water distribution networks in Carlsbad and neighboring areas. Source water for the project will come from once through non-contact seawater in the existing cooling water discharge system at the power plant. Up to 104 mgd of seawater would be diverted from the combined outlet of the power station condensers and piped to the desalination facility. The source water will be pre-treated and filtered through reverse osmosis (RO) membranes to produce high quality drinking water. The product water would be stored temporarily in on-site facilities prior to transmission to local and/or regional storage and distribution systems. New offsite pipelines would be constructed for conveyance of the product water to the City of Carlsbad, neighboring water agencies and/or the San Diego County Water Authority.

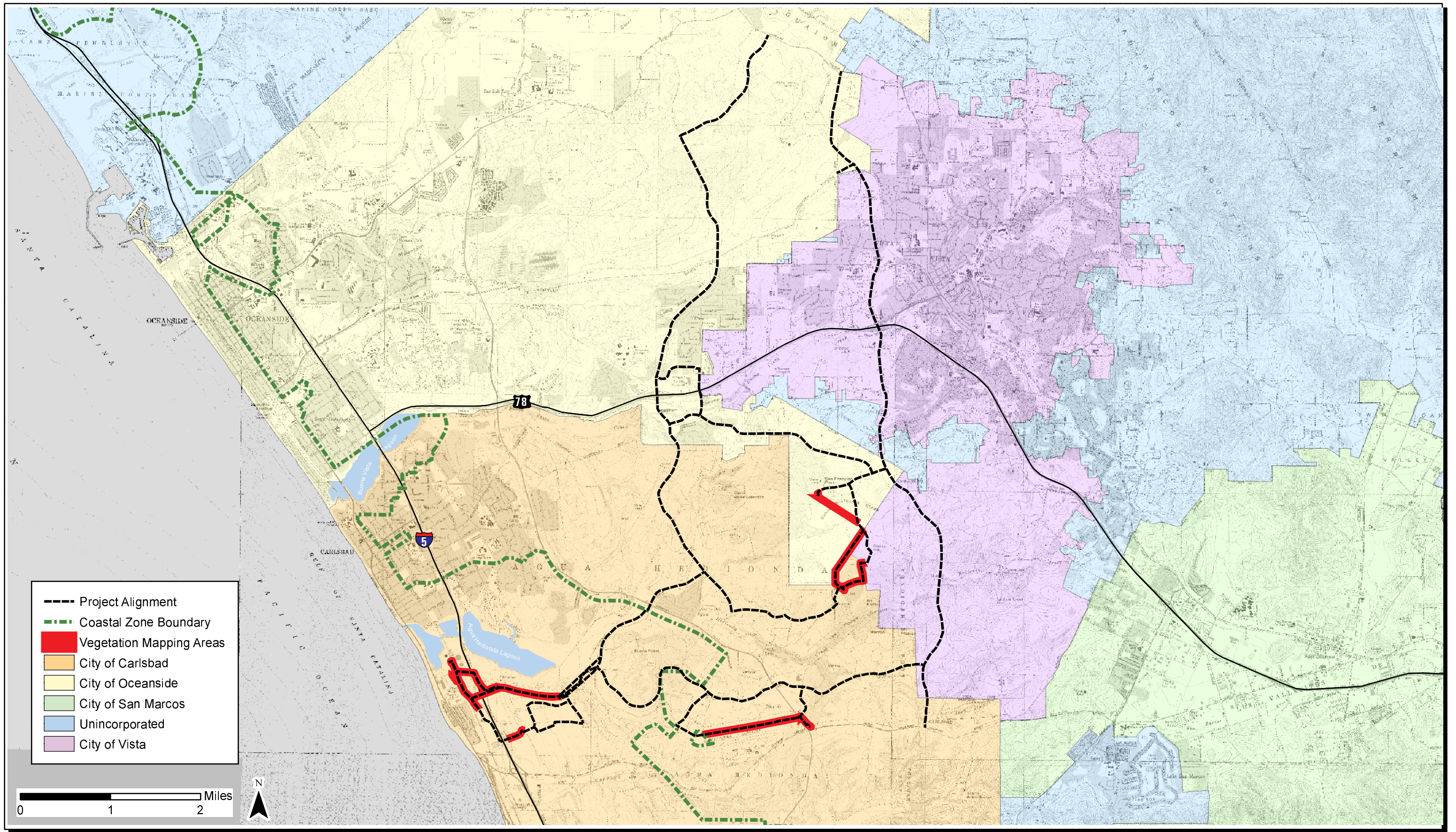
The desalination plant would occupy an approximately four-acre parcel in the area currently containing Fuel Oil Tank #3, which is the southernmost of three large tanks nearest Carlsbad Boulevard. The fuel oil tank would be demolished to accommodate the desalination facility. Surrounding features and land uses include the Pacific Ocean and Carlsbad Boulevard to the west, the Carlsbad State Beach and Agua Hedionda Lagoon to the west and north, Interstate 5 and SDG&E properties to the east, and SDG&E electric utility properties to the south. A North County Transit District railway bisects the power plant property north to south just east of the proposed desalination facility. Access to the site is provided from Carlsbad Boulevard via the Cannon Road interchange at Interstate 5.

Several options are being considered for pipeline alignments, including various combinations of segments. For purposes of this analysis, all of the potential alignments are analyzed to provide coverage for any combination of alignments that may be selected. The water delivery



Carlsbad Power and Desalination Plants - Biological Technical Report
Regional Map

FIGURE
1



- Project Alignment
- - - Coastal Zone Boundary
- Vegetation Mapping Areas
- City of Carlsbad
- City of Oceanside
- City of San Marcos
- Unincorporated
- City of Vista

0 1 2 Miles



Carlsbad Power and Desalination Plants - Biological Technical Report
Vicinity Map

FIGURE 2

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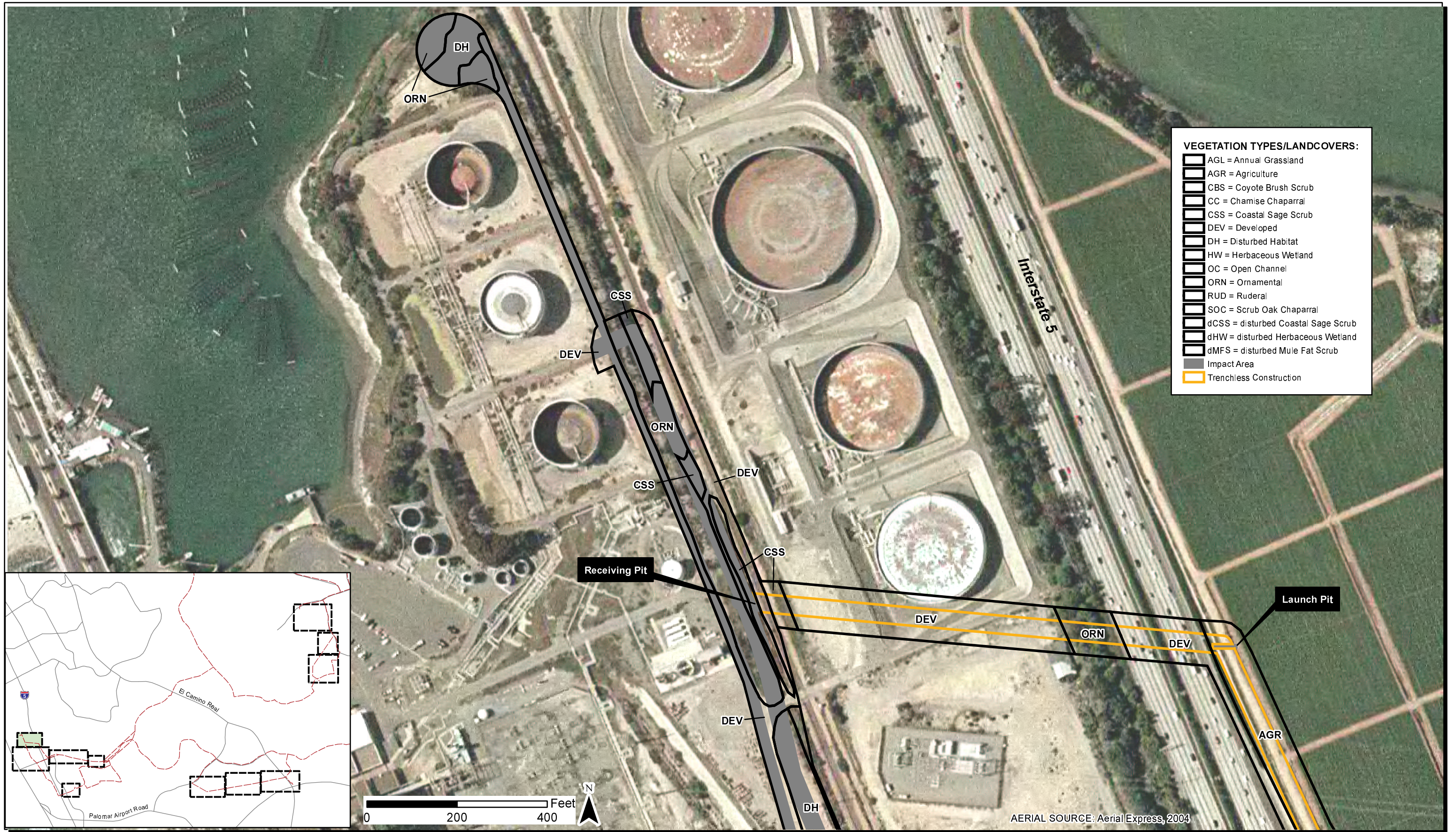
pipeline alignments generally follow existing and future roadways, including Cannon Road, Faraday Avenue, Melrose Avenue, Palomar Airport Road, within the cities of Carlsbad, Oceanside and Vista. In general, there are two primary delivery route alignments, one that follows the Cannon Road alignment to College Boulevard into Oceanside, and the other that follows Cannon Road to Faraday Street to Melrose Drive into Oceanside. Associated with the primary alignments, there are several sub-alignments and/or options for segments of the alignments. All of the potential alignment segments are located in the cities of Carlsbad and Oceanside and are depicted in *Figures 1 and 2*. Additionally, *Figure 2* highlights the portions of the proposed alignments that are addressed in this report. The remaining areas have already been incorporated into the analysis of existing Environmental Impact Reports (EIRs) for various projects, or occur in existing developed roadways.

Regardless of which combination of segments is ultimately selected, it is anticipated that the longest potential network of pipeline will not exceed approximately 16 miles. Pipe diameter will range from 48 inches in the upstream portions of the delivery system, to 24 inches in the downstream portions, and at the point of connection to existing reservoirs and delivery systems.

The primary focus of the environmental analysis contained in this biological technical report is the desalination plant and five discreet segments of the proposed pipe alignments (study area). The report specifically focuses on portions of the proposed project that support undeveloped land that has not been included in the analyses of previous EIRs. These undeveloped areas all occur along the proposed water delivery alignments in the following areas of Carlsbad and Oceanside.

Figures 3, 4, 6 and 7 depict an approximately 14,400-foot segment that includes the proposed delivery pipelines exiting the Encina Plant and generally moving south from the Plant and east along Cannon Road in the City of Carlsbad. This segment traverses the edges of agricultural land on the north side of Cannon Road near Lego Land. Underground horizontal directional drilling (HDD) is proposed for approximately 4,900 feet of this segment. A truck turn-around area and associated road is also included within the Encina Plant site.

Figure 5 depicts an approximately 900-foot segment located in a developed area along Car Country Drive in Carlsbad.

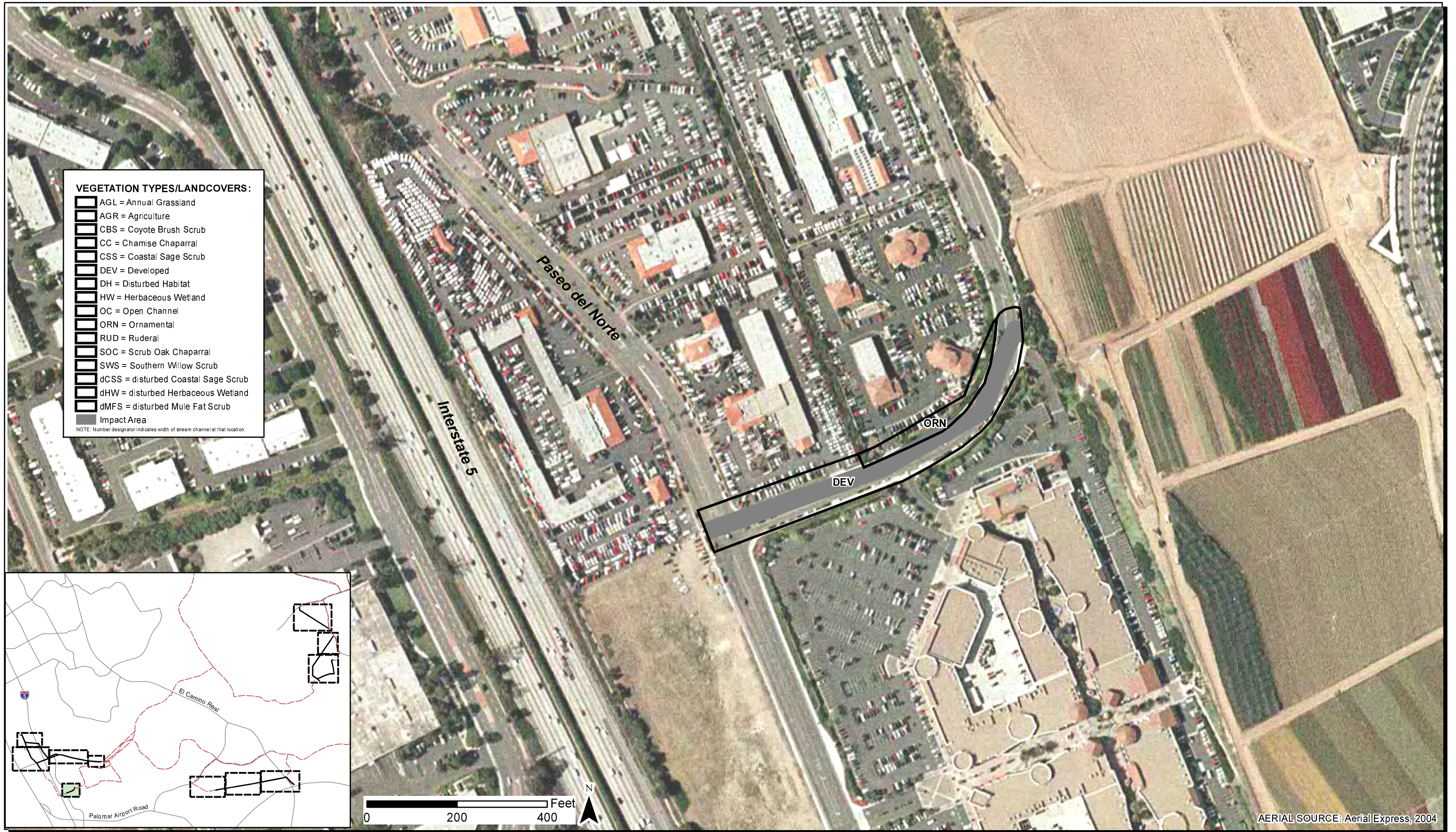


Carlsbad Power and Desalination Plants - Biological Technical Report
Biological Resources Map with Impact Area

FIGURE 3

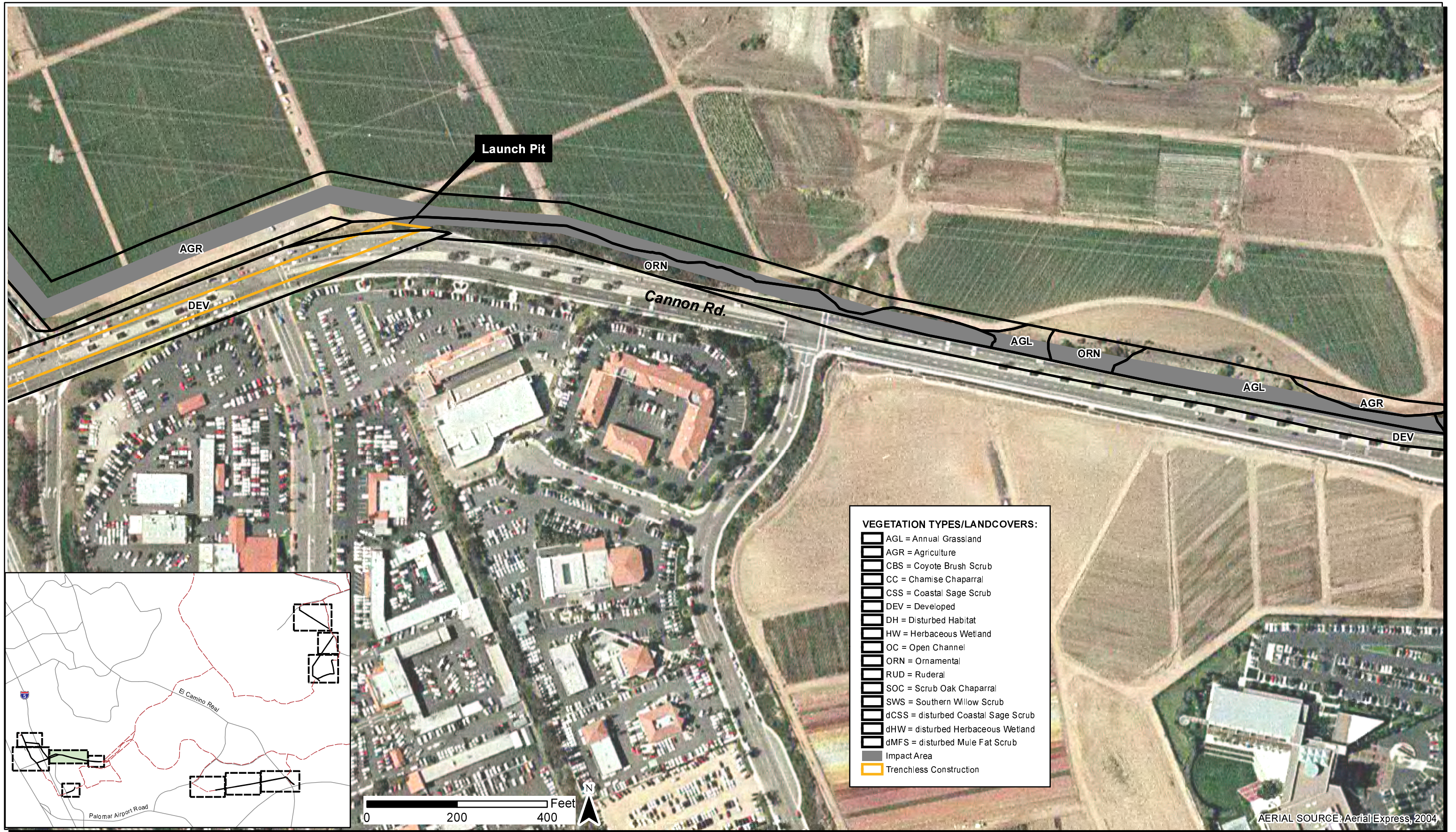


Carlsbad Power and Desalination Plants - Biological Technical Report
Biological Resources Map with Impact Area



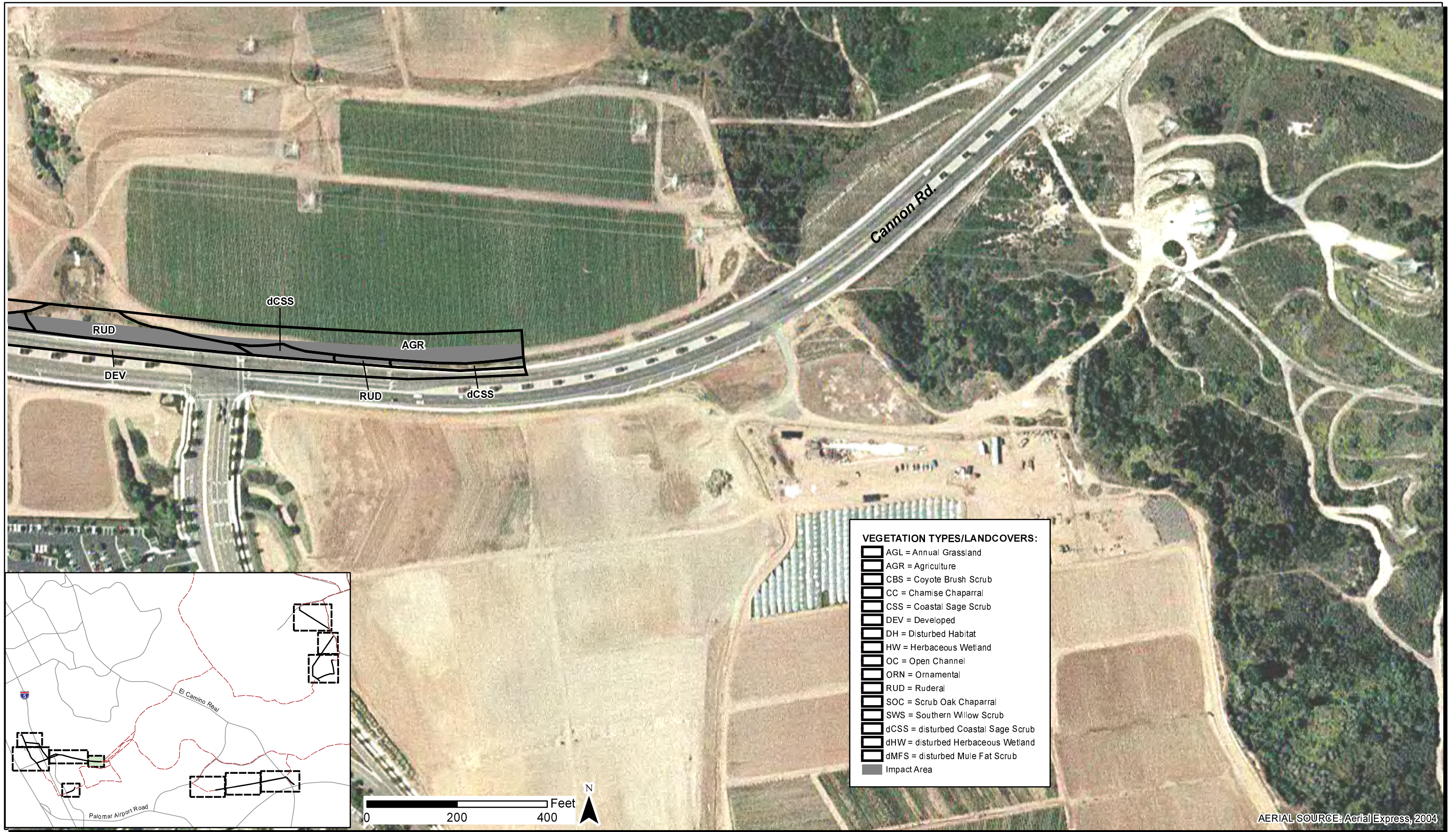
Carlsbad Power and Desalination Plants - Biological Technical Report
Biological Resources Map with Impact Area

FIGURE 5



Carlsbad Power and Desalination Plants - Biological Technical Report
Biological Resources Map with Impact Area

FIGURE 6



Carlsbad Power and Desalination Plants - Biological Technical Report
Biological Resources Map with Impact Area

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Figures 8, 9 and 10 depict an approximately 7,000-foot segment located between College Boulevard and El Camino Real, along the northern edge of McClellan Palomar Airport, as well as a short portion located along the eastern edge of El Camino Real. Underground HDD is proposed for approximately 300 feet of this segment.

Figures 11 and 12 depict an approximately 6,800-foot segment located northwest of the northern terminus of Sunny Creek Road, on the City of Carlsbad's Maerkle Reservoir property. This segment is located within the City of Carlsbad and along the boundary between the cities of Oceanside and Vista.

Figure 13 depicts an approximately 2,800-foot segment located between Shadowridge Drive and Cannon Road, immediately north of Leisure Village in the City of Oceanside. This segment is located within the existing tri-agency pipeline easement corridor.

Dudek & Associates, Inc. (Dudek) conducted vegetation surveys, wildlife habitat assessments, focused California gnatcatcher surveys, rare plant surveys and a formal wetlands delineation in 2004 to assess the existing biological resources within the study areas of the proposed project. This report includes the results of Dudek's field work as well as an assessment of impacts, recommendations for mitigation and evaluation of the project in the context of the Habitat Management Plan for Natural Communities in the City of Carlsbad (Draft HMP), the City of Carlsbad Local Coastal Program (LCP) and the Oceanside Subarea Habitat Conservation Plan/Natural Communities Conservation Plan. Impacts to the marine environment are addressed separately from this report.

2.0 METHODS AND SURVEY LIMITATIONS

Data regarding biological resources present on the project site were obtained through a review of pertinent literature and through field reconnaissance; both are described in detail below.

2.1 Literature Review

Sensitive biological resources present or potentially present onsite were identified through a literature search using the following sources: U.S. Fish and Wildlife Service (USFWS) (2004), California Department of Fish and Game (CDFG) (2004 a, b, c, d and e), the California Native Plant Society (CNPS) Inventory of Rare and Endangered Vascular Plants (CNPS 2004),



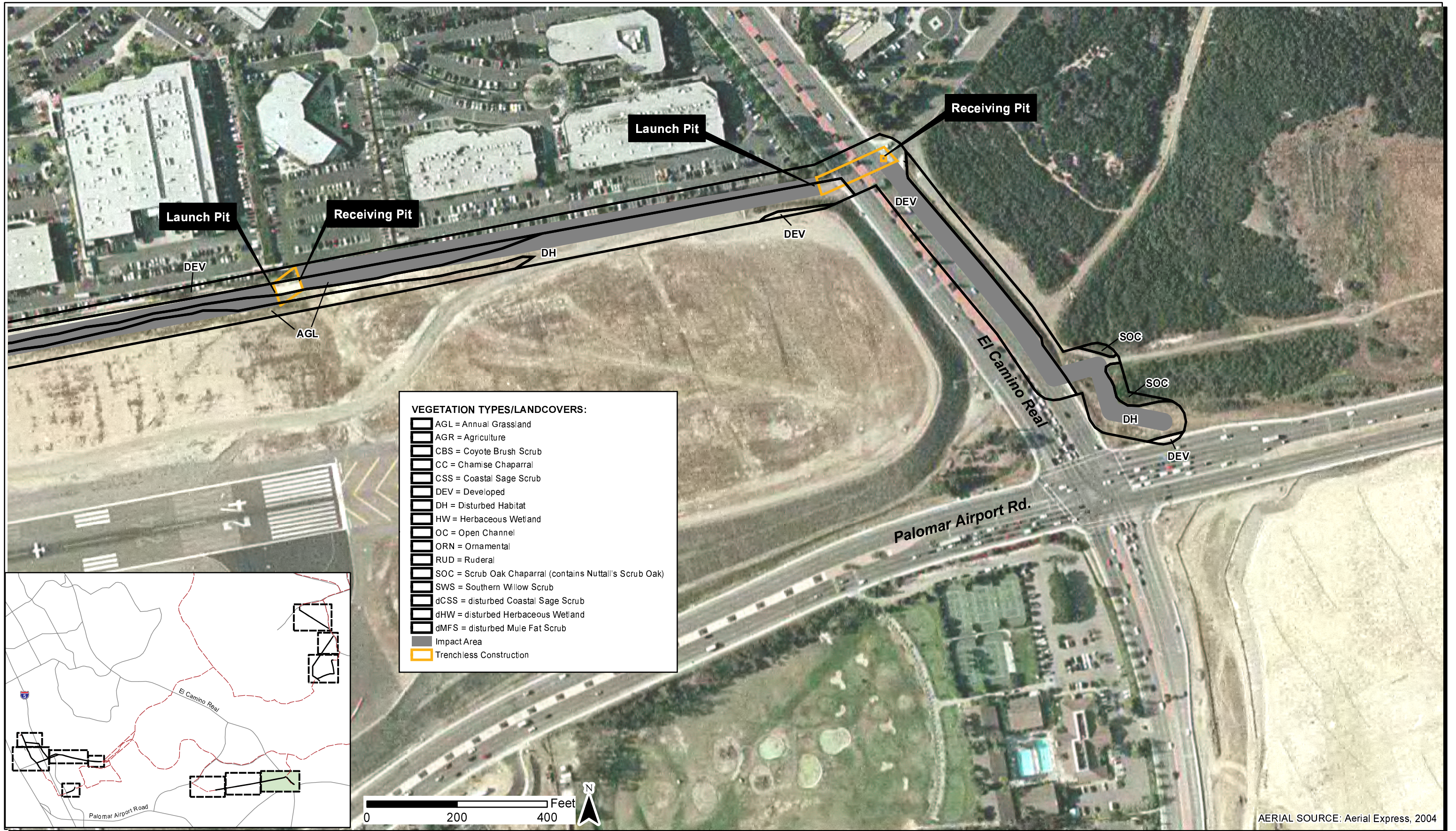
Carlsbad Power and Desalination Plants - Biological Technical Report
Biological Resources Map with Impact Area

FIGURE 8



Carlsbad Power and Desalination Plants - Biological Technical Report
Biological Resources Map with Impact Area

FIGURE 9



Carlsbad Power and Desalination Plants - Biological Technical Report
Biological Resources Map with Impact Area

FIGURE 10



Carlsbad Power and Desalination Plants - Biological Technical Report
Biological Resources Map with Impact Area



Carlsbad Power and Desalination Plants - Biological Technical Report
Biological Resources Map with Impact Area

**FIGURE
12**



Carlsbad Power and Desalination Plants - Biological Technical Report
Biological Resources Map with Impact Area

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and the vegetation and sensitive species mapping performed for the Multiple Habitat Conservation Program (MHCP) (SANDAG 2001). General information regarding wildlife species present in the region was obtained from Unitt (1984), Ehrlich (1988), and Garrett and Dunn (1981) for birds; Bond (1977) for mammals; Stebbins (2003) for reptiles and amphibians; and Emmel and Emmel (1973) for butterflies.

2.2 Field Reconnaissance

Biological surveys of the property were conducted by Dudek biologists Jeffrey D. Priest, Tricia L. Wotipka, Cathleen M. Weigand and Megan S. Enright, (*Table 1*). All surveys were conducted by foot under appropriate weather conditions, and all undeveloped areas that were not covered by previous EIRs were surveyed and inventoried for biotic components.

**TABLE 1. SCHEDULE OF SURVEYS
DESALINATION PLANT PROJECT**

DATE	TIME	PERSONNEL	SURVEY FOCUS	ENVIRONMENTAL CONDITIONS
5/17/04	0800-1630	Priest, Wotipka, Weigand, Enright	California Gnatcatcher Focused Survey; General Wildlife Survey; Jurisdictional Wetlands Delineation; Vegetation Mapping; Rare Plant Survey	68-72 degrees F; 100%-50% cloud cover; wind 0-5 mph
7/19/04	0630-1000	Priest	California Gnatcatcher Focused Survey	68-70 degrees F; 30%-20% cloud cover; wind 0-2 mph
7/29/04	0750-1630	Priest, Wotipka, Weigand,	Jurisdictional Wetlands Delineation; General Wildlife Survey; Vegetation Mapping; Rare Plant Survey	68-78 degrees F; 0% cloud cover; wind 1-4 mph
8/26/04	0820-1200	Priest	California Gnatcatcher Focused Survey	68-75 degrees F; 100%-30% cloud cover; wind 2-4 mph
9/2/04	0600-0900	Priest	California Gnatcatcher Focused Survey	66-70 degrees F; 100% cloud cover/fog-10% cloud cover (Note: CAGN survey was not initiated until the fog began to lift ~ 400 foot visibility)
9/14/04	0700-1100	Priest	California Gnatcatcher Focused Survey	68-72 degrees F; 100% cloud cover; wind 0-3 mph.
9/17/04	1030-1500	Priest, Wotipka, Weigand	General Wildlife Survey; Jurisdictional Wetlands Delineation; Vegetation Mapping; Rare Plant Survey	70 degrees F; 50% cloud cover; wind 1-3 mph
9/21/04	0715-0930	Priest	California Gnatcatcher Focused Survey	67-73 degrees F; 0% cloud cover; wind 3-8 mph
9/28/04	0800-0845	Priest	California Gnatcatcher Focused Survey	66 degrees F; 100% cloud cover; wind 1-2 mph
10/5/04	1345-1500	Priest, Wotipka	Vegetation Mapping; Jurisdictional Wetlands Delineation	74 degrees F; 20% could cover; wind 2-3 mph

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2.2.1 Resource Mapping/Jurisdictional Delineation

Plant communities and wetland delineation were mapped directly onto 200-scale (1"=200') aerial photographs (Aerial Express, 2004) of the site. The boundaries were transferred to a digital topographic base by Dudek GIS technician Mark McGinnis using ArcCAD.

Plant community classifications used in this report follow Holland (1986), with modifications to accommodate the lack of conformity of the observed communities to those of Holland. Locations of rare or sensitive plant and wildlife species also were mapped.

A jurisdictional delineation of “waters of the United States” and wetlands under the jurisdiction of the U.S. Army Corps of Engineers (ACOE), CDFG, Regional Water Quality Control Board (RWQCB), and California Coastal Commission (CCC) was conducted throughout the study area in 2004. The wetlands were delineated in accordance with the U.S. ACOE 1987 Manual for the Delineation of Wetlands (TR Y-87-1) and hydrology, hydrophytic vegetation, and soils were examined at potential wetland sites. Establishment of ACOE jurisdictional wetlands requires presence of all three criteria. Jurisdiction of RWQCB is generally coincident with the ACOE except in the case of areas isolated from navigable waters of the U.S., in which ACOE generally does not take jurisdiction but RWQCB may under the Porter-Cologne Act. The presence of one of three ACOE criteria, in association with a stream channel, was used to determine areas under the jurisdiction of CDFG. The presence of one of the three ACOE criteria, within the coastal zone, was used to determine areas under the jurisdiction of the CCC.

Portions of the project study area are situated within the Agua Hedionda Lagoon and Mello II segments of the Carlsbad LCP. Jurisdiction of wetlands in the LCP area is established by presence of any one of the three ACOE criteria in any area.

The extent of wetland features, above the five-foot contour, was determined in the field by pacing, aerial photo interpretation and GPS data collection. The dimensions of non-wetland jurisdictional areas (*i.e.*, incised channels with no wetland vegetation) were transferred to the topographic base as linear features. These shapes were digitized or downloaded into an ArcCAD file.

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2.2.2 Flora

All plant species encountered during the field surveys were identified and recorded. Those species that could not be identified immediately were brought into the laboratory for further investigation. Latin and common names of plants follow the Jepson Manual (Hickman 1993). Where not listed in Hickman (1993), common names are taken from Beauchamp (1986) or Abrams (1923). A cumulative list of plant species observed within the project study corridor during any of the surveys is presented in *Appendix A*.

2.2.3 Fauna

The assessment of wildlife within the project corridor was determined through several focused and general surveys, and by known habitat preferences of local species and knowledge of their relative distributions in the area. Dudek conducted focused surveys for the federally-listed threatened coastal California gnatcatcher (*Polioptila californica californica*). A cumulative list of wildlife species observed within the project study corridor during the surveys is presented in *Appendix B*.

Latin and common names of animals follow Stebbins (2003) for reptiles and amphibians, American Ornithologists' Union (2003) for birds, Jones *et al.* (1997) for mammals, and Emmel and Emmel (1973) for butterflies.

2.2.4 Sensitive Biological Resources

Sensitive biological resources are those defined as follows: **(1)** species that have been given special recognition by federal, state, or local conservation agencies and organizations due to limited, declining, or threatened population sizes; **(2)** species and habitat types recognized by local and regional resource agencies as sensitive; **(3)** habitat areas or plant communities that are unique, are of relatively limited distribution, or are of particular value to wildlife; and **(4)** wildlife corridors and habitat linkages.

Notes gathered from the field concerning biotic components were compared with lists of sensitive plants and animals from the CDFG, USFWS and CNPS.

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Focused surveys were conducted between May and September, 2004, for the coastal California gnatcatcher. All surveys for the California gnatcatcher were conducted in accordance with the USFWS protocol.

2.3 Survey Limitations

Limitations of the surveys include a diurnal bias and the absence of focused trapping for mammals and reptiles. Surveys were conducted during the daytime to maximize visibility for the detection of plants and most animals. Birds represent the largest component of the vertebrate fauna, and because they are active in the daytime, diurnal surveys maximize the number of observations of this portion of the fauna. In contrast, daytime surveys usually result in few observations of mammals, many of which may be active at night. In addition, many species of reptiles and amphibians are secretive in their habits and are difficult to observe using standard meandering transects. Botanical surveys were conducted in the Spring and Summer which help to maximize the number of plant species identified.

3.0 PHYSICAL CHARACTERISTICS

3.1 Site Description

Construction and operation of the desalination plant are proposed within the Encina Power Plant. It would occupy an approximately four-acre parcel in the area currently containing Fuel Oil Tank #3, which is the southernmost of three large tanks nearest Carlsbad Boulevard within the Encina Plant. The fuel oil tank would be demolished to accommodate the desalination facility.

Surrounding features include the Pacific Ocean and Carlsbad Boulevard to the west, the Carlsbad State Beach and Agua Hedionda Lagoon to the west and north, Interstate 5 and SDG&E properties to the east, and SDG&E electric utility properties to the south. A North County Transit District railway bisects the power plant north to south just east of the proposed desalination facility. Access to the site is provided from Carlsbad Boulevard via the Cannon Road interchange at Interstate 5. The water delivery pipeline alignments generally follow existing and future roadways, including Cannon Road, Faraday Avenue, Melrose Avenue, Palomar Airport Road, Palmer Way, Lake Boulevard, Oceanside Boulevard, and

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College Boulevard, within the cities of Carlsbad, Oceanside and Vista. The project study area is situated within the southern half of the U.S. Geological Survey 7.5 minute San Luis Rey quadrangle, Township 11 South, Range 4 West, on unsectioned land. The study area lies within approximately five miles to the east of the Encina Power Plant, within the cities of Carlsbad and Oceanside, California.

Land uses surrounding the power plant area include residential and recreational uses (*e.g.*, active and passive) such as swimming, surfing, walking, bird watching, fishing, and an aquaculture facility to the north; residential, commercial and industrial uses to the south; Interstate Freeway 5 and NCTD railroad tracks to the east; and the Pacific Ocean to the west. As noted above, the NCTD railroad tracks bisect the project area. Also to the north, adjacent to the outer lagoon is the Hubbs-Seaworld Research Institute and fish hatchery.

Agua Hedionda Lagoon is one of three coastal lagoons within the City of Carlsbad and is located in the west-central portion of the City. The lagoon comprises approximately 230 acres of water surface and extends 1.7 miles inland from the coast. At its widest point, the lagoon is 0.5 mile wide. Agua Hedionda Creek enters the lagoon at its easternmost point. The area surrounding the lagoon is characterized by open areas along the northern shoreline with residential development occurring on the bluffs above the lagoon to the north. Active agricultural fields occupy a portion of the slopes along the southern shoreline. The middle and inner lagoons are leased to the City as an aquatic-oriented recreational area. The middle lagoon has a recreation facility that is used by the YMCA for water sports and overnight camp groups. The inner lagoon is used for water sports, such as boating and jet skiing, and is administered by the City of Carlsbad, which issues recreational use permits and collects fees.

South of the power plant area is the SDG&E Operations Center and Cannon Park. Single-family residential neighborhoods are located south of Cannon Road, and west of Carlsbad Boulevard. The neighborhood west of Carlsbad Boulevard is referred to as the Terra Mar subdivision. South of Cannon Road between NCTD Railroad right-of-way and Interstate 5 is an industrially zoned area.

To the west of the power plant across Carlsbad Boulevard, which forms the western boundary of the power plant, is the Pacific Ocean and the southern end of Carlsbad State Beach. Interstate 5 forms the eastern boundary of the Encina plant site.

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Topography is relatively flat throughout the Encina Power Plant site and is varied and diverse throughout the proposed water distribution alternatives. Within the study areas, topography ranges from approximately 100 feet above mean sea level (amsl) in the western portion of the study areas adjacent to Cannon Road, to approximately 500 feet amsl in the eastern portion of the study area north of Maerkle Dam.

According to Bowman (1973) there are 20 soil types, including 10 soil series, four complexes and one landscape type found within or adjacent to the study areas (*Table 2*). However, in some portions of the study area, the landscape has been altered by urbanization since the soil mapping was completed in 1973.

TABLE 2
SOILS OF THE CARLSBAD DESALINATION PLANT PROJECT

Soil Type	Abbreviation, Slope
Altamont clay	AtE, 15%-30%
Bonsall sandy loam	BIC, 2%-9%
Carlsbad gravelly loamy sand	CbB, 2%-5%; CbE, 15%-30%
Cieneba coarse sandy loam	CID2, 5%-15%; CIG2, 30%-65%
Cieneba-Fallbrook rocky sandy loams	CnE2, 9%-30%
Diablo clay	DaC, 2%-9%
Diablo-Olivenhain complex	DoE, 9%-30%
Huerhuero loam	HrC; 2%-9%; HrC2 5%-9% eroded; HrD2 9%-15% eroded; HrE2, 15%-30% eroded
Huerhuero-Urban land complex	HuC; 2%-9%
Las Flores loamy fine sand	LeE, 15%-30%
Loamy alluvial land-Huehuero complex	LvF3, 9%-50% severely eroded
Marina loamy coarse sand	MIC, 2%-9%
Terrace escarpments	TeF (landscape)
Visalia sandy loam	VaB, 2%-5%
Vista coarse sandy loam	VsC, 5%-9%

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4.0 RESULTS OF SURVEY

This analysis only includes those areas that area outside of developed roadways and not already covered in existing EIRs for other projects.

4.1 Botany - Plant Communities and Floral Diversity

Based on species composition and general physiognomy, 11 native plant communities were identified within the project study area: chamise chaparral, coastal sage scrub (disturbed and undisturbed), coyote brush scrub, herbaceous wetland (disturbed and undisturbed), disturbed mule fat scrub, open channel, scrub oak chaparral and southern willow scrub. In addition to these native communities, there are six non-native, non-natural or unvegetated land covers within the project study area: non-native grassland, agriculture, developed, disturbed habitat, ornamental and ruderal habitat. *Table 3* provides acreages for each community, *Figures 3* through *13* depict the spatial distribution of habitat types, and a discussion of each community is provided following the table.

4.1.1 Chamise Chaparral

Chamise chaparral is a drought- and fire-adapted community of one- to three-meter-tall woody shrubs dominated by mature stands of chamise (*Adenostoma fasciculatum*) nearly to the exclusion of all other shrub species, and hence, is characterized by a lower species diversity. It develops primarily on mesic north-facing slopes and in canyons. Gaps between shrubs or edges adjacent to disturbance support a relatively rich understory of suffrutescent plants and other perennial and annual herbs (Holland 1986). Within the project area this vegetation community is dominated by chamise, but also includes some California sagebrush (*Artemisia californica*), toyon (*Heteromeles arbutifolia*), and lemonadeberry (*Rhus integrifolia*). Approximately 0.27 acre of chamise chaparral was identified within the study area.

4.1.2 Coastal Sage Scrub (Including Disturbed Forms)

Coastal sage scrub is a native plant community composed of a variety of soft, low, aromatic shrubs characteristically dominated by drought-deciduous species. Typical species include black sage (*Salvia mellifera*), California sagebrush, California bush sunflower (*Encelia*

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californica) and flat-topped buckwheat (*Eriogonum fasciculatum*). Scattered evergreen shrubs, including lemonadeberry, laurel sumac (*Malosma laurina*) and toyon typically occur within the coastal sage scrub community in more mesic areas, such as north-facing slopes (Holland 1986).

**TABLE 3
ACREAGES OF PLANT COMMUNITIES**

Habitat Type	Acreage
Native Habitats	
Coyote Brush Scrub	0.03
Chamise Chaparral	0.27
Coastal Sage Scrub	5.27
Disturbed Coastal Sage Scrub	1.12
Herbaceous Wetland	0.01
Disturbed Herbaceous Wetland	0.05
Disturbed Mule Fat Scrub	0.14
Open Channel	0.07
Scrub Oak Chaparral	0.13
Southern Willow Scrub	0.55
Non-Native Habitats	
Annual (non-native) Grassland	10.71
Agriculture	6.85
Developed	23.67
Disturbed Habitat	8.48
Ornamental	7.88
Ruderal	1.24
TOTAL	66.46

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The coastal sage scrub onsite is dominated by California sagebrush, flat-topped buckwheat, black sage, and laurel sumac, but also contains spreading goldenbush (*Isocoma menziesii* ssp. *menziesii*), bush monkey flower (*Mimulus aurantiacus*), deerweed (*Lotus scoparius* var. *scoparius*), osmadenia (*Osmadenia tenella*), rattlesnake weed (*Daucus pusillus*), blue-eyed-grass (*Sisyrinchium bellum*), splendid mariposa lily (*Calochortus splendens*), large clarkia (*Clarkia purpurea* ssp. *purpurea*) and ashy spike-moss (*Selaginella cinerascens*). The coastal sage scrub onsite contains small openings of grassland, including non-native annual grassland and valley needlegrass grassland, within the matrix of shrubs.

The disturbed coastal sage scrub community within the study area is similar in composition to coastal sage scrub as described above but supports a lower percent cover of native species. Typically these non-native species comprise approximately 30 to 50 percent cover with the remaining cover occupied by native species and bare ground. Non-native species present include Australian saltbush (*Atriplex semibaccata*), red-stemmed filaree (*Erodium cicutarium*), hottentot-fig (*Carpobrotus edulis*) and garland chrysanthemum (*Chrysanthemum coronarium*).

Approximately 5.27 acres of coastal sage scrub and 1.12 acres of disturbed coastal sage scrub are located within the study area.

4.1.3 Coyote Brush Scrub

Coyote brush scrub is not recognized as a native plant community by Holland (1986). Nonetheless, it is a distinct vegetational association in southern California, dominated by coyote brush (*Baccharis pilularis*) and a few mostly soft-leaved subshrubs such as California sagebrush scrub, with occasional evergreen shrubs. Coyote brush scrub occurs mostly in uplands, but can occur along xeric drainages as well. It generally is regarded as a sub-association of coastal sage and as a post-disturbance habitat in a successional state, with the climax community most often being coastal sage scrub.

Because coyote brush scrub is an effective colonizer of disturbed sites it can be found in xeric to seasonally mesic areas, in heavily disturbed upland areas and flat areas or canyons and drainages that receive low seasonal flow or urban runoff. Disturbed coyote brush scrub

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typically has a low cover of native species (less than 70 to 50 percent) and large amounts of bare ground or annual grasses. Approximately 0.03 acre of coyote brush scrub is located within the study area.

4.1.4 Herbaceous Wetland (Including Disturbed Forms)

The herbaceous wetlands onsite are dominated by two non-native and one native species including: Australian brass-buttons (*Cotula australis*), rabbit's-foot grass (*Polypogon monspeliensis*) and fleabane (*Pluchea* sp.). Limited amounts of winged three-square (*Scirpus americanus*) and cattail (*Typha* sp.) were present in ponding areas. Limited amounts of sprangletop grass (*Leptochloa* sp.) also were present. Disturbed herbaceous wetland is similar in composition to the undisturbed form, but with a higher occurrence of non-native species and a lower coverage of native species. Typically these non-native species comprise approximately 30 to 50 percent cover with the remaining cover occupied by native species and bare ground. Approximately 0.01 acre of herbaceous wetlands and 0.05 acre of disturbed herbaceous wetlands were identified within the study area.

Herbaceous wetland (including variations) is considered a wetland community under the jurisdiction of the CDFG, pursuant to Section 1602 of the California Fish and Game Code; the ACOE, pursuant to Section 404 of the federal Clean Water Act; and the RWQCB pursuant to Section 401 of the federal Clean Water Act.

4.1.5 Disturbed Mule Fat Scrub

Mule fat scrub is an early seral community strongly dominated by mule fat scrub (*Baccharis salicifolia*). It occurs mainly along major drainages and floodplains where the riparian habitat is open or disturbed. Frequent flooding or scouring apparently maintain this community in an early successional state. Characteristic plant species in this community include mule fat, coyote brush (*Baccharis pilularis*), western ragweed (*Ambrosia psilostachya* var. *californica*), San Diego marsh-elder (*Iva hayesiana*), southwestern spiny rush (*Juncus acutus* var. *leopoldii*) and a few other obligate or facultative wetland species (Holland 1986). Disturbed mule fat scrub is the same association but with obvious soil disturbance, less native shrub cover and significantly more bare ground or weed cover. Typically these non-native species comprise approximately 30 to 50 percent cover with the remaining cover occupied by native species and bare ground. Approximately 0.14 acre of disturbed mule fat scrub was identified within

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the study area.

Mule fat scrub (including variations) is considered a wetland community is under the jurisdiction of the CDFG, pursuant to Section 1602 of the California Fish and Game Code; the ACOE, pursuant to Section 404 of the federal Clean Water Act; and the RWQCB pursuant to Section 401 of the federal Clean Water Act.

4.1.6 Open Channel/Jurisdictional Waters of the U.S.

Open channel typically refers to unvegetated portions of ephemeral drainage channels. Within the tri-agency pipeline easement (*Figure 13*), open channel is comprised of ungrouted riprap bound by one 36-inch culvert to the north and two 24 inch culverts to the south. Approximately 0.07 acre of open channel was identified within the study area. Open channel is considered a jurisdictional water of the U.S.

All unvegetated ephemeral channels within the study area are defined by a distinct bed and bank and range in width from approximately two to 10 feet wide. These channels do not support wetlands vegetation. However, as stream channels, these areas are considered non-wetland waters of the U.S. and as such are regulated by Sections 401 and 404 of the federal Clean Water Act and Section 1602 of the California Fish and Game Code.

4.1.7 Scrub Oak Chaparral

According to Holland (1986), scrub oak chaparral is a dense, evergreen chaparral to 20 feet tall, dominated by Nuttall's scrub oak (*Quercus dumosa Nutt.*) with considerable birch-leaf mountain-mahogany (*Cercocarpus betuloides*). Within the study area, approximately 0.13 acre of this community occurs along the alignment located immediately northeast of the intersection of El Camino Real and Palomar Airport Road. Nuttall's scrub oak dominates this community.

4.1.8 Southern Willow Scrub

Southern willow scrub is a broad-leafed, winter-deciduous riparian community dominated by willow (*Salix* spp.) species, with scattered Fremont's cottonwood (*Populus fremontii*), western sycamore (*Platanus racemosa*) and lesser amounts of mulefat (Holland 1986). Due

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to the high density of the shrub canopy, the understory is fairly depauperate. This community is typically found along intermittent streams and creeks in southern California.

The southern willow scrub within the project area is dominated by arroyo willow (*Salix lasiolepis* var. *lasiolepis*) but also contains mule fat (*Baccharis salicifolia*). Other species within this vegetation community consist of telegraph weed (*Heterotheca grandiflora*), foxtail chess and virgate wreath-plant (*Stephanomeria virgata* ssp. *virgata*).

The southern willow scrub community within the project area has a relatively high percentage of mule fat associated with it in some places. Approximately 0.55 acre of southern willow scrub was identified within the study area.

Southern willow scrub (including variations) is considered a wetland community under the jurisdiction of the CDFG, pursuant to Section 1602 of the California Fish and Game Code; the ACOE, pursuant to Section 404 of the federal Clean Water Act; and the RWQCB pursuant to Section 401 of the federal Clean Water Act.

4.1.9 Annual (Non-native) Grassland

Non-native grasslands characterized by weedy, introduced annuals, primarily grasses, including wild oat (*Avena* spp.), bromes (*Bromus diandrus*, *B. madritensis*, *B. hordeaceus*), black mustard (*Brassica nigra*), filaree (*Erodium botrys* and *E. cicutarium*), and Russian-thistle (*Salsola tragus*). It may occur where disturbance by maintenance (mowing, scraping, discing, spraying, etc.), grazing, repetitive fire, agriculture, or other mechanical disruption have altered soils and removed native seed sources from areas formerly supporting native vegetation. Annual grasslands may support sensitive plant and animal species and provide valuable foraging habitat for raptors (birds of prey).

Within the project area non-native grasslands consist of wild oat (*Avena fatua*), ripgut grass (*Bromus diandrus*), foxtail chess (*Bromus madritensis* ssp. *rubens*), foxtail barley (*Hordeum murinum*), purple needle grass (*Nassella lepida*) and ruderal forb species such as garland chrysanthemum, tocalote (*Centaurea melitensis*) and black mustard. Within the non-native annual grassland onsite, a few scattered shrubs such as California bush sunflower occur. Approximately 10.71 acres of non-native grassland were identified within the study area.

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4.1.10 Agriculture

For the purposes of this report, agriculture refers to areas where irrigated row and field crops are being grown (*i.e.*, intensive agriculture) for commercial flowers and crops. This land has little biological resource value because it provides very limited habitat for most native species. Approximately 6.85 acres of agricultural lands were identified within the study area.

4.1.11 Developed Land

Developed land is characterized by areas occupied by structures or associated commercial, residential and industrial development, paving and other impermeable surfaces. Approximately 22.67 acres of developed land was identified within the study area.

4.1.12 Disturbed Habitat

Disturbed habitat refers to areas that lack vegetation entirely. These areas generally are the result of severe or repeated mechanical disturbance. Within the project site, disturbed habitat includes dirt roads and areas which have been frequently disced. Approximately 8.48 acres of disturbed habitat were identified within the study area.

4.1.13 Ornamental

Ornamental plantings include areas where landscape plantings have been installed and are maintained. Within the study area ornamental plantings include: jade plant (*Crassula ovata*), hottentot-fig, statice (*Limonium perezii*), eucalyptus trees (*Eucalyptus* sp.), sweet pea (*Lathyrus* sp.) and garland chrysanthemum. Approximately 7.88 acres of ornamental planting were identified within the study area.

4.1.14 Ruderal

Ruderal habitat refers to areas that are dominated by weedy, herbaceous, non-native vegetation. These areas generally are the result of frequent, often mechanical disturbance, allowing the invasion of non-native species. The areas of ruderal habitat onsite are sparsely vegetated and are characterized by non-native species such as Australian saltbush, red-

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stemmed filaree, sweet fennel, hottentot-fig, bromes and garland chrysanthemum. Approximately 1.24 acre of ruderal habitat was identified within the project area.

4.1.15 Floral Diversity

A total of 135 plant species was detected within the project study area of which 77 species (57 percent) are native. *APPENDIX A* contains a complete list of the plant species observed within the project site.

4.2 Zoology - Wildlife Diversity

4.2.1 Birds

Thirty-nine bird species were observed during the survey visits (*Appendix B*). The diversity of birds is limited due to the high levels of urbanization and relatively low habitat quality throughout the study area. The habitats and land covers within the study area provide habitat for a variety of birds, including house finch (*Carpodacus mexicanus*), Anna's hummingbird (*Calypte anna*), California towhee (*Pipilo crissalis*), bushtit (*Psaltiriparus minimus*), American crow (*Corvus brachyrhynchos*) and the federally-listed threatened coastal California gnatcatcher. All species were observed within the offsite pipeline study area with the exception of a brown pelican (*Pelecanus occidentalis californicus*), state- and federally-listed as endangered, which was observed west of the Encina Power Station over open water.

4.2.2 Reptiles and Amphibians

Two reptile species were observed onsite: side-blotched lizard (*Uta stansburiana*) and western fence lizard (*Sceloporus occidentalis*). However, reptiles common in the area and likely to occur onsite include gopher snake (*Pituophis melanoleucus*), red-diamond rattlesnake (*Crotalus ruber*), coachwhip (*Masticophis flagellum*) and common kingsnake (*Lampropeltis getulus*), among others.

No amphibian species were observed during the survey; however, one or more of the following species may occur within the study area: garden slender salamander (*Batrachoseps attenuatus*), western toad (*Bufo boreas*) and Pacific treefrog (*Hyla regilla*).

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Habitat quality for reptiles and amphibians is low and the diversity of these species is expected to be low because of the small amount of habitat available and the likely negative effects of the adjacent urban environment.

4.2.3 Mammals

Ten mammal species, or their sign, were observed within the study area during the survey including: brush rabbit (*Sylvilagus bachmani*), Botta's pocket gopher (*Thomomys bottae*), California ground squirrel (*Spermophilus beecheyi*), deer mouse (*Peromyscus maniculatus*), woodrat (*Neotoma* sp.), striped skunk (*Mephitis mephitis*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), common raccoon (*Procyon lotor*) and domestic dog (*Canis familiaris*). Mammals not observed onsite but likely to be present include California pocket mouse (*Chaetodipus californicus*), California mouse (*Peromyscus californicus*), Dulzura California pocket mouse (*Chaetodipus californicus femoralis*), cactus mouse (*Peromyscus eremicus*) and Virginia opossum (*Didelphis virginiana*).

4.2.4 Invertebrates

Ten (10) species of butterfly and one (1) skipper were recorded during surveys including: morning cloak (*Nymphalis antiopa*), cabbage butterfly (*Pieris rapae*), common white (*Pontia protodice*), west coast lady (*Vanessa annabella*), buckeye (*Junonia coenia*), Behr's metalmark (*Apodemia mormo virgulti*), marine blue (*Leptotes marina*), acmon blue (*Plebejus acmon*), California ringlet (*Coenonympha tullia*), tiger swallowtail (*Papilio rutulus*) and fiery skipper (*Hylephila phyleus*). The moderate plant species richness within most of the project corridor is undoubtedly accompanied by a fairly diverse number of phytophagous (plant-feeding) insect species. In particular, a variety of species of Lepidoptera (butterflies and moths) and a comparable number of Coleoptera (beetles), Hymenoptera (bees, ants and wasps), and Diptera (flies) are expected to be present within the local area.

4.3 Sensitive Biological Resources

The following resources are discussed in this section: **(1)** plant and animal species present in the project vicinity that are given special recognition by federal, state, or local conservation agencies and organizations owing to declining, limited, or threatened populations, that are

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the results, in most cases, of habitat reduction; and **(2)** habitat areas that are unique, are of relatively limited distribution, or are of particular value to wildlife. Sources used for determination of sensitive biological resources are as follows: **wildlife** --USFWS (2004), CDFG (2004 a, b, c, d and e), Remsen (1978), Everett (1979), McGurty (1980), and Murphy (1990); **plants** -- USFWS (2004), CDFG (2004 a, b, c, d and e), and CNPS (2004); and **habitats** -- Holland (1986).

4.3.1 Sensitive Plants

The suitability of the site, based on geographic location, soils and habitats present, to support sensitive plant species was evaluated during the surveys. *Table 3* lists those species which have likelihood of occurring on the property based on its location and provides the results of the suitability evaluation. The listing authorities and explanation of listing categories are presented in *APPENDIX C*.

No plant species listed as rare, threatened, or endangered by the USFWS or the CDFG were detected in the study area. One plant species designated as sensitive by the CNPS was detected in the project area in the City of Carlsbad: San Diego County viguiera (*Viguiera laciniata*), a CNPS List 4 species. Spatial distribution of this species is presented in *Figure 11* and species descriptions are presented below.

San Diego County viguiera is a CNPS List 4 species which is of limited distribution or infrequent throughout a broader area in California. Their vulnerability or susceptibility to threat appears relatively low at this time (CNPS Inventory 2004). Approximately 75-100 individuals were observed within disturbed coastal sage scrub along the segment located adjacent to Maerke Reservoir (*Figure 11*).

The potential for additional sensitive plant species to occur within the study area is discussed in *Table 4* below.

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TABLE 4
SENSITIVE PLANT SPECIES DETECTED
OR POTENTIALLY OCCURRING ON THE PROJECT SITE

Scientific Name	Common Name	Status Federal/ State/MHCP	CNPS List, R-E-D	Primary Habitat Associations/ Life Form/ Blooming Period	Status Onsite or Potential to Occur
<i>Acanthomintha ilicifolia</i>	San Diego thornmint	FT/ SE/ NE	1B, 2-3-2	Chaparral, coastal scrub, valley and foothill grassland, vernal pools; clay/ annual herb/ April-June	Low potential to occur; no vernal pools present within the study area. Not detected during 2004 surveys.
<i>Adolphia californica</i>	California adolphia	None/ None/None	2, 1-3-1	Chaparral, coastal scrub, valley and foothill grassland; clay/ shrub/ December-May	Moderate potential to occur onsite.
<i>Ambrosia pumila</i>	San Diego ambrosia	FE/ None/ NE	1B, 3-3-2	Chaparral, coastal scrub, valley and foothill grassland, vernal pools; often in disturbed areas/ perennial herb/ May - October	Low potential to occur; no vernal pools present within the study area. Not detected during 2004 surveys.
<i>Aphanisma blitoides</i>	Aphanisma	None/ None/None	1B, 2-2-2	Coastal bluff scrub, coastal dunes, coastal scrub; sandy/ annual herb/ March - June	Low potential to occur onsite. No suitable habitat present on project site. Not observed during 2004 surveys.
<i>Arctostaphylos glandulosa</i> ssp. <i>crassifolia</i>	Del Mar manzanita	FE/ None/ NE	1B, 3-3-2	Maritime chaparral; sandy/ shrub/ December-April	Low potential to occur onsite. Perennial, would have been observed during surveys.
<i>Astragalus tener</i> var. <i>titi</i>	Coastal dunes milk-vetch	FE/ SE/None	1B, 3-3-3	Coastal bluff scrub, coastal dunes,	Low potential to occur onsite. No suitable

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TABLE 4 (Continued)

Scientific Name	Common Name	Status Federal/ State/MHCP	CNPS List, R-E-D	Primary Habitat Associations/ Life Form/ Blooming Period	Status Onsite or Potential to Occur
				coastal prairie/ annual herb/ March- May	habitat present within project area. Not observed during 2004 surveys.
<i>Atriplex pacifica</i>	South Coast saltscale	None/ None/None	1B, 3-2-2	Coastal bluff scrub, coastal dunes, coastal scrub, playas/ annual herb/ March- October	No suitable habitat within project area. Not observed during 2004 surveys.
<i>Baccharis vanessae</i>	Encinitas baccharis	FT/ SE/ NE	1B, 2-3-3	Chaparral, cismontane woodland; sandstone/ deciduous shrub/ August- November	Low potential to occur onsite. Perennial, would have been observed during surveys.
<i>Bergerocactus emoryi</i>	Golden-spined cereus	None/ None/None	2, 2-2-1	Closed-cone conifer forest, chaparral, coastal scrub; sandy/ shrub/ May-June	No potential to occur onsite. Perennial, would have been observed during surveys.
<i>Brodiaea filifolia</i>	Thread-leaved brodiaea	FT/ SE/ NE	1B, 3-3-3	Chaparral (openings) coastal scrub, cismontane woodland, playas, valley and foothill grassland, vernal pools; often clay/ bulbiferous herb/ March-June	Moderate potential to occur onsite. Very little clay soils present. Not observed during 2004 surveys.
<i>Brodiaea orcuttii</i>	Orcutt's brodiaea	None/ None/Covered	1B, 1-3-2	Closed-cone conifer forest, chaparral, cismontane woodland, meadows	Moderate potential to occur onsite. Very little clay soils present. Not observed during 2004

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TABLE 4 (Continued)

Scientific Name	Common Name	Status Federal/ State/MHCP	CNPS List, R-E-D	Primary Habitat Associations/ Life Form/ Blooming Period	Status Onsite or Potential to Occur
				and seeps, valley and foothill grassland, vernal pools; mesic, clay, sometimes serpentine/ bulbiferous herb/ May-July	surveys.
<i>Ceanothus verrucosus</i>	wart-stemmed ceanothus	None/ None/Covered	2, 2-2-1	Chaparral/ shrub/ December-April	Low potential to occur onsite. Perennial, would have been observed during surveys.
<i>Centromadia [Hemizonia] parryi</i> spp. <i>australis</i>	Southern tarplant	None/ None/None	1B, 3-3-2	Marshes and swamps (margins), valley and foothill grassland (vernally mesic), vernal pools/ annual herb/ May-November	Moderate potential to occur onsite. Little suitable habitat present onsite; not observed during 2004 surveys.
<i>Chaenactis glabriuscula</i> var. <i>orcuttiana</i>	Orcutt's pincushion	None/ None/None	1B, 2-3-2	Coastal bluff and dune scrub / annual herb / January - August	Very low potential to occur onsite due to lack of suitable habitat. Not observed during 2004 surveys.
<i>Chorizanthe orcuttiana</i>	Orcutt's spineflower	FE/ SE/ NE	1B, 3-3-3	Maritime chaparral, closed-cone conifer forest, coastal scrub/ annual herb/ March-May	Low potential to occur onsite. Not observed during 2004 surveys, however surveys done outside of blooming period.
<i>Chorizanthe polygonoides</i> var. <i>longispina</i>	Long-spined spineflower	None/ None/None	1B, 2-2-2	Chaparral, coastal scrub, meadows and seeps, valley and	Low potential to occur onsite. Not observed during 2004 surveys.

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TABLE 4 (Continued)

Scientific Name	Common Name	Status Federal/ State/MHCP	CNPS List, R-E-D	Primary Habitat Associations/ Life Form/ Blooming Period	Status Onsite or Potential to Occur
				foothill grassland; often clay/ annual herb/ April-July	
<i>Comarostaphylis diversifolia</i> ssp. <i>diversifolia</i>	Summer-holly	None/ None/Covered	1B, 2-2-2	Chaparral, cismontane woodland/ shrub/ April-June	No potential to occur onsite. Perennial, would have been observed during surveys.
<i>Coreopsis maritima</i>	Sea dahlia	None/ None/None	2, 2-2-1	Coastal bluff scrub, coastal scrub/ perennial herb/ March-May	Low potential to occur onsite. Not observed during 2004 surveys.
<i>Corethrogyne filaginifolia</i> var. <i>incana</i>	San Diego sand aster	None/ None/None	1B, 3-3-2	Chaparral, coastal bluff scrub, coastal scrub/ perennial herb/ June-September	Low potential to occur onsite. Not observed during 2004 surveys.
<i>Corethrogyne filaginifolia</i> var. <i>linifolia</i>	Del Mar Mesa sand aster	None/ None/ NE	1B, 3-3-3	Maritime chaparral (openings), coastal bluff scrub, coastal scrub; sandy/ perennial herb/ May- September	Moderate potential to occur onsite.
<i>Dudleya blochmaniae</i> spp. <i>blochmaniae</i>	Blochman's dudleya	None/ None/Covered	1B, 2-3-2	Chaparral, coastal bluff scrub, coastal scrub, valley and foothill grassland, rocky; often clay or serpentinite/ perennial herb/ April- June	Low potential to occur onsite. Not observed during 2004 surveys.
<i>Dudleya viscida</i>	Sticky dudleya	None/ None/ Covered	1B, 2-2-3	Coastal bluff scrub, chaparral, coastal scrub; rocky/	No potential to occur onsite; no appropriate soils. Not observed

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TABLE 4 (Continued)

Scientific Name	Common Name	Status Federal/ State/MHCP	CNPS List, R-E-D	Primary Habitat Associations/ Life Form/ Blooming Period	Status Onsite or Potential to Occur
				perennial herb/ May- June	during 2004 surveys.
<i>Eryngium aristulatum</i> var. <i>parishii</i>	San Diego button- celery	FE/ SE/NE	1B, 2-3-2	Coastal scrub, valley and foothill grassland, vernal pools, mesic areas/ annual-perennial herb/ April-June	Moderate potential to occur onsite. Not observed during 2004 surveys.
<i>Euphorbia misera</i>	Cliff spurge	None/ None/ MHCP	2, 2-2-1	Coastal bluff scrub, coastal scrub; rocky/ shrub/ December- August	No potential to occur onsite. Perennial, would have been observed during surveys.
<i>Ferocactus viridescens</i>	San Diego barrel cactus	None/ None/ Covered	2, 1-3-1	Chaparral, coastal scrub, valley and foothill grassland, vernal pools/ shrub/ May-June	Moderate potential to occur onsite. Perennial, would have been observed during surveys.
<i>Geothallus tuberosa</i>	Campbell's liverwort	None/ None/None	1B, 3-3-3	Coastal scrub (mesic), vernal pools, soil / ephemeral liverwort / NA	Moderate potential to occur onsite. Not observed during 2004 surveys.
<i>Hazardia orcuttii</i>	Orcutt's hazardia	None/ None/ NE	1B, 3-3-2	Chaparral, coastal scrub; often clay/ evergreen shrub/ August-October	Low potential to occur onsite; no clay soils present. Perennial, would have been observed during surveys.
<i>Isocoma menziesii</i> var. <i>decumbens</i>	Decumbent goldenbush	None/ None/None	1B, 2-2-2	Chaparral, coastal scrub (sandy, often disturbed areas)/ shrub/ April- November	Low potential to occur onsite. Perennial, would have been observed during surveys.

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TABLE 4 (Continued)

Scientific Name	Common Name	Status Federal/ State/MHCP	CNPS List, R-E-D	Primary Habitat Associations/ Life Form/ Blooming Period	Status Onsite or Potential to Occur
<i>Iva hayesiana</i>	San Diego marsh-elder	None/ None/ Covered	2, 2-2-1	Marshes and swamps, playas/ perennial herb/ April-September	No potential to occur onsite; no appropriate habitat. Not observed during 2004 surveys.
<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	Coulter's goldfields	None/ None/None	1B, 2-3-2	Saltwater marsh and swamps, playas, vernal pools/ annual herb/ February-June	Moderate potential to occur onsite; no appropriate marsh or swamp habitat present. Not observed during 2004 surveys.
<i>Lotus nuttallianus</i>	Nuttall's lotus	None/ None/ NE	1B, 3-3-2	Coastal dunes, coastal scrub/ annual herb/ March-June	Low potential to occur onsite. Not observed during 2004 surveys.
<i>Muilla clevelandii</i>	San Diego goldenstar	None/ None/ NE	1B, 2-3-2	Chaparral, coastal scrub, valley and foothill grassland, vernal pools; clay/ bulbiferous herb/ May	Moderate potential to occur onsite. Not observed during 2004 surveys.
<i>Myosurus minimus</i> ssp. <i>apus</i>	Little mousetail	FSC/ None/NE	3, 2-3-2	Vernal pools (alkaline)/annual herb/ March-June	Moderate potential to occur onsite. Not observed during 2004 surveys.
<i>Nama stenocarpum</i>	mud nama	None/ None/None	2, 3-2-1	Marsh and swamps, lake margins and riverbanks/annual- perennial herb/January-July	Moderate potential to occur onsite. Not observed during 2004 surveys.

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TABLE 4 (Continued)

Scientific Name	Common Name	Status Federal/ State/MHCP	CNPS List, R-E-D	Primary Habitat Associations/ Life Form/ Blooming Period	Status Onsite or Potential to Occur
<i>Navarretia fossalis</i>	Spreading navarretia	FT/ None/ NE	1B, 2-3-2	Chenopod scrub, shallow freshwater marsh and swamps, vernal pools/annual herb/April-June	Moderate potential to occur onsite. No appropriate scrub, marsh, or swamp habitat present. Not observed during 2004 surveys.
<i>Nemacaulis denudata</i> var. <i>denudata</i>	Coast woolly- heads	None/ None/None	1B, 2-2-2	Coastal dunes/ herb/ April -September	Very low potential to occur onsite. Not observed during 2004 surveys.
<i>Nemacaulis denudata</i> var. <i>gracilis</i>	Slender woolly- heads	None/ None/None	2, 2-2-1	Coastal dunes, desert dunes, Sonoran desert scrub/ annual herb/ (March)-May	Very low potential to occur onsite. Not observed during 2004 surveys.
<i>Nolana cismontana</i>	Chaparral beargrass	None/ None/None	1B, 3-2-3	Chaparral, coastal scrub; sandstone or gabbro/ evergreen shrub/ May-July	No potential to occur onsite; no gabbro soils. Perennial, would have been observed during surveys.
<i>Orcuttia californica</i>	California Orcutt grass	FE/ SE/ NE	1B, 3-3-2	Vernal pools/ annual herb/ April-August	Moderate potential to occur onsite. Not observed during 2004 surveys.
<i>Phacelia stellaris</i>	Brand's phacelia	None/ None/None	1B, 3-3-2	Coastal dunes, coastal scrub/ annual herb/ March-June	Low potential to occur onsite. Not observed during 2004 surveys.
<i>Quercus dumosa</i>	Nuttall's scrub oak	None/ None/Coved	1B, 2-3-2	Chaparral, coastal scrub, closed-cone coniferous forest; sandy and clay loam/evergreen	Detected in one location during surveys: dominating scrub oak chaparral located immediately

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TABLE 4 (Continued)

Scientific Name	Common Name	Status Federal/ State/MHCP	CNPS List, R-E-D	Primary Habitat Associations/ Life Form/ Blooming Period	Status Onsite or Potential to Occur
				shrub/ February- March	east of McClellan Palomar Airport.
<i>Sphaerocarpus drewei</i>	Bottle liverwort	None/ None/None	1B, 3-3-3	Chaparral, coastal scrub (openings) / ephemeral liverwort / NA	Low potential to occur onsite. Not observed during 2004 surveys.
<i>Suaeda esteroa</i>	Estuary seablite	None/ None/None	1B, 2-2-2	Coastal salt marshes and swamps/ perennial herb/ May - (January)	No potential to occur onsite. Not observed during 2004 surveys.
<i>Viguiera laciniata</i>	San Diego County viguiera	None/ None/None	4, 1-2-1	Chaparral, coastal sage scrub/shrub/February- June	Approximately 75-100 individuals were observed within the study area.

4.3.2 Sensitive Wildlife Species

Focused surveys resulted in observation of one federally-listed threatened wildlife species: coastal California gnatcatcher. One individual was detected within the study area near Maerle Reservoir in the City of Carlsbad (*Figure 11*). The California gnatcatcher is an HMP covered species. Two non-listed wildlife species considered California State Species of Special Concern, the northern harrier and Cooper's hawk, also were observed near the Maerle Reservoir (*Figure 11*). *Table 5* lists other sensitive wildlife species known from the region and the potential for their occurrence within the project area.

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TABLE 5
SENSITIVE WILDLIFE SPECIES DETECTED OR
POTENTIALLY OCCURRING IN STUDY AREA

Scientific Name	Common Name	Status Federal/State HMP/MHCP	Primary Habitat Associations	Status Onsite or Potential to Occur
AMPHIBIANS				
<i>Scaphiopus hammondi</i>	Western spadefoot toad	None/CSC, P MHCP	Most common in grasslands, coastal sage scrub near rain pools or vernal pools; riparian habitats.	Moderate potential to occur in areas supporting suitable habitat. No vernal pools present within the study area.
<i>Taricha torosa torosa</i>	Western newt	None/CSC	Grassland, woodland, forest, but require ponds, reservoirs or slow-moving streams for reproduction.	Very low potential due to lack of suitable habitat.
REPTILES				
<i>Anniella pulchra pulchra</i>	Silvery legless lizard	FS, CNF/CSC	Loose soils (sand, loam, humus) in coastal dune, coastal sage scrub, woodlands, and riparian habitats	Moderate potential to occur based on habitat present.
<i>Arizona elegans occidentalis</i>	Coastal (California) glossy snake	None/None	Grassland, chaparral, coastal sage scrub, woodlands in sandy and rocky substrates	Moderate potential to occur based on habitat present.
<i>Charina [Lichanura] trivirgata roseofusca</i>	Coastal rosy boa	FS, CNF/None	Rocky chaparral, coastal sage scrub, oak woodlands, desert and semi-desert scrub	Moderate potential to occur based on habitat present.
<i>Clemmys marmorata pallida</i>	Southwestern pond turtle	FS, CNF/CSC, P, MHCP	Slow-moving permanent or intermittent streams, ponds, small lakes, reservoirs with emergent basking sites; adjacent uplands used during winter	Very low potential due to lack of suitable habitat.
<i>Cnemidophorus tigris multiscutatus</i>	Coastal western whiptail	None/None	Coastal sage scrub, chaparral	Moderate potential to occur where suitable habitat is present.
<i>Cnemidophorus hyperythrus</i>	Orange-throated whiptail	None/CSC, P HMP/MHCP	Coastal sage scrub, chaparral, grassland, juniper and oak woodland	Moderate potential to occur where suitable habitat is

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TABLE 5 (Continued)

Scientific Name	Common Name	Status Federal/State HMP/MHCP	Primary Habitat Associations	Status Onsite or Potential to Occur
<i>beldingi</i>				present.
<i>Crotalus ruber ruber</i>	Northern red-diamond rattlesnake	None/CSC	Variety of shrub habitats where there is heavy brush, large rocks, or boulders	Moderate potential to occur based on habitat present.
<i>Diadophis punctatus similis</i>	San Diego ringneck snake	FS, CNF/None	Moist habitats; woodland, forest, grassland, chaparral; typically found under debris	Moderate potential to occur based on habitat present.
<i>Eumeces skiltonianus interparietalis</i>	Coronado Island skink	BLM/CSC	Grassland, riparian and oak woodland; found in litter, rotting logs, under flat stones	Low potential to occur due to limited amount of suitable habitat and surrounding urbanization.
<i>Phrynosoma coronatum blainvillei</i>	San Diego horned lizard	FS, CNF/CSC, P MHCP	Coastal sage scrub, annual grassland, chaparral, oak and riparian woodland, coniferous forest	Moderate potential to occur where suitable habitat is present.
<i>Salvadora hexalepis virgulata</i>	Coast patch-nosed snake	None/CSC	Chaparral, washes, sandy flats, rocky areas	Moderate potential to occur based on habitat present.
<i>Sceloporus orcuttii orcuttii</i>	Granite spiny lizard	None/None	Granite rock outcrops within forest, woodland, chaparral and coastal sage scrub habitats	Very low potential due to lack of granite outcrops.
<i>Thamnophis sirtalis infernalis</i>	California red-sided garter snake	None/CSC	Marshes, meadows, sloughs, ponds, slow-moving water courses	Very low potential due to limited suitable habitat and because site is located south of known range for the species.
<i>Thamnophis hammondi</i>	Two-striped garter snake	FS, BLM, CNF/CSC, P	Streams, creeks, pools, streams with rocky beds, ponds, lakes, vernal pools	Moderate potential to occur where suitable habitat is present.
BIRDS				
<i>Accipiter cooperii</i>	Cooper's hawk	PIF, SBNF/CSC HMP/MHCP	Riparian and oak woodlands, montane canyons	One individual detected at the Maerkle Reservoir during surveys.
<i>Accipiter striatus</i>	Sharp-shinned hawk	PIF, SBNF/CSC	Nests in coniferous forests, ponderosa pine, black oak, riparian	Does not breed on coastal slope in California, but may occur

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TABLE 5 (Continued)

Scientific Name	Common Name	Status Federal/State HMP/MHCP	Primary Habitat Associations	Status Onsite or Potential to Occur
<i>Agelaius tricolor</i>	Tricolored blackbird	PIF, MNBMC/CSC MHCP	deciduous, mixed conifer, Jeffrey pine; winters in lowland woodlands and other habitats Nests near fresh water, emergent wetland with cattails or tules; forages in grasslands, woodland, agriculture	onsite during winter. Very low potential to occur due to lack of adequate breeding habitat.
<i>Aimophila ruficeps canescens</i>	So. Cal. rufous-crowned sparrow	None/CSC HMP/MHCP	Grass-covered hillsides, coastal sage scrub, chaparral with boulders and outcrops	Moderate potential to occur where suitable habitat is present.
<i>Ammodramus savannarum</i>	Grasshopper sparrow	PIF, SMC/None MHCP	Open grassland and prairie, especially native grassland with a mix of grasses and forbs	Low potential to occur in study area due to limited habitat availability and high level of urbanization. Suitable habitat is limited to small patches of non-native grassland spread throughout the study area.
<i>Amphispiza belli belli</i>	Bell's sage sparrow	PIF, SMC/CSC MHCP	Coastal sage scrub and dry chaparral along coastal lowlands and inland valleys	Moderate potential to occur where suitable habitat present (i.e., large areas of suitable habitat are only present east of College Blvd.
<i>Aquila chrysaetos</i>	Golden eagle	PIF, SBNF/CSC, P MHCP	Open country, especially hilly and mountainous regions; grassland, coastal sage scrub, chaparral, oak savannas, open coniferous forest	Low potential to occur based on surrounding urbanization; site may be within a foraging territory, however, no nesting habitat is present within the proposed alignment.
<i>Ardea herodias</i>	Great blue heron	None/None	Variety of habitats, but primarily wetlands; lakes, rivers, marshes, mudflats, estuaries, saltmarsh, riparian habitats	Detected during surveys.

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TABLE 5 (Continued)

Scientific Name	Common Name	Status Federal/State HMP/MHCP	Primary Habitat Associations	Status Onsite or Potential to Occur
<i>Asio otus</i>	Long-eared owl	PIF, SBNF/CSC	Riparian, live oak thickets, other dense stands of trees, edges of coniferous forest	Very unlikely to occur due to lack of suitable habitat and surrounding urbanization.
<i>Botarus lentiginosus</i>	American bittern	PIF, SMC/None	Emergent habitat of freshwater marsh and vegetation borders of ponds and lakes	Low potential to occur due to lack of suitable habitat.
<i>Buteo swainsoni</i>	Swainson's hawk	PIF/ST	Open grassland, shrublands, croplands	Low potential to occur as a migrant.
<i>Buteo regalis</i>	Ferruginous hawk	PIF, SMC/CSC, P	Open, dry country, grasslands, open fields, agriculture	Low potential to occur as a migrant.
<i>Buteo lineatus</i>	Red-shouldered hawk	None/None	Riparian and woodland habitats, eucalyptus	Low potential to occur due to lack of suitable habitat.
<i>Butorides virescens</i>	Green heron	None/None	Lakes, marshes, streams	Low potential to occur due to lack of suitable habitat.
<i>Campylorhynchus brunneicapillus cousei</i>	Coastal cactus wren	FS, CNF/CSC MHCP	Southern cactus scrub, maritime succulent scrub, cactus thickets in coastal sage scrub	Low potential to occur due to lack of suitable habitat.
<i>Cathartes aura</i>	Turkey vulture	SBNF/None	Rangeland, agriculture, grassland; uses cliffs and large trees for roosting, nesting and resting	Moderate potential to forage within study area; no suitable breeding habitat within study area.
<i>Catharus ustulatus</i>	Swainson's thrush	PIF, SBNF/CSC	Riparian habitat with dense understory and dense shrubs	Moderate potential to occur in association with limited riparian habitat in project vicinity.
<i>Charadrius alexandrinus nivosus</i>	Western snowy plover	FT, MNBMC/CSC (only coastal nesting population is listed) HMP/MHCP	Nesting habitat along coast includes sandy or gravelly beaches; inland nesting habitat is barren or sparsely vegetated ground at alkaline or saline lakes, reservoirs, ponds, riverine sand bars, and sewage, salt-evaporation and agriculture waste-water ponds	No potential to occur within study area due to lack of suitable habitat.

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TABLE 5 (Continued)

Scientific Name	Common Name	Status Federal/State HMP/MHCP	Primary Habitat Associations	Status Onsite or Potential to Occur
<i>Charadrius montanus</i>	Mountain plover	PFT, SMC, PIF/CSC	Nests in open, shortgrass prairies or grasslands; winters in shortgrass plains, plowed fields, open sagebrush, and sandy deserts	Very low potential to occur due to lack of suitable habitat.
<i>Circus cyaneus</i>	Northern harrier	PIF/CSC MHCP	Open wetlands (nesting), pasture, old fields, dry uplands, grasslands, rangelands, coastal sage scrub	One individual detected near the Maerkle Reservoir during surveys.
<i>Coccyzus americanus occidentalis</i>	Western yellow-billed cuckoo	PIF, SMC, FS, SBNF, CNF/ST	Dense, wide riparian woodlands and forest with well-developed understories	No potential to occur due to lack of habitat.
<i>Dendroica petechia</i>	Yellow warbler	PIF, SBNF/CSC	Nests in lowland and foothill riparian woodlands dominated by cottonwoods, alders and willows; winters in a variety of habitats	Low potential to occur as a migrant based on limited suitable habitat in project area.
<i>Elanus leucurus</i>	White-tailed kite	PIF, MNBMC, SBNF/R, P	Open grasslands, savanna-like habitats, agriculture, wetlands, oak woodlands, riparian	High potential to forage within the study area; low potential to breed due to lack of riparian woodland habitat.
<i>Empidonax traillii extimus</i>	Southwestern willow flycatcher	FE, PIF, CNF/SE HMP/MHCP	Riparian woodlands along streams and rivers with mature, dense stands of willows or alders; may nest in thickets dominated by tamarisk	Very low potential to occur; suitable habitat is highly limited and consists of small discrete patches of southern willow scrub spread throughout the alignment. Patches are too small to warrant focused surveys.
<i>Eremophila alpestris actia</i>	California horned lark	None/CSC	Open habitats, grassland, rangeland, shortgrass prairie, montane meadows, coastal plains, fallow grain fields	Moderate potential to occur in open habitat areas such as the Sunny Creek Road and Maerkle Reservoir portions of the study area.
<i>Falco columbarius</i>	Merlin	None/CSC	Nests in open country, open coniferous forest, prairie; winters in open woodlands, grasslands,	Low potential to occur as a winter migrant.

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TABLE 5 (Continued)

Scientific Name	Common Name	Status Federal/State HMP/MHCP	Primary Habitat Associations	Status Onsite or Potential to Occur
<i>Falco mexicanus</i>	Prairie falcon	PIF, SBNF/CSC	cultivated fields, marshes, estuaries and sea coasts Grassland, savannas, rangeland, agriculture, desert scrub, alpine meadows; nest on cliffs or bluffs	Low potential to occur due to lack of suitable habitat.
<i>Falco peregrinus</i>	Peregrine falcon	FE, FS, PIF, CNF, MNBMC/SE, P, CDF HMP/MHCP	Nests on cliffs, buildings, bridges; forages in wetlands, riparian, meadows, croplands, especially where waterfowl are present	Low potential to forage within the study area; unlikely; known nesting locations at Coronado island and on buildings downtown; no potential to breed within the proposed alignment due lack of suitable nest sites.
<i>Icteria virens</i>	Yellow-breasted chat	PIF, SBNF/CSC HMP/MHCP	Dense, relatively wide riparian woodlands and thickets of willows, vine tangles and dense brush.	Low potential to occur in limited riparian habitat within study area.
<i>Ixobrychus exilis hesperis</i>	Western least bittern	MNBMC/CSC	Dense emergent wetland vegetation, sometimes interspersed with woody vegetation and open water	Low potential to occur due to lack of suitable habitat.
<i>Lanius ludovicianus</i>	Loggerhead shrike	MNBMC/CSC	Open ground including grassland, coastal sage scrub, broken chaparral, agriculture, riparian, open woodland	Moderate potential to occur within study area.
<i>Nycticorax nycticorax</i>	Black-crowned night heron	None/None	Marshes, ponds, reservoirs, estuaries; nests in dense-foliaged trees and dense fresh or brackish emergent wetlands	Low potential to occur due to lack of suitable habitat.
<i>Pandion haliaetus</i>	Osprey	PIF, SBNF/CSC, CDF HMP/MHCP	Large waters (lakes, reservoirs, rivers) supporting fish; usually near forest habitats, but widely observed along the coast	Moderate potential to forage within the study area; no breeding potential.
<i>Passerculus sandwichensis rostratus</i>	Large-billed Savannah sparrow	None/CSC HMP/MHCP	Saltmarsh, pickleweed	No potential to occur within study area due to lack of suitable saltmarsh habitat.

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TABLE 5 (Continued)

Scientific Name	Common Name	Status Federal/State HMP/MHCP	Primary Habitat Associations	Status Onsite or Potential to Occur
<i>Passerculus sandwichensis beldingi</i>	Belding's Savannah sparrow	None/SE HMP/MHCP	Saltmarsh, pickleweed	No potential to occur within study area due to lack of suitable saltmarsh habitat.
<i>Pelecanus erythrorhynchos</i>	American white pelican	None/CSC (nesting colony)	Open water, coastal bays, large inland lakes	Moderate potential to occur in association with the Pacific Ocean and Agua Hedionda Lagoon. No potential to utilize study area due to lack of open water.
<i>Pelecanus occidentalis californicus</i>	California brown pelican	FE, MNBMC/SE, P HMP/MHCP	Open sea, large water bodies, coastal bays and harbors	Detected in association with the Pacific Ocean and Agua Hedionda Lagoon. No potential to utilize study area due to lack of open water.
<i>Phalacrocorax auritus</i>	Double-crested cormorant	None/CSC	Lakes, rivers, reservoirs, estuaries, ocean; nests in tall trees, rock ledges on cliffs, rugged slopes	Moderate potential to occur in association with the Pacific Ocean and Agua Hedionda Lagoon; no breeding habitat present within the study area.
<i>Picoides pubescens</i>	Downy woodpecker	None/None	Nests in deciduous (often willow) woodlands, oak woodlands, orchards, suburban plantings and occasionally conifers	Low potential due to lack of suitable habitat.
<i>Piranga flava</i>	Hepatic tanager	SBNF/CSC	Coniferous forests mixed with oak, pinyon-juniper woodland	Low potential to occur as a winter migrant.
<i>Piranga rubra</i>	Summer tanager	None/CSC	Nests in riparian woodland; winter habitats include parks and residential areas	Low potential to occur as a winter migrant.
<i>Plegadis chihi</i>	White-faced ibis	SMC/CSC HMP/MHCP	Nests in marsh; winter foraging in shallow lacustrine waters, muddy ground of wet meadows, marshes, ponds, lakes, rivers, flooded fields and estuaries	Moderate potential to occur in association with Pacific Ocean and Agua Hedionda Lagoon. No breeding potential within study area.

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TABLE 5 (Continued)

Scientific Name	Common Name	Status Federal/State HMP/MHCP	Primary Habitat Associations	Status Onsite or Potential to Occur
<i>Polioptila caeurulea</i>	Blue-gray gnatcatcher	None/None	Chaparral, brushland	High potential to occur as a winter migrant in association with coastal sage scrub and chaparral.
<i>Polioptila californica californica</i>	coastal California gnatcatcher	FT, CNF/CSC HMP/MHCP	Coastal sage scrub, coastal sage scrub-chaparral mix, coastal sage scrub-grassland ecotone, riparian in late summer	One individual detected during focused survey (<i>Figure 11</i>).
<i>Rallus longirostris levipes</i>	Light-footed clapper rail	FE/SE, P HMP/MHCP	Coastal saltmarsh	No potential to occur within study area due to lack of suitable habitat.
<i>Siala mexicana</i>	Western bluebird	None/None MHCP	Open forests of deciduous, coniferous or mixed trees, savanna, edges of riparian woodland	High potential to occur during winter; no breeding potential.
<i>Speotyto [Athene] cucularia</i>	Western burrowing owl	BLM, MNBMC/CSC HMP/MHCP	Grassland, lowland scrub, agriculture, coastal dunes and other artificial open areas	Low potential to occur along most of the study area due to limited open habitat. Moderate potential to occur in large open area associated with the Maerkle Reservoir.
<i>Sterna elegans</i>	Elegant tern	MNBMC/CSC HMP/MHCP	Coastal waters, estuaries, large bays and harbors, mudflats	High potential to occur in association with Pacific Ocean and Agua Hedionda Lagoon. No breeding potential within study area.
<i>Sterna antillarum browni</i>	California least tern	FE, MNBMC/SE, P HMP/MHCP	Coastal waters, estuaries, large bays and harbors, mudflats; nests on sandy beaches	Moderate potential to forage in Pacific Ocean and Agua Hedionda Lagoon. No breeding potential within study area.
<i>Tachycineta bicolor</i>	Tree swallow	PIF, SBNF/None	Nests in cavity-containing trees or snags near or in water; riparian forest and woodland, lodgepole pine belt; forages over water	Moderate potential to occur.

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TABLE 5 (Continued)

Scientific Name	Common Name	Status Federal/State HMP/MHCP	Primary Habitat Associations	Status Onsite or Potential to Occur
<i>Vireo bellii pusillus</i>	Least Bell's vireo	FE, CNF/SE HMP/MHCP	Nests in southern willow scrub with dense cover within 1-2 meters of the ground; habitat includes willows, cottonwoods, baccharis, wild blackberry or mesquite on desert areas	Very low potential to occur; suitable habitat is highly limited and consists of small discrete patches of southern willow scrub spread throughout the alignment. Patches are too small to warrant focused surveys.
<i>Wilsonia pusilla</i>	Wilson's warbler	PIF, SBNF/None	Nests in montane meadows and low, dense willow thickets; in migration occurs in chaparral, woodlands and forests with shrubs	Moderate potential to occur as a winter migrant.
MAMMALS				
<i>Chaetodipus fallax fallax</i>	Northwestern San Diego pocket mouse	None/CSC MHCP	Coastal sage scrub, grassland, sage scrub-grassland ecotones, sparse chaparral; rocky substrates, loams and sandy loams	High potential to occur within coastal sage scrub.
<i>Chaetodipus californicus femoralis</i>	Dulzura California pocket mouse	None/CSC	Coastal sage scrub, chaparral, riparian-scrub ecotone; more mesic areas	High potential to occur within coastal sage scrub.
<i>Dipodomys simulans</i>	Dulzura kangaroo rat	None/None	Coastal sage scrub, chaparral, grassland at elevation < 4,500 ft.	High potential to occur within coastal sage scrub and chaparral.
<i>Lepus californicus bennettii</i>	San Diego black-tailed jackrabbit	None/CSC MHCP	Arid habitats with open ground; grasslands, coastal sage scrub, agriculture, disturbed areas, rangelands	Low potential to occur due to surrounding urbanization; would have been readily detected during surveys.
<i>Neotoma lepida intermedia</i>	San Diego desert woodrat	None/CSC	Coastal sage scrub, chaparral, pinyon-juniper woodland with rock outcrops, cactus thickets, dense undergrowth	High potential to occur within coastal sage scrub and chaparral.
<i>Odocoileus hemionus</i>	Mule deer	None/Regulated MHCP	Coastal sage scrub, chaparral, riparian, woodlands, forest; often browses in open areas adjacent to cover	Very low potential to occur; unlikely due to surrounding urbanization.

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TABLE 5 (Continued)

Scientific Name	Common Name	Status Federal/State HMP/MHCP	Primary Habitat Associations	Status Onsite or Potential to Occur
<i>Onychomys torridus ramona</i>	Southern grasshopper mouse	None/CSC	Grassland, sparse coastal sage scrub	Very low potential to occur due to lack of suitable habitat.
<i>Perognathus longimembris pacificus</i>	Pacific pocket mouse	FE/CSC MHCP	Grassland, coastal sage scrub with sandy soils; along immediate coast	Very low potential; trapping studies in vicinity of project study area have been negative for this species.
<i>Puma concolor</i>	Mountain lion	SBNF/Regulated MHCP	Coastal sage scrub, chaparral, riparian, woodlands, forest; rests in rocky areas, and on cliffs and ledges that provide cover	Very low potential; surrounding urbanization likely precludes occurrence within the study area.
<i>Taxidea taxus</i>	American badger	SBNF/R	Dry, open treeless areas, grasslands, coastal sage scrub	Very low potential; surrounding urbanization likely precludes occurrence within the study area.
<i>Urocyon cinereoargenteus</i>	Gray fox	None/None	Coastal sage scrub, chaparral, riparian, woodlands, forest	High potential to occur within the study area.
INVERTEBRATES				
<i>Branchinecta lynchi</i>	Vernal pool fairy shrimp	FT/None	Vernal pools; cool-water pools with low to moderate dissolved solids	No potential to occur; no vernal pools present within the study area.
<i>Branchinecta sandiagonensis</i>	San Diego fairy shrimp	FE/None MHCP	Small, shallow vernal pools, occasionally ditches and road ruts	No potential to occur; no vernal pools present within the study area.
<i>Euphydryas editha quino</i>	quino checkerspot butterfly	FE, CNF/None MHCP	Sparsely vegetated hilltops, ridgelines, occasionally rocky outcrops; host plant <i>Plantago erecta</i> and nectar plants must be present	Project site is located outside of the USFWS protocol survey area for this species.
<i>Lycaena hermes</i>	Hermes copper	None/None MHCP	Coastal sage scrub, southern mixed chaparral supporting at least 5% cover of host plant <i>Rhamnus crocea</i>	Lack of sufficient host plant precludes occurrence onsite.

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TABLE 5 (Continued)

Scientific Name	Common Name	Status Federal/State HMP/MHCP	Primary Habitat Associations	Status Onsite or Potential to Occur
<i>Panoquia errans</i>	Saltmarsh skipper	None/None HMP/MHCP	Salt marsh from Los Angeles to Baja, Mexico	No potential to occur in study area due to lack of suitable habitat.
<i>Streptocephalus woottonii</i>	Riverside fairy shrimp	FE/None	Deep, long-lived vernal pools, vernal pool-like seasonal ponds, stock ponds; warm water pools that have low to moderate dissolved solids	No potential to occur; no vernal pools present within the study area.

Federal Designations:

BLM	Bureau of Land Management Sensitive Species
CNF	Cleveland National Forest Sensitive Species
FE	Federally-listed Endangered
FS	Forest Service Region 5 Sensitive Species
FT	Federally-listed as Threatened
MNBMC	Fish and Wildlife Service Migratory Nongame Birds of Management Concern
PFT	Proposed for listing as Federally Threatened
PIF	Partners in Flight Watch List
SBNF	San Bernardino National Forest Sensitive
SMC	Fish and Wildlife Service Region 1 Species of Management Concern

State Designations:

CDF	California Department of Forestry and Fire Protection Sensitive Species
CSC	California Special Concern Species
P	California Department of Fish and Game Protected and Fully Protected Species
R	California Rare Species
SE	State-listed as Endangered
ST	State-listed as Threatened

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4.3.3 Sensitive Habitats

Sensitive habitats are those that are considered rare within the region, support sensitive plant or wildlife species, or function as corridors for wildlife movement. Habitat types found within the study area that are considered sensitive include coastal sage scrub (including disturbed forms), scrub oak chaparral, herbaceous wetland (including disturbed forms), disturbed mule fat scrub, open channel and southern willow scrub (including disturbed forms).

4.3.4 Wildlife Corridors and Habitat Linkages

Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the immigration and emigration of animals. Wildlife corridors contribute to population viability in several ways: **(1)** they assure the continual exchange of genes between populations which helps maintain genetic diversity; **(2)** they provide access to adjacent habitat areas representing additional territory for foraging and mating; **(3)** they allow for a greater carrying capacity; and **(4)** they provide routes for colonization of habitat lands following local population extinctions or habitat recovery from ecological catastrophes (*e.g.*, fires).

Habitat linkages are patches of native habitat that function to join larger patches of habitat. They serve as connections between habitat patches and help reduce the adverse effects of habitat fragmentation. Although individual animals may not move through a habitat linkage, the linkage does represent a potential route for gene flow and long-term dispersal. Habitat linkages may serve as both live-in habitat and avenues of gene flow for small animals such as reptiles and amphibians. Habitat linkages may be represented by continuous patches of habitat or by nearby habitat "islands" that function as "stepping stones" for dispersal.

4.4 Regional Resource Planning Context

The study area analyzed in this report is situated within the Cities of Carlsbad and Oceanside, California. It falls under the sphere of influence of the Carlsbad HMP, the City of Oceanside Habitat Conservation Plan/Natural Communities Conservation Plan (hereafter, Oceanside Subarea Plan) and the City of Carlsbad LCP. Other regional resource documents are discussed briefly below.

The City of Carlsbad HMP guides biological resource planning, protection and development

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within the City in conformance with the NCCP. The HMP identifies core and linkage areas throughout the City and focuses preserve assembly in these areas. Based on proposed development and biological resources, hard and soft line Focus Planning Areas (FPA) are designated in the HMP. Hard line areas generally require 100% conservation and soft line areas generally require specific conservation standards to be implemented during development review.

The portion of the segment at McClellan Palomar Airport located east of El Camino Real (*Figure 10*) and the entire segment located on the Maerke Reservoir Property (*Figures 11 and 12*) are located within Core 5 of the Carlsbad HMP Focused Planning Areas (FPAs). These areas do not fall within any existing or proposed Hard Line Conservation Areas. No other portions of the study area are located in FPAs. The project study area contains several habitat types considered sensitive by the HMP: coastal sage scrub, scrub oak chaparral, herbaceous wetland, disturbed mule fat scrub, southern willow scrub and open channel. Sensitive species detected within the study area which are covered under the HMP include California gnatcatcher and Cooper's hawk. The California brown pelican (*Pelecanus occidentalis*), another HMP-covered species, also was detected in association with the Pacific Ocean and Agua Hedionda Lagoon. As a public infrastructure project within the proposed FPA, the HMP allows for impacts to covered habitats and species but also requires mitigation.

The Oceanside Subarea Plan guides biological resource planning, protection and development within the City in conformance with the NCCP. *Figure 13* depicts the approximately 2,800 foot segment that is situated within the sphere of this Plan. This segment is located outside of all Preserve Planning Zones identified by the Subarea Plan. However, this area supports habitats identified as sensitive by the Plan: coastal sage scrub, herbaceous wetland, southern willow scrub and open channel. The Plan allows for impacts to covered habitats but also requires mitigation.

5.0 ANTICIPATED PROJECT IMPACTS

This section addresses direct, indirect, and cumulative impacts to biological resources that would result from implementation of the proposed project.

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Direct impacts were quantified by overlaying the limits of project grading, trenching and construction staging on the biological resources map of the study area (*Figures 3 through 13*). For the purposes of this assessment, all biological resources within the limits of the proposed trenching, and drilling and receiving pits are considered temporary impacts. For lengths of the pipeline not utilizing trenchless construction (the majority of the pipeline), open trench construction techniques would be utilized. A 40-foot impact corridor has been used to assess direct impacts for trench construction.

Portions of the pipeline alignments will utilize trenchless, HDD construction in areas of sensitive environmental resources or at freeway crossings. HDD involves the drilling of a pilot hole at a prescribed angle from one end of the area to be crossed to the other utilizing a pilot drill string. Once the pilot hole is complete, the hole must be enlarged to a suitable diameter for the pipeline. This is accomplished by “pre-reaming” the hole to an appropriate diameter. A reamer is attached to the drill string and is pulled through the pilot hole by a drilling rig. Large quantities of slurry are pumped into the hole to maintain the integrity of the hole and to flush out cuttings. Once the drilled hole is enlarged, the pipeline is prefabricated, a reamer is once again attached to the drill string, and the pipeline is connected behind the reamer via a swivel. The drilling rig then pulls the reamer and pipeline through the tunnel until surfacing at the opposite end, once again circulating high volumes of drilling slurry.

Indirect Impacts are very difficult to identify and quantify but are presumed to occur. They primarily result from adverse "edge effects:" either short-term indirect impacts related to construction or long-term, chronic indirect impacts associated with the location of urban development in proximity to biological resources within natural open space. During construction of the project, short-term indirect impacts may include dust and noise which could disrupt habitat and species vitality temporarily and construction related soil erosion and runoff. However, all project grading will be subject to the typical restrictions and requirements that address erosion and runoff, including the federal Clean Water Act, National Pollution Discharge Elimination System (NPDES), and preparation of a Stormwater Pollution Prevention Plan. Long-term indirect impacts may include intrusions by humans and domestic pets, noise, lighting, invasion by exotic plant and wildlife species, effects of toxic chemicals (*e.g.*, fertilizers, pesticides, herbicides, and other hazardous materials), urban runoff from developed areas, soil erosion, litter, fire, and hydrological changes (*e.g.*, groundwater level and quality).

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Cumulative Impacts refer to incremental individual environmental effects of two or more projects when considered together. These impacts taken individually may be minor, but collectively significant as they occur over a period of time.

5.1 Direct Impacts

5.1.1 Vegetation Communities

Implementation of the proposed project would result in the direct loss of the vegetation community acreages intersecting the proposed 40-foot construction corridor associated with open trench construction techniques. All impacts are considered temporary. Losses would occur as the result of trench construction and HDD techniques. Acreages representing temporary impacts are presented in *Table 6*. Impacts were calculated by overlaying the 40-foot impact corridor over the vegetation map and all work is assumed to be contained within this impact corridor.

TABLE 6
TEMPORARY IMPACTS TO PLANT COMMUNITIES AND LAND USE TYPES *

Habitat Type	Impacts (acres)
Native Habitats	
Coyote Brush Scrub	0.03
Coastal Sage Scrub	3.84
Disturbed Coastal Sage Scrub	0.66
Herbaceous Wetland	0.01
Disturbed Herbaceous Wetland	0.05
Open Channel	0.07
Southern Willow Scrub	0.44
TOTAL NATIVE IMPACTS	5.10
Non-Native Habitats	
Annual (non-native) Grassland	4.39
Agriculture	2.12
Developed	7.95
Disturbed Habitat	4.71

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TABLE 6 (Continued)

Habitat Type	Impacts (acres)
Ornamental	3.03
Ruderal	0.82
TOTAL NON-NATIVE IMPACTS	23.02
TOTAL IMPACT**	28.12

* Numbers do not total precisely due to rounding.

Direct impacts shall be reduced through implementation of typical construction BMPs and implementation of an approved SWPPP. In order to assure that these measures are adequately protecting adjacent biological resources, construction activity shall be monitored by a qualified biologist familiar with the sensitive flora and fauna of the area. Biological monitoring shall be of a frequency and duration necessary to reasonably assure that indirect impacts are minimized. This shall include implementation of a contractor education program, verification of proper construction staking/fencing, full-time monitoring of vegetation removal, periodic monitoring of construction activity adjacent to sensitive resource areas, and reporting of contractor compliance and impact minimization measures on a monthly basis.

5.1.2 Sensitive Plants

Implementation of the proposed project would result in direct impacts to approximately 75 to 100 San Diego County viguiera within the project impact corridor, City of Carlsbad. This plant is not federally- or state-listed. No sensitive plants occur within the portion of the study area situated in Oceanside. San Diego County viguiera is designated as sensitive by the CNPS, a CNPS List 4 species. Spatial distributions of this species is presented in *Figure 11*. No plant species listed as rare, threatened, or endangered by the USFWS or the CDFG were detected in the study area.

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5.1.3 Sensitive Animals

Implementation of the proposed project would result in the temporary loss of suitable habitat for one individual coastal California gnatcatcher. This is considered a direct temporary impact.

In regard to the potential impacts to California least tern (*Sterna antillarum browni*) prey species, a study by Atwood and Kelly (1984) indicates that northern anchovy, topsmelt, jacksmelt, and deep body or slough anchovies were the primary food items eaten by Least Terns in California. Based on the tern's mobility, diversity of diet and the relatively small area of potential effect (Zone of Initial Dilution {ZID} = 1,000 foot radius from the discharge mouth), California least terns and other birds that utilize this area for foraging are not expected to be impacted by implementation of the project. Further, the lighting from the Power Plant would be directed away from the lagoon and beach and is not expected to have a significant effect on terns or their prey species.

5.1.4 Habitat Linkages/Movement Corridors

Because of the temporary nature of project impacts, no direct impacts are anticipated to habitat linkages or wildlife movement corridors.

5.2 Indirect Impacts

The project has been designed to minimize indirect impacts in both the short- and long-terms. Long-term maintenance activities would be minimal and would not prevent wildlife or plants from utilizing the resources in the area. Furthermore, because the impacts are temporary, revegetation efforts will replace resources disturbed during construction. Additional detail is provided below.

5.2.1 Vegetation Communities

Indirect impacts to vegetation communities primarily would result from adverse "edge effects." During construction of the project, edge effects may include dust which could disrupt plant vitality or construction related soil erosion and run-off. However, it is assumed that typical construction practices including dust and erosion controls will be implemented

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and will reduce these effects. Long-term indirect impacts on vegetation communities most likely would not increase as a result of this project because all impacts are considered temporary and resources will be revegetated to their pre-construction conditions.

5.2.2 Sensitive Plants

Most of the indirect impacts to vegetation communities cited above can also affect sensitive plants. However, no federally- or state-listed plants were observed within the study area. Further, substantial numbers or diversity of sensitive plants have not been observed within the project site, and indirect effects to sensitive plant species are not regarded as significant.

5.2.3 Sensitive Wildlife

Most of the indirect impacts to vegetation communities and sensitive plants cited above can also affect sensitive wildlife. In addition, short-term noise has the potential to affect wildlife activity including bird breeding behavior. Long-term maintenance-related noise is expected to be limited in volume and frequency and therefore not expected to result in indirect impacts to wildlife including coastal California gnatcatcher.

5.2.4 Habitat Linkages/Movement Corridors

Because the temporary nature of project impacts and absence of above ground project features that could preclude linkages or movements, no indirect impacts are anticipated to habitat linkages or wildlife movement corridors.

5.3 Cumulative Impacts

The HMP was developed primarily to address cumulative impacts. Since the project is consistent with the HMP, there would be no cumulative impacts. Implementation of the proposed project is not expected to encourage further development of the project area. Project implementation would have little or no effect on the completion of regional or local conservation goals, particularly the successful completion of habitat linkage or wildlife movement corridors. The proposed project in this context would not have significant cumulative effects. Moreover, the City's HMP effectively addresses cumulative impacts through its standards, preserve areas and mitigation requirements.

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6.0 ANALYSIS OF SIGNIFICANCE

6.1 Explanation of Findings of Significance

Impacts to native habitats, sensitive plants, and sensitive wildlife species must be quantified and analyzed to determine whether such impacts are significant under the California Environmental Quality Act (CEQA). CEQA Guidelines section 15064(b) states that an ironclad definition of "significant" effect is not possible because the significance of an activity may vary with the setting. Appendix G of the Guidelines, however, does provide "examples of consequences which may be deemed to be a significant effect on the environment" (Guidelines section 15064(e)). These effects include substantial effects on rare or endangered species of animal or plant or the habitat of the species. Guidelines section 15065(a) also is helpful in defining whether a project may have "a significant effect on the environment." Under that section, a proposed project may have a significant effect on the environment if the project has the potential to: **(1)** substantially degrade the quality of the environment; **(2)** substantially reduce the habitat of a fish or wildlife species; **(3)** cause a fish or wildlife population to drop below self-sustaining levels; **(4)** threaten to eliminate a plant or animal community; **(5)** reduce the number or restrict the range of a rare or endangered plant or animal; or **(6)** eliminate important examples of the major period of California history or prehistory.

The evaluation of whether or not an impact to a particular biological resource is significant must consider both the resource itself and the role of that resource in a regional context. Substantial impacts are those that contribute to, or result in, permanent loss of an important resource, such as a population of a rare plant or animal. Impacts may be important locally because they result in an adverse alteration of existing site conditions, but considered not significant because they do not contribute substantially to the permanent loss of that resource regionally. The severity of an impact is the primary determinant of whether or not that impact can be mitigated to a level below significant.

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6.2 Vegetation Communities

6.2.1 Coastal Sage Scrub (including disturbed forms)

Implementation of the project would temporarily impact approximately 3.84 acres of coastal sage scrub and 0.66 acre of disturbed coastal sage scrub. Because coastal sage scrub is known to support a variety of sensitive species regionally, and because it has been reduced in acreage throughout San Diego County, it is considered a sensitive habitat by local, state, and federal agencies. A temporary loss of 3.84 acres of coastal sage scrub and 0.66 acre of disturbed coastal sage scrub is a significant impact.

6.2.2 Coyote Brush Scrub

Implementation of the project would temporarily impact 0.03 acre of coyote brush scrub. Coyote brush scrub is a seral form of coastal sage scrub and is therefore considered sensitive. This is regarded as a significant impact.

6.2.3 Herbaceous Wetland (including disturbed forms)

Implementation of the project would temporarily impact 0.01 acre of herbaceous wetland and 0.05 acre of disturbed herbaceous wetland habitat. The HMP identifies a no net loss goal for habitats associated with wetlands. This is regarded as significant. Impacts to herbaceous wetland are subject to review under Sections 401 and 404 of the federal Clean Water Act and/or Section 1602 of the California Fish and Game Code.

6.2.4 Open Channel/Jurisdictional Waters of the U.S.

Implementation of the project would temporarily impact 0.07 acre of open channel which is considered to be jurisdictional waters of the U.S. The HMP identifies a no net loss goal for habitats associated with wetlands. This is regarded as significant. Impacts to open channel are subject to review under Sections 401 and 404 of the federal Clean Water Act and/or Section 1602 of the California Fish and Game Code.

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6.2.5 Southern Willow Scrub

Implementation of the project would temporarily impact 0.44 acre of southern willow scrub habitat. The HMP identifies a no net loss goal for habitats associated with wetlands. This is regarded as significant. Impacts to southern willow scrub are subject to review under Sections 401 and 404 of the federal Clean Water Act and/or Section 1602 of the California Fish and Game Code.

6.2.6 Annual Non-Native Grassland

Implementation of the project would temporarily impact 4.39 acres of annual non-native grassland habitat. This is regarded as significant.

6.2.7 Agriculture

Implementation of the project would temporarily impact 2.12 acres of agricultural land. This is regarded as less than significant.

6.2.8 Developed Land

Implementation of the project would temporarily impact 7.95 acres of developed land. Because developed land includes only non-vegetated areas supporting no wildlife, impacts to this area are not considered significant because of the lack of sensitivity of this land cover type.

6.2.9 Disturbed Habitat

Implementation of the project would temporarily impact 4.71 acres of disturbed habitat. These areas provide little or no habitat value and therefore impacts to this habitat are not considered significant.

6.2.10 Ornamental

Implementation of the project would temporarily impact 3.03 acres of ornamental landscaping. This land cover consists of non-native landscaped vegetation. Therefore, this impact is not considered significant.

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6.2.11 Ruderal

Implementation of the project would temporarily impact 0.82 acre of ruderal habitat. This habitat contains few native species and no sensitive species, therefore impacts to this habitat are not considered significant.

6.3 Sensitive Plants

No plant species listed as rare, threatened, or endangered by the USFWS or the CDFG were detected in the study area. One plant species designated as sensitive by the CNPS was detected in the project area: San Diego County viguiera is a CNPS List 4 species.

Impacts to San Diego County viguiera are not considered significant. This is because the CNPS RED code (1-2-1) is so low that impacts to this species do not represent a substantial reduction to the population of this species.

The HMP identifies conservation and management of habitat for the species in the preserve system as the primary mitigation for impacts to HMP-covered species. The City-wide standard for Narrow Endemics includes 100% conservation within preserve areas and at least 80% conservation outside of preserve areas.

6.4 Sensitive Wildlife

Temporary loss of occupied coastal sage scrub habitat for the federally-listed threatened coastal California gnatcatcher (*e.g.*, one individual; *Figure 11*) is considered significant.

Based on the tern's mobility, diversity of diet and the relatively small area of potential effect (ZID= 1,000 foot radius from the discharge mouth), California least terns and other birds that utilize this area for foraging are not expected to be significantly affected by implementation of the project. Further, the lighting from the desalination plant would be directed away from the lagoon and beach and is not expected to have a significant effect on terns or their prey species.

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6.5 Habitat Linkages/Wildlife Corridors

As stated previously, project impacts are temporary in nature and therefore are not expected to result in any impacts to habitat linkages or wildlife corridors.

7.0 MITIGATION REQUIREMENTS

The following conservation and mitigation measures will reduce significant effects identified in *Section 6.0* to a level less than significant. These conservation and mitigation measures were developed in a regional context as part of ongoing planning efforts consistent with the HMP and Oceanside Subarea Plan mitigation guidelines.

7.1 Vegetation Communities

According to the HMP and the Oceanside Subarea Plan mitigation guidelines, higher ratios of compensatory mitigation will be assessed to impacts occurring within an FPA or Conservation Overlay Zones. Portions of the study area that lie within an FPA as defined by the HMP include: the segment adjacent to McClellan Palomar Airport located east of El Camino Real (*Figure 10*) and the entire segment located on the Maerkle Reservoir Property (*Figures 11 and 12*). These are located within Core 5 of the Carlsbad HMP FPAs. These areas do not fall within any existing or proposed Hard Line Conservation Areas. No other portions of the study area are located in FPAs. Additionally, no portions of the study area fall within Conservation Overlay Zones as defined by the Oceanside Subarea Plan.

Because all project impacts are considered temporary, proposed mitigation includes a combination of 1:1 revegetation of in-kind habitats at the location of impact, purchase of mitigation bank credits and/or offsite acquisition of habitat for sensitive communities requiring higher than a 1:1 ratio and payment of a fee for Group F habitats. Temporary impacts to habitats designated as Group F by the HMP (*i.e.*, disturbed lands, eucalyptus and agricultural lands) are non-native and expected to recover on their own and therefore are not included in revegetation efforts. *Table 7* lists the proposed mitigation ratios for temporary impacts. Mitigation acreages for disturbed and undisturbed habitats have been added together.

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Table 7
Mitigation Ratios by Habitat Type

Habitat Type	Impact (Acres)			Mitigation Ratio	Mitigation (acres) @ ratio		
	In Coastal Zone	Outside Coastal Zone	Total		In Coastal Zone	Outside Coastal Zone	Total
Coastal Sage Scrub	0.90	3.6	4.5	2:1	1.80	7.20	9.00
Coyote Bush Scrub	0.00	0.03	0.03	2:1	0.00	0.06	0.06
Herbaceous Wetland	0.00	0.06	0.06	3:1	0.00	0.18	0.18
Open Channel	0.00	0.07	0.07	1:1	0.00	0.07	0.07
Southern Willow Scrub	0.00	0.44	0.44	3:1	0.00	1.32	1.32
Annual (non-native) grassland	0.68	3.71	4.39	Fee	0.00	0.00	0.00
Agriculture/disturbed/ruderal	3.12	4.53	7.65	Fee	0.00	0.00	0.00

Sensitive vegetation communities shall be restored to the pre-existing vegetation type. Restoration of wetlands shall be discussed in a Conceptual Wetlands Mitigation and Monitoring Plan which shall, at a minimum, include discussion of impact assessment, recording of pre-construction site conditions, post-construction site preparation, planting, irrigation, five-year maintenance and monitoring, and long-term preservation. Restoration of uplands shall be discussed in an Uplands Mitigation and Monitoring Plan which shall, at a minimum, include discussion of impact assessment, recording of pre-construction site conditions, post-construction site preparation, planting, irrigation, maintenance, and monitoring. These measures will reduce significant effects identified in *Section 6.0* to a level less than significant.

Indirect impacts including dust, soil erosion, pollution, siltation, and runoff shall be reduced through implementation of typical construction BMPs and implementation of an approved SWPPP. At a minimum, implementation of these practices shall include the following.

- Placement of stockpiles of soils and materials such that they cause minimal interference with onsite drainage patterns.
- Hay bale barriers or gravel bags shall be placed along the toes of graded slopes to help reduce sedimentation during grading operations.

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- Placement of a silt curtain or other drainage control device around construction areas shall be required to protect natural drainage channels from sedimentation.
- Dewatering conducted in accordance with the standard regulations of the RWQCB. A permit to discharge water from dewatering activities will be required.
- Use of paved roadways or designated staging areas for all equipment and vehicle refueling and maintenance.
- Implementation of dust control measures such as watering.
- Temporary fencing of the limits of the temporary construction easement and staging areas with clearly visible orange construction fencing.
- Temporary fencing of the Nuttall's scrub oak population located adjacent to the work area and northeast of the intersection of El Camino Real and Palomar Airport Road to avoid impacts.

In order to assure that these measures are adequately protecting adjacent biological resources, construction activity shall be monitored by a qualified biologist familiar with the sensitive flora and fauna of the area. Biological monitoring shall be of a frequency and duration necessary to reasonably assure that indirect impacts are minimized. This shall include implementation of a contractor education program, verification of proper construction staking/fencing, full-time monitoring of vegetation removal, periodic monitoring of construction activity adjacent to sensitive resource areas, and reporting of contractor compliance and impact minimization measures on a monthly basis. These measures shall ensure that indirect impacts on vegetation communities, including dust, erosion, sedimentation, pollution, siltation, and runoff are reduced to level below significant.

7.2 Sensitive Wildlife

The temporary loss of habitat for sensitive wildlife shall be mitigated through implementation of the habitat restoration plans discussed above. In addition, the potential for direct impacts to coastal California gnatcatcher individuals shall be mitigated by restricting the clearing of coastal sage scrub within the project alignment to outside of the gnatcatcher breeding season (*i.e.*, August 16 through February 14).

Indirect impacts to sensitive wildlife are similar to potential indirect impacts to sensitive vegetation communities. Thus, mitigation measures discussed in *Section 7.1* above, also serve

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to reduce indirect impacts to sensitive wildlife. The potential short-term increase in noise related to construction shall be mitigated through avoidance of construction during the gnatcatcher breeding season or maintenance of noise levels below 60 dBA Leq at occupied nest locations if construction takes place during the breeding season (*i.e.*, February 15 through August 15). The maintenance of appropriate noise levels shall be confirmed through protocol gnatcatcher surveys to determine presence of all gnatcatcher within 500 feet of project construction and noise measurements at nest locations during peak construction activity by a qualified acoustician.

7.3 Sensitive Plants

Direct impacts to listed species shall be mitigated by implementing the habitat restoration plans discussed above and incorporating San Diego County viguiera into the restoration areas. Indirect impacts to sensitive plants are similar to potential indirect impacts to sensitive vegetation communities. Thus, mitigation measures discussed in *Section 7.1* above, also serve to reduce indirect impacts to sensitive plants.

7.4 Cumulative Impacts

Implementation of the mitigation measures above demonstrate conformance with Carlsbad HMP and Oceanside Subarea Plan guidelines. In particular, the project would mitigate the loss of habitat at appropriate ratios, mitigation is directed to the preserve in a location near the impact area, and overall design features would not adversely affect preserve management of covered species.

8.0 ACKNOWLEDGMENTS

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APPENDICES

APPENDIX A

VASCULAR PLANT SPECIES

LYCOPODS

SELAGINELLACEAE - SPIKE-MOSS FAMILY

Selaginella bigelovii - Bigelow's spike-moss

ANGIOSPERMAE (DICOTYLEDONS)

AIZOACEAE - CARPET-WEED FAMILY

- * *Carpobrotus edulis* - hottentot-fig
- * *Mesembryanthemum crystallinum* - crystal ice plant

AMARANTHACEAE - AMARANTH FAMILY

Amaranthus blitoides - prostrate amaranth

ANACARDIACEAE - SUMAC FAMILY

Malosma laurina - laurel sumac
Rhus integrifolia - lemonadeberry
Toxicodendron diversilobum - poison-oak

APIACEAE - CARROT FAMILY

- Daucus pusillus* - rattlesnake weed
- * *Foeniculum vulgare* - sweet fennel

ASTERACEAE - SUNFLOWER FAMILY

- Ambrosia psilostachya* var. *californica* - western ragweed
Artemisia californica - coastal sagebrush
Baccharis pilularis - coyote brush
- * *Centaurea melitensis* - tocalote
 - * *Chaenactis glabriuscula* var. *glabriuscula* - yellow pincushion
 - * *Chrysanthemum coronarium* - garland chrysanthemum

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APPENDIX A (Cont.)

- * *Conyza canadensis* - horseweed
- * *Cotula australis* - Australian brass-buttons
- Encelia californica* - California bush sunflower
- Erigeron foliosus* var. *stenophyllus* - leafy daisy
- * *Filago gallica* - narrow-leaf filago
- Gnaphalium bicolor* - bicolor cudweed
- Gnaphalium canescens* - white everlasting
- Grindelia camporum* - gum plant
- Helianthus annuus* - common sunflower
- Hemizonia fasciculata* - fascicled tarweed
- Heterotheca grandiflora* - telegraph weed
- * *Hypochaeris glabra* - smooth car's-ear
- Isocoma menziesii* ssp. *veneta* - coastal goldenbush
- * *Lactuca serriola* - prickly lettuce
- Lessingia filaginifolia* - virgate cudweed aster
- Osmadenia tenella* - rosin-weed
- * *Picris echioides* - bristly ox-tongue
- Pluchea* sp.- fleabane
- Psilocarphus bevissimus* - wooly marbles
- * *Sonchus asper* - prickly sow-thistle
- * *Sonchus oleraceus* - common sow-thistle
- Stylocline gnaphalioides* - everlasting nest-straw
- Uropappus lindleyi* - silver puffs
- Viguiera laciniata* - San Diego County viguiera

BORAGINACEAE - BORAGE FAMILY

- * *Echium candicans* - Pride of Madeira
- Plagiobothrys collinus* - California popcorn flower

BRASSICACEAE - MUSTARD FAMILY

- * *Brassica nigra* - black mustard
- * *Brassica ripa* - field mustard
- * *Hirschfeldia incana* - short-podded mustard

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APPENDIX A (Cont.)

- * *Lobularia maritima* - sweet alyssum
- * *Raphanus sativus* - wild radish
- * *Sisymbrium irio* - London rocket
- * *Sisymbrium orientale* - Oriental mustard

CACTACEAE - CACTUS FAMILY

- Opuntia littoralis* - coastal prickly-pear
- Opuntia prolifera* - coast cholla

CAPPARACEAE - CAPER FAMILY

- Isomeris arborea* - bladderpod

CAPRIFOLIACEAE - HONEYSUCKLE FAMILY

- Sambucus mexicana* - Mexican elderberry

CARYOPHYLLACEAE - PINK FAMILY

- * *Silene gallica* - common catchfly
- * *Stellaria media* - common chickweed

CHENOPODIACEAE - GOOSEFOOT FAMILY

- * *Atriplex semibaccata* - Australian saltbush
- * *Chenopodium murale* - nettle-leaved goosefoot
- * *Salsola tragus* - Russian-thistle

CONVOLVULACEAE - MORNING-GLORY FAMILY

- * *Convolvulus arvensis* - bindweed

CRASSULACEAE - STONECROP FAMILY

- Dudleya pulverulenta* - chalk dudleya

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APPENDIX A (Cont.)

CUCURBITACEAE - GOURD FAMILY

Marah macrocarpus - wild cucumber

CUSCUTACEAE - DODDER FAMILY

Cuscuta californica - California dodder

CYPERACEAE - SEDGE FAMILY

Scirpus americanus - winged three-square

ERICACEAE - HEATH FAMILY

Arctostaphylos glandulosa ssp. *crassifolia*- Del Mar manzanita

EUPHORBIACEAE - SPURGE FAMILY

Chamaesyce albomarginata - rattlesnake spurge

Eremocarpus setigerus - doveweed

* *Euphorbia peplus* - petty spurge

Ricinus communis - castor-bean

FABACEAE - PEA FAMILY

* *Acacia baileyana* - golden mimosa

Lotus purshianus - Spanish-clover

Lotus scoparius - deerweed

* *Medicago polymorpha* - California burclover

* *Melilotus albus* - white sweet-clover

* *Melilotus indica* - yellow sweet-clover

Trifolium sp. - clover

FAGACEAE - BEECH FAMILY

Quercus berberidifolia - scrub oak

GENTIANACEAE - GENTIAN FAMILY

Centaurium venustum - canchalagua

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APPENDIX A (Cont.)

GERANIACEAE - GERANIUM FAMILY

* *Erodium cicutarium* - red-stemmed filaree/storksbill

HYDROPHYLLACEAE - WATERLEAF FAMILY

Emmenanthe penduliflora - whispering bells

LAMIACEAE - MINT FAMILY

Salvia columbariae - chia

Salvia mellifera - black sage

MALVACEAE - MALLOW FAMILY

Malacothamnus densiflorus - many-flowered mallow

* *Malva parviflora* - cheeseweed

MYRTACEAE - MYRTLE FAMILY

* *Eucalyptus* sp. - gum tree

NYCTAGINACEAE - FOUR O'CLOCK FAMILY

Mirabilis californica var. *californica* - California wishbone-bush

ONAGRACEAE - EVENING-PRIMROSE FAMILY

Camissonia bistorta - California sun cup

Clarkia purpurea - winecup clarkia

Epilobium ciliatum - California cottonweed

Oenothera elata ssp. *hookeri* - Hooker's evening primrose

PAPAVERACEAE - POPPY FAMILY

Eschscholzia californica - California poppy

PLANTAGINACEAE - PLANTAIN FAMILY

Plantago erecta - dot-seed plantain

* *Plantago lanceolata* - English plantain

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APPENDIX A (Cont.)

PLUMBAGINACEAE - LEADWORT FAMILY

* *Limonium perezii* - sea-lavender

POLEMONIACEAE - PHLOX FAMILY

Navarretia hamata ssp. *hamata* - hooked skunkweed

POLYGONACEAE - BUCKWHEAT FAMILY

Chorizanthe fimbriata - fringed turkish rugging

Eriogonum fasciculatum - California buckwheat

* *Rumex crispus* - curly dock

PRIMULACEAE - PRIMROSE FAMILY

* *Anagallis arvensis* - poor man's weatherglass, scarlet pimpernel

ROSACEAE - ROSE FAMILY

Adenostoma fasciculatum - chamise

Heteromeles arbutifolia - toyon

RUBIACEAE - MADDER FAMILY

Galium angustifolium - narrow-leaved bedstraw

* *Galium aparine* - goose grass

SALICACEAE - WILLOW FAMILY

Salix lasiolepis var. *bracelinae* - arroyo willow

SCROPHULARIACEAE - FIGWORT FAMILY

Mimulus aurantiacus - bush monkeyflower

SOLANACEAE - NIGHTSHADE FAMILY

* *Nicotiana glauca* - tree tobacco

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APPENDIX A (Cont.)

TAMARICACEAE - TAMARISK FAMILY

- * *Tamarix* sp. - tamarisk

ZYGOPHYLLACEAE - CALTROP FAMILY

- * *Tribulus terrestris* - puncture vine

ANGIOSPERMAE (MONOCOTYLEDONES)

ARECACEAE - PALM FAMILY

- * *Phoenix canariensis* - Canary Island date palm
- Washingtonia filifera* - California fan palm

IRIDACEAE - IRIS FAMILY

- Sisyrinchium bellum* - blue-eyed grass

LILIACEAE - LILY FAMILY

- * *Asparagus asparagoides* - smilax
- Bloomeria crocea* - common goldenstar
- Calochortus splendens* - splendid mariposa lily
- Chlorogalum parviflorum* - small-flowered amole
- Dichelostemma capitata* - blue dicks
- Yucca schidigera* - Mohave yucca
- Yucca whipplei* - our lord's candle

POACEAE - GRASS FAMILY

- * *Avena fatua* - wild oat
- * *Bromus hordeaceus* - soft chess
- * *Bromus madritensis* ssp. *rubens* - foxtail chess
- * *Cortaderia selloana* - pampas grass
- * *Cynodon dactylon* - Bermuda grass
- * *Gastridium ventricosum* - nit grass
- * *Hordeum vulgare* - barley

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APPENDIX A (Cont.)

- * *Lamarckia aurea* - goldentop
- Leymus condensatus* - giant ryegrass
- * *Lolium multiflorum* - Italian ryegrass
- Melica imperfecta* - California melic
- Nassella lepida* - foothill stipa
- Nassella pulchra* - purple needlegrass
- * *Pennisetum setaceum* - African fountain grass
- * *Phalaris minor* - Mediterranean canary grass
- * *Polypogon monspeliensis* - rabbit's-foot grass
- * *Vulpia myuros* var. *myuros* - rattail fescue

TYPHACEAE - CATTAIL FAMILY

- Typha* sp. - cattail
- Typha latifolia* - broad-leaved cattail

- * *signifies introduced (non-native) species*

APPENDIX B

CUMULATIVE LIST OF WILDLIFE SPECIES OBSERVED ONSITE

WILDLIFE SPECIES -VERTEBRATES

REPTILES

IGUANIDAE - IGUANID LIZARDS

Sceloporus occidentalis - western fence lizard

Uta stansburiana - side-blotched lizard

BIRDS

PELECANIDAE - PELICANS

Pelecanus occidentalis - brown pelican

ARDEIDAE - HERONS

Ardea herodias - great blue heron

Casmerodius albus - great egret

ANATIDAE - WATERFOWL

Anas platyrhynchos - mallard

ACCIPITRIDAE - HAWKS

Accipiter cooperii - Cooper's hawk

Buteo jamaicensis - red-tailed hawk

Circus cyaneus - northern harrier

FALCONIDAE - FALCONS

Falco sparverius - American kestrel

PHASIANIDAE - PHEASANTS & QUAILS

Callipepla californica - California quail

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APPENDIX B (Cont.)

CHARADRIIDAE - PLOVERS

Charadrius vociferus - killdeer

LARIDAE - GULLS & TERNS

Larus sp. - gull

COLUMBIDAE - PIGEONS & DOVES

Columba livia - rock dove

Zenaida macroura - mourning dove

TROCHILIDAE - HUMMINGBIRDS

Calypte anna - Anna's hummingbird

PICIDAE - WOODPECKERS

Colaptes auratus - northern flicker

TYRANNIDAE - TYRANT FLYCATCHERS

Sayornis nigricans - black phoebe

Sayornis saya - Say's phoebe

Tyrannus vociferans - Cassin's kingbird

Tyrannus verticalis - western kingbird

HIRUNDINIDAE - SWALLOWS

Hirundo pyrrhonota - cliff swallow

Hirundo rustica - barn swallow

CORVIDAE - JAYS & CROWS

Aphelocoma coerulescens - scrub jay

Corvus brachyrhynchos - American crow

Corvus corax - common raven

AEGITHALIDAE - BUSHTITS

Psaltriparus minimus - bushtit

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APPENDIX B (Cont.)

TROGLODYTIDAE - WRENS

Thryomanes bewickii - Bewick's wren

Troglodytes aedon - house wren

MUSCICAPIDAE - KINGLETS, GNATCATCHERS, THRUSHES & BABBLERS

Chamaea fasciata - wren tit

Polioptila californica californica - coastal California gnatcatcher

MIMIDAE - THRASHERS

Mimus polyglottos - northern mockingbird

Toxostoma redivivum - California thrasher

PTILOGONATIDAE - SILKY-FLYCATCHERS

Phainopepla nitens - phainopepla

STURNIDAE - STARLINGS

* *Sturnus vulgaris* - European starling

EMBERIZIDAE - WOOD WARBLERS, TANAGERS, BUNTINGS & BLACKBIRDS

Melospiza melodia - song sparrow

Pipilo crissalis - California towhee

Pipilo erythrophthalmus - spotted towhee

FRINGILLIDAE - FINCHES

Carpodacus mexicanus - house finch

Carduelis psaltria - lesser goldfinch

PASSERIDAE - OLD WORLD SPARROWS

* *Passer domesticus* - house sparrow

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APPENDIX B (Cont.)

MAMMALS

LEPORIDAE - HARES & RABBITS

Sylvilagus bachmani - brush rabbit

SCIURIDAE - SQUIRRELS

Spermophilus beecheyi - California ground squirrel

GEOMYIDAE - POCKET GOPHERS

Thomomys bottae - Botta's pocket gopher

MURIDAE - RATS & MICE

Neotoma sp. - woodrat (midden)

Peromyscus maniculatus - deer mouse

CANIDAE - WOLVES & FOXES

* *Canis familiaris* - domestic dog

Canis latrans - coyote

PROCYONIDAE - RACCOONS & RELATIVES

Procyon lotor - common raccoon

MUSTELIDAE - WEASELS, SKUNKS, & OTTERS

Mephitis mephitis - striped skunk

FELIDAE - CATS

Lynx rufus - bobcat

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APPENDIX B (Cont.)

WILDLIFE SPECIES - INVERTEBRATES

BUTTERFLIES AND MOTHS

HESPERIIDAE - SKIPPERS

Hylephila phyleus - fiery skipper

PAPILIONIDAE - SWALLOWTAILS

Papilio rutulus - tiger swallowtail

PIERIDAE - WHITES AND SULFURS

Pieris rapae - cabbage butterfly

Pontia protodice - common white

RIODINIDAE - METALMARKS

Apodemia mormo virgulti - Behr's metalmark

LYCAENIDAE - BLUES, HAIRSTREAKS, & COPPERS

Leptotes marina - marine blue

Plebejus acmon - acmon blue

NYMPHALIDAE - BRUSH-FOOTED BUTTERFLIES

Nymphalis antiopa - morning cloak

Vanessa annabella - west coast lady

Junonia coenia - buckeye

Coenonympha tullia - California ringlet

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APPENDIX C

SPECIES SENSITIVITY CATEGORIES

Federal (1996)

Endangered. Taxa threatened throughout all or a significant portion of their range.

Threatened. Taxa likely to become endangered in the foreseeable future.

Category 1. Taxa for which the USFWS has enough information on biological vulnerability and threat(s) to support listing them as endangered or threatened species.

Category 2. A category formerly used for taxa for which information in possession of the USFWS indicated that listing as endangered or threatened may be appropriate but for which sufficient data to support the preparation of rules were unavailable. This category has been eliminated owing to its frequent misinterpretation.

Category 3. Taxa that were once considered for listing as endangered or threatened, but are currently not receiving such consideration. These taxa are included in one of the following three subcategories.

Subcategory 3A: Taxa presumed to be extinct.

Subcategory 3B: Taxa whose names do not meet the Endangered Species Act's legal definition of species.

Subcategory 3C: Taxa now considered to be more widespread than originally thought.

Note: The taxa in Categories 1 and 2 are candidates for possible addition to the list of endangered and threatened species. The USFWS encourages their consideration in environmental planning.

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APPENDIX C (Cont.)

State of California (1990)

Endangered. Taxa which are in serious danger of becoming extinct throughout all, or a significant portion, of their range due to one or more causes including loss of habitat, change in habitat, over exploitation, predation, competition, or disease (Section 2062 of the Fish and Game Code).

Threatened. Taxa which, although not presently threatened with extinction, are likely to become endangered species in the foreseeable future (Section 2067 of the Fish and Game Code).

Rare. Taxa which, although not presently threatened with extinction, are present in such small numbers throughout their range that they may become endangered if the present environment worsens (Section 1901 of the Fish and Game Code).

Candidate. Taxa which the Fish and Game Commission has formally noticed as being under review by the Department in addition to the list of threatened and endangered species.

California Native Plant Society (2001)

Lists

- 1A: Presumed Extinct in California
- 1B: Rare or Endangered in California and Elsewhere
- 2: Rare or Endangered in California, More Common Elsewhere
- 3: Need More Information
- 4: Plants of Limited Distribution

Note: Plants on CNPS list 1B meet California Department of Fish and Game Criteria for Rare or Endangered listing.

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APPENDIX C (Cont.)

R-E-D code

R (Rarity)

- 1- Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction or extirpation is low at this time.
- 2- Occurrence confined to several populations or to one extended population.
- 3- Occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported.

E (Endangerment)

- 1- Not endangered
- 2- Endangered in a portion of its range
- 3- Endangered throughout its range

D (Distribution)

- 1- More or less widespread outside of California
- 2- Rare outside California
- 3- Endemic to California