

**South Orange County
Transportation Infrastructure
Improvement Project**

(SOCTIIP)



Biological Assessment

SOCTIIP

South Orange County and North San Diego County
Watersheds of San Mateo and San Juan Creeks

Extension of the State Route 241

February 28, 2005



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U.S. Department of Transportation
Federal Highway Administration, and
State of California
Department of Transportation

Executive Summary of Findings, Conclusions and Determinations

The proposed project will involve removal of vegetative resources which are known to provide or may have the potential to provide suitable habitat for ten federally-listed Threatened, Endangered, or Proposed wildlife and plant species. In addition, there is designated or proposed critical habitat for some of species within the action area. The potential to directly affect these wildlife species or areas of designated or proposed critical habitat for these species is summarized in Table 1 below. The A7C-FEC-M alternative includes conservation and avoidance measures. Indirect impacts will be limited through project design. For example, the drainage and water quality features will prevent water quality impacts to the species. The A7C-FEC-M alternative will only have lighting at toll plazas and interchanges and low-light design features will be incorporated where feasible (for example, in locations where such features will not conflict with Caltrans design standards).

**TABLE 1
SUMMARY OF PROJECT EFFECTS ON BIOLOGICAL RESOURCES FOR A7C-FEC-M**

Common Name and Scientific Name	Summary of Direct Impacts	Plant Communities Impacted	Critical Habitat Unit/Status	Total Critical Habitat	Critical Habitat Impacted	Determination of Affect
San Diego fairy shrimp <i>Branchinecta sandiegonensis</i>	Avoided/No direct impacts to habitat known to support or suitable to support this species.	Not Applicable	Remanded, re-proposed	6,098 ac (2,462 ha)	0	May affect, likely to adversely affect
Riverside fairy shrimp <i>Streptocephalis woottoni</i>	Avoided/No direct impacts to habitat known to support or suitable to this species.	Not Applicable	Not defined Vacated, re-proposed	5,795 ac (2,340 ha)	195.91 ac (79 ha)	May affect, likely to adversely affect
southern steelhead <i>Oncorhynchus mykiss</i>	Likely historically present in lower reaches of the creek. However, extensive groundwater extraction, development such grade control structures and sediment deposition at key access points and spawning areas would likely preclude use of this drainage by this species.	2.89 ac (1.17 ha) San Juan Creek (ACOE OHWM). No record of occurrence in San Juan Creek	No applicable	No applicable	2.89 ac (1.17 ha) San Juan Creek (ACOE OHWM)	May affect, likely to adversely affect
	Likely historically present in lower reaches of the creek. Suitable habitat occurs within the upper reaches of this drainage. However, loss of riparian habitat, increased channel width, lack of surficial flows due to extensive groundwater extraction, development, and sediment deposition at key access points and spawning areas would likely limits use of this drainage by this species.	7.60 ac (3.08 ha) San Mateo Creek (ACOE OHWM)	No applicable	No applicable	7.60 ac (3.08 ha) San Mateo (ACOE OHWM)	
tidewater goby <i>Eucyclogobius newberryi</i>	Species is not likely to be affected by the project crossing within San Juan Creek due to the lack of surficial flows, sand and gravel operations and grade control structures within this drainage.	Not Applicable	Not within a Critical Habitat Unit	Not applicable	0	May affect, likely to adversely affect
	Potential for species to occur within project construction footprint within San Mateo Creek. However, implementation of construction minimization measures will maintain creek flows during construction.	7.60 ac (3.08 ha) San Mateo Creek (ACOE OHWM)	Unit 2 - San Mateo Creek Designated	San Mateo Creek 10 to 15 ac (4 to 6 ha)	22.93 ac (9.28 ha)	
	Potential for species to occur within project construction footprint within San Onofre Creek. However, implementation of construction minimization measures will maintain creek flows during construction.	0.92 ac (0.37 ha) San Onofre (ACOE OHWM)	Unit 3 - San Onofre Creek Designated	San Onofre Creek 5 to 10 ac (2 to 4 ha)	7.4 ac (2.99 ha)	
Arroyo toad <i>Bufo californicus</i>	Potential impacts as crossings occur in construction footprint of the A7C-FEC-M alignment	Breeding – 1.4 ac (14.61 ha) San Juan, San Mateo, and San Onofre Creeks (ACOE OHWM)	Vacated (and) re-proposed	138,713 ac (56,133 ha)/ Proposed	227.20 ac (91.86 ha)	May affect, likely to adversely affect
southwestern willow flycatcher <i>Empidonax traillii extimus</i>	No location known to support this species will be affected by the A7C-FEC-M alignment.	33.55 ac (13.58 ha) of riparian habitat	Vacated (and) re-proposed	376,095 ac (152,124 km)	6.77 ac (2.74 ha)	May affect, likely to adversely affect
California gnatcatcher <i>Polioptila californica californica</i>	15 or 17 locations known to support this species will be affected by the A7C-FEC-M alignment.	Potential impacts to 385 ac (156 ha) of coastal sage scrub habitat	Remanded, re-proposed	513,650 ac (207,890 ha)	1,126.10 ac (454.62 ha)	May affect, likely to adversely affect
least Bell's vireo <i>Vireo bellii pusillus</i>	No locations known to support this species will be directly affected by the A7C-FEC-M alignment.	33.55 ac (13.58 ha) of riparian habitat	None in Orange County	38,000 ac (15,379 ha)	0	May affect, likely to adversely affect
Pacific pocket mouse <i>Perognathus longimembris pacificus</i>	Avoided/No direct impacts to habitat known to support this species.	Not Applicable	Not Applicable	Not Applicable	Not Applicable	May affect, likely to adversely affect
thread-leaved brodiaea <i>Brodiaea filifolia</i>	23 plants/3 populations will be directly affected as a result of project construction.	Not Applicable	4g and 4h within proposed action area	4,690 ac (1,898 ha)	66.39 ac (26.87 ha)	May affect, likely to adversely affect

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Chapter 1. Introduction

The purpose of this Biological Assessment (BA) is to provide technical information and to review the proposed project in sufficient detail to determine to what extent the proposed project may effect Threatened, Endangered, or Proposed species, in support of consultation on potential impacts to listed species and critical habitat and conferencing on potential impacts to proposed critical habitat as provided in 50 CFR 402. The BA is prepared in accordance with legal requirements found in 50 CFR 402 and with Federal Highway Administration (FHWA) and California Department of Transportation (Caltrans) regulation, policy, and guidance. The document presents technical information upon which later decisions regarding project impacts are developed.

1.1 Proposed Project

The Natural Environment Study (NES) for the South Orange County Transportation Infrastructure Improvement Project (SOCTIIP) evaluated several alternatives including the Far East Corridor Alternative, Central Corridor Alternative, Alignment 7 Corridor Alternative, Arterials Improvement Only Alternative, Arterial Improvements Plus High Occupancy Vehicle (HOV) and Mixed Spot Lanes on Interstate-5 (I-5) Alternative (TCA, December 2003), and the I-5 Alternative. Based on information from the NES and other technical information provided to and from the Collaborative members during the 404 Integrated Process, A7C-FEC-M has been selected: Alignment 7 Corridor-Far East Crossover-Modified-(A7C-FEC-M) Initial Alternative. The A7C-FEC-M is also referred to as the green alignment. This alternative is generally located in the southern portion of Orange and northwestern portion of San Diego counties (Figures 1 and 2).

The A7C-FEC-M alternative is a proposed toll road corridor with a cross section providing two general purpose lanes in each direction for the entire length of the alternative. As shown in the initial corridor cross sections in Figure 3, the A7C-FEC-M alternative could accommodate one future HOV lane in each direction. The A7C-FEC-M alternative provides the number of traffic lanes necessary to meet forecasted demand through 2025, which is the design forecast year for the SOCTIIP and the planning horizon year for regional plans and socioeconomic forecasts. The right-of-way limits for the A7C-FEC-M alternative are also shown conceptually on the typical cross sections on Figure 3. Figure 4 shows the anticipated disturbance limits, which include the grading limits, remedial grading limits, right-of-way limits, utility relocation, and construction staging areas for the A7C-FEC-M.

1.2 General Location

The proposed A7C-FEC-M alternative is generally located in the coastal foothills of southern Orange and extreme northwestern San Diego counties. The A7C-FEC-M alignment is approximately 26 kilometers (16 miles) long, with approximately 1.3 kilometers (0.8 mile) of improvements on the I-5. Table 1 summarizes the characteristics of the A7C-FEC-M alternative by segment.

Topographically, this region exhibits low-lying ridgelines and mountains interspersed with relatively broad valleys and canyon bottoms. Elevations range from sea level at the coastline to approximately 275 meters (900 feet) above sea level in the interior hills. The region is entirely underlain with marine and non-marine sedimentary rocks with overlaying marine terrace, fan, alluvium, and landslide deposits. The A7C-FEC-M alternative occurs primarily within a largely undeveloped area with scattered areas of active agriculture, sand and gravel mining, a state



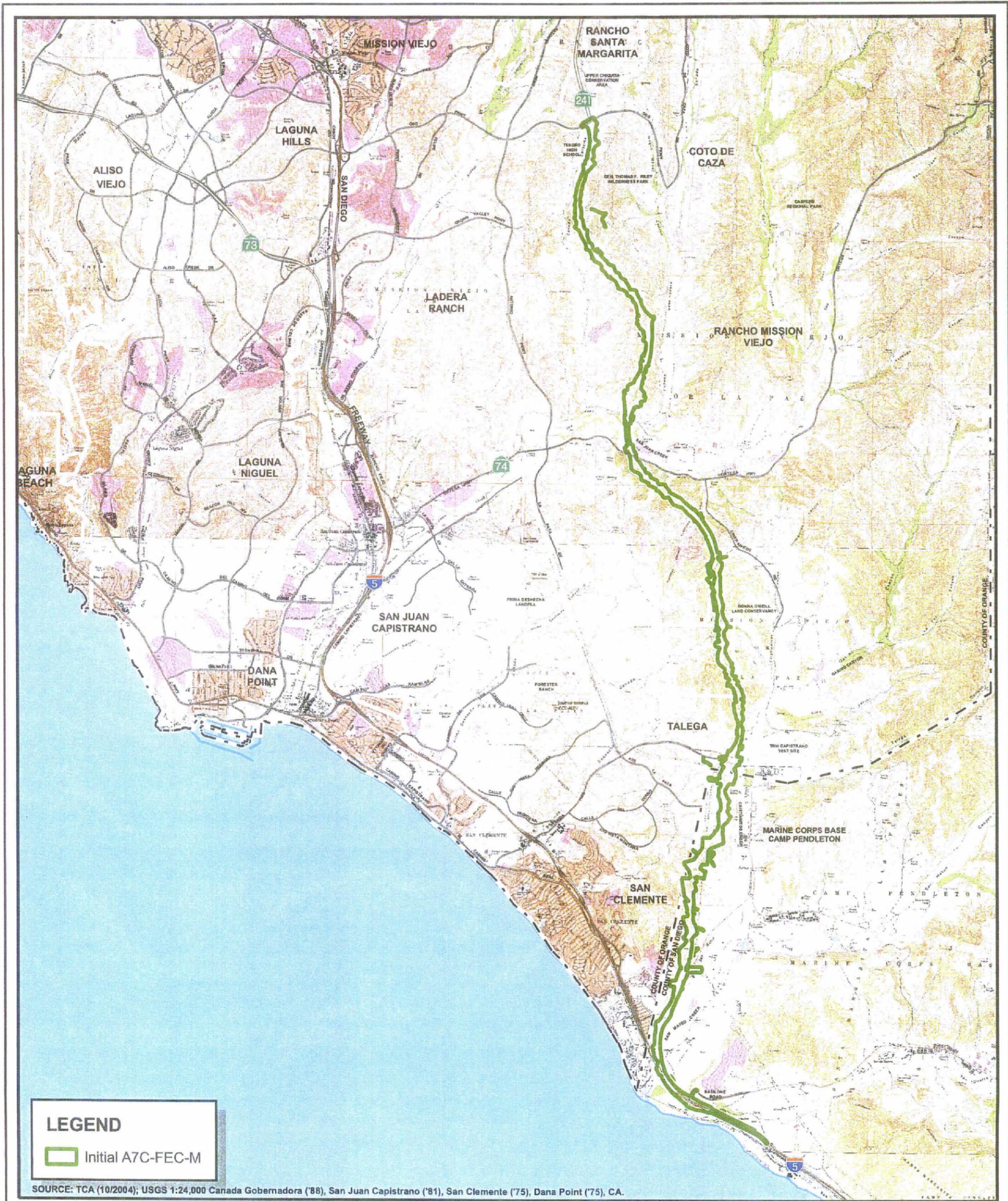
SOURCE: TCA (10/2004); ESRI (2003)



Locality

SOCTIIP Biological Assessment

Figure 1

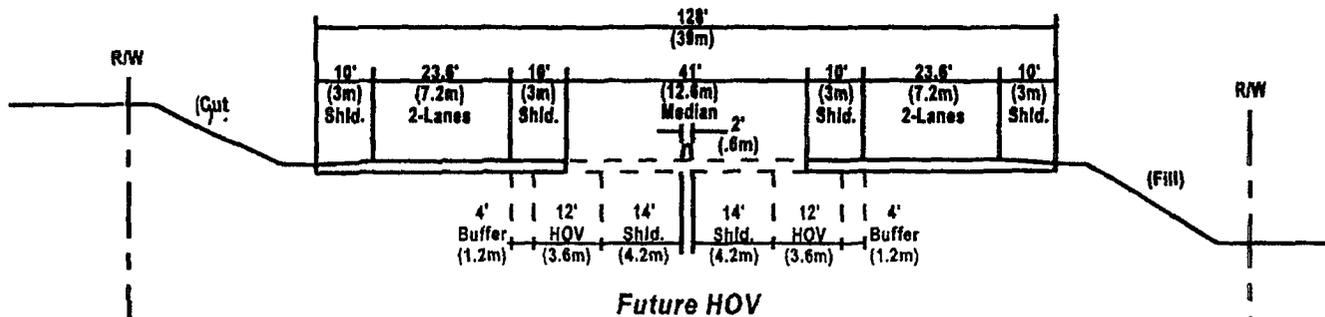


0 2 4 Miles

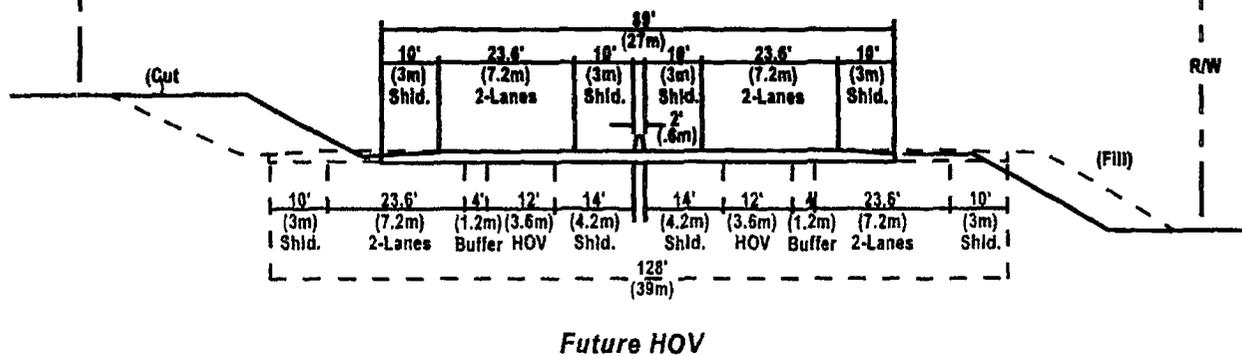
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Vicinity Map

Initial Corridor (Oso Parkway to Ortega Highway)

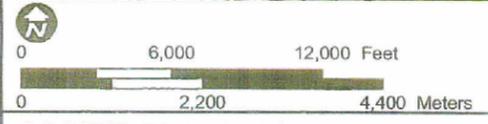


Initial Corridor (Ortega Highway to I-5)



SOURCE: TCA (10/2004)

Typical Corridor Cross Sections



Disturbance Limits

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park on leased land and Marine Corps operations. Much of the remaining undeveloped area has supported and/or is being used for livestock grazing. Considerable areas of natural open space also exist. These areas support several major vegetation types including grasslands, scrub, chaparral, oak and riparian woodlands, marshes, and other wetlands. These in turn provide habitat for a wide variety of animals, including many invertebrate, amphibian, reptile, bird, and mammal species.

There are two major drainage basins, including the San Juan Creek Watershed and San Mateo Creek Watershed, within the vicinity of the A7C-FEC-M alternative (Figure 5). The San Juan Creek Watershed covers 346.8 square kilometers (133.9 square miles) and includes portions of the cities of Dana Point, Laguna Hills, Laguna Niguel, Mission Viejo, Rancho Santa Margarita, and San Juan Capistrano. Its main tributary, San Juan Creek, originates in the Santa Ana Mountains district of the Cleveland National Forest in the easternmost part of Orange County. Other smaller, but still substantial, drainage courses include Bell Canyon, Cañada Gobernadora, and Cañada Chiquita, which are tributaries to San Juan Creek. The San Mateo Creek Watershed covers approximately 360.01 square kilometers (139 square miles). Its drainage area lies within western Riverside and northwestern San Diego counties, with approximately 20 percent in the boundary of southeastern Orange County. Gabino/Blind canyons and Cristianitos Creek are tributaries to San Mateo Creek.

The southern Orange County and northwestern San Diego County areas have a number of designated open space areas. The largest of these areas include (1) open space along the northern part of Chiquita Ridge, dedicated to the County of Orange for the Las Flores Planned Community; (2) approximately 512.8 ha (1,282 ac) in the Upper Chiquita Canyon Conservation Easement area developed through a Biological Opinion rendered by the United States Fish and Wildlife Service (USFWS) for the Foothill Transportation Corridor-North (FTC-N), Oso Section project, and including California gnatcatcher credits for future TCA projects; (3) open space along the southern part of Chiquita Ridge as part of the Ladera Planned Community; (4) General Thomas F. Riley Wilderness Park; (5) Caspers Regional Park; (6) Donna O'Neill Land Conservancy; and (7) portions of San Onofre State Park, which is leased by the Marine Corps Base (MCB) Camp Pendleton to the California Department of Parks and Recreation through 2021. In addition to designated open space, other currently vacant or undeveloped areas in the region include much of RMV and MCB Camp Pendleton. Throughout the San Juan and San Mateo creek watersheds are several locations where projects have implemented mitigation programs for a variety of impacts of upland as well as wetland resources. These mitigation sites are discussed in greater detail in the NES.

Long term planning for conservation and development of these individual areas and the southern Orange County and northwestern San Diego County region are currently being addressed through the Orange County Southern Subregion Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP) and resource management programs developed by MCB Camp Pendleton. These open space planning efforts are discussed further in the NES.



SOURCE: TCA (10/2004); USGS 1:24,000 Canada Gobernadora ('88), San Juan Capistrano ('81), San Clemente ('75), Dana Point ('75), CA. California Department of Forestry and Fire Protection (11/18/04)

**TABLE 2
CHARACTERISTICS OF THE ALIGNMENT 7 CORRIDOR-FAR EAST CROSSOVER –
MODIFIED-INITIAL ALTERNATIVE**

Segment	Geographic Extent	Length in km (mi)	Typical Corridor Cross Sections	Interchanges	Bridges and Other Crossings	Other Relevant Features
W	Oso Parkway south to Ortega Highway.	8.4 km (5.2 mi)	Initial: Four GP lanes. Could accommodate two future HOV lanes.	Oso Parkway. New Ortega Highway. C Street. Crown Valley Parkway (future interchange to be constructed by others; not a part of these alternatives).	Bridge over San Juan Creek at the mainline. Ortega Highway undercrossing.	Mainline toll plaza north of Ortega Highway. Ramp toll plazas on the southbound on ramp and the northbound off ramp at New Ortega Highway (connector). Ramp toll plazas on the southbound on ramp and the northbound off ramp at C Street.
Y	From Ortega Highway south to just south of Avenida Pico.	7.8 km (4.8 mi)	Initial: Four GP lanes. Could accommodate two future HOV lanes.	Avenida Pico.	Quarry Access Road undercrossing.	
C	From just south of Avenida Pico to where the corridor crosses San Mateo Creek.	8.1 km (5.0 mi)	Initial: Four GP lanes. Could accommodate two future HOV lanes.	Avenida Pico.	Bridge over San Mateo Creek at I-5.	Ramp toll plazas on the southbound on ramp and the northbound off ramp at Avenida Pico.
D	From where the corridor crosses San Mateo Creek, southeast to I-5 and south on I-5 to the terminus south of Basilone Road.	2.6 km (1.6 mi) [1.3 km (0.8 mi) of corridor; 1.3 km (0.8 mi) of improvements to I-5].	Initial: Four GP lanes. Could accommodate two future HOV lanes.	I-5 connector (to and from the south only).	Bridge over San Onofre Creek at I-5. Widening of I-5 bridge over San Onofre Creek.	Reconstruction of the existing I-5/Basilone Road interchange. No direct connection to/from Basilone Road.
Source: CDMG and P&D Consultants (2003).						

1.3 Purpose and Need for the Project

As part of the SOCTIIP Collaborative, the Collaborative member federal regulatory agencies developed and adopted the purpose and need statement provided in this Section. The FHWA, the lead agency for the SOCTIIP environmental document under the National Environmental Policy Act (NEPA) and a member of the Phase I Collaborative, adopted this purpose and need statement. This was consistent with the NEPA/Section 404 Integration Process Memorandum of Understanding (MOU) for Surface Transportation Projects in California.

The project purpose and need statement prepared by the SOCTIIP Phase I Collaborative and as adopted by FHWA is provided below.

1.3.1 Need for the Project

Transportation infrastructure improvements are necessary to address needs for mobility, access, goods movement and projected freeway capacity deficiencies and arterial congestion in south Orange County. Freeway capacity deficiencies and arterial congestion are anticipated as a result of projected traffic demand, which will be generated by projected increases in population, employment, housing and intra- and inter-regional travel estimated by the Southern California Association of Governments (SCAG) and the San Diego Association of Governments (SANDAG).

Traffic projections and analysis for 2020 indicate that I-5 will be operating at a deficient level of service (LOS) as defined by Caltrans. In the SOCTIIP EIS/SEIR action area, the deficient LOS extends from Alicia Parkway to the Orange/San Diego County line, a distance of approximately 29 kilometers (18 miles). The 2020 traffic projections assume full implementation of the Orange County Master Plan of Arterial Highways (MPAH), improvements to I-5 such as HOV lanes between State Route 1 (SR-1, Pacific Coast Highway) and Avenida Pico, and arterial highway improvements.

LOS F(0) represents a vehicle-to-capacity ratio between 1.00 and 1.25, causing a spreading of the peak period and up to one hour of stop and go traffic, which is experienced by each vehicle on the freeway. LOS F(1) represents a vehicle-to-capacity ratio between 1.26 and 1.35, causing a spreading of the peak period of between one and two hours of stop and go traffic. LOS F(2) represents a vehicle-to-capacity ratio between 1.36 and 1.45, causing a spreading of the peak period of between two and three hours of stop and go traffic. The projected future deficient LOS will result in tens of thousands of vehicle hours of delay per day. In addition to deficiencies on I-5, various arterial highway intersections and segments of the arterial highway network in the action area are projected to operate at deficient LOS as defined by the local jurisdictions.

1.3.2 Purpose of the Project

The purpose of the SOCTIIP, and the A7C-FEC-M alternative, is to provide improvements to the transportation infrastructure system that would help alleviate future traffic congestion and accommodate the need for mobility, access, goods movement and future traffic demands on I-5 and the arterial network in the action area. The following is an objective in implementing the project purpose:

- Improve the projected future LOS and reduce the amount of congestion and delay on the freeway system and, as a secondary objective, the arterial network, in southern Orange County. The overall goal is to improve projected levels of congestion and delay as much as is feasible and cost effective. This may include strategies which lead to a reduction in the length of time LOS F will occur, even if the facility will still operate at LOS F for a short period of time, if the strategy will result in benefits to the traveling public and more efficient movement of goods because it reduces total delay.

1.4 Summary of Consultation to Date

1.4.1 NEPA/Section 404 Memorandum of Understanding

Overview of the NEPA/404 Process

In 1996, as a result of the 1994 NEPA/Clean Water Act (CWA) Section 404 Integration Process for Surface Transportation Projects, the FHWA initiated coordination to implement the policies of the NEPA/Section 404 MOU in developing the EIS and Section 404 permitting for the SOCTIIP. The NEPA/Section 404 MOU implements the FHWA, U.S. Army Corps of Engineers (ACOE), and Environmental Policy Act (EPA) policies of improved interagency coordination and integration of the NEPA and Section 404 procedures. The NEPA/Section 404 MOU applies to all projects needing both FHWA action under NEPA and an ACOE individual permit under Section 404 of the CWA. In March 1999, pursuant to the NEPA/Section 404 MOU, a purpose and need statement was approved for the SOCTIIP, as described earlier.

Between August 1999 and November 2000, the NEPA/Section 404 MOU signatory agencies and the Transportation Corridor Agency (TCA) retained a neutral facilitator to assist in developing the project alternatives to be evaluated in the EIS/SEIR. It was during this process that the signatory agencies re-named the Foothill Transportation Corridor-South project as the SOCTIIP. The NEPA/404 MOU agencies and the TCA are collectively referred to as the "SOCTIIP Collaborative." In November 2000, the SOCTIIP Collaborative concurred on the alternatives to be evaluated in the EIS/SEIR.

Since November 2000, FHWA and the TCA have prepared technical reports assessing the potential adverse impacts of the SOCTIIP Alternatives and an EIS/SEIR that has been circulated to the public for comment. The Collaborative participated in (1) review of the scopes of work for the technical reports, (2) review of the technical reports, and (3) evaluation of the alternatives for possible elimination from consideration in the EIS/SEIR.

In August 2003, based on the findings of the technical analyses, the Collaborative agreed to remove some alternatives from detailed consideration in the EIS/SEIR, based on their inability to meet the purpose and need and/or on the environmental impacts of those alternatives. The alternatives advanced for evaluation in the EIS/SEIR and all the alternatives eliminated from evaluation in the EIS/SEIR, including the reasons for their exclusion, are described in detail in Section 2.0 of the EIR/SEIR.

SOCTIIP Collaborative Process

The SOCTIIP Collaborative is comprised of a group of federal and state transportation and resource agencies collaboratively working toward implementation of the 1994 NEPA/CWA Section 404 MOU. The NEPA/Section 404 MOU implements the FHWA, ACOE, EPA, USFWS, and Caltrans policies of:

- (1) improved interagency coordination, and
- (2) integration of the NEPA and Section 404 procedures.

Because FHWA is responsible for the Federal NEPA process, the TCA was obliged to work with the signatory agencies of the NEPA/Section 404 MOU to implement the policies of this document in developing the EIS and Section 404 permitting. In March 1999, after 28 months of negotiations, a Purpose and Need Statement was approved by FHWA for the project. That Purpose and Need Statement, provided above, was concurred with by the Collaborative.

In July 1999, the NEPA/Section 404 MOU signatory agencies and the TCA agreed to use the assistance of a neutral party to facilitate the implementation of the NEPA/Section 404 MOU for the federal EIS process.

Phase I of the SOCTIIP Collaborative

The SOCTIIP Collaborative first convened in August 1999 and continued to meet through June 2000, a time period that is referred to as Phase I. Phase I of the SOCTIIP Collaborative resulted in an objective facilitated process to specifically develop a list of alternatives to be evaluated in the EIS/SEIR. During this time, the Collaborative conducted 14 full-day meetings.

During the process of selecting alternatives for the NEPA/Section 404 review, the Collaborative requested the use of a neutral Senior Transportation Planning Expert to review and provide independent analysis on the traffic studies prepared in conjunction with the proposed project. As a result of this request, a neutral peer review expert was employed to facilitate the alternatives selection and has continued to be involved in the SOCTIIP.

After 15.5 months of discussion, a set of alternatives were selected for analysis in the EIS/SEIR. All of the SOCTIIP alternatives met the Purpose and Need Statement concurred upon by the NEPA/Section 404 MOU signatory agencies. In November 2000, the SOCTIIP Collaborative concurred on the alternatives to be evaluated in the EIS/SEIR. A public meeting was held in November 2000 to announce and describe the alternatives to the public and to obtain public input.

Phase II of the SOCTIIP Collaborative

The objective of Phase II of the SOCTIIP Collaborative was to ensure a comprehensive and efficient process for managing the issues during the preparation and approval of the EIS/SEIR for the SOCTIIP and implementation of the steps in the NEPA/Section 404 MOU. Building on the success of Phase I of the SOCTIIP Collaborative, a facilitated process to develop and review the technical analyses and environmental documentation leading to the EIS/SEIR development was implemented. Facilitated meetings to manage key identified issues were held approximately monthly during the EIS/SEIR development.

In addition to the Collaborative members under the NEPA/404 MOU, the TCA and Caltrans also participated in the Collaborative process in Phases I and II. MCB Camp Pendleton also participated in Phase II of the Collaborative process, in its role as a cooperating agency on the EIS/SEIR.

1. During Phase II, the SOCTIIP Collaborative participated in the development of the scope for the Technical Reports and review of those reports and the environmental document.

2. During June, July, and August 2003, the Collaborative participated in an alternative elimination process. The preliminary environmental analysis for the selected measures involved determination of key environmental issues for assessment. This was accomplished through the development of the evaluation measures. Using the associated measured parameters, specific impacts were calculated for each of the 16 corridor and three non-corridor build alternatives. The evaluation measures were applied equally to all the alternatives. This process resulted in the elimination and/or substitution of ten of the alternatives that were being evaluated. For more discussion on the alternative elimination process, refer to Section 2.5 of the EIS/SEIS.
3. Next Phases of the SOCTIIP Collaborative

The SOCTIIP Collaborative will continue conduct monthly-facilitated meetings leading to the Record of Decision (ROD) for permitting and construction.

1.5 Preparation History/Project History

The California State Legislature created the TCA in 1986 as a Joint Powers Agency (JPA) to plan, finance, design, construct and operate a toll highway system in Orange County. The State Legislature's creation of this JPA was key to the success of meeting the County's transportation needs. The TCA is a governmental agency made up of two Board of Directors, one each for the Foothill/Eastern Transportation Corridor Agency and the San Joaquin Hills Transportation Corridor Agency.

The FTC-S (also known as the SOCTIIP), the proposed southern extension of the State Route 241 (SR-241 or FTC-N), has been the subject of continuing planning efforts for approximately 20 years. Many local and regional transportation planning agencies, including the SCAG, the County of Orange, the Orange County Transportation Authority (OCTA), Caltrans, local cities, and the TCA, have considered this proposed project. Prior studies of the SOCTIIP include Final EIR 123 certified by the County of Orange in 1981. That EIR resulted in a conceptual alignment for a transportation corridor facility being placed on the County of Orange MPAH. The Foothill Transportation Corridor Alternatives Alignment Analysis (County of Orange and the TCA, 1986) identified four alternative alignments to be carried forward for evaluation in an EIR. Between 1989 and 1991, the TCA prepared TCA EIR No. 3, pursuant to California Environmental Quality Act (CEQA), for the selection of a locally preferred road alignment for the FTC-S. TCA EIR No. 3 addressed the C and BX road alignments of the FTC-S, selected as part of the Alternatives Analysis phase of the project, as the primary build alternatives. TCA EIR No. 3 was circulated for a 60-day review period that included public hearings. Written responses to comments and a Supplemental EIR were circulated for public review. The Supplemental EIR addressed changes to the C Alignment through San Onofre State Beach and concerns of San Clemente residents regarding potential noise and visual impacts, resulting in the changed C Alignment being named the Modified C Alignment. On October 10, 1991, the Modified C Alignment was selected as the locally preferred alternative.

Subsequently, as a result of coordination with the USFWS, the Modified C Alignment was slightly altered to minimize impacts to the Pacific pocket mouse (*Perognathus longimembris pacificus*) (federally listed as Endangered) and to further address resident concerns for potential noise and visual impacts. It was referred to as the "CP Alignment."

In December 1993, the TCA initiated the preparation of a Subsequent SEIR to evaluate the CP Alignment, the BX Alignment, and the No-Build Alternative. The CP Alignment is similar to the FEC-M Alternative described in the SOCTIIP EIS/SEIR. The BX Alignment is identical to the CC Alternative described in the EIS/SEIR.

Between 1993 and 1996, technical analysis of the CP and BX alignment alternatives and the No-Build Alternative was conducted. FHWA originally published an NOI for the Foothill Transportation Corridor-South EIS/SEIR in the Federal Register on June 4, 1986 (51 Fed. Reg. 20,398) and again on December 16, 1993.

In 1996, as a result of the 1994 NEPA/CWA Section 404 Integration Process for Surface Transportation Projects, FHWA initiated coordination to implement the policies of the Memorandum of Understanding for the NEPA and Section 404 Integration Process for Surface Transportation Projects in Arizona, California, and Nevada (MOU) in developing the EIS and Section 404 permitting for the FTC-S. The NEPA/Section 404 MOU implements the FHWA, ACOE, and EPA policies of improved interagency coordination and integration of the NEPA and Section 404 procedures. The NEPA/Section 404 MOU applies to all projects needing both FHWA action under NEPA and an ACOE individual permit under Section 404 of the CWA. The signatory agencies to the NEPA/Section 404 MOU include FHWA, EPA, ACOE, USFWS, National Marine Fisheries Services (NMFS), and Caltrans.

In March 1999, pursuant to the NEPA/Section 404 MOU, a purpose and need statement was approved for the SOCTIIP. Between August 1999 and November 2000, the NEPA/Section 404 MOU signatory agencies developed a list of project alternatives to be evaluated in the EIS/SEIR. It was during this process that the signatory agencies referred to the project as the South Orange County Transportation Infrastructure Improvement Project or SOCTIIP. The NEPA/Section 404 MOU agencies and the TCA are collectively referred to as the "SOCTIIP Collaborative." In November 2000, the SOCTIIP Collaborative concurred on the Alternatives to be carried forward and evaluated in the EIS/SEIR.

FHWA published a Revised NOI on February 20, 2001, in the Federal Register (66 Fed. Reg. 10,934) that notified federal agencies that an EIS will be prepared for a proposed transportation improvement in south Orange County and northern San Diego County. The February 2001 NOI described the proposed SOCTIIP alternatives and the history of the project related to the earlier NEPA and CEQA notices and studies. FHWA published a Supplemental NOI in the Federal Register on March 14, 2001 (66 Fed. Reg. 10,934), to inform federal agencies of the dates, times and locations of the three scoping meetings in March 2001. The EIS/SEIR is the culmination of the planning and environmental studies conducted since the early 1990s for the FTC-S/SOCTIIP.

In support of the biological resources for the above described EIS/SEIR, several specific resources-related technical reports/studies have been prepared. In addition, technical experts have been consulted for several specific issues. These technical studies and communications are identified in Appendix A and are available upon request by the USFWS.

Chapter 2. Project Description

2.1 Project Description

The SOCTIIP A7C-FEC-M alternative proposes a southern extension of the existing SR-241 in south Orange County from Oso Parkway to I-5 in the vicinity of the Orange/San Diego County line. The corridor would accommodate bus, minibus, and shared ride travel modes. The A7C-FEC-M would be operated as a toll facility until the construction bonds for the corridor are paid off. The corridor would operate as a closed barrier system, where all vehicles pay at least one toll. The corridor would include both mainline and ramp toll collection facilities as described in Table 2.4-8 of the EIS/SEIR. At the mainline toll plaza and the ramp toll facilities, tolls will be paid with cash or the Automatic Vehicle Identification (AVI) system where users stay in the FasTrak[®] travel lanes and pass through the toll plaza without stopping.

There are two typical cross sections for the A7C-FEC-M. From Oso Parkway to Ortega Highway, the typical section, from the edge of one outside shoulder to the edge of the other outside shoulder, is 39 meters (128 feet) wide. This cross section would accommodate two general purpose lanes in each direction and would accommodate one future HOV lane in each direction in the median, if needed in the future. South of Ortega Highway to I-5, the corridor typical section would be 27 meters (89 feet) wide. This would accommodate two general purpose lanes in each direction. To accommodate one future HOV lane in each direction, this typical section would have to be widened on the outside.

Climbing and auxiliary lanes will also be provided along the corridor alternatives, as required by the *Caltrans Highway Design Manual*.

The project corridor provides the number of traffic lanes that would be needed to meet forecasted demand through 2025, the design forecast year for the project and the planning horizon year for regional plans and socioeconomic forecasts.

The construction limits include all areas disturbed for grading, remedial grading, realigned access roads for agricultural and utilities, utility relocations, water quality features and materials and equipment storage areas.

Structures would be provided at major crossings of water and natural resources and local roads and to provide access under the corridors for wildlife.

The A7C-FEC-M is approximately 26 km (16 mi) long, with approximately 1.3 km (0.8 mi) of improvements on the I-5. The A7C-FEC-M is proposed to extend from the existing terminus of the FTC-N at Oso Parkway. It will traverse the east side of Cañada Chiquita and extend south, across San Juan Creek to Ortega Highway, approximately 2.1 km (1.3 mi) east of the intersection of Antonio Parkway/Avenida La Pata. The alignment will then progress southeast from Ortega Highway, then south traversing the west side of the Donna O'Neill Land Conservancy to the existing terminus of Avenida Pico. From Avenida Pico, the alignment continues south, crossing the inland part of the San Onofre State Beach lease on MCB Camp Pendleton in San Diego County, extending across Cristianitos Road approximately 1.1 km (0.7 mi) north of I-5. The alignment then turns to the southeast crossing over San Mateo Creek and onto the I-5, with direct connectors between the corridor and I-5. I-5 would be widened from 0.9 km (0.6 mi) south of Basilone Road to 2.2 km (1.4 mi) south of Basilone Road.

Interchanges are proposed along the A7C-FEC-M at Oso Parkway, "C" Street, Cow Camp Road, Avenida Pico, Cristianitos Road and I-5. Bridges will be constructed at the major

waterway crossings including San Juan Creek and San Mateo Creek. A mainline toll plaza will be located approximately 3.7 km (2.3 mi) south of Oso Parkway.

2.2 **Project Footprint**

The footprint for the proposed A7C-FEC-M includes areas for grading, remedial grading and construction disturbance areas. In addition to the paved road and associated bridges and interchanges, the construction area includes access roads, materials storage areas, areas for utility relocations and areas for the construction of the Best Management Practices (BMPs).

Both temporary and permanent impacts are anticipated within the project footprint. Permanent impacts include:

1. Paved road areas
2. Sites for water quality BMPs (primarily extended detention basins)
3. Bridge support structures
4. Ramps and structures at interchange locations
5. Drainage structures (including cross culverts)
6. Realignment of existing agricultural and utility access roads
7. Overhead electrical tower relocations
8. Mainline toll plaza and ramp plazas

Caltrans will maintain the features listed in 1-7 after opening. Caltrans' maintenance will include routine maintenance to assure that features remain functional.

Temporary impacts include:

- Cut and fill grading to establish final road elevations. Following grading, all slopes will be planted with a native seed mix and with time the slopes will become naturalized.¹
- Erection of falsework for bridge construction
- Material storage areas
- Pull zones to string overhead utilities
- Remedial grading

Minimization, avoidance and enhancement measures have been incorporated into the design of the A7C-FEC-M to reduce project impacts. During the Collaborative process, the alignment was adjusted to avoid some of the biologically sensitive resources within the south Orange County and northwestern San Diego County area. In addition, the Collaborative adjusted the alignment to avoid, to the greatest extent possible, the current natural open space areas in the eastern and/or central portion of the SOCTIIP action area. These adjustments to the A7C-FEC-M substantially reduced the potential impacts to the size of a NCCP reserve design as compared to an alignment such as the FEC-M. The adjustments from the FEC-M to the A7C-FEC-M resulted in the increase of 11 percent more open space areas to the east of the two alignments considered.

Additional shifts have been made to avoid geotechnical hazards, thus reducing remedial grading. Avoidance of existing utilities was also performed to limit relocation impacts.

¹ Caltrans is authorized to access manufactured slopes within the right-of-way containing landscaped areas, access roads, fencing, drainage structures, etc. for routine maintenance. No off-site measures will be required to offset impacts as a result of the maintenance activities.

Bridges have been incorporated at the major stream crossings to minimize hydrologic impacts and impacts to wetland habitats. To minimize impacts during construction, features such as cofferdams can be utilized in wetland areas to limit the necessary construction area at the bridge supports. The addition of walls was also incorporated to limit the grading footprint in sensitive areas.

It is anticipated that the project will be balanced in relation to earthwork quantities and no borrow or disposal will be required. Access to the project site will be via existing major arterials at Oso Parkway, Ortega Highway and Avenida Pico and existing Cristianitos Road. Construction staging areas will occur within the designated project footprint, which has been documented in the environmental document.

2.3 Dust, Erosion and Sedimentation Controls

All contractor specifications shall incorporate directions to contractors to control fugitive dust. Fugitive dust shall be controlled by maintaining an adequate moisture content in the soil, watering grading areas, establishing ground cover in inactive areas and watering unpaved roads, or by other dust preventive measures, as defined in South Coast Air Quality Management District (SCQAMD) Rule 403.

During construction of the A7C-FEC-M construction site BMPs will be implemented as appropriate. These BMPs are described in the Caltrans Construction Site Best Management Practices Manual (March, 1993), Storm Water Management Plan (SWMP) and Storm Water Quality Handbooks. BMP categories include measures for temporary sediment control, temporary soil stabilization, preservation of existing vegetation, conveyance controls, wind control, temporary stream crossings and waste management, as well as many other measures which may be implemented during construction of the A7C-FEC-M.

Prior to start of soil-disturbing activity at the project site, a Storm Water Pollution Prevention Plan (SWPPP) will be prepared in accordance with and to partially fulfill the General Construction Permit. The SWPPP will be prepared per the SWPPP and Water Pollution Control Program (WPCP) Preparation Manual (Storm Water Quality Handbooks, November 2000). The SWPPP will meet the applicable provisions of Sections 301 and 402 of the CWA by requiring controls of pollutant discharges that utilize best available technology (BAT) which is economically achievable and best conventional pollutant control technology (BCT) to reduce pollutants. The SWPPP will be implemented concurrently with commencement of the soil-disturbing activity. The SWPPP will include a description of the BMPs and control practices to be used for both temporary and permanent erosion control measures. Permanent BMP's, such as extended detention basins, will be regularly maintained by Caltrans per the adopted Caltrans maintenance manual.

The SWPPP will include a description or illustration of BMPs, which will be implemented to prevent a net change of sediment load in storm water discharge relative to pre-construction levels. Sediment control BMPs are required at appropriate locations along the site perimeter and at all operational internal inlets to the storm drain system at all times during the rainy season. Sediment control practices may include filtration devices and barriers (such as fiber rolls, silt fence, straw bale barriers, and gravel inlet filters) and/or settling devices (such as sediment traps or basins).

2.4 How the Project will be Accomplished

Finished road grade for the A7C-FEC-M will be accomplished using standard cut and fill grading operations. Concrete box girder construction is anticipated at the bridge locations. Asphaltic concrete will be used to pave the mainline of the road with concrete pavement used at selected locations.

Heavy-duty earth moving equipment will be used for road grading and paving. It is anticipated that the type of equipment will consist of:

- Scraper
- Dozer
- Dump truck
- Water truck
- Asphalt paving machine
- Steel wheel roller
- Compactor
- Loader
- Backhoe
- Excavator
- Belly dump truck
- Rubber tired roller

Equipment anticipated for bridge construction will consist of:

- Crane
- Pile driving hammer
- Low boy trailer
- Drilling rig
- Forklift
- Concrete pump truck
- Concrete truck

This equipment would be used for clearing and grubbing, grading, excavation, backfilling, materials and equipment delivery and removal, concrete and asphalt installation, and other construction activities. Staging areas within the disturbance limits would be used during construction for materials storage, equipment and employee parking, temporary storage of soils and other related activities. Access to the construction areas would be via existing public roads and existing ranch/utility access roads.

The A7C-FEC-M would be designed and constructed as a "design/build" contract. Under a design/build contract, the TCA would contract with a single contractor to complete the design and construct the entire corridor Alternative. The advantages of design/build include opportunities for input/feedback between the designers and the builder throughout the design and construction processes; for concurrent preparation of design on one segment and construction on another segment; substantially reducing the total time elapsed for design and construction, and reducing costs associated with work change orders and design changes once construction has begun. The TCA has successfully used the design/build approach for the existing Eastern and San Joaquin Hills Transportation Corridors in Orange County.

2.5 Project Timing

It is anticipated that construction on the A7C-FEC-M would begin in early 2006. The construction period will last between 36 to 48 months and should be continuous over this time frame.

2.6 Contractor Constraints

The contractor for the A7C-FEC-M project will:

- Be required to stay within the project footprint documented in the EIS/SEIR.
- Perform and abide by all pertinent minimization measures identified in the EIS/SEIR.
- Abide by all permits obtained from the resource agencies.
- Conform to all local noise ordinances.

A construction engineering manager (CEM), working in conjunction with the TCA, will oversee the contractor throughout the length of the design/build contract.

Chapter 3. Listed and Proposed Species Potentially in the Biological Action Area

3.1 Biological Action Area

The affected environment related to Threatened and Endangered species includes all areas in which federally listed Threatened or Endangered species were observed or have the potential to occur in the SOCTIIP Biological Study Area depicted on Figure 6. This study area includes areas potentially affected by direct or indirect impacts from construction and use of any of the built alternatives. Given the scale of the study area, the biological resources present, and the number of alternatives considered, the assessment required a flexible yet focused study design. This challenge was further compounded by the need to assess the entire lengths of all build alternatives. The study methods used were designed to effectively identify and address these issues and the potential constraints they presented.

The first and most crucial element of the study design was the need to establish an appropriate and meaningful survey area based on biological criteria. Although the survey area varies in width and extent, in no case was the survey area boundary less than 0.40 kilometer (0.25 mile) on either side of the centerline of all corridor alignments. It should be noted that the action area boundary referenced throughout this document is located within the study area and is 0.40 kilometer (0.25 mile) on either side of the centerline of all corridor alignments. The survey area boundary for the arterial improvements was 151 meters (500 feet) from the edge of future projected improvements and the survey area boundary for the I-5 widening was 60 meters (200 feet) and, in some cases where native habitat was present adjacent to I-5, 151 meters (500 feet). From a biological perspective, this was established as the minimum survey width for which all biological resources and potential impacts were likely to be addressed. In many cases, however, a biological survey area extended well beyond 0.40 kilometer (0.25 mile) on either side of the centerline so that other biological resources, such as wildlife corridors, can be evaluated on a landscape level. This was done to include an examination of potentially far-reaching and long-term impacts such as habitat fragmentation or downstream effects, which must be addressed in a broader spatial and temporal context. In this regard, the study provides a thorough and focused assessment of the entire area potentially affected.

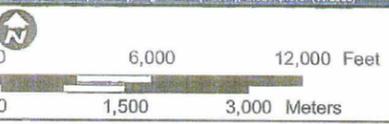
For this analysis, the SOCTIIP action area is divided into eastern and western sections. The western section includes predominately urbanized areas, with limited open space, primarily within the Arroyo Trabuco. The eastern section occurs east of Antonio Parkway, from Oso Parkway to Ortega Highway. South of Ortega Highway, the eastern section of the SOCTIIP action area occurs east of the incorporated cities of San Juan Capistrano and San Clemente. The eastern section of the SOCTIIP action area contains mostly undeveloped lands owned by RMV with scattered areas of active agriculture and sand and gravel mining operations. A County of Orange landfill operation, a state park, and MCB Camp Pendleton are additional land uses in the eastern section of the action area. Much of the remaining undeveloped area has supported or currently supports livestock grazing. Considerable areas of natural open space also exist.

3.2 Listed and Proposed Species Potentially Present

Federally Threatened (FT) and Federally Endangered (FE) species observed in the action area include San Diego fairy shrimp (*Branchinecta sandiegonensis*) (FE), Riverside fairy shrimp



Initial A7C-FEC-M (with BMPs and towers)
 Biological Study Area



Biological Study Area

(*Streptocephalus woottoni*) (FE), tidewater goby (*Eucyclogobius newberryi*) (FE), southern steelhead trout (*Oncorhynchus mykiss*) (FE), arroyo toad (*Bufo californicus*) (FE), southwestern willow flycatcher (*Empidonax traillii extimus*) (FE), coastal California gnatcatcher (*Poliophtila californica californica*) (FT), least Bell's vireo (*Vireo bellii pusillus*) (FE), Pacific pocket mouse (*Perognathus longimembris pacificus*) (FE), and thread-leaved brodiaea (*Brodiaea filifolia*) (FT). Threatened and Endangered plant species that are known to occur in the project region but were not observed during multiple years of focused surveys within the action area include: Braunton's milk-vetch (*Astragalus brauntonii*) (FE), Nevin's barberry (*Berberis nevinii*) (FE), spreading navarretia (*Navarretia fossalis*) (FT), Orcutt's grass (*Orcuttia californica*) (FE), and Gambel's watercress (*Rorippa gambelii*) (FE). Threatened and Endangered wildlife species that are known to occur in the project region but were not observed within the action area include the vernal pool fairy shrimp (*Branchinecta lynchi*) (FT), Quino checkerspot butterfly (*Euphydryas editha quino*) (FE), and California red-legged frog (*Rana aurora draytoni*) (FT). Threatened or Endangered species known to occur in the project region are listed in Table 3. The species that have been observed within the action area are discussed below. A detailed discussion of plant and wildlife species either present or not present is provided in the NES (P&D Consultants 2003). The detailed survey/study methods and personnel identified in Section 3 of the NES are provided in Appendix D. Graphical illustrations are provided that support the following discussions of the thread-leaved brodiaea (Figures 7a-7e); fairy shrimp (Figures 8a-8e); southern steelhead and tidewater goby (Figure 9); arroyo toad (Figures 10a-10e); coastal California gnatcatcher, southwestern willow flycatcher, and least Bell's vireo (Figures 11a-11e); and Pacific pocket mouse (Figures 12a and 12b). Many of the figures are multiple plates. These figures depict the data gathered from the comprehensive surveys in the SOCTIIP action area.

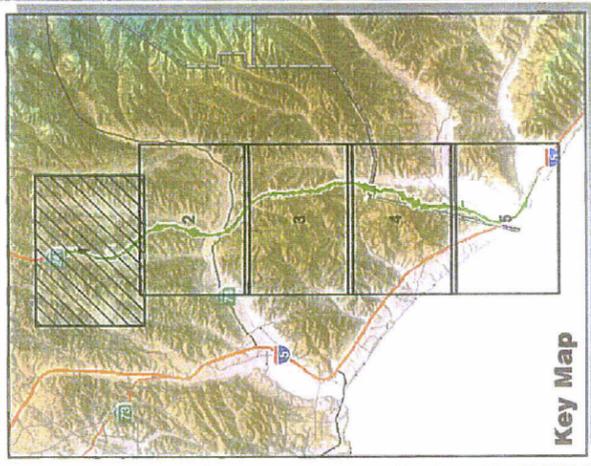
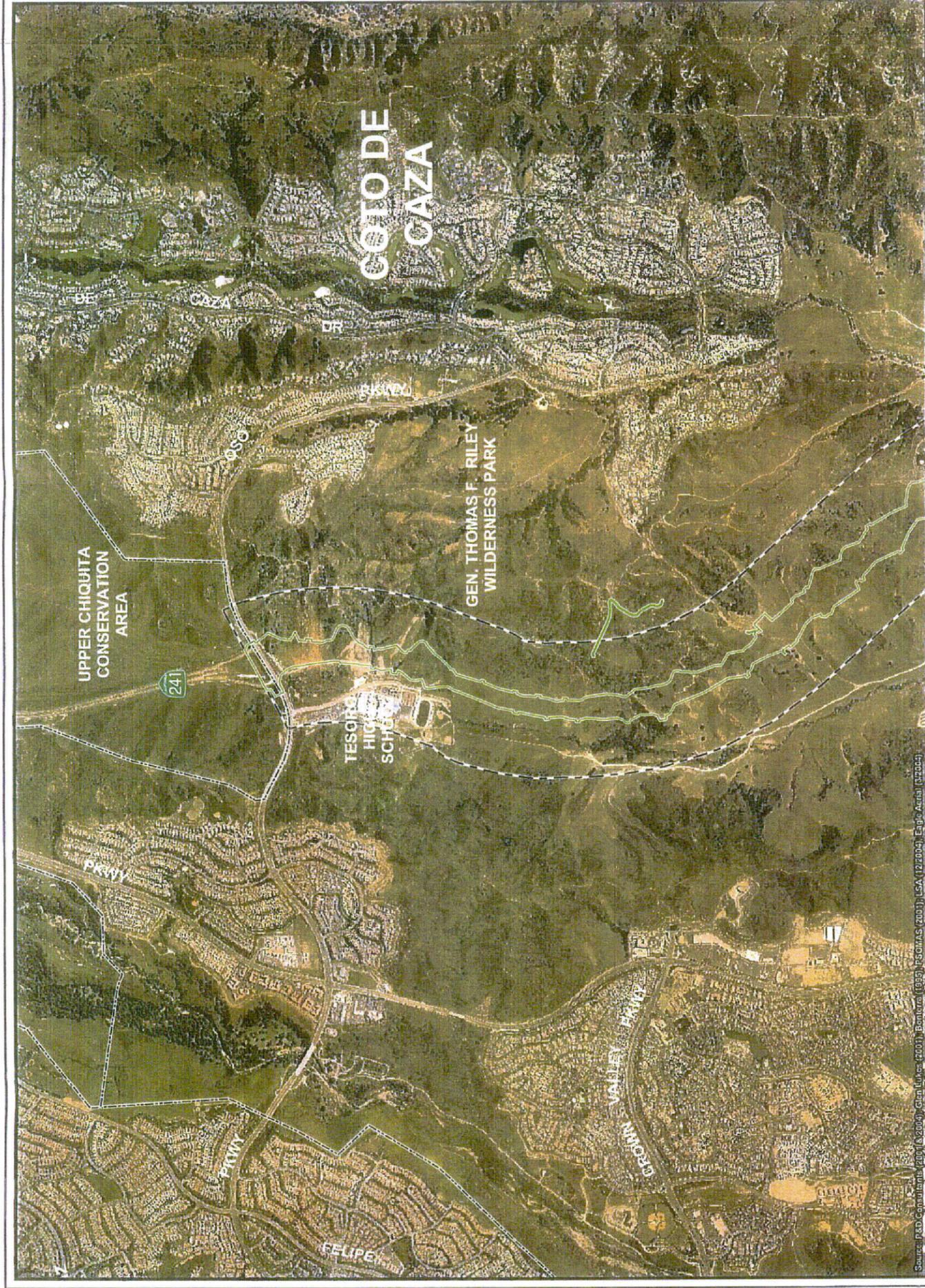
3.2.1 Fairy Shrimp

Two fairy shrimp species that are listed as Endangered under the FESA, the San Diego fairy shrimp and Riverside fairy shrimp, are located within the action area. The San Diego fairy shrimp occurs in one location in the action area in three pools located south of Ortega Highway, also approximately 686 meters (2,250 feet) from the centerline of the A7C-FEC-M. Therefore, the habitat containing these species will be avoided. The following is a summary of the survey data that support this conclusion:

Surveys for fairy shrimp performed in Winter-Spring 2001 and 2003 were conducted pursuant to USFWS Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the FESA for the Listed Vernal Pool Branchiopods. Within the San Diego County portion of the action area, Riverside fairy shrimp were identified in one basin and San Diego fairy shrimp were identified in eight basins (Figures 8a-8e). These basins occur on a ridgeline west of Cristianitos Creek or along the bluff overlooking Surf Beach in SOSB. During the 2002-2003 survey season, both species were confirmed in vernal pools previously surveyed; however, new vernal pools surveyed were not occupied by fairy shrimp listed as Endangered or Threatened. Within the Orange County portion of the action area, the Riverside fairy shrimp is known from two pools located south of Ortega Highway, approximately 686 meters (2,250 feet) from the centerline of the A7C-FEC-M.

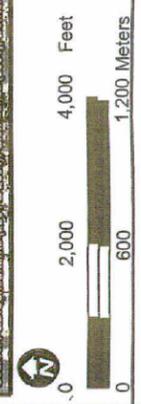
3.2.2 Tidewater Goby

The tidewater goby is a small brackish-water fish that is listed as Endangered under the FESA. This species may be affected during the construction of bridge structures over San Mateo Creek. The following summary is provided in support of this conclusion:

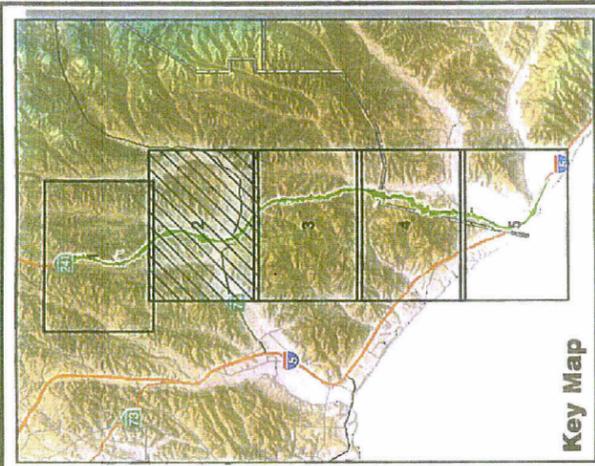
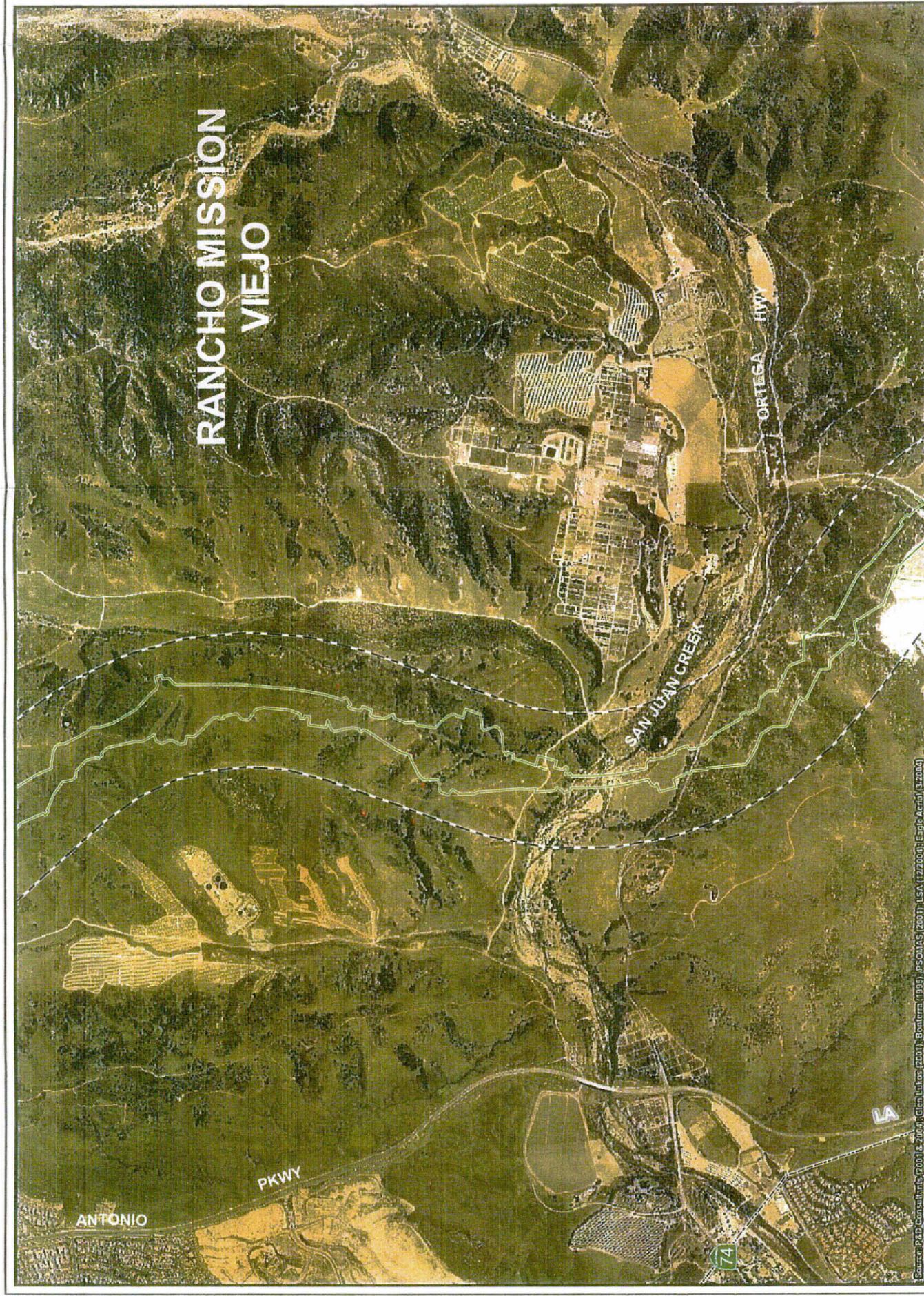


Key Map

- Thread-leaved Brodiaea
- Coastal Zone Boundary
- Biological Action Area
- A7C-FEC-M (with BMPs & towers)
- County Boundary
- City Boundary

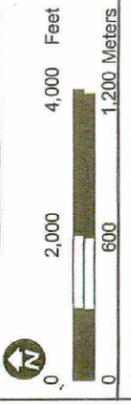


Rare Plants
Sheet 1



Key Map

-  Thread-leaved Brodiaea
-  Coastal Zone Boundary
-  Biological Action Area
-  A7C-FEC-M (with BMPs & towers)
-  County Boundary
-  City Boundary

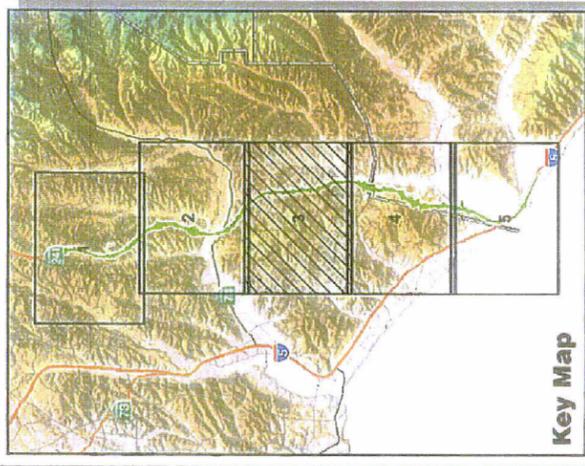


Rare Plants
Sheet 2

SOCTIIP Biological Assessment

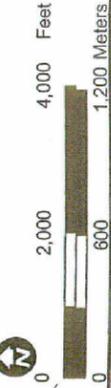
Figure 7b

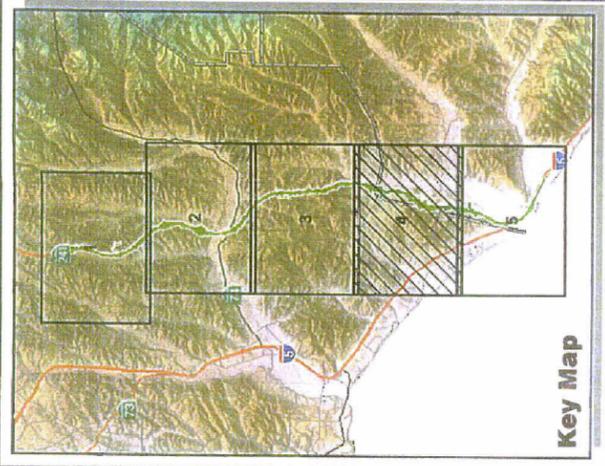
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Key Map

-  Thread-leaved Brodiaea
-  Coastal Zone Boundary
-  Biological Action Area
-  ATC-FEC-M (with BMPs & towers)
-  County Boundary
-  City Boundary





Key Map

-  Thread-leaved Brodiaea
-  Coastal Zone Boundary
-  Biological Action Area
-  A7C-FEC-M (with BMPs & towers)
-  County Boundary
-  City Boundary

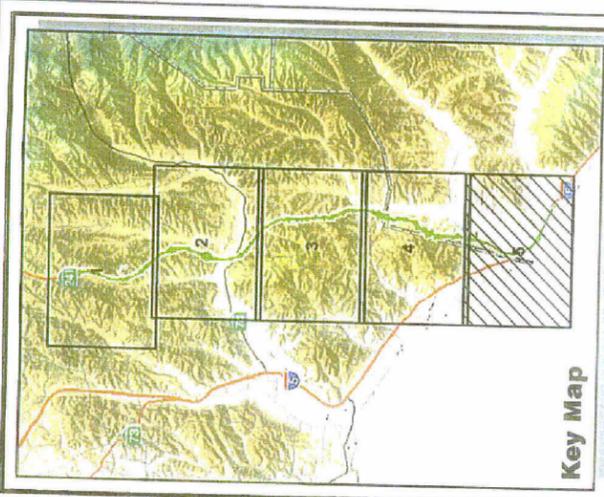
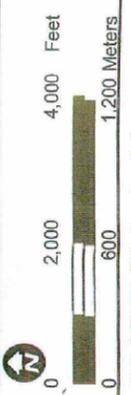
Rare Plants
Sheet 4

SOCTIIP Biological Assessment
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Figure 7d



Source: P&D Consultants (2001 & 2004), Grant/Urban (2001), Benhara (1992), Poulos (1997), LOR (12/2004), Eagle Areas (2/2004)



Key Map

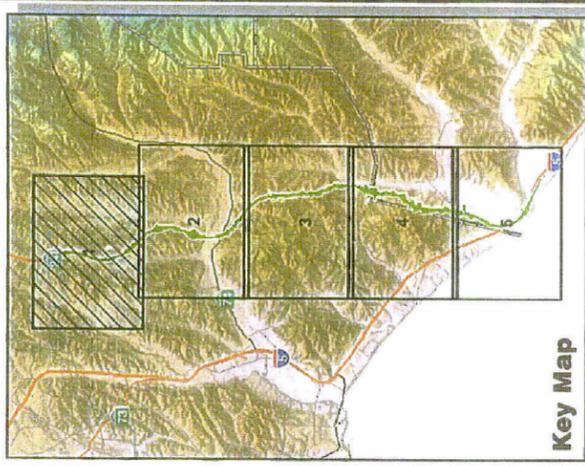
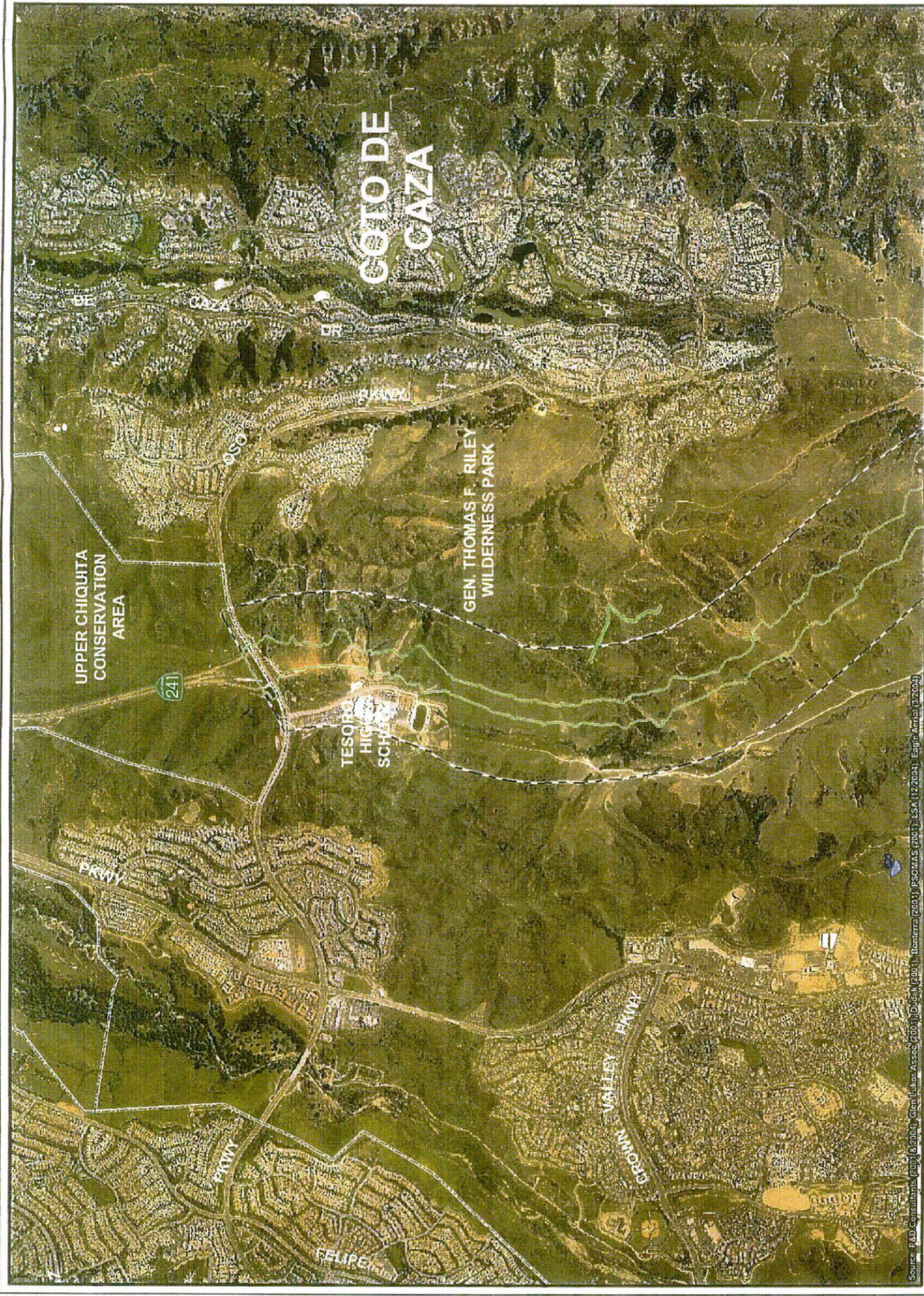
- Thread-leaved Brodiaea
- Coastal Zone Boundary
- Biological Action Area
- A7C-FEC-M (with BMPs & towers)
- County Boundary
- City Boundary

Rare Plants
Sheet 5

SOCTIIP Biological Assessment

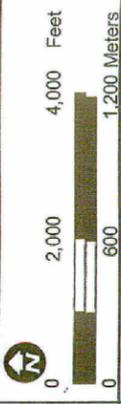
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Figure 7e

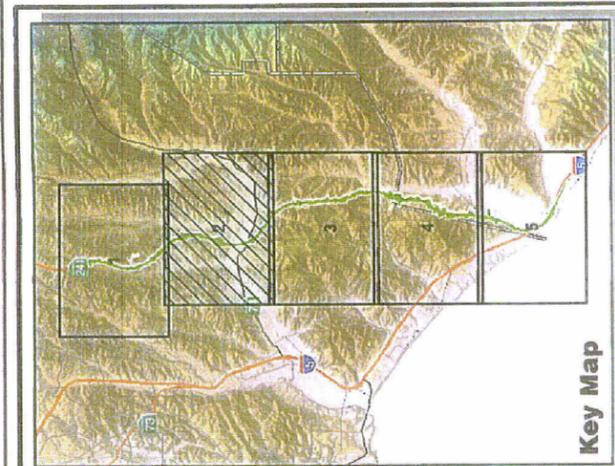
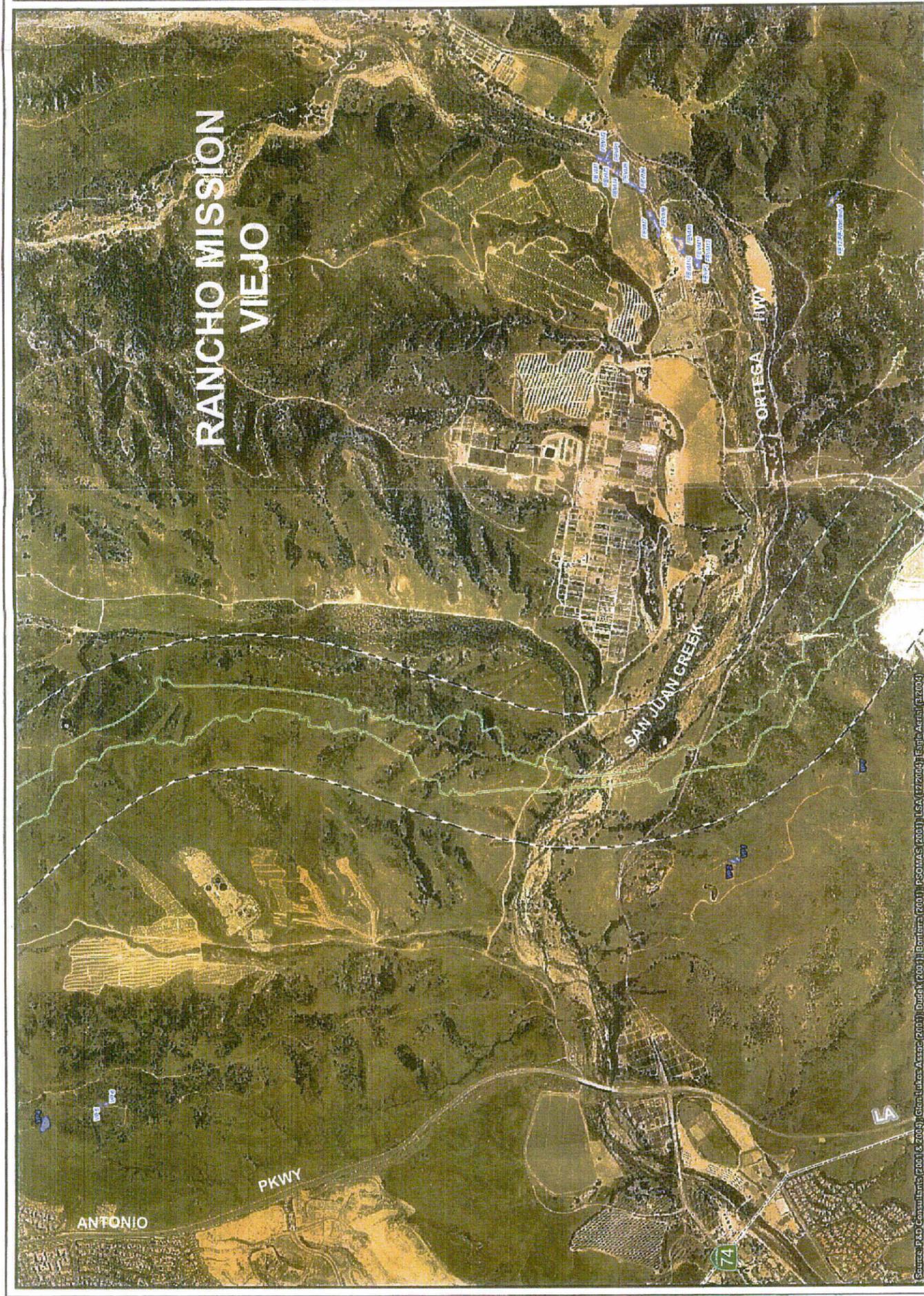


Key Map

- Coastal Zone Boundary
- Biological Action Area
- Fairy Shrimp
- Unoccupied (with IDs)
- Occupied by Listed Species (with IDs)
- Labels with "VP" prefix are from Dudek Assoc. and "FE" prefix are from Glen Lukes Assoc.
- A7C-FEC-M (with BMPs & towers)
- County Boundary
- City Boundary



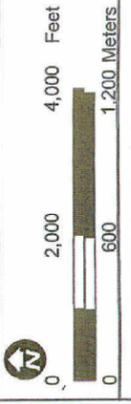
Fairy Shrimp
Sheet 1



Key Map

- Coastal Zone Boundary
- - - Biological Action Area
- Fairy Shrimp
 - Unoccupied (with IDs)
 - Occupied by Listed Species (with IDs)
- Labels with "VP" prefix are from Dudek Assoc. and "FE" prefix are from Glen Lukos Assoc.
- A7C-FEC-M (with BMPs & towers)
- County Boundary
- - - City Boundary

Source: F&D Consultants (2001 & 2004), Glen Lukos Assoc (2004), Dudek (2001), Bonterra (2001), PSONMAS (2001), USA (1972004), Eagle Aerial (2004)

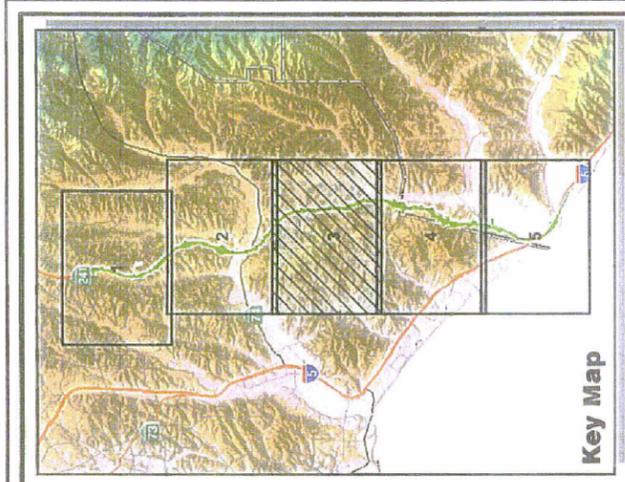


SOCTIIP Biological Assessment

(2/16/05) I:\TCM\430\GISB_FAIRYSHRIMP.mxd

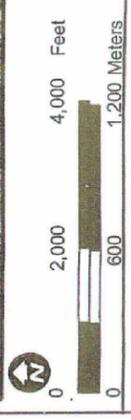
Fairy Shrimp
Sheet 2

Figure 8b

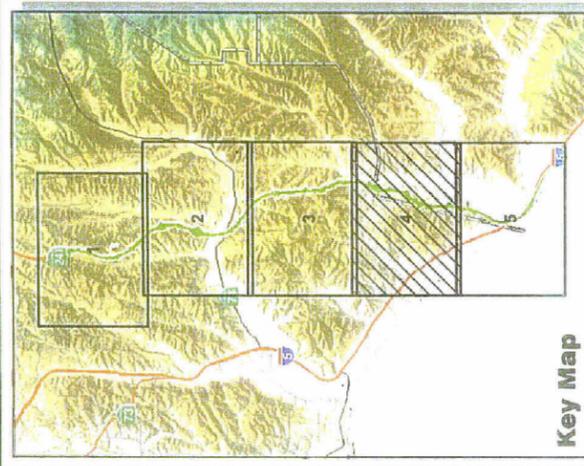


Key Map

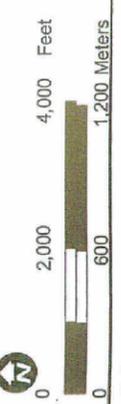
- Coastal Zone Boundary
- Biological Action Area
- Fairy Shrimp**
- Unoccupied (with IDs)
- Occupied by Listed Species (with IDs)
- Labels with "YF" prefix are from Dudek Assoc. and "FE" prefix are from Glen Lukos Assoc.
- ATC-FEC-M (with BMPs & towers)
- County Boundary
- City Boundary



Fairy Shrimp
Sheet 3



- Key Map**
- Coastal Zone Boundary
 - - Biological Action Area
 - Fairy Shrimp
 - Unoccupied (with IDs)
 - Occupied by Listed Species (with IDs)
- Labels with "VP" prefix are from Dudek Assoc. and "FE" prefix are from Glen Lukos Assoc.
- A7C-FEC-M (with BMPs & towers)
 - County Boundary
 - City Boundary

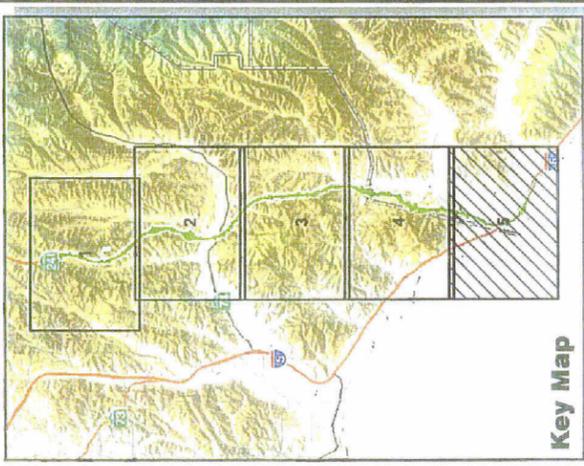


SOCTIIP Biological Assessment

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Fairy Shrimp
Sheet 4

Figure 8d



Key Map

- Coastal Zone Boundary
 - - - Biological Action Area
 - Fairy Shrimp
 - Unoccupied (with IDs)
 - Occupied by Listed Species (with IDs)
- Labels with "VP" prefix are from Dudek Assoc. and "FE" prefix are from Glen Lukos Assoc.
- A7C-FEC-M (with BMPs & towers)
 - County Boundary
 - - - City Boundary



Source: P&D Consultants (2001 & 2004); Glen Lukos Assoc (2001); Dudek (2001); Banterra (2001); PSCMAS (2001); USA (2004); Eagle Aerial (2004)



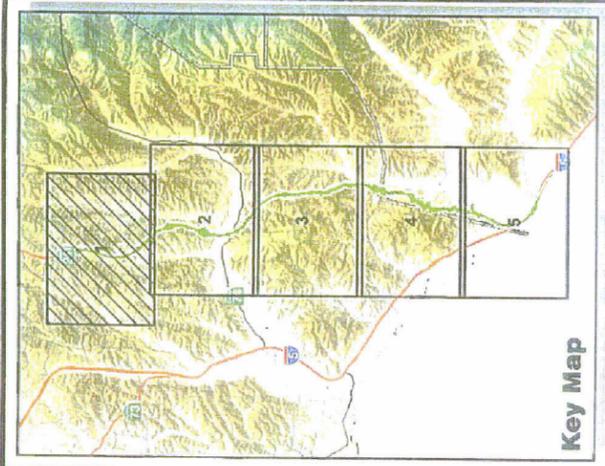
SOCTIP Biological Assessment

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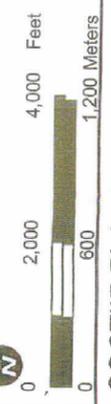
Southern Steelhead and Tidewater Goby

(2/24/05) I:\TCA430\GIS\B_SSH-TWG-HABITAT.MXD



Key Map

- Arroyo Toad Locations
- Coastal Zone Boundary
- - - Biological Action Area
- A7C-FEC-M (with BMPs & towers)
- County Boundary
- - - City Boundary

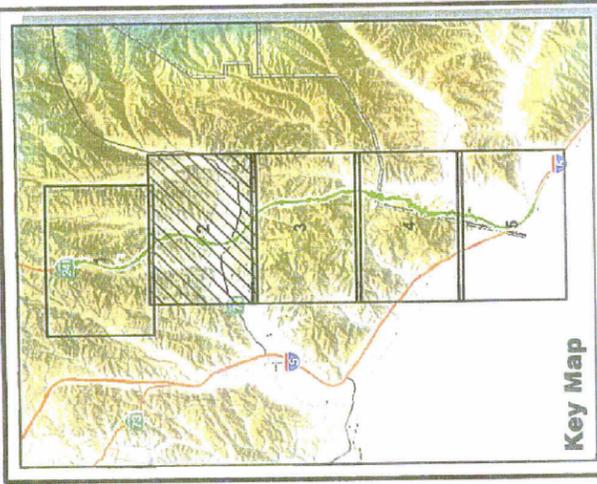


Arroyo Toad
Sheet 1

SOCTIIP Biological Assessment

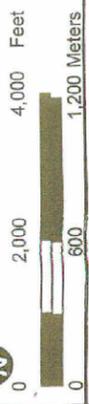
(1/21/04) I:\CA430GISB_ARROYO10A.mxd

Figure 10a



Key Map

- Arroyo Toad Locations
- Coastal Zone Boundary
- - - Biological Action Area
- A7C-FEC-M (with BMPs & towers)
- County Boundary
- City Boundary



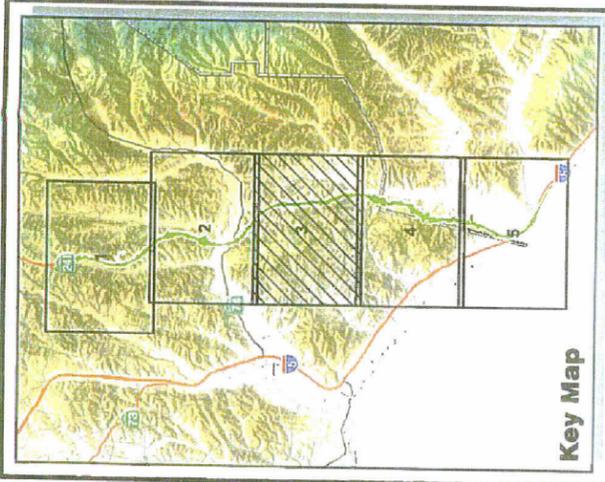
Source: F&D Consultants, Point 2014, Esri, DeLorme, USGS, Intermap, Inc., Swire, GEBCO, Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, AeroGRID, IGN, Esri, Swire

Arroyo Toad
Sheet 2

SOCTIP Biological Assessment

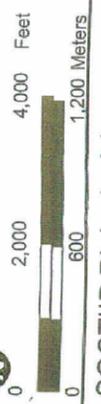
(12/2/04) I:\TCAR30GIS\ARROYO_TOAD.mxd

Figure 10b



Key Map

- Arroyo Toad Locations
- Coastal Zone Boundary
- - - Biological Action Area
- A7C-FEC-M (with BMPs & towers)
- County Boundary
- - - City Boundary

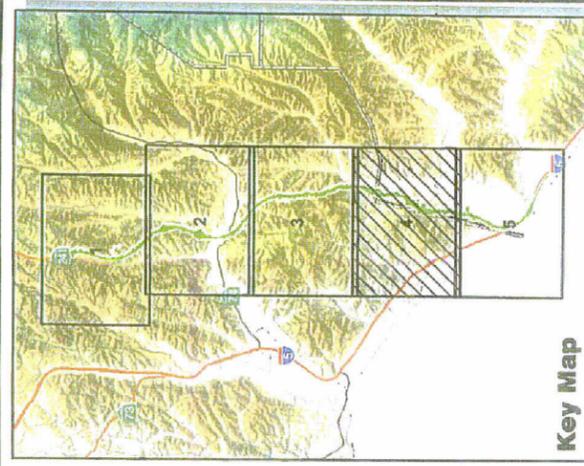


Arroyo Toad
Sheet 3

SOCTIIP Biological Assessment

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Figure 10c



Key Map

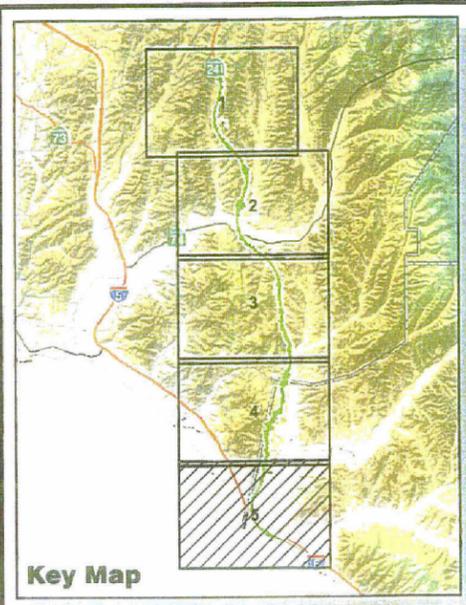
- Arroyo Toad Locations
- Coastal Zone Boundary
- - - Biological Action Area
- A7C-FEC-M (with BMPs & towers)
- County Boundary
- City Boundary

Arroyo Toad
Sheet 4

SOCTIIP Biological Assessment

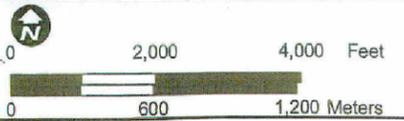
(122104) RTCA430GISB_ARROYOTOAD.mxd

Figure 10d

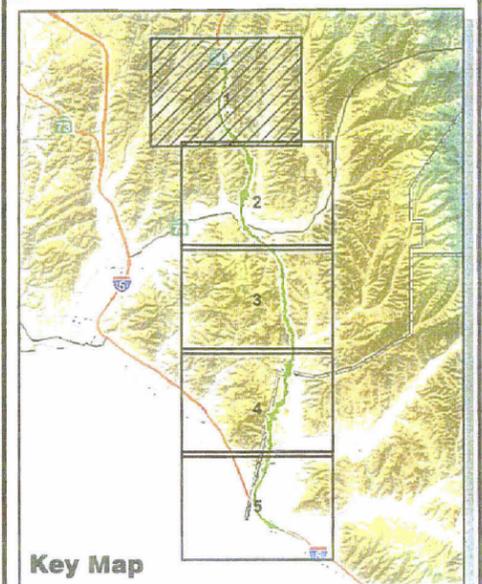


- Key Map**
- ⊙ Arroyo Toad Locations
 - Coastal Zone Boundary
 - - Biological Action Area
 - ▨ A7C-FEC-M (with BMPs & towers)
 - County Boundary
 - ⋯ City Boundary

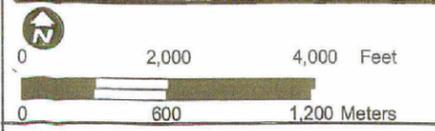
Source: P&D Consultants (2001 & 2004); PSOMAS (2001); LSA (12/2004); Eagle Aerial (3/2004)



Arroyo Toad
Sheet 5



- Key Map**
- California Gnatcatcher
 - Least Bell's Vireo
 - Southwestern Willow Flycatcher
 - Coastal Zone Boundary
 - Biological Action Area
 - A7C-FEC-M (with BMPs & towers)
 - County Boundary
 - City Boundary

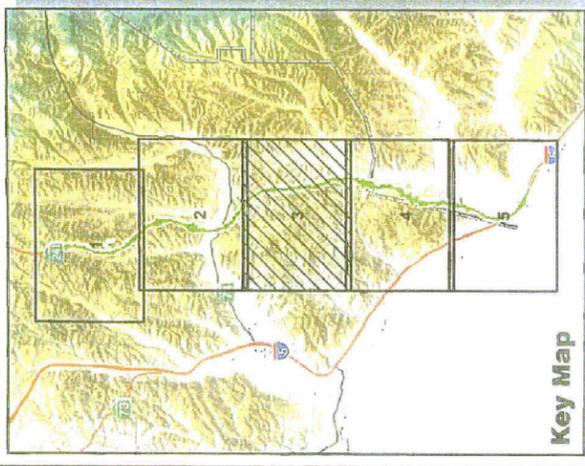


Birds
Sheet 1



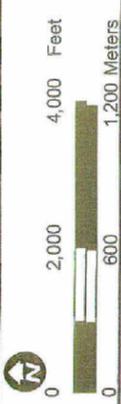
Birds
Sheet 2

Figure 11b



Key Map

- California Gnatcatcher
- Least Bell's Vireo
- Southwestern Willow Flycatcher
- Coastal Zone Boundary
- - - Biological Action Area
- A7C-FEC-M (with BMPs & towers)
- County Boundary
- City Boundary



Birds
Sheet 3

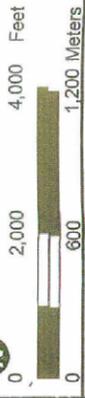
SOCTIIP Biological Assessment

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Figure 11c

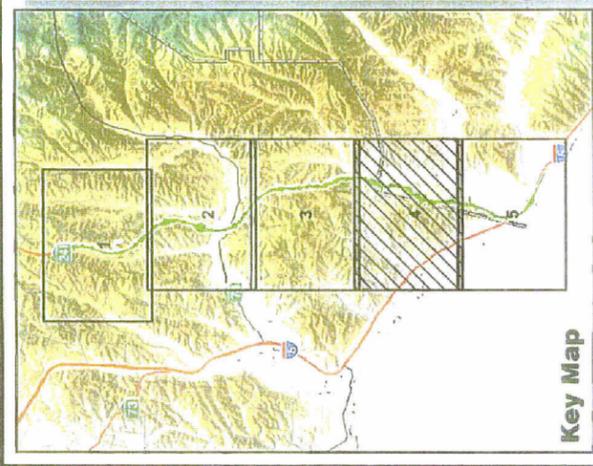


Source: P&D Consultants (2001 & 2004); P&D/CORAS (2000) USA (12/2004) Eagle Aerial (12/2004)



SOCTIIP Biological Assessment

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Key Map

- California Gnatcatcher
- Least Bell's Vireo
- Southwestern Willow Flycatcher
- Coastal Zone Boundary
- - - Biological Action Area
- A7C-FEC-M (with BMPs & towers)
- County Boundary
- City Boundary

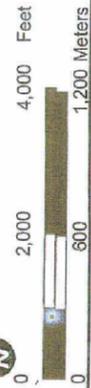
Birds
Sheet 4

Figure 11d



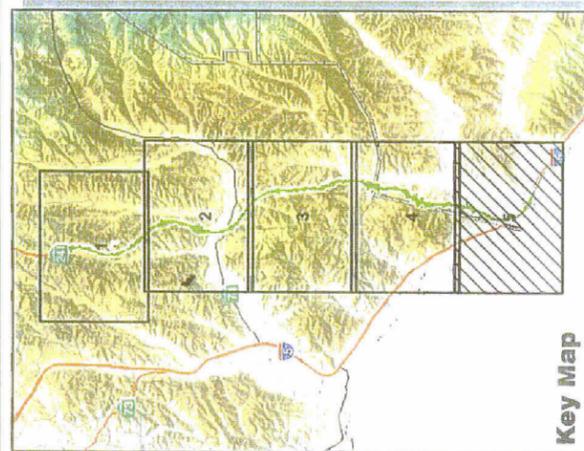
Source: P&D Consultants (2001 & 2004); PSONAS (2003); USA (12/2004); Eagle Aerial (3/2004)

Least Bell's Vireo sites on this map are not being impacted by the ATC-FEC-42 direct disturbance limits



SOCTIIP Biological Assessment

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Key Map

- California Gnatcatcher
- Least Bell's Vireo
- Southwestern Willow Flycatcher
- Coastal Zone Boundary
- - - Biological Action Area
- A7C-FEC-M (with BMPs & towers)
- County Boundary
- - - City Boundary

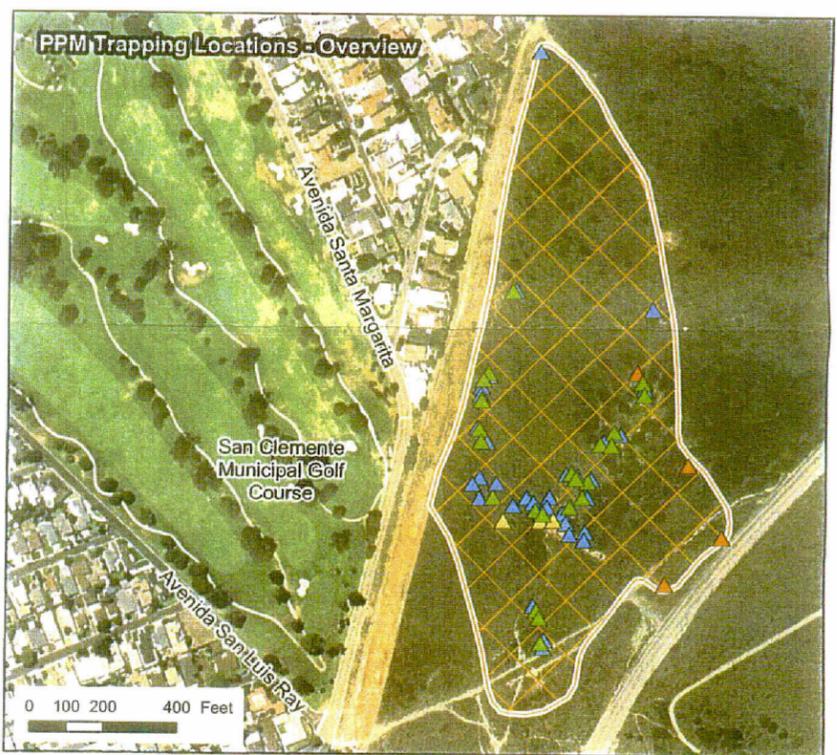
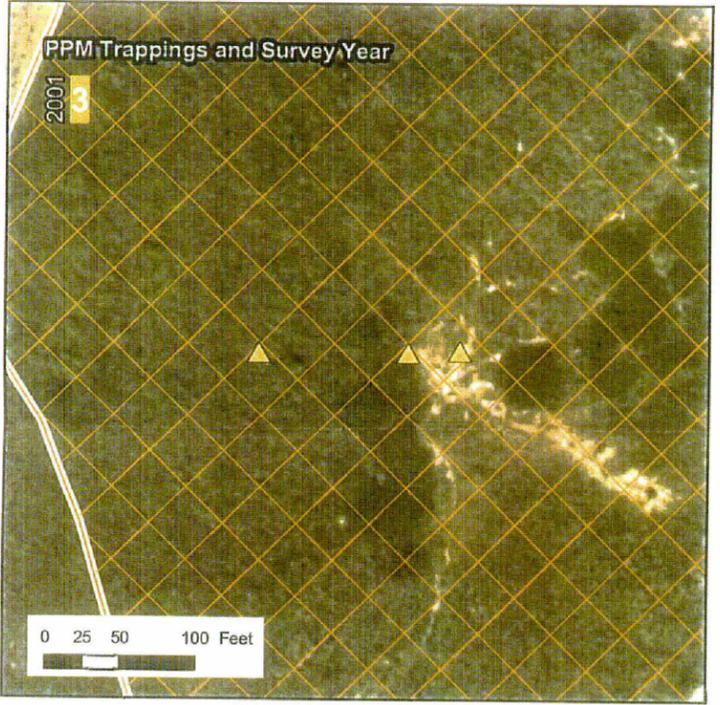
Birds
Sheet 5

Figure 11e



Pacific Pocket Mouse - San Mateo North

Figure 12a



- Pacific Pocket Mouse Habitat
- Occupied Habitat
- Pacific Pocket Mouse Locations
(Survey Author and Date)
- MBA (1995)
 - MBA (1996)
 - Shana Dodd (2001)
 - P&D Consultants (2003)



SOURCE: Aerial Data - Eagle Aerial (4/2003)

Pacific Pocket Mouse - San Mateo North

Figure 12b

This fish lives in primarily coastal brackish-water lagoons along the California coastline. Populations of the tidewater goby in San Diego County exist in the San Mateo, San Onofre, Las Flores, Hidden, and Cocklebur lagoons (Swift et al. 1993 and D. Kramer, pers. comm., 1997). A large population of tidewater gobies (137) was observed in San Mateo Lagoon, and one individual was caught in San Mateo Creek during the 1995 survey (Figure 9). In addition, a population of approximately 10,000 individuals is present in San Onofre Lagoon in the SOCTIIP biological action area (D. Kramer, pers. comm., 1997).

**TABLE 3
THREATENED OR ENDANGERED SPECIES KNOWN TO
OCCUR IN THE PROJECT REGION**

Scientific Name	Common Name	USFWS	General Habitat Description	Habitat Present (P)/ Absent (A)	Rationale (Potential for Species to Occur)
Plants					
<i>Astragalus brauntonii</i>	Braunton's milk-vetch	FE	Scattered locations in southern California foothills below about 640 meters (2,100 feet) elevation; Ventura, Los Angeles, Orange counties; chaparral, often on carbonate soils; often follows fire or soil disturbance.	P	Species Not Present
<i>Berberis nevini</i>	Nevin's barberry	FE	Large, distinctive shrub that occurs in alluvial scrub habitat in Los Angeles, San Diego, and Riverside counties with no recorded occurrences for Orange County.	P	Species Not Present
<i>Brodiaea filifolia</i>	thread-leaved brodiaea	FT	Vernal pools and alkali sink in inland valleys; also on upland mesic clay soils nearer coast; hot spring soils at Arrowhead Hot Springs; scattered locations in foothills and valleys (Los Angeles County east to San Bernardino, south to San Diego County), below 610 meters (2,000 feet) elevation.	P	Species Present
<i>Navarretia fossalis</i>	spreading navarretia	FT	Vernal pools in San Diego, Riverside, and Los Angeles counties.	P	Species Not Present
<i>Orcuttia californica</i>	Orcutt's grass	FE	Vernal pools in San Diego, Riverside, and Los Angeles counties.	P	Species Not Present
<i>Rorippa gambellii</i>	Gambell's watercress	FE	Marsh habitats. Presently, the only known occurrences of this species are from the San Luis Obispo area (Skinner and Pavlik 1994).	P	Species Not Present
Invertebrates					
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	FT	Seasonal vernal pools, ephemeral ponds, and stock ponds.	P	Species Not Present
<i>Branchinecta sandiegonensis</i>	San Diego fairy shrimp	FE	Seasonal vernal pools, ephemeral ponds, and stock ponds.	P	Species Present
<i>Euphydryas editha quino</i>	Quino checkerspot butterfly	FE	Meadow habitats, clearings in scrub, or chaparral vegetation; often characterized by clay soils with low-growing herbaceous annuals.	P	Species Not Present

TABLE 2 (Continued)
THREATENED OR ENDANGERED SPECIES KNOWN TO
OCCUR IN THE PROJECT REGION

Scientific Name	Common Name	USFWS	General Habitat Description	Habitat Present (P)/ Absent (A)	Rationale (Potential for Species to Occur)
<i>Streptocephalus woottoni</i>	Riverside fairy shrimp	FE	Deep, seasonal vernal pools, ephemeral ponds, and stock ponds.	P	Species Present
Fish					
<i>Eucyclogobius newberryi</i>	tidewater goby	FE	Coastal – brackish-water lagoons.	P	Species Present
<i>Oncorhynchus mykiss</i>	southern steelhead trout	FE	Freshwater streams/coastal lagoons.	P	Species Present
Amphibians					
<i>Bufo californicus</i>	arroyo toad	FE	Rivers with shallow, gravelly pools adjacent to sandy terraces.	P	Species Present
<i>Rana aurora draytoni</i>	California red-legged frog	FT	Riparian areas with intermittent streams and permanent ponds.	P	Species Not Present
Birds					
<i>Poliophtila californica californica</i>	coastal California gnatcatcher	FT	Coastal sage scrub.	P	Species Present
<i>Empidonax traillii extimus</i>	southwestern willow flycatcher	FE	Riparian habitats along rivers, streams or other wetlands with dense growths of willows.	P	Species Present
<i>Vireo bellii pusillus</i>	least Bell's vireo	FE	Riparian woodlands.	P	Species Present
Mammals					
<i>Perognathus longimembris pacificus</i>	Pacific pocket mouse	FE	Open coastal sage scrub and sandy substrates.	P	Species Present
Federal Designations					
FE = Listed by the federal government as an Endangered species					
FT = Listed by the federal government as a Threatened species					

3.2.3 Southern Steelhead

The presence of southern steelhead trout in the action area varies substantially on an annual basis; overall, the likelihood of the steelhead being present is low. This is primarily due to conditions in the creeks and watersheds, including groundwater extraction and subsequent reduced creek flows, sediment deposition at important entry and spawning areas, and man-made obstructions such as grade control structures within San Juan Creek and San Mateo Creek. Implementation of the project will include construction minimization measures that will ensure continued access to upstream areas during construction.

Southern steelhead is listed as Endangered under the FESA. All species of steelhead are anadromous; they spend most of their life in the sea and migrate into freshwater streams to spawn. The young hatch, spend a year or two in fresh water, and then return to the sea. In the SOCTIIP action area, the upstream migration occurs from December to April. Suitable habitat is currently located mostly in the upper reaches of San Mateo and San Juan creeks but was likely prevalent in the lower reaches historically (Figure 9). A detailed description of these reaches and their potential to support steelhead are discussed below.

San Mateo Creek

San Mateo Creek watershed historically supported steelhead runs from the creek mouth up to 13 km (8 mi) upstream. At one time, San Mateo Creek was an important steelhead producing stream to the extent that it supported significant local fisheries of both juveniles and adults (Hubbs, 1946). Through the late 1940s, steelhead populations likely exceeded 10,000 individuals, and adults as large as 9 kg (20 lbs) were observed. A February 2000 report prepared by CDFG for NMFS entitled *Steelhead Rainbow Trout in San Mateo Creek, San Diego County*, describes changes in habitat conditions since the 1940s as follows: "There were fewer observations of juvenile steelhead/rainbow trout in San Mateo Creek after 1950. Trout were found from the lagoon to the headwaters at Los Alamos Canyon during a Department survey on September 1, 1979. Woelfel (1991) reported anecdotes of juvenile steelhead/rainbow trout presence in pools in the upper drainage during the early 1980s, and of a few steelhead adults captured by a local resident in the lower creek in 1986. However, no juvenile steelhead/rainbow trout were found in San Mateo Creek by Woelfel during surveys in 1987 and 1988."

In addition, CDFG biologists observed 78 steelhead in San Mateo Creek between March 3 and September 3, 1999. The majority of these observations occurred in the reach between the upper gauging station and the confluence with Devil Canyon Creek. Four steelhead trout were observed in San Mateo Creek above the confluence with Devil Canyon Creek, one of which was observed 4 km (2.5 mi) above the confluence. Four steelhead trout were observed in Devil Canyon Creek (CDFG 2000). CDFG did not conduct mark-and-recapture studies so the precise population size cannot be estimated; however, it is believed to be quite low (CDFG 2000). However, the loss of riparian vegetation, widening of the stream channel, reduction in stream flows due to extensive ground water extraction, sediment deposition at key access points and within the historical spawning areas are considered important factors that have contributed to low species occurrence and obstructions to species migration within this drainage.

San Juan Creek

The CDFG has performed some fieldwork focused on the presence of native fish (including arroyo chub and three-spine stickleback) in the San Juan Creek watershed during recent years. However, no southern steelhead individuals were found unarmored during these surveys.

The potential presence of southern steelhead has been documented in the Arroyo Trabuco, a tributary to San Juan Creek, south of the I-5 underpass (CDFG, November 25, 2003 letter to NOAA). The CDFG letter acknowledges that the I-5 underpass is a "complete barrier to upstream migration of steelhead" at this location. It is the TCA's understanding that genetic studies are currently underway to confirm the initial identification of steelhead in the Arroyo Trabuco; however, the results of these studies are not available at this time. Steelhead have not been documented in San Juan Creek within the action area limits during decades of various biological surveys along San Juan Creek, including surveys specifically designed to detect fish species. In addition, there is no anecdotal information from fishing records within San Juan Creek in RMV for the steelhead.

If certain environmental conditions occur (i.e., storm flows eliminate natural sediment barriers and provide for adequate water resources within the stream course), the steelhead could occur within San Juan Creek in the action area. However, in the existing condition, this species is not expected to occur due to lack of recent detection, limited historical occurrences, and possible barriers to upstream movement to or through the action area from the ocean.

3.2.4 Arroyo Toad

This species may be affected during the construction of culverts and bridge structures over San Juan, Gabino, San Mateo, and Cristianitos creeks and associated upland estivation areas. The following summary is provided in support of this conclusion:

The arroyo toad is listed as Endangered under the FESA. In the action area, arroyo toads were observed within San Juan, Gabino, San Mateo, and Cristianitos creeks between 1996 and 2001 (Figures 10a-10e). Arroyo toad populations were observed along San Juan Creek in Trampas Canyon in RMV during 2003 surveys. On MCB Camp Pendleton, San Onofre Creek is also known to support the arroyo toad, and it is likely that suitable habitat within this drainage occurs in the SOCTIIP action area.

3.2.5 Southwestern Willow Flycatcher

Although suitable habitat for this species is present within the action area, the species was not detected during protocol surveys and, therefore, would not be affected by this project. A summary of the data in support of this conclusion is provided below:

The southwestern willow flycatcher is listed as Endangered under the FESA. Although this species has been detected within the study area, it was not detected in the action area. One territorial male flycatcher was present in Cañada Gobernadora in 2001 (Figures 11a-11e). Southwestern willow flycatchers have also been noted in Whispering Hills and the Prima and Segunda Deshecha areas. In addition, a couple of migrant flycatchers were observed in 2001, and use areas were confirmed in 2003. A use area is an area where the presence of any life stage (such as fledgling, juvenile, adult, or breeding pair) is observed during a focused survey for avian species other than raptors. Suitable nesting habitat for this species is present along San Mateo Creek and Cañada Gobernadora.

3.2.6 Coastal California Gnatcatcher

Fifteen to 17 sighting locations will be affected as a result of the implementation of A7C-FEC-M. Each location could involve impacts to an individual or pair of gnatcatchers between 15 and 34 birds. This conclusion is based on the following data:

The coastal California gnatcatcher is listed as Threatened under the FESA. In the action area, gnatcatchers occurred in coastal sage scrub and a combination of scrub communities and grassland habitats, usually dominated by California sagebrush² (Figures 11a-11e). Most observations occurred on relatively dry south- and east-facing slopes. Gnatcatchers were also occasionally found on north- and west-facing slopes. Several gnatcatchers were also located in drainages where scrub community vegetation integrates with mule fat and coyote brush. In the action area, gnatcatchers were recorded at 234 locations in 1995. An estimated 140 gnatcatcher use areas were recorded in the study area during the 2001 surveys. New gnatcatcher locations were mapped throughout RMV, Trampas Canyon, Cañada Gobernadora, and Talega Canyon within the footprint of disturbances of various alternatives during the 2001 surveys.

3.2.7 Least Bell's Vireo

No least Bell's vireo location will be directly affected as a result of the implementation of A7C-FEC-M. This conclusion is based on the following information:

The least Bell's vireo is listed as Endangered under the FESA. Least Bell's vireos inhabit lowland riparian woodlands for primary foraging, breeding, and dispersal. The decline of the least Bell's vireo had been attributed in part to the combined, perhaps synergistic, effects of destruction and fragmentation of riparian habitat and to brood parasitism by brown-headed cowbirds (Garrett and Dunn 1981).

Territorial least Bell's vireos were observed at 16 locations in the study area during the 1995 surveys (Figures 11a-11e). All but one of the observations occurred along San Mateo Creek; one sighting occurred along Cristianitos Creek. Observations in 1994 included eight pairs and three territorial males: seven pairs and two territorial males were observed along San Mateo Creek, one territorial male was observed along Cristianitos Creek, and one pair was observed in an unnamed drainage immediately northwest of San Mateo Creek. All eight pairs were observed with at least one fledgling. No least Bell's vireo were observed in San Juan Creek or any of its associated drainages during the 1994 or 1995 surveys. During the 2001 surveys, a minimum of 27 least Bell's vireo use areas were recorded in the study area. These included three in Cañada Chiquita, three in Cañada Gobernadora, one along San Juan Creek, two in Prima Deshecha Canyon, seven along Cristianitos Creek, at least seven along San Mateo Creek and four on small tributaries to San Mateo Creek (in SOSB). The least Bell's vireo has also been reported in Talega and Whispering Hills. All previously recorded least Bell's vireo locations in all impact areas of the various SOCTIIP alternatives were confirmed during 2003 focused surveys, and new observations along San Juan Creek in Trampas Canyon were recorded.

3.2.8 Pacific Pocket Mouse

No Pacific pocket mouse will be directly affected by A7C-FEC-M. This conclusion is based on the following information:

The Pacific pocket mouse is listed as Endangered under the FESA. However, Pacific pocket mouse was believed to be extinct for nearly 20 years, until a previously unknown population was discovered in 1993 at the Dana Point headlands (Brylski 1993). This subspecies is largely restricted to fairly open scrub communities and sandy substrates. The 1995 and 1996 trapping

² For ease of reading, scientific names for plant species (Latin) (except for those subject to the FESA) are not included within this document. Scientific names can be found within the NES.

efforts for the Pacific pocket mouse identified one population of this subspecies in the SOCTIIP action area near the I-5 and Cristianitos Road interchange (Figures 12a and 12b). This population is not within the direct impact area of the A7C-FEC-M alternative. Totals of 33 and 22 individuals were caught at this site during the 1995 and 1996 trapping programs, respectively. Trapping efforts in June and July 2001 resulted in the capture of three individuals (Stephen J. Montgomery, pers. comm.). A total of four individuals were trapped during the 2003 focused survey effort.

3.2.9 Thread-Leaved Brodiaea

Twenty-three plants from three populations will be directly affected by A7C-FEC-M. This conclusion is based on the following information:

Thread-leaved brodiaea is listed as Threatened under the FESA. Thirty-four populations of thread-leaved brodiaea with over 4,400 individuals were identified in the SOCTIIP action area in 2001 (Figures 7a-7e). Populations were observed on the ridgeline directly west of the Cañada Gobernadora mitigation area, on the east edge of the action area, near the west edge of the action area, west of Cristianitos Creek Road and north of Avenida Pico, near Talega west of the Donna O'Neill Land Conservancy, and north of Ortega Highway in Cañada Gobernadora and Cañada Chiquita. During 2003 surveys, populations were observed in Talega Canyon within the biological action area.

3.3 Description of the Existing Biological and Physical Conditions

3.3.1 Topography

Topographically, this region exhibits low-lying ridgelines and mountains interspersed with relatively broad valleys and canyon bottoms (Figure 13). Elevations range from sea level at the coastline to approximately 275 meters (900 feet) above mean sea level in the interior hills.

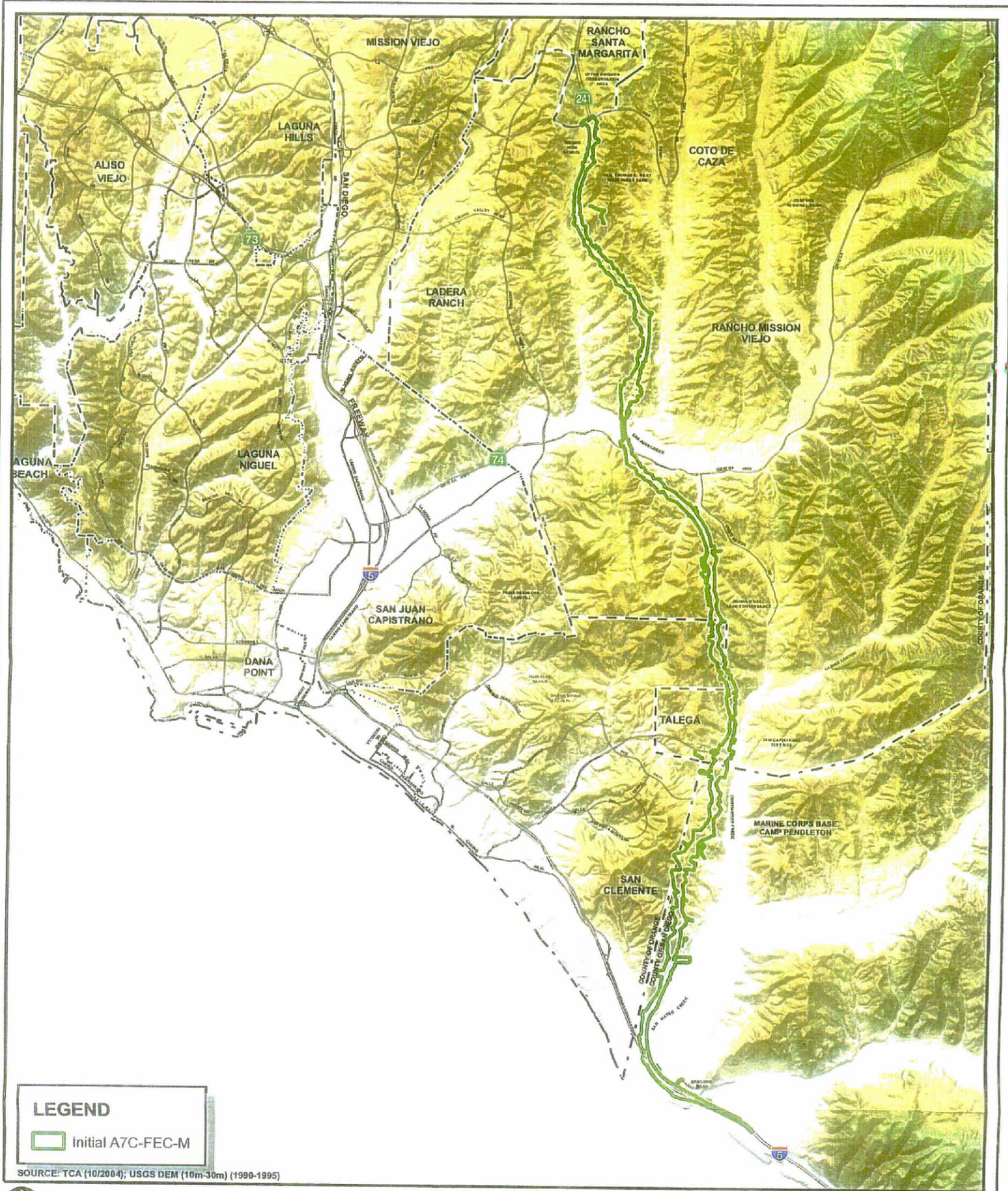
3.3.2 Soils and Geology

The following discussion describes the earth resource conditions that exist within the action area and along the A7C-FEC-M alignment. The discussion provides general descriptions of the various geologic units, geologic structure, and geotechnical conditions present in the area. Additional details of the earth resources can be found in Section 4.20 of the EIS/SEIR and the Geotechnical, Geology and Soils Technical Report (GeoPentech, Inc., 2003).

Regional Geologic and Seismic Setting

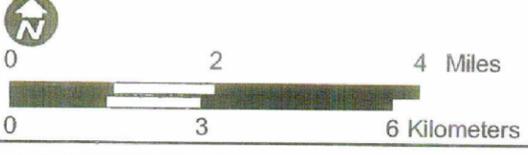
The A7C-FEC-M generally trends north to northwest across the foothills of the Santa Ana and Santa Margarita mountains. These mountains are in the Peninsular Ranges Physiographic Province of California, which is characterized by its generally northwest trending mountains and geologic structure. This Province is bound on the north by the Transverse Ranges Province, which is characterized by its east-west geologic structural and topographic grain, and on the east by the Colorado and Mojave Desert provinces.

The most complete section of late Mesozoic and Cenozoic geologic units in the north part of the Peninsular Ranges Province is exposed in the foothills and valleys along the A7C-FEC-M. These units are divided into surficial and bedrock units. The surficial units are generally composed of poorly to moderately consolidated sediments of Pleistocene and Holocene geologic age, and they generally occur in valley bottoms. The surficial units include landslide



LEGEND
 Initial A7C-FEC-M

SOURCE: TCA (10/2004); USGS DEM (10m-30m) (1990-1995)



Topography

SOCTIIP Biological Assessment

Figure 13

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deposits within the bedrock units and man-made fills. The bedrock units consist of a series of clastic sedimentary rocks of Upper Cretaceous to Tertiary geologic age. They are composed dominantly of marine and non-marine sandstones and siltstones that form a blanket that thickens to the south and west with a thickness estimated to be as much as 7,500 m (24,600 ft). Below the sedimentary bedrock units, and not exposed along the A7C-FEC-M, are the basement or subjacent series rocks of Middle to Upper Jurassic geologic age. These rocks form much of the core of the Santa Ana Mountains and consist of crystalline and metamorphic rocks that are unconformably overlain by the sedimentary bedrock units.

Site Geologic Setting

The principal geologic surficial units in the vicinity of the A7C-FEC-M include man-made fills, landslide deposits, colluvium, alluvium, non-marine terrace deposits, and marine terrace deposits. Bedrock units present include the Capistrano Formation, Monterey Formation, San Onofre Breccia, Topanga Formation, Sespe Formation, Santiago Formation, Silverado Formation, and Williams Formation (Pleasants Sandstone Member) (Figure 14). Additional geologic structures present include fault zones and groundwater.

3.3.3 Hydrological Resources

There are three major drainage basins within the SOCTIIP action area: San Juan Creek Watershed, San Mateo Creek Watershed, and Prima Deshecha–Segunda Deshecha Watershed (Figure 5).

The San Juan Creek Watershed covers 346.8 square kilometers (133.9 square miles) and includes portions of the cities of Dana Point, Laguna Hills, Laguna Niguel, Mission Viejo, Rancho Santa Margarita, and San Juan Capistrano. Its main tributary, San Juan Creek, originates in the Santa Ana Mountains district of the Cleveland National Forest in the easternmost part of Orange County. Other smaller, but still substantial, drainage courses include Bell Canyon, Cañada Gobernadora, and Cañada Chiquita, which are tributaries to San Juan Creek and are located in the northeasterly part of the SOCTIIP action area.

The San Mateo Creek Watershed covers approximately 360.01 square kilometers (139 square miles). Its drainage area lies within western Riverside and northwestern San Diego counties, with approximately 20 percent in the boundary of southeastern Orange County. Gabino/Blind canyons and Cristianitos Creek, which are tributaries to San Mateo Creek, are located in the southeast part of the action area.

The Prima Deshecha-Segunda Deshecha Watershed covers an area of 82.36 square kilometers (31.8 square miles) in the southernmost corner of Orange County. It includes the City of San Clemente, a small portion of the City of San Juan Capistrano, and a large portion of unincorporated territory. Prima Deshecha Cañada and Segunda Deshecha Cañada are the two main tributaries within the Prima Deshecha-Segunda Deshecha Watershed. These creeks are maintained by spring-fed, perennial flows.

Several other large streams, Aliso Creek, Oso Creek, and Trabuco Creek are located in the western portion of the SOCTIIP action area. In addition, there are many smaller unnamed creeks in the SOCTIIP action area. In the less developed westerly area, flows in most of the drainages are intermittent. However, perennial flows may occur during years of high rainfall in San Juan Creek, San Mateo Creek, and other large drainages such as San Onofre Creek. The large drainages that proceed through urban areas before crossing I-5 typically transport nuisance flows from irrigation and other sources throughout the year.

3.3.4 Natural Communities

This section describes the natural communities that occur in the SOCTIIP action area. The general locations of these resources, as they relate to the A7C-FEC-M alternative alignment, is shown in Figures 15a-15e. Many of the figures are multiple plates. These figures depict the data gathered from the comprehensive surveys in the SOCTIIP biological action area. Quantification of the acreage of vegetation communities identified in the action area during the field surveys is provided in Table 3. Data regarding the area of developed, disturbed, and graded communities is included for comparison purposes.

The term “plant community” is a general one that can be applied to vegetation types of various sizes and longevity. The Orange County Habitat Classification System (OCHCS, Gray and Bramlet 1992) was used to classify plant communities within the action area. The code following the plant community name refers to the code in the OCHCS. Similar plant community types have been combined for simpler graphic representation (e.g., all riparian communities are shown as 7.0). As previously stated, to make the document easier to read, common names are used throughout the text; however, scientific (Latin) names for the plant species identified below are generally provided in the NES. Appendix D of the NES contains a list of all the plant species observed within the SOCTIIP action area. The plant communities in the SOCTIIP action area are shown in Figures 15a-15e and described in Appendix B of this Biological Assessment.

3.3.5 Aquatic Resources

The potential impacts of the A7C-FEC-M on Waters of the United States (WoUS) and wetlands are evaluated in detail in the NES and are summarized below. R. Daniel Smith of the ACOE Research and Development Center, Waterways Experiment Station conducted an assessment titled *Potential Impacts of Alternative Transportation Corridors on Waters of the U.S. and Riparian Ecosystems for the Southern Orange County Transportation Infrastructure Improvement Project* (2003). This assessment involved two objectives: (1) to conduct a baseline assessment of ecosystem integrity along each corridor alternative; and (2) to analyze the potential impact of each alternative on ecosystem integrity. The entire report is located in Appendix A of the NES.

The following steps were performed to accomplish the stated objectives:

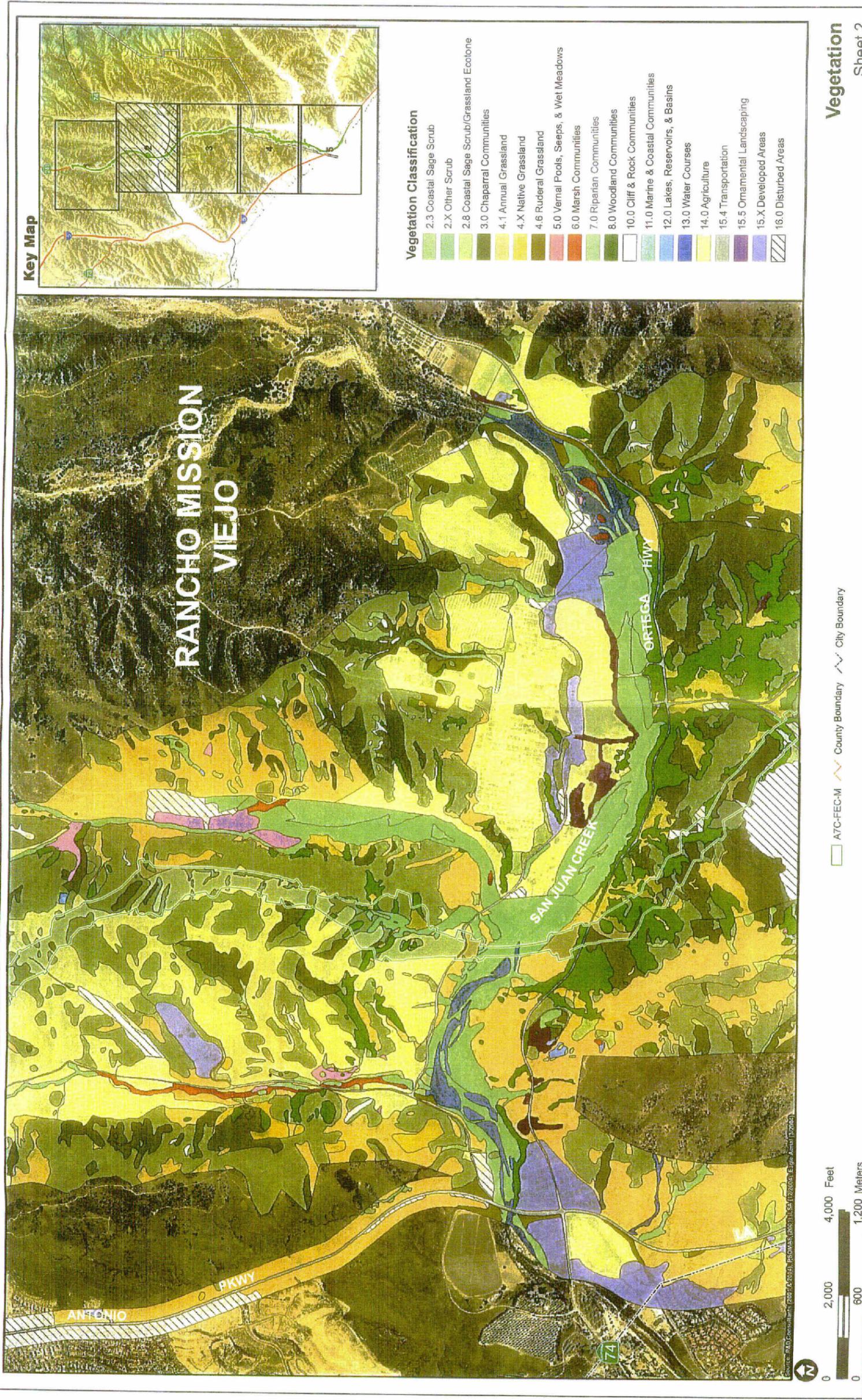
1. A planning level delineation of WoUS and associated riparian areas was prepared.
2. All WoUS and riparian areas were subdivided into assessment units.
3. A functional assessment was performed on each riparian reach using a set of indicators of ecosystem integrity.
4. The assessment indicators were used to develop three integrity indices, representing ecosystem integrity.
5. Four criteria were defined to evaluate the potential impact of each alternative alignment on WoUS and riparian ecosystems.

A planning level delineation of WoUS and riparian ecosystems was performed using a combination of remote sensing techniques and field investigations (Lichvar 2000). The methods

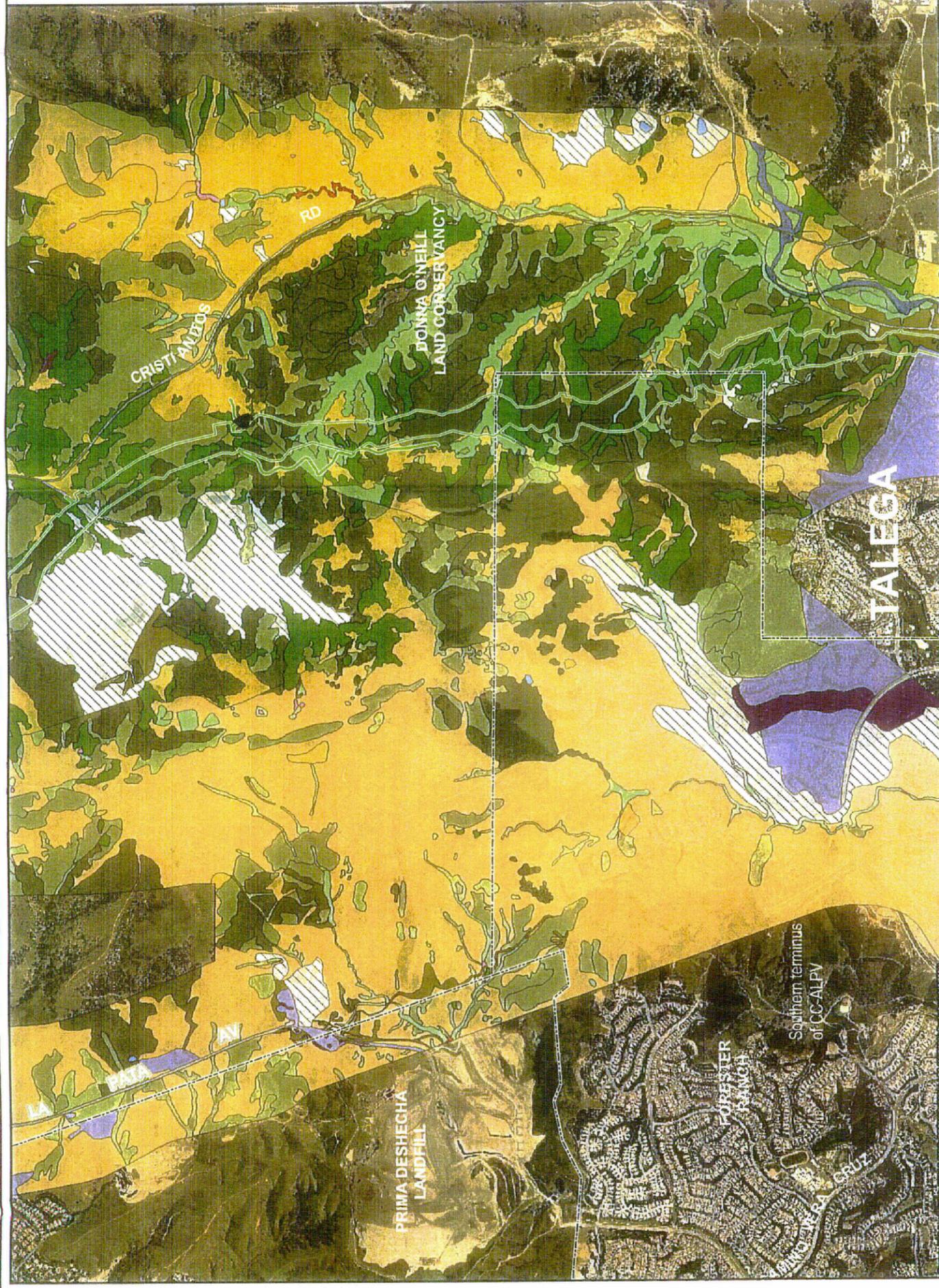


SOCTIIP Biological Assessment

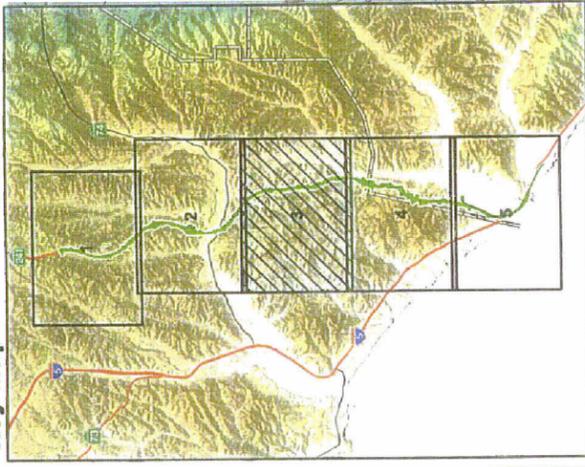
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SOCTIIP Biological Assessment
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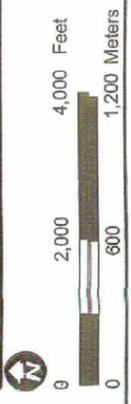
Key Map



Vegetation Classification

- 2.3 Coastal Sage Scrub
- 2.X Other Scrub
- 2.8 Coastal Sage Scrub/Grassland Ecotone
- 3.0 Chaparral Communities
- 4.1 Annual Grassland
- 4.X Native Grassland
- 4.6 Ruderal Grassland
- 5.0 Vernal Pools, Seeps, & Wet Meadows
- 6.0 Marsh Communities
- 7.0 Riparian Communities
- 8.0 Woodland Communities
- 10.0 Cliff & Rock Communities
- 11.0 Marine & Coastal Communities
- 12.0 Lakes, Reservoirs, & Basins
- 13.0 Water Courses
- 14.0 Agriculture
- 15.4 Transportation
- 15.5 Ornamental Landscaping
- 15.X Developed Areas
- 16.0 Disturbed Areas

- A7C-FEC-M
- County Boundary
- City Boundary

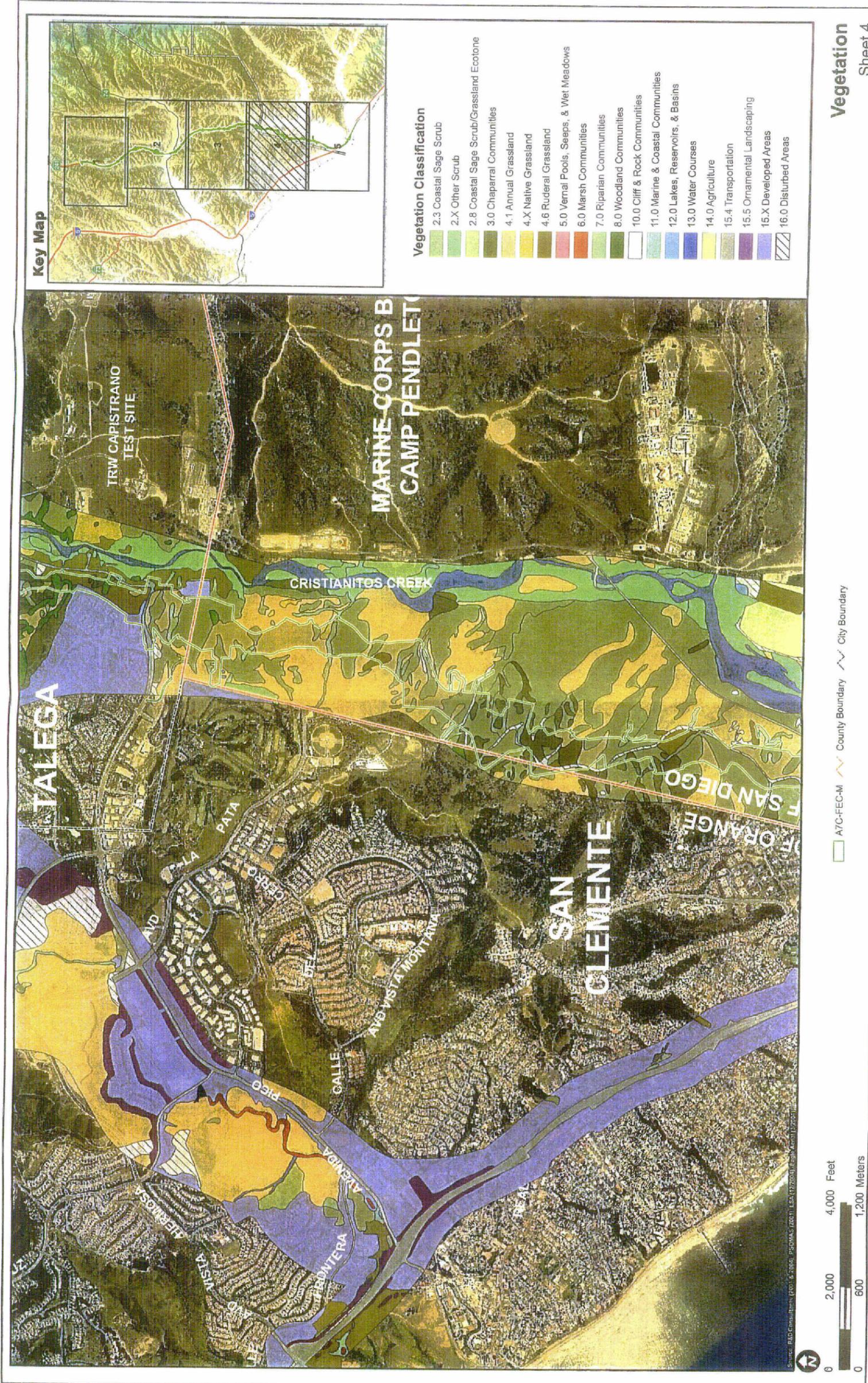


Vegetation
Sheet 3

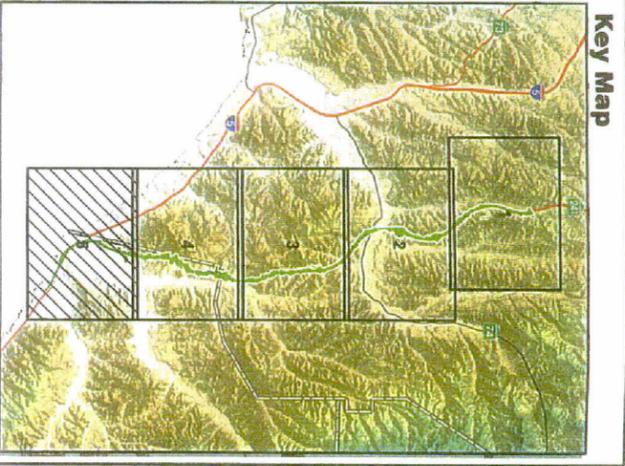
SOCTIP Biological Assessment

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Figure 15c



Vegetation
Sheet 4



- Vegetation Classification**
- 2.3 Coastal Sage Scrub
 - 2.X Other Scrub
 - 2.8 Coastal Sage Scrub/Grassland Ecotone
 - 3.0 Chaparral Communities
 - 4.1 Annual Grassland
 - 4.X Native Grassland
 - 4.6 Ruderal Grassland
 - 5.0 Vernal Pools, Seeps, & Wet Meadows
 - 6.0 Marsh Communities
 - 7.0 Riparian Communities
 - 8.0 Woodland Communities
 - 10.0 Cliff & Rock Communities
 - 11.0 Marine & Coastal Communities
 - 12.0 Lakes, Reservoirs, & Basins
 - 13.0 Water Courses
 - 14.0 Agriculture
 - 15.4 Transportation
 - 15.5 Ornamental Landscaping
 - 15.X Developed Areas
 - 16.0 Disturbed Areas

0 2,000 4,000 Feet
 0 800 1,200 Meters

ATC-FEC-M County Boundary City Boundary

SOCTIIP Biological Assessment

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Vegetation Sheet 5

Figure 15e

used to develop this delineation are an adaptation of the *ACOE Wetlands Delineation Manual* (Environmental Laboratory 1987) and 33 CFR Section 328 to a watershed scale.

Delineated areas were divided into polygons and assigned a probability rating to reflect the likelihood that a given polygon would meet the criteria for a wetland or WoUS, as defined in the ACOE regulations. The probability ratings are outlined in Table 4.10-1 of the EIS/SEIR. The delineation resulted in a final map of WoUS and riparian ecosystems using these probability ratings.

For purposes of conducting the functional assessment, the delineated WoUS and riparian ecosystems were subdivided into assessment units called the "riparian reach" (RR). The RR was defined as "...a segment of the main stem, bank full stream channel and adjacent riparian ecosystem that was relatively homogenous with respect to geology, geomorphology, channel morphology, substrate type, vegetation communities, and cultural alteration" (Olson and Harris 1997). Smith defines two other areas in association with each RR. The "local drainage" (RRLD) refers to the immediate upstream drainage and tributaries associated with the RR. The "drainage basin" (RRDB) refers to all drainages within the local watershed area that drain to the given RR. The RR, RRLD, and RRDB provide the scales at which the assessment indicators were evaluated.

Riparian ecosystem function was assessed using indices to represent the hydrologic, water quality, and habitat functions of each RR. These indices were calculated based on a set of watershed characteristics called "indicators." Assessment indicators are measurable factors that influence the functional integrity of the riparian ecosystem. For each assessment indicator, a measurable value was defined. This is referred to as a "metric". For each assessment indicator, a metric value was determined within each RR using either field observations or Geographic Information System (GIS) techniques. The resulting metric values for each assessment indicator were grouped into categories where natural breaks occurred in the data. These categories were assigned a rank between 1 and 5 to represent the degree of deviation from the reference condition.

Assessment indicators were chosen to assess riparian ecosystem integrity. These assessment indicators represent the characteristics and processes that influence the ability of a riparian ecosystem to perform the functions normally ascribed to riparian ecosystems. The assessment indicators are:

1. Altered Hydraulic Conveyance (AHC, RR Scale)
2. Altered Hydraulic Conveyance (AHC, RRDB Scale)
3. Surface Water Retention (RRDB Scale)
4. Perennialized Stream Flow (RR Scale)
5. Perennialized Stream Flow (RRDB Scale)
6. Import, Export, or Diversion of Surface Water (RRDB Scale)
7. Floodplain Interaction (RR Scale)
8. Sediment Regime (RR Scale)
9. Land Use/Land Cover (LU/LC) in Drainage Basin (RRDB Scale)
 - 9A. LU/LC – Nutrient Increase
 - 9B. LU/LC – Pesticide Increase
 - 9C. LU/LC – Hydrocarbon Increase
 - 9D. LU/LC – Sediment Increase
10. Area of native riparian vegetation (RR Scale)
11. Riparian Corridor Continuity (RR Scale)
12. Riparian Corridor Continuity (RRDB Scale)

13. Land Use/Land Cover at Riparian Ecosystem Boundary (RR Scale)
14. Land Use/Land Cover in Upland Buffer (RR Scale)

Each of these indicators was measured using field observations or spatial analysis using GIS. The resulting measurements were assigned a score between 1 and 5, with 5 being the highest level of ecosystem function. Scoring was based on the degree of deviation from the reference condition. The reference condition was defined as a culturally unaltered condition and was assigned a value of 5. In southern California riparian ecosystems, the culturally unaltered reference condition implies conditions that existed prior to European influence, including grazing, agriculture, fire suppression, water resource management, transportation corridors, urbanization, and other cultural alterations that can be identified. Tables 4.10-2 through 4.10-11 of the EIS/SEIR show the relationship between the indicator values and the assigned scores.

Using the altered hydrologic conveyance indicator (Table 4.10-2) of the EIS/SEIR as an illustration, if the value of the altered hydrologic conveyance indicator for a riparian reach was less than five percent, a score of 5 was assigned to that riparian reach. If the value of the altered hydrologic conveyance indicator for a riparian reach was greater than 30 percent and less than 50 percent, a score of 2 was assigned to that riparian reach. A score of 5 represented close concurrence with the reference condition, and consequently a high level of integrity. A score of 1 represented a deviation of 50 percent or more from the reference condition, and consequently a low level of integrity.

Three integrity indices were used to represent riparian ecosystem integrity: hydrologic integrity, water quality integrity, and habitat integrity. These indices were determined using the assessment indicators. Six assessment indicators described hydrologic integrity:

- Altered Hydraulic Conveyance (RRDB Scale).
- Surface Water Retention (RRDB Scale).
- Perennialized Stream Flow (RRDB Scale).
- Import, Export, or Diversion of Surface Water (RRDB Scale).
- Altered Hydraulic Conveyance (RR Scale).
- Floodplain Interaction (RR Scale).

Nine assessment indicators described water quality integrity:

- Land Use/Land Cover (LU/LC) types (averaged value of four sub-indicators: nutrient, pesticide, hydrocarbon, and sediment increase) (Table 4.10-12 of the EIS/SEIR).
- Altered Hydraulic Conveyance (RRDB Scale).
- Altered Hydraulic Conveyance (RR Scale).
- Surface Water Retention (RRDB Scale).
- Perennialized Stream Flow (RRDB Scale).
- Import, Export, or Diversion of Surface Water (RRDB Scale).
- Floodplain Interaction (RR Scale).
- Sediment Regime (RR Scale).
- Area of native riparian vegetation (RR Scale).

Five assessment indicators described habitat integrity:

- Area of native riparian vegetation (RR Scale).
- Riparian Corridor Continuity (RR Scale).
- Riparian Corridor Continuity (RRDB Scale).

- Land Use/Land Cover at Riparian Ecosystem Boundary (RRLD Scale).
- Land Use/Land Cover in Upland Buffer (RRDB Scale).

To calculate integrity indices, indicator values (i.e., percent deviation from the reference condition on a scale of 0 to 100) were converted to scores. Indicator values were assigned a score of 1 to 5 based on the relationship between indicator values and scores. The hydrologic, water quality, and habitat indices were calculated by summing the scores of each of the assessment indicators listed above.

Construction Impacts to Wetlands and Waters of the United States

Impacts due to construction associated with wetlands and WoUS are based upon the findings of Smith (2003). Potential construction impacts to WoUS and riparian ecosystems were assessed for all alternatives using the following four criteria:

- Criterion 1: Quantity of non-wetland WoUS directly impacted, categorized by Strahler stream order (miles/kilometers).
- Criterion 2: Riparian ecosystems directly impacted (acres/hectares).
- Criterion 3: Hydrology, water quality, and habitat integrity units directly impacted, shown by high, moderate, and low range.
- Criterion 4: Loss of hydrologic, water quality, and habitat integrity units directly impacted, shown by high, moderate, and low range.

Criteria 1 to 3 were assessed for each alternative by overlaying the grading footprint on the stream channel and riparian ecosystem areas and calculating the affected area using GIS. Criterion 1 was assessed using the linear distance of wetlands and stream channels directly impacted by a given SOCTIIP build Alternative. Criterion 2 was assessed using the acreage of riparian ecosystem directly impacted by a given SOCTIIP build Alternative. Criterion 3 was assessed using the quantity of the integrity units directly impacted by a given SOCTIIP build Alternative. Integrity units were defined as the acreage of riparian ecosystem directly impacted by the grading footprint multiplied by the integrity index for riparian ecosystems in a particular RR.

Criterion 4 was assessed by simulating any changes in the ecosystem integrity units that would occur as the result of a given project alternative. This was accomplished by recalculating the assessment indicators based on changes expected to occur following implementation of a given corridor alternative.

The results for each of the four criteria used to assess the potential impact of the A7C-FEC-M on WoUS and riparian ecosystems are summarized in Tables 3 through 12. Results include a reporting of values used to assess impacts as well as a ranking used to compare alternatives. For each criterion, a normalized rank was assigned to the alternative. The normalized rank is determined by dividing the number of km (mi) impacted by a given alternative by the number of km (mi) from the alternative with the most impacts. Therefore, the closer the alternative ranks to 0.0, the less the impacts are to WoUS or riparian ecosystems. A ranking close to 1.0 represents more impact to WoUS and riparian ecosystems.

TABLE 4
CRITERION 1: DIRECTLY IMPACTED NONWETLAND WOUS BY STRAHLER ORDER
INITIAL CORRIDOR FOOTPRINTS

Corridor Alternative	Miles (Kilometers) of WoUS Stream Channels by Strahler Order						Normalized Rank ¹
	1 st Order	2 nd Order	3 rd Order	4 th Order	5 th Order	Total	
A7C-FEC-M	5.2 (8.4)	2.5 (4.0)	1.0 (1.6)	0.1 (0.2)	0.2 (0.3)	8.9 (14.3)	0.8

¹ Normalized rank was recalculated based only on those alternatives analyzed in the EIS/SEIR to adjust for deleted alternatives.

TABLE 5
CRITERION 2: RIPARIAN ECOSYSTEM DIRECTLY IMPACTED
INITIAL CORRIDOR FOOTPRINTS

Corridor Alternative	Acres (Hectares) of Riparian Ecosystem Directly Impacted	Normalized Rank ¹
A7C-FEC-M	42.9 (17.4)	0.8

¹ Normalized rank was recalculated based only on those alternatives analyzed in the EIS/SEIR to adjust for deleted alternatives.

TABLE 6
CRITERION 3A: QUANTITY OF HYDROLOGIC INTEGRITY UNITS DIRECTLY IMPACTED
INITIAL CORRIDOR FOOTPRINTS

Corridor Alternative	Quantity of Hydrologic Integrity Units Directly Impacted				Normalized Rank ¹
	High Index Range	Moderate Index Range	Low Index Range	Total	
A7C-FEC-M	23.4	0.5	0.0	23.9	0.5

¹ Normalized rank was recalculated based only on those alternatives analyzed in the EIS/SEIR to adjust for deleted alternatives.

TABLE 7
CRITERION 3B: QUANTITY OF WATER QUALITY INTEGRITY UNITS DIRECTLY
IMPACTED INITIAL CORRIDOR FOOTPRINTS

Corridor Alternative	Quantity of Water Quality Integrity Units Directly Impacted				Normalized Rank ¹
	High Index Range	Moderate Index Range	Low Index Range	Total	
A7C-FEC-M	22.3	0.9	0.0	23.2	0.5

¹ Normalized rank was recalculated based only on those alternatives analyzed in the EIS/SEIR to adjust for deleted alternatives.

TABLE 8
CRITERION 3C: QUANTITY OF HABITAT INTEGRITY UNITS DIRECTLY IMPACTED
INITIAL CORRIDOR FOOTPRINTS

Corridor Alternative	Quantity of Habitat Integrity Units Directly Impacted				Normalized Rank ¹
	High Index Range	Moderate Index Range	Low Index Range	Total	
A7C-FEC-M	9.9	9.5	0.0	19.4	0.5

¹ Normalized rank was recalculated based only on those alternatives analyzed in the EIS/SEIR to adjust for deleted alternatives.

TABLE 9
CRITERION 4A: CHANGE/TOTAL LOSS OF HYDROLOGIC INTEGRITY UNITS
INITIAL CORRIDOR FOOTPRINTS

Corridor Alternative	Hydrologic Integrity Units				Normalized Rank ¹
	High Index Range	Moderate Index Range	Low Index Range	Total Loss	
A7C-FEC-M	15.0	0.0	0.0	15.0	0.6

¹ Normalized rank was recalculated based only on those alternatives analyzed in the EIS/SEIR to adjust for deleted alternatives.

TABLE 10
CRITERION 4B: CHANGE/TOTAL LOSS OF WATER QUALITY INTEGRITY UNITS
INITIAL CORRIDOR FOOTPRINTS

Corridor Alternative	Quantity of Water Quality Integrity Units Directly Impacted				Normalized Rank ¹
	High Index Range	Moderate Index Range	Low Index Range	Total	
A7C-FEC-M	18.5	0.2	0.0	18.7	0.7

¹ Normalized rank was recalculated based only on those alternatives analyzed in the EIS/SEIR to adjust for deleted alternatives.

TABLE 11
CRITERION 4C: CHANGE/TOTAL LOSS OF HABITAT INTEGRITY UNITS
INITIAL CORRIDOR FOOTPRINTS

Corridor Alternative	Quantity of Habitat Integrity Units Directly Impacted				Normalized Rank ¹
	High Index Range	Moderate Index Range	Low Index Range	Total	
A7C-FEC-M	8.0	7.7	0.0	15.7	0.5

¹ Normalized rank was recalculated based only on those alternatives analyzed in the EIS/SEIR to adjust for deleted alternatives.

TABLE 12
NORMALIZED IMPACT RANK SCORES FOR ALL CRITERIA AND CORRIDOR
ALTERNATIVES INITIAL CORRIDOR FOOTPRINTS¹

Corridor Alternative	Criteria								Total Impact Rank Score
	1	2	3a	3b	3c	4a	4b	4c	
A7C-FEC-M	0.9	0.8	0.5	0.5	0.5	0.6	0.7	0.5	5.0

¹ Normalized rank was recalculated based only on those alternatives analyzed in the EIS/SEIR to adjust for deleted alternatives.

TABLE 13
NORMALIZED IMPACT RANK SCORES FOR DIRECT IMPACT CRITERIA
INITIAL CORRIDOR FOOTPRINTS^{1,2}

Corridor Alternative	Criteria		Total Impact Rank Score
	1	2	
A7C-FEC-M	0.9	0.8	1.7

¹ Normalized rank was recalculated based only on those alternatives analyzed in the EIS/SEIR to adjust for deleted alternatives.
² Criteria 1 and 2 only.

Except for the CC Alternative, A7C-FEC-M (along with FEC-M and CC-ALPV) would have greater impacts than the other corridor Alternatives relative to Criteria 1. Criteria 2 impacts would also be higher under the FEC-M, CC, CC-ALPV, and A7C-FEC-M alternatives. The A7C-FEC-M Alternative would have approximately the same magnitude of impacts the CC and CC-ALPV alternatives, which have the highest impacts relative to Criteria 3 and 4. A detailed comparison of all the alternatives can be found in detail within Section 4.10 of the EIS/SEIR.

Long Term Impacts to Wetlands and Waters of the United States

Direct and indirect impacts associated with wetlands and WoUS are similar to those discussed for vegetation communities in Sections 4.11.3.1 and 4.11.3.2 of the EIS/SEIR. In addition to those impacts, the potential impacts to water quality could impact the quality and extent of wetlands and WoUS. The following is an analysis incorporating applicable data from hydrology/hydraulics and water quality studies.

Long term impacts to wetlands and WoUS may be associated with the changes to water quality in the absence of project design considerations. A Runoff Management Plan (RMP) was prepared to address potential impacts to water quality (Psomas 2003) and is discussed in Section 4.9 (Affected Environmental Impacts and Mitigation Measures Related to Water Quality) of the EIS/SEIR. The analysis evaluated whether the alternatives would create or contribute runoff water which would provide a substantial additional source of polluted runoff which may require supplemental water treatment. The RMP stipulates that the designated water quality volume generated from the project facility would be routed along each highway segment to appropriate water quality remediation facilities prior to discharge into receiving waters. The treatment facilities are incorporated into the project as a design feature. Therefore, the A7C-FEC-M would not create a substantial additional source of polluted runoff.

The RMP analysis also evaluated whether surface water quality criteria as outlined in the applicable RWQCB Water Quality Control Plans for the San Diego and Santa Ana regions would be exceeded (Psomas 2003). The RMP stipulates that the designated water quality volume of runoff generated from the project facility would be treated at appropriate water quality remediation facilities prior to discharge into downstream receiving waters. Treatment would be provided at or above the Maximum Extent Practicable (MEP) level. Therefore, the A7C-FEC-M would not exceed the applicable RWQCB Water Quality Control Plans for the San Diego and Santa Ana regions.

The RMP analysis also evaluated whether increased runoff from the SOCTIIP build Alternatives would result in increased natural flow velocities in major or local watercourses, which in turn could result in increased erosion or the loss of groundwater recharge capability flow gradient from the project area, based on changes in the surface water volumes. Similarly, the analysis evaluated whether altering the existing drainage pattern of the site or area, including through the alteration of the course of the stream or river in a manner which would result in substantial erosion or siltation on or off site, would negatively affect the recharge of groundwater in the area. The RMP stipulates that flow splitters would be designed to divert excess and potentially erosive project runoff to proposed treatment BMPs structures. Treated runoff from the BMPs would be discharged into the same receiving waters at nonerosive rates which are at or below existing velocities. The changes in the overall surface water volumes would be minimal. Furthermore, the proposed BMPs and appropriate maintenance of these BMPs would ensure that the generated sediment and silt materials, which may impact groundwater recharge, are properly removed. Therefore, neither increased natural flow velocities nor alterations to the

existing drainage pattern of the site or area would result in increased erosion or the loss of the groundwater recharge capability flow gradient from the project area.

The RMP analysis evaluated whether surface water quality in groundwater recharge areas would exceed the RWQCB water quality criteria or negatively affect the ability of surface waters to recharge groundwater aquifer systems. The RMP designates locations for the selected BMPs which would be implemented to reduce potential impacts to groundwater quality. Treatment would be provided at or above the MEP level. Therefore, surface water quality in groundwater recharge areas would not exceed the RWQCB water quality criteria or negatively affect the ability of surface waters to recharge groundwater aquifer systems.

The analysis evaluated whether the SOCTIIP build Alternatives would deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or lowering of the local groundwater table (e.g., the production rate of preexisting wells would not support existing land uses or planned uses for which permits have been granted). The RMP stipulates that excess runoff generated from the project facility would be detained and treated at appropriate water quality remediation facilities prior to being released into downstream receiving waters at non-erosive rates. The excess runoff discharged into the receiving waters would eventually recharge the underlying groundwater through percolation into the natural stream alluvium. Therefore, the overall water balance of the local and regional watersheds, as well as aquifer volumes and groundwater table levels, would not be impacted. Based on the analyses presented in the RMP, adverse water quality impacts would not occur as a result of the A7C-FEC-M.

Chapter 4

Chapter 4. Summary Results: Biological Resources, Effects of the Action and Minimization

4.1 General Effects Analysis and Statutory Background

4.1.1 General Effects Analysis

Impacts related to threatened and endangered species are discussed for the initial A7C-FEC-M alternative. Direct and indirect impacts for the A7C-FEC-M are summarized in Table 1 and shown on Figures 7 through 12. For a detailed description of impacts of the A7C-FEC-M, direct impacts are presented, followed by a discussion of indirect impacts. Construction impacts related to Threatened and Endangered species are direct and indirect impacts and are either permanent (long term) or temporary (short term) as discussed below.

Construction Impacts

Direct construction impacts were determined by overlaying the disturbance limits for the A7C-FEC-M on the biological resources information in the GIS database. The disturbance limits include consideration of cut and fill, remedial grading, and stockpile locations associated with the corridors, bridge locations, and the widening of I-5 and the arterials. Direct impacts can result from the removal of individuals or populations of threatened and endangered species, as well as removal of plant communities and habitat utilized by threatened and endangered species, which includes both permanent (long term) and temporary (short term) impacts.

Indirect construction impacts are those related to incidental disturbance of threatened and endangered species and associated biological resources beyond the area of direct impact; these include, but are not limited to dust accumulation; increased mortality of species displaced by construction due to competition for resources in adjacent areas and increased incidence of road kill; increased potential for soil erosion, siltation, and runoff; increased fire risk; soil and water contamination due to road runoff and construction equipment fluid leakage; and physical and visual barriers to suitable habitat or connected habitat from sound walls. Increased potential for soil erosion, siltation, runoff, and construction fluid leakage will be minimized with implementation of project design features and pollution prevention strategies as discussed in Sections 4.8 and 4.9 of the EIS/SEIR.

Permanent (Long-Term) Impacts

Threatened and endangered wildlife species and plant species that may or will be directly affected are the tidewater goby, southern steelhead trout, arroyo toad, coastal California gnatcatcher, and thread-leaved brodiaea by implementation of the A7C-FEC-M alternative.

Threatened and endangered plant species that would not be directly impacted, and for which potentially suitable habitat is available are as follows: Braunton's milk-vetch, Nevin's barberry, spreading navarretia, Orcutt's grass, and Gambel's watercress. The following threatened and endangered wildlife species would not be directly impacted, but potential habitat for them is available: vernal pool fairy shrimp, San Diego fairy shrimp, Riverside fairy shrimp, Quino checkerspot butterfly, California red-legged frog, least Bell's vireo, southwestern willow flycatcher, and Pacific pocket mouse. Removal of potentially suitable habitat would result in indirect impacts to these species by decreasing opportunity for dispersal and genetic exchange

between populations. There will be an impact on critical habitat for the San Diego (remanded) and Riverside fairy shrimp (proposed) and the Southwestern willow flycatcher (proposed).

4.1.2 Exclusion of Areas from Critical Habitat Under ESA Section 4(b)(2)

ESA section 4(b)(2) authorizes the exclusion of areas from critical habitat if “the benefits of specifying such exclusion outweigh the benefits of specifying such areas as part of the critical habitat.” 16 U.S.C. § 1533(b)(2). The only limitation on such exclusions is that an exclusion must not result in the extinction of the species. *See id.*

TCA has requested exclusion from critical habitat under Section 4(b)(2) of ESA. See Appendix E for details.

4.2 Federally Listed Wildlife Species

4.2.1 Discussion of San Diego and Riverside Fairy Shrimp

Although San Diego and Riverside fairy shrimp are located within the study area, no vernal pools occupied by San Diego or Riverside fairy shrimp will be affected by this project. These fairy shrimp species are both recognized as endangered under the FESA.¹

Surveys for fairy shrimp performed in winter-spring 2001 and 2003 were conducted pursuant to USFWS Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the FESA for the Listed Vernal Pool Branchiopods. Within the San Diego County portion of the action area, Riverside fairy shrimp were identified in one basin and San Diego fairy shrimp were identified from eight basins (Figures 8a-8e). Portions of these basins occur on a ridgeline west of Cristianitos Creek or along the bluff overlooking Surf Beach in SOSB. During the 2002-2003 survey season, both species were confirmed in vernal pools previously surveyed; however, new vernal pools surveyed were not occupied by fairy shrimp listed as endangered or threatened. Within the Orange County portion of the study area, the Riverside fairy shrimp is known from two pools located south of Ortega Highway, approximately 686 meters (2,250 feet) from the centerline of the A7C-FEC-M. The San Diego fairy shrimp occurs in one location in the study area in three pools located south of Ortega Highway, also approximately 686 meters (2,250 feet) from the centerline of the A7C-FEC-M.

4.2.1.1 CRITICAL HABITAT

San Diego Fairy Shrimp

Critical Habitat/Role of Individual Units

The USFWS designated critical habitat for San Diego fairy shrimp on October 23, 2000 (“2000 Final Rule”). However, critical habitat for San Diego fairy shrimp has been remanded to the USFWS by court order. The USFWS was directed to repropose critical habitat, because the court found that the USFWS had not complied with the requirements of the FESA in its 2000 Final Rule designating critical habitat for San Diego fairy shrimp. The existing critical

¹ There is suitable habitat for the federally threatened vernal pool fairy shrimp species in the study area; however, no individuals of the vernal pool fairy shrimp were found in any of the vernal pools surveyed.

habitat units designated in USFWS's 2000 Final Rule remain in effect until the USFWS issues a final rule designating critical habitat for San Diego fairy shrimp.

USFWS's 2000 Final Rule designating critical habitat for San Diego fairy shrimp in San Diego and Orange counties together include 1,629 ha (4,025 ac) of critical habitat (Figure 4.12-3a). On April 22, 2003 (USFWS 2003a), critical habitat for the San Diego fairy shrimp was re-proposed, and a total of 2,468 ha (6,098 ac) of critical habitat has been proposed in these counties. The following discussion includes an analysis under both the 2000 Final Rule (remanded) and the 2003 proposed rule ("2003 Proposed Rule").

Under the 2000 Final Rule, the vernal pool complex in southern Orange County (USFWS Unit 1) includes the northernmost part of the San Diego fairy shrimp critical habitat, which is approximately 25 ha (62 ac). This vernal pool is approximately 4.05 km (2.5 mi) east of Highway 35 and 4.8 km (three mi) north of Highway 1 between Brookhurst Street and Harbor Boulevard. This area is approximately 24 km (15 mi) to 31 km (20 mi) from the action area. Along with vernal pools in Carlsbad, the San Diego critical habitat unit (USFWS Unit 2A) covers approximately 79 ha (195 ac). The vernal pool complex in northern San Diego (USFWS Unit 2A) is located 0.5 km (0.3 mi) south of El Camino Real (Figure 16a).

Proposed Unit 1 encompasses 147 ha (363 ac). The pools in this proposed Unit include examples of the historic distribution of coastal terrace pools at Fairview Regional Park and Newport-Banning Ranch, vernal pool-like ephemeral ponds formed by landslide and fault activity on Rancho Mission Viejo, and the only known rock pool in Southern California (located a substantial distance northwest of the action area). (2003 Proposed Rule.) Unit 2 includes a small portion of Camp Pendleton, including lands leased by the Marine Corps to the California Department of Parks and Recreation and private interests. (2003 Proposed Rule).

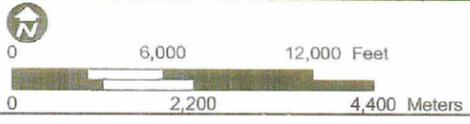
Primary Constituent Elements

The proposed critical habitat listing identifies San Diego fairy shrimp primary constituent elements as those elements that are found in areas that support "vernal pools or other ephemeral depressional wetlands. Primary constituent elements include the vernal pool basins and associated watersheds, and include, but are not limited to small to large vernal pools with shallow to moderate depths that hold water for sufficient lengths of time necessary for San Diego fairy shrimp incubation and reproduction, but not necessarily every year; associated watershed(s) and hydrology for vernal pool basins and their related vernal pool complexes; ephemeral depressional wetlands, flat or gently sloping topography, and any soil type with a clay component and/or an impermeable surface or subsurface layer known to support vernal pool habitat" (2003 Proposed Rule).

Riverside Fairy Shrimp

Critical Habitat/Role of Individual Units

On May 30, 2001, the USFWS published a final rule designating 2,790 ha (6,870 ac) of land as critical habitat for the Riverside fairy shrimp in Los Angeles, Orange, Riverside, San Diego, and Ventura counties, California (USFWS May 30, 2001 "2001 Rule"). Following the designation of critical habitat, several lawsuits were filed challenging various aspects of the designation. On October 30, 2002, critical habitat for the Riverside fairy shrimp was vacated by court order. A proposed critical habitat designation was published on April 27, 2004 (USFWS April 27, 2004 "2004 Proposed Rule"). The final designation is pending.



Critical Habitat

Figure 16a

The relevant individual units provide the “essential watershed primary constituent element that contributes to the pooling basins that support the Riverside fairy shrimp.” (2004 Proposed Rule at 23035, 23036.)

Primary Constituent Elements

Primary constituent elements for the Riverside fairy shrimp are those elements that are essential to the conservation of the species and may require special management considerations or protection. These features include “(1) Small to large pools with moderate to deep depths that have the appropriate temperature, water chemistry, and length of time of inundation for the incubation and reproduction of the species; (2) associated watersheds or hydrologic features that support vernal pool basins and their related complexes; (3) a soil type with a clay component and/or impermeable surface or subsurface layer known to support vernal pools.” (Summarized from 2004 Proposed Rule.)

Recovery Plan for San Diego and Riverside Fairy Shrimp

The recovery plan in effect for both the San Diego and Riverside fairy shrimp is the Recovery Plan for Vernal Pools of Southern California (September 3, 1998, USFWS, “Recovery Plan”). The plan encompasses conservation, maintenance, and restoration for both the San Diego and Riverside fairy shrimp and four other associated vernal pool species that are listed as endangered or threatened. The objective of the vernal pool recovery plan for the Riverside and San Diego fairy shrimp is to reclassify the status of fairy shrimp from endangered to threatened. For reclassification to threatened status or delisting, the recovery plan illustrates that vernal pools are not independent of one another, but rather are considered a vernal pool complex which includes vernal pools in Orange, Riverside, and San Diego counties. The recovery criteria focus on securing existing vernal pools and their watersheds from further loss and degradation in a configuration that maintains habitat function and species viability. The recovery criteria list several specific pools, either by the species that occupy them, or the location of the pools. In addition to the overall quality and maintenance of the vernal pools complex, population trends must show stability or increase in numbers for a minimum of 10 consecutive years, as determined by a 10-year monitoring effort. As indicated in the recovery plan, the importance of protecting this area is for genetic diversity (Recovery Plan).

Environmental Baseline

Urban, agricultural, and water development practices, and flood control, highway, and utility projects have eliminated and degraded vernal pool habitats for San Diego and Riverside fairy shrimp. Additional human disturbances include military activities, unauthorized filling, overgrazing, off-road vehicle use, and changing hydrologic regimes. Local flora and fauna needed to support optimum water quality in vernal pools change when the hydrologic regime is altered. Introduction and competition from invasive botanical species, trash dumping, fire, and suppression of fire also indirectly contribute to the population and vernal pool decrease. Vernal pool conservation is the primary emphasis in the overall success of conserving populations of both fairy shrimp species.

4.2.1.2 PROJECT IMPACTS/EFFECTS OF THE ACTION

Direct impacts to federally endangered fairy shrimp species from construction will be avoided because there will be no disturbances of any occupied vernal pool habitat. Any potential indirect impacts such as decreased water quality from erosion, runoff, siltation, and introduction

of invasive species to vernal pools occupied by fairy shrimp have been eliminated through project design avoidance and implementation of BMPs implemented as part of the RMP. See the discussion of the RMP in the Arroyo toad section for more details on the RMP.

The A7C-FEC-M will not impact San Diego fairy shrimp proposed critical habitat. The A7C-FEC-M will impact approximately 77.28 ha (195.91 ac) of proposed critical habitat for the Riverside fairy shrimp. Under the 2000 Final Rule, the critical habitat area in Unit 2A includes approximately 10 percent of the northwestern portion of Camp Pendleton. The A7C-FEC-M will impact 0.08 kilometer (0.05 mile) in this specific area of critical habitat (Table 9.1-10 of the NES).

Relationship to Recovery Plan

The A7C-FEC-M will not impair recovery of the San Diego and Riverside fairy shrimp. There will be no direct impacts to the species from construction because there will be no disturbances of any occupied vernal pool habitat. Thus, the A7C-FEC-M does not impair the USFWS ability to secure existing vernal pools and their watersheds from further loss and degradation in a configuration that maintains habitat function and species viability. In addition, project design and drainage features will prevent adverse effects of runoff, erosion or sedimentation, which will result in maintaining existing characteristics and functions of the watersheds. The recovery plan lists several recovery tasks. These tasks include establishing a preserve system and research and management. These tasks are tasks to be completed by the USFWS, not by an applicant for a federal approval. The A7C-FEC-M does not prevent the USFWS ability to complete these tasks.

Net Habitat Value

The A7C-FEC-M is expected to result in no net loss of habitat value for the San Diego or Riverside fairy shrimp. The net habitat value equation takes into consideration habitat replacement (through preservation and/or restoration) and loss (project impacts). Because there are no expected habitat losses for these species, there is no corresponding need for habitat gains. Therefore, the overall value of habitat for these species in the action area remains the same with or without the A7C-FEC-M.

4.2.1.3 CUMULATIVE EFFECTS

There are two future projects that are reasonably certain to occur within the study area: the RMV project and the southern subregion NCCP/HCP. Both of these projects will involve a Federal action requiring separate consultation with the USFWS (unrelated to the proposed action), and thus, in accordance with the USFWS regulations, are not considered in the cumulative effects.

There are no cumulative impacts on these species in southern Orange County/northwestern San Diego County.

4.3 Discussion of Tidewater Goby

The tidewater goby is a small fish that is listed as endangered under the FESA. This fish primarily lives in coastal brackish-water lagoons along the California coastline. Populations of the tidewater goby in San Diego County exist in the San Mateo, San Onofre, Las Flores, Hidden, and Cocklebur lagoons (Swift et al. 1993 and D. Kramer, pers. comm., 1997). A large

population of tidewater gobies (of ostensibly 137 individuals) was observed in San Mateo Lagoon, and one individual was caught in San Mateo Creek during the 1995 survey. In addition, a population of approximately 10,000 individuals is present in San Onofre Lagoon (D. Kramer, pers. comm., 1997), which is located in the southernmost portion of the action area.

The available tidewater goby habitat in San Juan Creek encompasses approximately 4 to 10 ha (10 to 25 ac). Gobies were last collected here in 1968 and no gobies were found during sampling in 1994 (K. Lafferty, pers. Comm. 2004). The available tidewater goby habitat in San Mateo Creek encompasses approximately 4 to 6 ha (10 to 15 ac). Tidewater gobies were reintroduced here after being extirpated during the 1998 El Niño storm events and by the North County Transit emergency bridge protection activities (C. Swift pers. comm. 2004). Tidewater gobies were subsequently found in San Mateo Creek during surveys in 2003 (K. Lafferty, pers. comm. 2004).

The available tidewater goby habitat in San Onofre Creek encompasses approximately 2 to 4 ha (5 to 10 ac). Gobies were rediscovered in 1996 by Dan Holland and last collected in San Onofre Creek in 2003 (K. Lafferty, pers. comm. 2004).

4.3.1.1 CRITICAL HABITAT

Critical Habitat

Two units of the tidewater goby critical habitat areas occur within the action area of the A7C-FEC-M. Unit 2 of the tidewater goby critical habitat includes approximately 1.3 km (0.9 mi) of San Mateo Creek, measures from the Pacific Ocean to upstream areas. It includes the 50-year floodplain and associated lagoons and marsh of this section of San Mateo Creek. Unit 3 includes an approximately 0.6 km (0.4 mi)-long section along San Onofre Creek, also measured from the Pacific Ocean to upstream areas. It also includes the 50-year floodplain, and associated lagoons and marsh of this section of San Onofre Creek. (Figure 16b.)

Primary Constituent Elements

The foundation for the primary constituent elements of the tidewater goby is provided by coastal lagoons and estuaries supported by a relatively natural hydrologic regime and an environment with so few exotic fishes that tidewater gobies are unaffected by their presence (USFWS, 2000). These elements include: (1) a combination of slightly different habitat types (e.g., freshwater creek, brackish lagoon, and coastal salt marsh); (2) some deep pockets of permanent water for refugia; (3) a variety of substrate types, of which sand and silt are necessary for construction of burrows; (4) structural complexity of the stream channel, which supports various types of aquatic and emergent vegetation; (5) diversity of prey species (e.g., aquatic invertebrates, including aquatic insect larvae, ostracods, crustaceans, and snails); and (6) a system that is free (or nearly so) from exotic species.

Recovery Plan

A draft recovery plan has been prepared for the goby by the USFWS (USFWS 2004). The objective of the draft recovery plan is to downlist the species from endangered to threatened status, then to delist entirely. This objective focuses on eliminating the threats to the goby and improving the population status sufficiently to warrant reclassification. According to the draft recovery plan, the geographic distribution of this species is subdivided into 6 recovery units, encompassing a total of 26 sub-units defined according to genetic differentiation and



Critical Habitat

Figure 16b

geomorphology (USFWS 2004). The A7C-FEC-M action area falls into the South Coast Unit (SC) of Sub-Unit SC1. This recovery unit is bound on the north by San Pedro Harbor, Los Angeles County, and on the south by Los Pensacitos Creek, San Diego County (USFWS 2004). The SC1 Sub-Unit includes San Pedro, Bolsa Chica, Aliso Creek, San Juan Creek, San Mateo Creek, and San Onofre Creek.

4.3.1.2 PROJECT IMPACTS/EFFECTS OF THE ACTION

Direct Impacts

Impacts to the tidewater goby may occur during construction or construction activities of the A7C-FEC-M along or across San Mateo and San Onofre creeks. If construction occurs during the breeding season, construction activities could result in a disruption of breeding activities. Physical activities in the stream could cause additional mortality of adults or dispersing juveniles. Without avoidance and minimization measures, long term impacts to the physical characteristics (substrate materials and creation of impediments due to upstream improvements) could also occur due to the bridge structures over San Mateo and San Onofre creeks, and such changes could effect local populations.

The A7C-FEC-M crossing of San Mateo and San Onofre creeks is proposed to span these areas. The choice of this crossing location and design features resulted from the consultation with the USFWS, ACOE, and EPA during the refinement process for the project. Since the road will be above the creeks, impacts will be negligible, as water will flow around the column supports maintaining existing natural processes within the creek.

Indirect Impacts

Based on the analyses presented in the RMP, adverse water quality impacts to the tidewater goby should not occur. The A7C-FEC-M includes design and project features to prevent indirect impacts. Design measures required by the Runoff Management Plan (RMP) would minimize impacts to erosion, siltation, and water quality degradation from runoff. The RMP stipulates that designated water quality volume, defined as the volume of runoff produced from a 24 hour 85th percentile storm event, as determined from the local historical rainfall record (two centimeters [0.8 inch] approximate average for the Orange County area), generated from the project facility would be routed along each highway segment to appropriate water quality remediation facilities prior to discharge into receiving waters; therefore, the project would not create a substantial additional source of polluted runoff.

The A7C-FEC-M would not exceed the applicable RWQCB Water Quality Control Plans for the San Diego and Santa Ana Regions. The RMP stipulates that the designated water quality volume of runoff generated from the project facility would be treated at appropriate water quality mitigation facilities prior to discharge into downstream receiving waters. Treatment would be provided at a Maximum Extent Practicable (MEP) level.

Neither increased natural flow velocities nor alterations to the existing drainage pattern of the site or area, would result in increased erosion or the loss of the groundwater recharge capability flow gradient from the project area. The RMP stipulates that flow splitters would be designed to divert excess and potentially erosive project runoff to treatment BMPs structures. Treated runoff from the BMPs would be discharged into the same receiving waters at nonerosive rates (at or below existing velocities). The changes in the overall surface water volumes would be minimal. Furthermore, the proposed BMPs and appropriate maintenance of these BMPs would ensure

that the generated sediment and silt materials, which may impact groundwater recharge, are properly removed.

The RMP stipulates that selected BMPs would be implemented to treat surface water to MEP in order to reduce potential impacts to groundwater quality. Surface water quality in groundwater recharge areas is not expected to adversely affect the ability of surface waters to recharge groundwater aquifer systems.

The RMP stipulates that excess runoff generated from the project facility would be detained and treated at appropriate water quality mitigation facilities prior to being released into downstream receiving waters at nonerosive rates. The excess runoff discharged into the receiving waters would eventually recharge the underlying groundwater through the stream alluvium system. The overall water balance of the local and regional watersheds, as well as aquifer volumes and groundwater table levels, therefore, would not be impacted

In addition, the existing I-5 crossings of San Mateo and San Onofre Creeks do not include runoff water treatment. The A7C-FEC-M includes an extensive water quality BMP system as noted above. Thus, with the A7C-FEC-M in place, there will be an improvement in water quality, as all dry flows, all first flush storm flows, and most other storm flows will be treated through the BMPs.

Critical Habitat

The A7C-FEC-M will impact 12.41 ha (30.67 ac) of critical habitat in San Onofre Creek and San Mateo Creek. The primary constituent elements of the tidewater goby are provided by coastal lagoons and estuaries, with relatively natural hydrologic regimes and few exotic fishes. These conditions, that could support the goby, occur within the natural habitat areas that are present with the direct and indirect impact areas of the A7C-FEC-M as discussed above.

The A7C-FEC-M, however, is expected to result in no net loss of habitat value for the tidewater goby. The net habitat value equation takes into consideration habitat and habitat value gains (through preservation and/or restoration) and loss (project impacts). The habitat value gains by the proposed project (i.e., increased water quality entering San Mateo and San Onofre Creeks [see Section 4.8 of the EIS/SEIR and the Runoff Management Plan]) offset the habitat losses to result in no net loss of habitat values.

4.3.1.3 CUMULATIVE EFFECTS

There are two future projects that are reasonably certain to occur within the study area: the RMV project and the southern subregion NCCP/HCP. Both of these projects will involve a Federal action requiring separate consultation with the USFWS (unrelated to the proposed action), and thus, in accordance with the USFWS regulations, are not considered in the cumulative effects. Cumulative impacts are not anticipated.

4.3.1.4 CONSERVATION MEASURES

Within the EIS/SEIR and NES, several minimization and avoidance measures were identified that relate directly or indirectly to potential impacts to the tidewater goby. These measures are summarized below with their corresponding EIS/SEIR measure number:

- Identification/Responsibilities of the Project Biologist (WW 1)
- Project Biologist Review of Project Design (WW 2)
- Preparation and Implementation of a Biological Resources Management Plan (BRMP) (WW 3)
- Identification and Implementation of Environmentally Sensitive Areas (ESAs) (WW 4)
- Installation of Protective Fencing and Other Protective Measures (WW 5)
- Biological Monitoring/Documentation (WW 5)
- Restoration of River/Stream Hydrology (WW 6)
- Preconstruction Educational Meetings (WW 6)
- Construction Storage (WW 7)
- Construction Disposal (WW 8)
- Implementation of Water Quality Protection Measures (WW 9)
- Construction Staging Areas (WW 10)
- Design and Installation of Wildlife Movement Corridor Bridges and Culverts (WW 15)
- Installation of Fish Navigable Creek Crossings (WW 21)
- Invasive Plant Species Minimization (WW 27,28, and 29)

The text of these biological measures is provided in Appendix C.

Within Section 4.12 of the EIS/SEIR, *Affected Environment, Impacts, and Mitigation Measures Related to Threatened and Endangered Species*, Measure TE 9 addresses the biological resource needs of the tidewater goby. Measure TE 9 has been included below:

During final design, the TCA or other implementing agencies, in coordination with the RMP, shall design, construct, and/or maintain any structure/culvert placed within a stream where Endangered or Threatened fish do/may occur such that it does not constitute a barrier to upstream or downstream movement of aquatic life, or cause an avoidance reaction by fish that impedes their upstream or downstream movement. This includes, but is not limited to, the supply of water at an appropriate depth for fish migration.

4.3.2 Discussion of Southern Steelhead

Southern steelhead is listed as Endangered under the FESA. All species of steelhead are anadromous, meaning they spend most of their life in the sea and migrate into freshwater streams to spawn. The young hatch out, spend a year or two in fresh water, and then return to the sea. In the SOCTIIP action area, the upstream migration occurs from December to April. As documented in the NES, suitable habitat for the southern steelhead is located mostly in the upper reaches of San Mateo and San Juan creeks. This species may also have been prevalent in the lower reaches as well in early historical times.

San Mateo Creek

At certain times of the year, under particular environmental conditions, (i.e., storm flows eliminate a sediment barrier at the mouth of San Mateo Lagoon and adequate water is present in the streamcourse), steelhead could occur in San Mateo Creek in the vicinity of the proposed bridge structure at its connection with the I-5 on alternative A7C-FEC-M.

San Juan Creek

When certain environmental conditions occur (i.e., storm flows eliminate natural sediment barriers and provide for adequate water resources within stream course), the steelhead might occur within San Juan Creek in the action area. Steelhead are not expected, however, reflecting the lack of recent detection, limited historical occurrences, and additional barriers to upstream movement from the ocean.

4.3.2.1 EVOLUTIONARY SIGNIFICANT UNITS/CRITICAL HABITAT

Potential southern steelhead locations in the action area are in one of the 15 Endangered Evolutionary Significant Units (ESU) within its range. On February 16, 2000, the National Oceanic and Atmospheric Administration (NOAA) Fisheries Service designated critical habitat for 19 ESUs of West Coast salmon and steelhead. However, in April 2002, NOAA Fisheries Service withdrew the 2000 critical habitat designation of 19 populations of West Coast salmon and steelhead. As indicated in the memorandum order by U.S. District Court for the District of Columbia (USDDC 2002), although critical habitat is vacated by the consent decree, the FESA listings of steelhead remain along with the regulatory protection attendant to federal listed status. When NMFS conducts new rulemaking designating critical habitat for southern steelhead, it must be consistent with the 10th Circuit's 2001 ruling regarding economic analysis. A settlement was entered in which NOAA Fisheries agreed to file proposed critical habitat designations for the 19 ESUs covered by the vacated rule by November 30, 2004 (NOAA 2004). On November 30, 2004, NOAA filed a proposed rule with the *Federal Register* to designate critical habitat areas for seven for salmon and steelhead species listed in California. The proposed rule includes analyses of the economic and other impacts of such designations, and a range of areas that are being considered for exclusion in the final rules. Both San Juan Creek and San Mateo Creek in the action area have been proposed as critical habitat in the December 10, 2004 *Federal Register*. Following the public comment period and hearings, the final rule by NOAA is expected in June, 2005.

As of 1999, the southern California ESU extended only to Malibu Creek. Populations south of Malibu Creek were thought to be extirpated; and the previous rule designating critical habitat for southern steelhead did not extend south of Malibu Creek (NMFS 2000). However, new evidence as described in the Federal Register, Volume 67 (NMFS 2002), produced findings of steelhead existence in Topanga and San Mateo creeks, both of which are south of Malibu Creek.

Essential features considered for critical habitat designation for the southern California ESU are juvenile rearing habitats, juvenile and adult migration corridors, space for growth and development, and spawning areas with sufficient water quality and quantity. Life cycle stages have variable habitat types, because the southern steelhead is anadromous. Formerly designated critical habitat is comprised of habitats that include shade, sediment transport, nutrient or chemical regulation, stream bank stability, and woody debris and organic materials. In addition to riparian habitats, marine habitats that offer migration pathways to freshwater streams were also designated as critical habitat and remain protected for conservation of the species (NMFS 2000).

NMFS deemed critical habitat for steelhead species as having any accessible reaches within the historical range of the ESUs that can be occupied by any life stage. Recent field surveys conducted by the CDFG revealed the presence and spawning activities of the anadromous southern steelhead south of the designated ESUs. San Mateo Creek is in the southern portion

of the SOCTIIP action area. In addition, Jennifer Nielson, a USGS biologist, has suggested that the population in the San Mateo watershed may be endemic, with a unique genetic haplotype that was identified from tissue sample analysis in 1999 and 2000. Comparisons of steelhead genetic haplotypes determined that individuals recently observed in San Mateo Creek appear to be genetically distinct from those from hatcheries. This evidence resulted in a revision of the 19 steelhead ESUs. Since May 2000, CDFG has completed numerous surveys that confirm the presence of a San Mateo Creek population. The range extension of the southern steelhead includes the Santa Maria River south to the United States/Mexican border, including San Mateo Creek (NMFS 2002).

Primary Constituent Elements

The habitat value of an area for the steelhead is determined by the presence of primary constituent elements that include sites essential to support one or more life stages of the ESU (sites for spawning, rearing, migration and foraging). The December 10, 2004, Federal Register states that "These sites in turn contain physical or biological features essential to the conservation of the ESU (for example, spawning gravels, water quality and quantity, side channels, forage species). Specific types of sites and the features associated with them include:

1. Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development;
2. Freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks;
3. Freshwater migration corridors free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival;
4. Estuarine areas free of obstruction with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.
5. Nearshore marine areas free of obstruction with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.
6. Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation."

Base on the primary constituent elements site types listed above, the action area only potentially supports freshwater migration corridors, and estuarine and nearshore areas for the steelhead.

4.3.2.2 PROJECT IMPACTS/EFFECTS OF THE ACTION

Direct Impacts

Suitable habitat for southern steelhead is located mostly in the upper reaches of San Mateo and San Juan creeks. Conditions during most years are likely to be unsuitable for this species in the SOCTIIP action area. Although southern steelhead were not found during the fish surveys conducted for this project, they were known to be present in San Mateo Creek during 1998, an El Niño rainfall year. CDFG has undertaken periodic surveys documenting presence of southern steelhead in upper San Mateo Creek since May 2000. Although during most years the likelihood of impacts on southern steelhead would be low, the possibility still exists for the occasional presence of this species in the project area, especially during years with higher rainfall.

Potential impacts to southern steelhead may occur from construction activities along or across streams, creeks, or any drainage. Direct impacts to southern steelhead during spawning runs from construction include disruption in breeding activities or removal of individuals. Physical activities in the stream could cause additional mortality of adults or dispersing juveniles through impacts on physical characteristics (substrate materials and creation of impediments to upstream improvements) of the stream that might occur during the construction of the bridge/culvert structures.

The A7C-FEC-M would not directly preclude the return of the steelhead to areas because the A7C-FEC-M does not include project features that would stop fish dispersal, or alter or significantly modify the bottoms of San Mateo Creek and/or San Juan Creek and associated riparian vegetation.

The A7C-FEC-M, at the crossing of San Mateo Creek and San Juan Creek, is proposed to span the creek. These features reflect consultation discussions with the USFWS, ACOE, and EPA during the refinement process for the project, regarding the design and location of bridge structures for all alternatives in the area. Since the road is elevated above the creeks, impacts will be negligible; water will flow around the column supports that maintain existing natural processes within the creek.

Indirect Impacts

As described in detail under section 4.3.1.2 for the tidewater goby, design measures required by the Runoff Management Plan would minimize impacts to erosion, siltation, and water quality degradation from runoff.

Treated runoff from the BMPs would be discharged into the same receiving waters at nonerosive rates (at or below existing velocities). The changes in the overall surface water volumes would be minimal. Furthermore, the proposed BMPs and appropriate maintenance of these BMPs would ensure that the generated sediment and silt materials, which may impact groundwater recharge, are properly removed. Neither increased natural flow velocities nor alterations to the existing drainage pattern of the site or area, therefore, would result in increased erosion or the loss of the groundwater recharge capability flow gradient from the project area. Based on the analyses presented in the RMP, adverse water quality impacts to the steelhead will not occur.

Critical Habitat

The A7C-FEC-M will impact 1.17 ha (2.89 ac) within San Juan Creek and 3.08 ha (7.60 ac) within San Mateo Creek within areas proposed as critical habitat.

These calculations are based on the ACOE OHWM within these drainages. According to NOAA, the primary constituent elements for the steelhead that are essential for the primary biological needs in the action areas include freshwater migration corridors, and estuarine and nearshore areas. These elements are present with the natural habitat areas that are present with the direct impact and indirect areas of the A7C-FEC-M as discussed above.

The A7C-FEC-M is expected to result in no net loss of habitat value for the steelhead. The net habitat value equation takes into consideration habitat gains (through preservation and/or restoration) and loss (project impacts). The habitat value gains by the proposed project (i.e., increased water quality entering San Mateo Creek [see discussion under tidewater goby and Section 4.8 of the EIS/SEIR]) have offset the habitat losses to result in no net loss of habitat values.

4.3.2.3 CUMULATIVE EFFECTS

There are no cumulative projects within the action area that are not subject to consultation requirements with the USFWS.

4.3.2.4 MINIMIZATION AND AVOIDANCE MEASURES

Within the EIS/SEIR, several minimization and avoidance measures were identified that relate directly or indirectly to potential impacts on the southern steelhead. These measures will provide for habitat protection and management which will, in the longterm, provide the required avoidance and minimization for the steelhead potentially within or downstream from the proposed project. These avoidance and minimization measures are provided in Appendix C.

Within Section 4.12 of the EIS/SEIR, Affected Environment, Impacts, and Mitigation Measures Related to Threatened and Endangered Species, Measure TE 9 addresses the biological resource needs of the southern steelhead, as follows:

During final design, the TCA or other implementing agencies, in coordination with the RMP, shall design, construct, and/or maintain any structure/culvert placed within a stream where endangered or threatened fish do/may occur such that it does not constitute a barrier to upstream or downstream movement of aquatic life, or cause an avoidance reaction by fish that impedes their upstream or downstream movement. This includes, but is not limited to, the supply of water at an appropriate depth for fish migration.

Avoidance and minimization measures that could be implemented during construction may include installation of sheet pile cofferdams to contain construction activities at the San Juan Creek and San Mateo Creek stream crossings. A cofferdam is a small structure around the proposed bridge column supports to isolate the construction area. Cofferdams contain the disturbed soil area preventing siltation of the stream flow while allowing the flow of water around the imbedded sheet piles thus maintaining an uncontaminated supply of water for southern steelhead.

4.3.3 Discussion of Arroyo Toad

The arroyo toad is listed as endangered under the FESA. Within the action area, arroyo toads have been found in San Juan Creek, San Mateo Creek, Cristianitos Creek, and San Onofre Creek. The A7C-FEC-M alignment crosses or runs parallel to these creeks. These streamcourses were identified as occupied during numerous surveys conducted in the action area between 1996 and 2003 (Figure 4.11-3).

The arroyo toads in the San Juan Creek portion of the action area are considered a portion of a "major population" according to the Draft NCCP/HCP Planning Guidelines. Major populations "are those considered sufficiently large to be self-sustaining with a minimum of active or invasive management intervention or that at least support enough breeding individuals to contribute reliably to the overall metapopulation stability of the species." (Draft NCCP/HCP Planning Guidelines, April 2003). The A7C-FEC-M alignment will primarily avoid this major population due to the proposed bridge at this location that will span San Juan Creek. The southern/central portion of the A7C-FEC-M alignment runs parallel, but does not cross the lower Cristianitos population of the arroyo toad. This population is considered an "important population" in a "key location". Key locations "are those locations that are deemed necessary for the conservation of the species in the subregion." Important populations "may not meet the relative size standards of major populations, but may nonetheless be important to the species' long-term survival". (Draft NCCP/HCP Planning Guidelines, April 2003). Because the Draft NCCP/HCP study area does not extend into San Diego County, the populations within the southernmost portion of Cristianitos Creek and San Mateo Creek, and San Onofre Creek have not been identified as important populations, major populations, or key locations.

4.3.3.1 CRITICAL HABITAT

Status of the Species/Critical Habitat

On March 7, 2001, the USFWS published a final rule designating 182,360 acres of land as critical habitat for the arroyo toad in Monterey, Santa Barbara, Ventura, Los Angeles, San Bernardino, Riverside, Orange, and San Diego counties, California (USFWS March 7, 2001)("2001 Rule"). Following the designation of critical habitat, several lawsuits were filed challenging various aspects of the designation. In response to these lawsuits, the critical habitat designation was vacated and the USFWS was instructed by the court to re-evaluate its previous position. A new critical habitat designation was published on April 28, 2004 (USFWS April 28, 2004)("2004 Rule") covering portions of the action area along San Juan, Cristianitos, and San Mateo creeks (Figure 16b). These rules are the source for much of the text below on critical habitat.

On February 15, 2005, the USFWS published a proposed rule with revisions to the proposed designated critical habitat. (2005 Rule.) The 2005 Rule includes a revision to the criteria used to identify essential habitat. This revision limits the essential habitat areas in the upland areas to a distance of 1,640 feet (500 m) from streams if the 82 feet (25 m) elevation limit had not yet been reached at that point. The 2005 Rule did not include a revised map of critical habitat. According to a Preliminary GIS analysis based on the revised criteria the proposed critical habitat in the vicinity of San Mateo and San Onofre Creeks will change slightly with the revised criteria.

Features of Entire Designated Critical Habitat that are Essential to Conservation

The designation of critical habitat for the arroyo toad generally reflects the drainage basins identified in the final Recovery Plan as “areas necessary to achieve arroyo toad recovery.” (2001 Rule). The USFWS states in the 2001 rule that to recover the arroyo toad “it is essential to preserve the species’ genetic diversity as well as the variety of ecological environments in which it has persisted.” The criteria used to identify critical habitat is listed in the 2001 Rule, and the 2004 Rule states that the criteria for that Rule is identical to the 2001 Rule.

An area was determined essential to the conservation of the arroyo toad if it had one or more of the following characteristics: (1) supports a substantial core population of arroyo toads; (2) supports at least a small toad population and possesses favorable habitat conditions for population expansion and persistence; (3) suitable habitat situated in a location that appears to be crucial for maintaining the viability of a larger metapopulation; (4) occupied habitat on the periphery of the arroyo toad’s geographic range; and (5) occupied habitat in atypical or underrepresented ecological environments (e.g., high elevation or desert-edge populations).

The Recovery Plan identifies three recovery units, reflecting the species occurrence in a variety of ecologically and geographically distinct areas. The combination of habitats form “ecologically functional units” which are “essential to the conservation of the arroyo toad. All lands identified as essential and proposed as critical habitat contain one or more of the Primary Constituent Elements for the arroyo toad.” (2004 Rule). The SOCTIIP project is located within the southern critical habitat unit. In the 2004 Rule, there are 56, 133 ha (138, 713) acres of total designated critical habitat. This acreage was reduced to 132,282 acres (53,533 ha) based on revisions to the upland delineation distance from 4,921 feet (1,500 m) to 1,640 feet (500 m) in the 2005 Rule. The SOCTIIP is located within subunits 10 and 11 as defined under the 2004 Rule.

Primary Constituent Elements

The primary constituent elements (“PCEs”) for the arroyo toad are those habitat components that are essential for the primary biological needs of foraging, breeding, growth of larvae (tadpoles) and juveniles, intra-specific communication, dispersal, migration, genetic exchange, and sheltering. Specific primary constituent elements for the arroyo toad include (1) rivers or streams with a hydrologic regime that supplies sufficient flowing water of suitable quality and sufficient quantity and at the appropriate times to provide space, food, and cover needed to sustain eggs, tadpoles, metamorphosing juveniles and adult breeding toads; (2) low-gradient stream segments with sandy or fine gravel substrates which support the formation of shallow pools and sparsely vegetated sand and gravel bars for breeding and rearing of tadpoles and juveniles; (3) a natural flooding regime or one sufficiently corresponding to a natural regime that will periodically scour riparian vegetation, rework stream channels and terraces, and redistribute sands and sediments, such that adequate numbers and sizes of breeding pools and sufficient terrace habitats with appropriate vegetation are maintained; (4) riparian and adjacent upland habitats (particularly alluvial streamside terraces and adjacent valley bottomlands that include areas of loose soil and dependable subsurface moisture where toads can burrow underground and avoid desiccation) of sufficient width and quality to provide foraging and living areas for subadult and adult arroyo toads and; (5) stream channels and upland habitats where manmade barriers do not completely or substantially impede migration to estivation sites, dispersal between populations, or recolonization of areas that contain suitable habitat. (Summarized from 2004 Rule.)

Role of Individual Units

As described in the 2004 Rule, Unit 10, the San Juan Creek Basin, encompasses approximately 6,285 ac (2,544 ha), of which 54 percent is private land, 34 percent is Orange County Park Land (Caspers Wilderness Park and O'Neill Regional Park), and 12 percent is within the Cleveland National Forest.

Unit 10 supports a large core population in San Juan and Bell Creeks that is concentrated within Caspers Wilderness Park and private lands downstream, "the protection of which is essential for the conservation of the species. These areas contain several primary constituent elements, such as low-gradient stream segments with sandy or fine gravel substrates that support shallow pools and alluvial scrub habitat that provides foraging habitat. This unit also supports a population along a stretch of Trabuco Creek . . . where conditions such as low-gradient streams with shallow pools and adjacent upland habitat for foraging and burrowing are favorable for population persistence. Arroyo toad populations in this unit possibly belong to a greater arroyo toad metapopulation in the Santa Ana Mountains and may serve as an important linkage between toads in Santiago Creek (Unit 8) to the north and the San Mateo Creek Basin to the south. Threats to this population that may require special management considerations include exotic predators (bullfrogs), increased water diversions, and residual effects of recent gravel mining operations." (2004 Rule at 23263.)

Unit 11, the San Mateo Creek Basin, encompasses approximately 4,580 ac (1,854 ha), of which 68 percent is within portions of Marine Corps Base, Camp Pendleton (Camp Pendleton), including areas leased to outside parties for other land uses (i.e., San Onofre State Park and agricultural lands) and adjacent cantonment areas; 1 percent is within the Cleveland National Forest; and 31 percent is on private land. Other habitats were excluded because they are within mission-essential training areas. "This unit contains several primary constituent elements, including low-gradient stream segments with sandy or fine gravel substrates, shallow pools for breeding and rearing of tadpoles and juveniles, and riparian and adjacent uplands habitats for foraging and dispersal to other populations. With so many favorable habitat conditions, Unit 11 is able to support large core populations in San Mateo and Cristianitos Creeks." (2004 Rule at 23263.)

Environmental Baseline

This species ranges from Monterey County south into Baja California, Mexico. Populations are fragmented throughout southern California in coastal and desert drainages. Degradation and loss of vegetative habitats contribute to reduction or elimination of foraging and overwintering areas. Runoff from roads decreases water quality. Along with natural traumatic occurrences, human impacts from urbanization, agricultural consequences, and general development can cause temporary or permanent extirpations from occupied areas.

Recovery Plan

A Recovery Plan has been prepared for the arroyo toad by the USFWS (USFWS 1999). The objective of the Recovery Plan is to downlist the species from endangered to threatened status, then to delist entirely. This objective focuses on eliminating the threats to the arroyo toad and improving the population status sufficiently to warrant reclassification. According to the Recovery Plan, the geographic distribution of this species is subdivided into 9 counties, encompassing a total of 22 river basins defined to geographic boundaries (USFWS 1999). The

A7C-FEC-M action area falls into the north San Diego County and south Orange County areas which include the streamcourses of San Juan, Cristianitos, San Mateo, and San Onofre creeks.

In relation to A7C-FEC-M and other projects in the project area, the arroyo toad can be considered threatened when management plans have been approved and implemented on federally managed lands such as San Mateo and San Onofre creeks within MCB Camp Pendleton. These are considered wildlife corridors connecting areas of MCB Camp Pendleton to the southern portion of the action area. These recovery area lands provide conservation, maintenance, and restoration of the riparian and uplands habitats utilized for breeding populations of arroyo toads. These measures must maintain at least 20 self-sustaining metapopulations or subpopulations.

Delisting can occur when the genetic phenotype variation can maintain 15 additional self-sustaining subpopulations and metapopulations outside federal jurisdiction. In relation to the action area, this includes the San Juan Creek basin. (Recovery Plan, USFWS, 1999.)

4.3.3.2 PROJECT IMPACTS/EFFECTS OF THE ACTION

Direct Impacts

Impacts to the arroyo toad from implementation of the A7C-FEC-M include construction of bridges across San Juan, San Mateo, and San Onofre creeks where this species is known to occur. Bridge construction would result in impacts to sandy bottom areas where the arroyo toad is known to breed and burrow within these drainages. Direct mortality of adults or dispersing juveniles and the loss of or temporary modification to suitable habitat may occur as a result of project implementation. Construction of the A7C-FEC-M would also displace individuals to adjacent upland habitat, fragment breeding habitat from estivating habitat, and potentially increase the risk of vehicular mortality.

However, because the A7C-FEC-M is crossing San Juan, San Mateo, and San Onofre creeks with substantial bridge structures, the A7C-FEC-M will not preclude the ability of the arroyo toad to use these areas after construction. Design features reflect the consultation of the USFWS, ACOE, and EPA during the refinement process for the project, regarding the design and location of bridge structures for any alternative in the vicinity of these areas. Since the road is above the creeks, impacts will be negligible, as water will flow around the column supports maintaining the existing natural processes within the creek.

Indirect Impacts

As described in detail in section 4.3.1.2 for the tidewater goby, adverse water quality impacts to the arroyo toad would not occur. Design measures required by the Runoff Management Plan would minimize/eliminate impacts to erosion, siltation, and water quality degradation from runoff and the project would not create a substantial additional source of polluted runoff.

Effects on Critical Habitat and Primary Constituent Elements

The A7C-FEC-M will impact 91.86 ha (227.20 ac) of proposed critical habitat in the San Juan Creek and San Mateo Creek basins. The A7C-FEC-M will not effect four of the five PCEs for arroyo toad critical habitat. For PCEs one through four, the A7C-FEC-M will not: change hydrologic or flooding regimes, alter low-gradient stream segments, change sediment flow, and will not completely or substantially impede migration, dispersal or recolonization. The A7C-

FEC-M will remove a small amount of riparian and adjacent upland habitat, through the bridge supports within the creek, and roadbed and right-of-way adjacent to the bridges. Regarding sediment flow, as described in the hydrology analysis in the Draft EIS/SEIR and in the sediment transport analysis (RBF Consulting, 2004. Sediment Continuity Analysis, lower San Mateo Creek, attached to the Responses to Comments to the EIS/SEIR), runoff from the roadway for water quality storm events is exceptionally small. The use of extended detention as a primary mitigation tool provides for both water quality mitigation as well as mitigation for changes in watershed hydrology. Changes to the peak flow rate and/or runoff volume (for the return periods studied) in the after-project condition within San Mateo Creek are less than 3%. The storm water treatment program effectively limits impacts to a level with no discernable cumulative adverse effects. The A7C-FEC-M will have an insignificant effect on the transport of sediment within the San Mateo Creek watershed.

Relationship to Recovery Plan

The A7C-FEC-M will not impair recovery of the arroyo toad. The Recovery Plan identifies five elements of the recovery strategy for the toad. These are listed below, followed by a discussion of the A7C-FEC-M in relation to the recovery strategy.

Strategy 1) *Stabilize and maintain populations throughout the range of the arroyo toad in California by protecting sufficient breeding and nonbreeding habitat.* The A7C-FEC-M has been designed to avoid occupied habitat to the extent feasible. The A7C-FEC-M may impact one arroyo toad location, but impacts will be avoided through bridge design using the minimum number of facilities within the stream bed, and through construction measures as outlined later in this report. In addition, project design features will route all roadway runoff through water quality treatment facilities, and thus there will be no adverse hydrology and sedimentation effects (pre-project hydrology features will be preserved (see earlier discussion for more detail). In summary, the A7C-FEC-M does not impair the USFWS ability to implement this strategy.

Strategy 2): Monitor the status of existing populations to ensure recovery actions are successful. This strategy is one to be implemented directly by the USFWS, not by applicants for federal approvals. The A7C-FEC-M does not impair the USFWS ability to implement this strategy.

Strategy 3): Identify and secure, by appropriate management and monitoring, additional suitable arroyo toad habitat and populations. This strategy is one to be implemented directly by the USFWS, not by applicants for federal approvals. The A7C-FEC-M does not impair the USFWS ability to implement this strategy.

Strategy 4): Conduct research to determine the population dynamics and ecology of the species to guide management efforts and determine the best methods for reducing threats. This strategy is one to be implemented directly by the USFWS, not by applicants for federal approvals. The A7C-FEC-M does not impair the USFWS ability to implement this strategy.

Strategy 5): Develop and implement an outreach program. This strategy is one to be implemented directly by the USFWS, not by applicants for federal approvals. The A7C-FEC-M does not impair the USFWS ability to implement this strategy.

Net Habitat Value

The A7C-FEC-M is expected to result in no net loss of habitat value for the arroyo toad. The net habitat value equation takes into consideration habitat gains (through preservation and/or

restoration) and loss (project impacts). The habitat loss by the project (91.86 ha [227.20 ac]) of proposed critical habitat based on the 2004 Rule represents approximately 0.16 percent of the entire area proposed for critical habitat for the species (56,133 ha [138,713 ac]). This would not be an appreciable loss of habitat for this species. The habitat avoidance measures and gains by the proposed project (i.e., increased water quality entering San Mateo Creek [see Section 4.8 of the EIS/SEIR]) will offset the habitat losses to result in no net loss of habitat values.

4.3.3.3 CUMULATIVE EFFECTS

There are two future projects that are reasonably certain to occur within the action area: the RMV project and the southern subregion NCCP/HCP. Both of these projects will involve a Federal action requiring separate consultation with the USFWS (unrelated to the proposed action), and thus, in accordance with the USFWS regulations, are not considered in the cumulative effects. Nevertheless, it is anticipated that the NCCP will contribute to conservation of the arroyo toad, through preservation of open space and adaptive management.

4.3.3.4 CONSERVATION MEASURES

Within the EIS/SEIR, several minimization and avoidance measures were identified that relate directly or indirectly to potential impacts on the arroyo toad. These measures are provided in Appendix C.

Within Section 4.12 of the EIS/SEIR, *Affected Environment, Impacts, and Mitigation Measures Related to Threatened and Endangered Species*, Measures TE 10 through 17 have been developed to avoid or minimize impacts to the arroyo toad. All of the measures above and that follow are consistent with the "Potential Conservation Measures" in the Recovery Plan, pages 64-66. Measures TE 10 through 17 have been included below:

Measure TE 10. An Arroyo Toad Resource Management Plan (ATRMP) will be prepared, incorporated into the BRMP, and monitored by the Project Biologist. The plan shall include measures detailing how the impact area will be surrounded with a silt fence enclosure, from which arroyo toads will be removed and relocated from the construction impact area during the breeding season (when they are detectable by vocalizations) and placed in suitable habitat either upstream or downstream of the selected alternative during construction. The ATRMP will identify areas of collection, suitable areas for temporary storage, and restoration guidelines to be in place prior to release of the toad to their original location. The plan shall be submitted to and approved by the USFWS. The locations of areas known to support arroyo toads shall be identified in the ATRMP and on the ESA maps.

Measure TE 11. Prior to initiating any ground-disturbing activities in occupied/suitable habitats or habitats proximal to suitable or occupied habitats, exclusionary fencing shall be installed around the perimeter of the construction area. Fencing or screening approximately 60 cm (two ft) in height (30 cm [one ft] of which will be buried below the surface) shall be installed to prevent arroyo toads from entering the area after the onset of construction. The fencing will be installed at least 14 days prior to the initiation of work and must be made of a material appropriate to preclude any arroyo toads from entering the construction area. Fencing will be removed each winter during construction and at the end of project construction. Vehicle use will be restricted within areas known to support populations of the arroyo toad as reflected on the ESA maps.

Measure TE 12.

- a) *The Project Biologist shall conduct three focused arroyo toad surveys within the fenced construction site for arroyo toads a minimum of 14 nights prior to initiating project construction. If climatic conditions are not appropriate for arroyo toad movement during the surveys, the Project Biologist may attempt to illicit a response from the arroyo toads, during nights with temperatures of 13 °C (55 °F) or greater, by spraying the project area with water to simulate a rain event. During construction, arroyo toads surveys will be performed a minimum of once per week and on all nights where the combination of rain/humidity and temperature would increase the movement of arroyo toads.*
- b) *If arroyo toads are found with the construction side of the exclusionary fencing, arroyo toads will be removed by the Project Biologist and relocated from the construction impact area and placed in suitable habitat either upstream or downstream of the construction area as outlined in the Arroyo Toad Resource Management Plan.*

Measure TE 13. *The Contractor shall locate staging areas for construction equipment outside of areas within the jurisdiction of the USACOE or CDFG known to support arroyo toad to minimize impacts to sandy creek benches that may provide aestivating habitat for the arroyo toad to avoid taking any individuals.*

Measure TE 14. *When conducting construction and/or other ground-disturbing activities in arroyo toad-occupied habitats or in adjacent upland areas proximal to known arroyo toad habitats, the Contractor shall cover all grubbing spoils or other grading debris with plastic sheeting to prevent arroyo toads from opportunistically burrowing in these exposed and friable soil piles. This sheeting must be placed on the soil piles before sunset and shall remain on (during nighttime hours) for the duration of the construction/ground disturbing activities. The areas where these measures must be implemented shall be determined by the Project Biologist in coordination with the USFWS. If the sheeting does not remain in place due to unforeseen circumstances, (inclement weather or other disturbances) a biologist will monitor the soil piles for the arroyo toad.*

Measure TE 15. *The Contractor shall not drive upon construction roads or other roads/surfaces adjacent to arroyo toad occupied habitat after sunset. If the site must be accessed, a biologist permitted to handle arroyo toad must be present in the vehicle to identify any individuals on the road and the vehicle shall not exceed a speed of 16 km per hour (10 mi per hour) within these areas.*

Measure TE 16. *At the conclusion of construction, the TCA or other implementing agencies shall construct artificial pools and gravel bars within the temporary disturbance areas of creeks that are known to be occupied by arroyo toad. The artificial pools and gravel bars shall provide potential breeding and aestivating habitat for arroyo toad. These areas will be identified and established by the Project Biologist in the BRMP. Because of the natural flooding and scouring conditions of the creeks within the study area, no maintenance of these areas will be required. The construction of these features shall not preclude required Caltrans bridge maintenance. Plans shall be submitted to USFWS for review and approval prior to implementation.*

Measure TE 17. *Prior to the arroyo toads' re-establishment to their original locations, specific activities to enhance their habitat and improve their potential for re-occupation will be implemented. These measures include the removal (up to 15 days in advance of the re-*

establishment), to the extent practicable, of predatory species such as bullfrogs, western mosquito fish, yellow bullheads, bluegill, and additional predatory invertebrates, amphibians, and introduced fish species. Plans shall be submitted to USFWS for review and approval prior to implementation.

4.3.4 Discussion of Southwestern Willow Flycatcher

Status of the Species/Critical Habitat

The southwestern willow flycatcher is listed as Endangered under the FESA and CESA. It is restricted to riparian woodlands along streams and rivers with mature, dense stands of willows, cottonwoods, or smaller spring fed or boggy areas with willows or alders (Sedgwick and Knopf 1992).

On July 22, 1997, the USFWS published a final critical habitat for this species. The 1997 ruling identified approximately 161 kilometers (100 river miles) in Kern, Riverside, San Bernardino, and San Diego counties as critical habitat for the southwestern willow flycatcher. The action area was not located in the designated critical habitat area for this species. However, this critical habitat designation was vacated by the Court. On October 12, 2004, the USFWS proposed critical habitat in southern California, southern Nevada, southwestern Utah, south-central Colorado, Arizona, and New Mexico (69 Fed. Reg. 60,706). A total of 152,124 ha (376,095 ac) have been proposed for designation as critical habitat for this species.

Features of Entire Designated Critical Habitat that are Essential to Conservation/Primary Constituent Elements

Specific primary constituent elements include: 1) Nesting habitat with trees and shrubs that include, but are not limited to, willow and boxelder; 2) Dense riparian vegetation with thickets of trees and shrubs ranging in height from 2 m to 30 m (6 to 98 ft) with lower-stature thickets of (2 to 4 m or 6 to 13 ft tall) found at higher elevation riparian forests and tall-stature thickets at found at middle- and lower-elevation riparian forests; 3) Areas of dense riparian foliage at least from the ground level up to approximately 4 m (13 ft) above ground or dense foliage only at the shrub level, or as a low, dense tree canopy; 4) Sites for nesting that contain a dense tree and/or shrub canopy (the amount of cover provided by tree and shrub branches measured from the ground) (i.e. a tree or shrub canopy with densities ranging from 50 percent to 100 percent); 5) Dense patches of riparian forests that are interspersed with small openings of open water or marsh or shorter/sparser vegetation, that creates a mosaic that is not uniformly dense. Patch size may be as small as 0.1 ha (0.25 ac) or as large as 70 ha (175 ac); and 6) A variety of insect prey populations, including but not limited to, wasps and bees (Hymenoptera); flies (Diptera); beetles (Coleoptera); butterflies/moths and caterpillars (Lepidoptera); and spittlebugs (Homoptera). <http://www.epa.gov/fedrgstr/EPA-IMPACT/2004/October/Day-12/i22394.htm>

Role of Individual Units

Southwestern willow flycatchers have been noted in the project region (Whispering Hills and Prima and Segunda Deshecha areas). In addition, a couple of migrant flycatchers were observed in 2001. Suitable nesting habitat for this species is present along San Mateo Creek and Cañada Gobernadora in the action area. In the action area, one territorial male flycatcher was present in Cañada Gobernadora in 2001 (Figure 11). San Mateo Creek and San Onofre Creek are the only drainages within the action area that are included within the proposed critical

habitat designation. However, these areas appear to be excluded from proposed critical habitat because they are located within the Marine Corps Base, Camp Pendleton.

NOTE TO USFWS: It is unclear whether San Mateo Creek and San Onofre Creek are actually excluded because there is an inconsistency between the narrative description of stream and river segments and the map. We need to discuss. In the following discussion, it is assumed that portions of both Creeks that are proposed for critical habitat overlap with the A7C-FEC-M.

Environmental Baseline

A 6-mile (8 km) segment of San Mateo Creek and a 4-mile (6 km) segment of San Onofre Creek are within the action area. In 1997, two territories were detected at San Mateo Creek. No territories have been detected at San Onofre Creek. These segments are included as proposed critical habitat because they fall within an 18-mile (29 km) radius of a large Flycatcher population and provide connectivity between populations.

4.3.4.1 PROJECT IMPACTS/EFFECTS OF THE ACTION

No occupied southwestern willow flycatcher locations known to support the southwestern willow flycatcher would be affected by the A7C-FEC-M. Potential impacts to non-occupied southwestern willow flycatcher habitat from construction include removal, degradation, modification, and fragmentation of potentially occupied riparian habitats. The A7C-FEC-M would directly affect approximately 13.85 ha (33.55 ac) of riparian habitat.

Effects on Primary Constituent Elements

The A7C-FEC-M will result in the loss of 2.74 ha (6.77 ac) of areas proposed as critical habitat (see Figure 16a). The effects of the A7C-FEC-M on the riparian critical habitat result from the bridge supports used where the highway crosses the Creeks. This would not be an appreciable loss of habitat for this species, as it constitutes a fraction of a percentage of the 152,124 ha (376,095 ac) proposed for designation, an extremely small area. The limited acreage of critical habitat and low number of locations affected by the A7C-FEC-M indicate that there will be only minimal effects on the PCEs. Moreover, flycatcher territories have been detected only twice at only one of the two Creeks at issue, San Mateo Creek, in 1997.

Benefits of Minimization within Critical Habitat

Within the EIS/SEIR, several minimization and avoidance measures were identified that relate indirectly to potential impacts the southwestern willow flycatcher. These measures are provided in Appendix C.

While there are no A7C-FEC-M impacts on the flycatcher, conservation measures being carried out in the area have been contributing to recovery of the species. The key measure is management of cowbirds, a species in a parasitic relationship with the flycatcher. Cowbirds lay their eggs in the nest of species such as the flycatcher; the hatchlings outcompete the offspring of the host species. Cowbirds also act as nest predators by removing eggs and nestlings of host species from their nests. Cowbirds therefore negatively affect the reproductive success of flycatchers. Management of cowbird parasitism through trapping of cowbirds is an important contributing factor in flycatcher recovery. Cowbird trapping has been performed with success since 1983 at the Marine Corps Base at Camp Pendleton, through which San Mateo and San Onofre Creeks run.

No additional specific avoidance and/or minimization measures are proposed for the southwestern willow flycatcher due to this species' absence within the impact area.

Relationship to Recovery Plan

In August of 2002, the USFWS published a final recovery plan for the southwestern willow flycatcher. The objective of the recovery plan is to downlist the species from Endangered to Threatened, then ultimately to delist the species. The action areas are located within the Coastal California Recovery Unit, the San Diego Management Unit, and the Reaches of San Juan Creek Watershed, San Mateo Creek, and San Onofre Creek.

Reclassification from Endangered to Threatened may be considered when either of the following criterion have been met (USFWS 2002):

Criterion A: Increase the total known population to a minimum of 1,950 territories (equating to approximately 3,900 individuals), geographically distributed to allow proper functioning as metapopulations, so that the flycatcher is no longer in danger of extinction. For reclassification to Threatened status, these prescribed numbers and distributions must be reached as a minimum, and maintained over a five-year period (USFWS 2002).

or

Criterion B: Increase the total known population to a minimum of 1,500 territories (equating to approximately 3,000 individuals), geographically distributed among Management Units and Recovery Units, so that the flycatcher is no longer in danger of extinction. For reclassification to threatened status, these prescribed numbers and distributions must be reached *as a minimum, and maintained over a three-year period*, and the habitats supporting these flycatchers must be protected from threats and loss.

The southwestern willow flycatcher may be delisted when both of the following criteria have been met (USFWS 2002):

Criterion 1. Meet and maintain, at a minimum, the population levels and geographic distribution specified under reclassification to Threatened Criterion A; increase the total known population to a minimum of 1,950 territories (equating to approximately 3,900 individuals), geographically distributed to allow proper functioning as metapopulations, as presented in Table 10.

and

Criterion 2. Provide protection from threats and create/secure sufficient habitat to assure maintenance of these populations and/or habitats over time. The sites containing flycatcher breeding groups, in sufficient number and distribution to warrant downlisting, must be protected into the foreseeable future through development and implementation of conservation management agreements. Prior to delisting, the USFWS must confirm that the agreements have been created and executed in such a way as to achieve their role in flycatcher recovery, and individual agreements for all areas within all Management Units (public, private, and Tribal) that are critical to metapopulation stability (including suitable, unoccupied habitat) must have demonstrated their effectiveness for a period of at least 5 years.

Net Habitat Value

The A7C-FEC-M is expected to result in no net loss of habitat value for the southwestern willow flycatcher. The net habitat value equation takes into consideration habitat gains (through preservation and/or restoration) and loss (project impacts). The habitat gains by the proposed project (i.e., restoration through the ACOE 404/CDFG 1600 processes) offset the habitat losses to result in no net loss of habitat values.

The project will affect only a small portion of the proposed critical habitat near San Mateo and San Onofre creeks and will not substantially reduce the habitat components that are essential for the primary biological needs of the species. Much less than one percent of the proposed critical habitat will be affected. This reduction in available acreage is unlikely to affect the biological needs of the species.

4.3.4.2 CUMULATIVE EFFECTS

There are two future projects that are reasonably certain to occur within the action area: the RMV project and the southern subregion NCCP/HCP. Both of these projects will involve a Federal action requiring separate consultation with the USFWS (unrelated to the proposed action), and thus, in accordance with the USFWS regulations, are not considered in the cumulative effects. There are no cumulative impacts in southern Orange County on southwestern willow flycatcher.

4.3.5 Discussion of Coastal California Gnatcatcher

The coastal California gnatcatcher is listed as threatened under the FESA. In the study area, coastal California gnatcatchers occurred in Venturan-Diegan sage scrub (coastal sage scrub), and a combination of general scrub community and grassland habitats, usually dominated by California sagebrush (Figure 15). Most observations occurred on relatively dry south- and east-facing slopes; however, some were also occasionally found on north- and west-facing slopes. Several coastal California gnatcatchers were also located in drainages where scrub community vegetation integrates with mule fat and coyote brush. The coastal California gnatcatcher is an obligate resident of the coastal sage scrub plant community, which this species utilizes for breeding, foraging, shelter, and dispersal opportunities.

This nonmigratory species will defend an area generally of one to six hectares (two to 14 acres) of breeding territory and five to 15 hectares (13 to 39 acres) of home range. The breeding season for the coastal California gnatcatcher ranges from late February to July. Nests are generally located in various materials in sagebrush about one meter (three feet) above ground. The dispersal of juveniles requires natural vegetative corridors that provide the essentials for foraging and protection. Corridors link larger fragmented habitats, which provide genetic exchange and opportunities for recolonization of extirpated populations.

In the biological study area, coastal California gnatcatchers were recorded at 234 locations in 1995. During the 2001 surveys, an estimated 140 coastal California gnatcatcher use areas were recorded in the study area. During 2003 surveys, new coastal California gnatcatcher use areas (bring the total use areas to 154) were mapped throughout RMV, Trampas Canyon, Cañada Gobernadora, and Talega Canyon within the study area.

The northern portion of the A7C-FEC-M, north of San Juan Creek, traverses the hillsides and minor canyons between Chiquita Canyon to the west and Cañada Gobernadora to the east.

This area is known to support a major population of gnatcatchers in a key location according to the NCCP/HCP Guidelines (Figure 11). The remainder of the A7C-FEC-M alignment, south of San Juan Creek, avoids the five important gnatcatcher populations that are in key locations according to the NCCP/HCP Guidelines. The easternmost portion of a relatively small important gnatcatcher population is present in the vicinity of the A7C-FEC-M as it continues south of the Orange County/San Diego County boundary. Further south along the A7C-FEC-M, the gnatcatcher population appears sporadic on the MCB Camp Pendleton within the study area, with the majority of the birds within this area being present south of the junction of Cristianitos and San Mateo creeks.

4.3.5.1 CRITICAL HABITAT

Status of the Species/Critical Habitat

The USFWS published a final rule designating critical habitat for the coastal California gnatcatcher in 2000. However, critical habitat for the coastal California gnatcatcher has been remanded to the USFWS by a court order. USFWS was directed to redesignate critical habitat because the court found that the USFWS had not complied with the requirements of the FESA in designating critical habitat. The existing critical habitat units designated in the USFWS's 2000 final rule remain in effect until the USFWS issues a final rule designating critical habitat for the coastal California gnatcatcher. The following is a discussion of the critical habitat designation obtained from the USFWS Final Determination of Critical Habitat for the California Gnatcatcher (2000d) ("2000 Rule") and the proposed rule designating critical habitat for the coastal California gnatcatcher (2003b) ("2003 Rule").

Features of Entire Designated Critical Habitat that are Essential to Conservation

Critical habitat under both the 2000 Rule and the 2003 Rule is designated based on the geographical and elevational ranges of occupancy and dispersal, occupied plant communities in their natural state, documented areas of core population areas, and core population linkages. All lands within the geographical range of gnatcatchers and lands that are likely to be used for reproduction, territory claim, or migration are designated as critical habitat for the coastal California gnatcatcher. Habitat fragmentation, predation, brood cowbird parasitism, and human disturbance have all led to population declines for the coastal California gnatcatcher. In 1999, the USFWS estimated the California population of the coastal California gnatcatcher to be approximately 3,035 pairs (Atwood and Bontrager 2001).

Of the approximately 3,035 pairs of gnatcatchers estimated by the USFWS to be present in California, approximately 643 pairs, or 21 percent, were estimated for Orange County. In the 2000 Rule, there are 207,890 ha (513,650 ac) of designated critical habitat for the coastal California gnatcatcher in Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties; the 2003 Rule proposes 200,595 ha (495,795 ac) of critical habitat covering Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties. In both the 2000 Rule and 2003 Rule, critical habitat located in Southern California is divided into 13 Units. The SOCTIIP project is located with Unit 6 and Unit 7 as defined under both the 2000 Rule and the 2003 Rule.

Primary Constituent Elements

Under both the 2000 Rule and the 2003 Rule, the primary constituent elements (PCEs) for the coastal California gnatcatcher are those habitat components that are essential for the primary

biological needs of foraging, nesting, rearing of young, intra-specific communication, roosting, dispersal, genetic exchange, or sheltering. More specifically, the PCEs are provided in undeveloped areas that support various types of sage scrub or chaparral which may be used for biological needs such as breeding, feeding and sheltering, and those areas which provide connectivity or linkage between larger core areas.

Role of Individual Units

As described in the 2003 Rule, Unit 6 encompasses approximately 17,940 ha (44,340 ac) within the planning area for the Southern NCCP Subregion of Orange County. Unit 6 contains large, robust populations, as well as essential regional populations and linkages. It also provides the primary linkage between populations in North San Diego County and those further north in Orange County. Unit 7 encompasses approximately 2,340 ha (5,775 ac) within the Orange County Central Coastal NCCP planning area, which includes several dense populations and provides linkage between southern Orange County, and northern and eastern populations in north Orange County and Riverside County.

Environmental Baseline

Gnatcatcher populations undergo wide variations in numbers, depending on annual rainfall and climatic conditions, but other factors also restrict the population. The decline in populations is attributed to widespread destruction of habitat and consequences that follow habitat fragmentation such as predation, parasitism of cowbirds, and human disturbance. Fragments of habitat are bordered on at least one side by urban or agricultural development, which impedes natural and essential habitats. The remaining population consists of 1,000 to 1,500 pairs in the United States, which are localized in Southern California.

4.3.5.2 PROJECT IMPACTS/EFFECTS OF THE ACTION

This loss would not preclude the ability of the southern subregion to conserve this species in the subregion because approximately 99.2 percent of the recorded occurrence within the southern subregion would remain after completion of the alignment.

Potential impacts to coastal sage scrub for the A7C-FEC-M are approximately 156 ha (385 ac). Impacts on the coastal California gnatcatcher from construction include removal, degradation, modification, or fragmentation of coastal sage scrub habitat, and coastal sage scrub/grassland ecotones, especially those communities dominated by California sagebrush and California buckwheat. Note that not all of the areas within the study area that support coastal sage scrub are known to support the gnatcatcher. Specifically, the coastal sage scrub along the A7C-FEC-M from just south of Ortega Highway, south through the Donna O'Neill Land Conservancy is not known to support gnatcatchers; therefore, these areas have been eliminated in the coastal sage scrub calculations of the acreage and 15-17 bird locations.

The A7C-FEC-M will impact 1,114.44 acres of critical habitat as designated in the 2000 Rule and only 14.19 acres of critical habitat as proposed in the 2003 Rule (see Figure 16c).

The A7C-FEC-M is anticipated to effect approximately 15 known locations of the coastal California gnatcatcher. This represents approximately 10.7 percent of the recorded locations within the SOCTIIP study area. That portion of the A7C-FEC-M alignment within the southern subregion would result in the loss of approximately 6 of these locations, representing 0.8 percent of the recorded locations within the subregion.



Critical Habitat

Figure 16c

Effect on PCEs

The limited acreage of critical habitat and low number of gnatcatcher locations affected by the project indicate that there will be similarly minimal effect on those habitat components that are essential for the primary biological needs of the species, including foraging, nesting, rearing of young, intra-specific communication, roosting, dispersal, genetic exchange, or sheltering.

Benefits of Minimization and Avoidance measures within Critical Habitat

The A7C-FEC-M alignment includes wildlife bridges and culverts which serve to maintain linkages within and between the critical habitat units. As detailed in mitigation measure WV 15 in the SOCTIIP EIS/SEIR the location of the proposed wildlife bridges and culverts identified in the NES will provide adequate travel capabilities, contain adequate vegetation cover, have adequate daylight, and have appropriate fencing to encourage animals to use these underpasses. As discussed above, the bridges, arch culverts, and box culverts that provide for wildlife undercrossings along the A7C-FEC-M have been incorporated into the project design at locations that are consistent with the linkages identified in the NCCP/HCP guidelines.

With the A7C-FEC-M in place, there will be no net loss of habitat value for the California gnatcatcher. The chart below summarizes the net habitat value gains and losses relative to the gnatcatcher and its coastal sage scrub habitat.

California Gnatcatcher SOCTIIP A7C-FEC-M Habitat Values	
A7C-FEC-M impacts to coastal sage scrub	-385 acres
A7C-FEC-M impacts to gnatcatcher use areas	-15 use areas
Chiquita Conservation - Existing	+327 credits (occupied)
Chiquita Restoration - Proposed	+241 credits
Chiquita bird locations - Existing	+31 locations
Chiquita bird locations - estimated for restoration	+12 locations

As shown, habitat values will be increased with the A7C-FEC-M alternative. Also, indirect impacts will be avoided through the hydrology and runoff system and measures such as lighting design to avoid light spillage.

4.3.5.3 CONCLUSION - CRITICAL HABITAT

The project will affect only a small portion of the critical habitat in Units 6 and 7, and thus will not substantially reduce the habitat components that are essential for the primary biological needs of the species. Under the proposed designation of the 2003 Rule, less than 15 acres will be affected. This reduction in available acreage is unlikely to deleteriously affect the biological needs of the species, in the context of specific mitigation associated with the project and the regional protection offered by the Southern Subregion NCCP/HCP.

4.3.5.4 CUMULATIVE EFFECTS

The 2003 Rule refers to the Southern Subregion NCCP/HCP in Orange County as one of several pending HCPs that will be excluded from the critical habitat designation if the HCP is completed before a final critical habitat designation. The 2003 Rule describes the benefits of excluding HCP areas, including comprehensive planning, treatment of unlisted species, and preservation of conservation partnerships with public and private participants. Even if the HCP is not complete in time to allow exclusion from final critical habitat, the planning effort has served to guide the effects of potential future projects, and when adopted, the NCCP/HCP will comprehensively address cumulative or subregional impacts on the gnatcatcher.

The NCCP Conservation Guidelines (1993) state that "subregional NCCPs will designate a system of reserves designed to provide for no net loss of habitat value from the present, taking into account management and enhancement." According to the April 2003 Draft NCCP/HCP Planning Guidelines, the "combination of a properly formulated Habitat Reserve and a comprehensive Adaptive Management Program will allow the NCCP/HCP program to maintain net habitat value on a long-term basis for species ultimately receiving regulatory coverage under the program." The net habitat value equation takes into consideration habitat gains (through preservation and/or restoration) and loss (project impacts). Habitat gains by the proposed project (i.e., Upper Chiquita Conservation Area, and habitat restoration) have offset the habitat losses to result in a "no net loss of habitat values" finding consistent with the NCCP guidelines.

This level of conservation, with "no net loss of habitat values" will be achieved for the SOCTIIP project even in the absence of a completed NCCP/HCP. TCA has established habitat preservation and proposed restoration activities in the Upper Chiquita Canyon Conservation Area. The Upper Chiquita Canyon Conservation Area consists of approximately 478.7 ha (1,182 ac), and was created by the TCA to offset and minimize biological impacts resulting from construction of the SOCTIIP. The Conservation Area was originally under substantial threat from development. The gnatcatchers present in the Conservation Area represent the northern portion of a gnatcatcher major population in a key location of the Chiquita Canyon, Western Gobernadora/Chiquadora Ridge, and Wagon Wheel area (Draft NCCP/HCP Planning Guidelines, April 2003). These areas are identified as "integral to the overall function of the reserve for this species because they provide linkages to other populations, including Camp Pendleton (Draft NCCP/HCP Planning Guidelines, April 2003)".

The RMV project, and the NCCP/HCP, are subject to the requirements of FESA consultation. Thus, the effects of the RMV and the NCCP are not considered in the cumulative impacts for SOCTIIP. Nevertheless, it is anticipated that the NCCP will contribute to conservation of the gnatcatcher, through preservation of open space and adaptive management. There are no other cumulative projects in the action area.

4.3.5.5 MINIMIZATION AND AVOIDANCE MEASURES

Within the EIS/SEIR, several minimization and avoidance measures were identified that relate directly or indirectly to potential impacts on the coastal California gnatcatcher. These measures, provided in Appendix C identify conceptual avoidance, protective, and compensatory measures to offset potential adverse impacts on the gnatcatcher by the A7C-FEC-M. These measures will be refined in the BRMP, subject to USFWS, USACOE, and CDFG review and approval, and consistent with any resource agency approval documentation. The measures in the BRMP shall be detailed to the design level, and will provide performance standards and goals with a

commitment to an appropriate level of avoidance, minimization, and compensation. The SOCTIIP Collaborative and the TCA will continue to discuss and refine the biological resource avoidance and minimization measures for the A7C-FEC-M, in the context of the project impacts and other major governmental actions anticipated in the study area, i.e., the SAMP, NCCP, and the RMV development plan.

Within Section 4.12 of the EIS/SEIR, Affected Environment, Impacts, and Mitigation Measures Related to Threatened and Endangered Species, Measures TE 18, 19 and 25 have been developed to avoid or minimize impacts to the coastal California gnatcatcher as shown below.

***Measure TE 18.** To minimize and offset adverse effects of the selected alternative on the coastal California gnatcatcher, habitat suitable for this species (as determined by the Project Biologist) shall be grubbed from the project footprint area from September to February if feasible (generally outside the breeding season for these species). The Project Biologist shall survey the suitable habitat within the areas to be grubbed one day prior to any vegetation disturbance to determine the location and numbers of coastal California gnatcatchers. The Project Biologist will be on-site and present during all suitable habitat clearing and removal activities to minimize the potential for individual coastal California gnatcatchers to be wounded or killed during the clearing of habitat.*

***Measure TE 19.** If grubbing activities are unavoidable during the coastal California gnatcatcher breeding season, which is between February and August, the following measures will be implemented:*

- A.** Surveys by the Project Biologist will be conducted a minimum of three times on separate days after the initiation of the nesting season to determine the presence of coastal California gnatcatchers, nest building activities, egg incubation activities, or brood rearing activities. These surveys will be conducted within the week prior to the initiation of brushing, grading, or other construction activities. One survey will be conducted the day immediately prior to the initiation of work. The USFWS will be notified in writing seven days prior to the initiation of surveys.*
- B.** If no nest(s), nesting behavior, or brood rearing activities are detected, work may commence. Prior to and during work activities, the Project Biologist will locate any individual coastal California gnatcatchers on-site and direct operators to begin in an area away from the birds. The pattern of brushing/grubbing activities will be designed to optimize opportunities for flushed birds to be directed towards the open space areas in the vicinity of the impact area.*
- C.** During construction, no activity will occur within approximately 150 m (500 ft) of active nests.*

***Measure TE 25.** To partially mitigate impacts, the TCA has identified additional habitat preservation and restoration activities in the Upper Chiquita Canyon Conservation Area. The Upper Chiquita Canyon Conservation Area consists of approximately 478.7 ha (1,182 ac) created by the TCA to mitigate biological impacts resulting from construction of the FTC-N. Of these 478.7 ha (1,182 ac), 327 credits have been set aside as a mitigation bank for future project impacts. The Conservation Area was originally under substantial threat for development and the resources within the Area have been conserved, but otherwise would have been lost or substantially degraded. In addition, the Upper Chiquita Canyon Conservation Area provides opportunities for preservation activities consisting of*

additional habitat for oak woodland and sensitive plant species. There are also opportunities for restoration activities on site that would include additional acres of oak woodland, nonwetland drainages, coastal sage scrub, coastal sage scrub/native perennial grassland ecotone, and native perennial grassland habitats. These opportunities for preservation and restoration activities would also serve to mitigate impacts on sensitive plants for the SOCTIIP Alternatives.

- A. *Impacts to scrub communities (and all sub-types thereof except floodplain sage scrub) shall be mitigated through the use of scrub mitigation credits in the Upper Chiquita Canyon Conservation Easement area and additional preservation (if necessary). The Upper Chiquita Canyon Conservation Easement area currently contains 327 mitigation credits approved by the USFWS and CDFG. The scrub areas impacted by the selected alternative will be mitigated at a credit to hectare ratio of 1:0.40 (one Upper Chiquita Canyon Conservation Easement mitigation credit for every 0.40 ha impact or one Upper Chiquita Canyon Conservation Easement mitigation credit for every 1.0 ac lost).*
- B. *Any additional scrub areas restored within the Upper Chiquita Canyon Conservation Easement area may be added to the credit total, with the approval of the USFWS, and applied to the mitigation ratio accordingly. The TCA or other implementing agencies and the USFWS shall determine the criteria for the establishment of the new credits for the restored areas pursuant to the Upper Chiquita Canyon Conservation Bank Agreement which was entered into with the USFWS and the CDFG.*
- C. *Any scrub areas that are impacted by the selected alignment and that have not been mitigated by the use of the Upper Chiquita Canyon Conservation Easement mitigation credits (i.e., impact area exceeds mitigation credits available) shall be mitigated through preservation at a ratio of 1:1.*

4.3.6 Discussion of Least Bell's Vireo

The least Bell's vireo is listed as Endangered under both FESA and CESA. The least Bell's vireo inhabits lowland riparian woodlands for primary foraging, breeding, and dispersal.

Territorial least Bell's vireos were observed at 16 locations in the study area during the 1995 surveys (Figure 4.11-4). All of the observations were along San Mateo Creek except one sighting along Cristianitos Creek. Observations in 1994 included eight pairs and three territorial males: seven pairs and two territorial males were observed along San Mateo Creek, one territorial male was observed along Cristianitos Creek, and one pair was observed in an unnamed drainage immediately northwest of San Mateo Creek. All eight pairs were observed with at least one fledgling. No least Bell's vireos were observed in San Juan Creek or any of its associated drainages during 1994 or 1995 surveys. During the 2001 surveys, a minimum of 27 least Bell's vireo use areas were recorded in the action area. These included three in Cañada Chiquita, three in Cañada Gobernadora, one along San Juan Creek, two in Prima Deshecha Canyon, seven along Cristianitos Creek, at least seven along San Mateo Creek, and four on small tributaries to San Mateo Creek (in SOSB).

4.3.6.1 CRITICAL HABITAT/PRIMARY CONSTITUENT ELEMENTS/RECOVERY PLAN

Critical Habitat

The USFWS has designated critical habitat in Santa Barbara, Ventura, Los Angeles, Riverside, San Bernardino, and San Diego counties. No critical habitat has been designated for the least Bell's vireo in Orange County. A total of 15,379 ha (38,000 ac) has been designated as critical habitat for the least Bell's vireos in southern California counties (Table 4.12-4). This is approximately 49 percent of the species range in the United States. In San Diego County, just 21 ha (53 ac) are designated as critical habitat. None of this critical habitat is located in the SOCTIIP action area.

Primary Constituent Elements

Primary constituent elements that are essential to the conservation of this species include those resources that support feeding, nesting, roosting and sheltering. The USFWS described these resources as "riparian woodland vegetation that generally contains both canopy and shrub layers, and includes some associated upland habitats." Because the A7C-FEC-M is located outside designated critical habitat for this species, the primary constituent elements within the critical habitat areas would not be affected by the A7C-FEC-M.

Recovery Plan

In March of 1998, the USFWS published a draft recovery plan for the least Bell's vireo. The objective of the recovery plan is to downlist the species from endangered to threatened, then to ultimately delist the species. The USFWS identified three criteria that need to be met for the reclassification and delisting to occur. Criteria 1 requires stable or increasing populations of at least several hundred pairs of the least Bell's vireo at protected and managed sites. The recovery plan is specific as to which rivers in the southern California region are required to meet this criterion. Neither San Mateo, Cristianitos, nor San Juan Creek are mentioned in criteria 1. Criteria 2 applies to vireo populations in the central California region, and therefore does not apply to the A7C-FEC-M action area. Criteria 3 requires the reduction or elimination of threats to the least Bell's vireo in the populations listed in criteria 1 and 2. Because criteria 1 and 2 do not apply to the action area, criteria 3 would also not be applicable to the A7C-FEC-M.

4.3.6.2 PROJECT IMPACTS/EFFECTS OF THE ACTION

Impacts to the least Bell's vireo from construction include removal, degradation, modification, and fragmentation of occupied or potentially occupiable riparian habitats. The A7C-FEC-M would directly affect approximately 13.85 ha (33.55 ac) of suitable or potentially suitable riparian habitat for this species. Indirect effects such as noise and lighting from bridge construction along or across drainages where this species occurs or potentially occurs would also occur.

Net Habitat Value

The A7C-FEC-M is expected to result in no net loss of habitat value for the least Bell's vireo. The net habitat value equation takes into consideration habitat gains (through preservation and/or restoration) and loss (project impacts). Habitat gains that will result from the proposed project (i.e., restoration through the ACOE 404/CDFG 1600 processes) offset the habitat losses, resulting in no net loss of habitat values.

4.3.6.3 CUMULATIVE EFFECTS

There are two future projects that are reasonably certain to occur within the action area: the RMV project and the southern subregion NCCP/HCP. Both of these projects will involve a Federal action requiring separate consultation with the USFWS (unrelated to the proposed action), and thus, in accordance with the USFWS regulations, are not considered in the cumulative effects.

4.3.6.4 CONSERVATION MEASURES

Within the EIS/SEIR, several minimization and avoidance measures were identified that relate directly or indirectly to potential impacts the least Bell's vireo. These measures are provided in Appendix C.

Within Section 4.12 of the EIS/SEIR, Affected Environment, Impacts, and Mitigation Measures Related to Threatened and Endangered Species, Measures TE 20, 21, and 22 have been developed to avoid or minimize impacts to the coastal California gnatcatcher as:

Measure TE 20. To minimize and offset adverse effects of the selected alternative on the least Bell's vireo, suitable habitat for this species, as determined by the Project Biologist, shall be grubbed from the impact area from 16 September to 14 March (generally outside the breeding season for this species).

Measure TE 21. If grubbing activities between 15 March and 15 September (generally within the breeding season for the least Bell's vireo) are unavoidable, the following contingency measures will be implemented:

- a) Surveys by the Project Biologist will be conducted a minimum of three times on separate days after the initiation of the nesting season to determine the presence of least Bell's vireos, nest building activities, egg incubation activities, or brood rearing activities. These surveys will be conducted within the week prior to the initiation of brushing, grading, or other construction activities. One survey will be conducted the day immediately prior to the initiation of work. The USFWS will be notified in writing prior to the initiation of surveys.*
- b) If no nest(s), nesting behavior, or brood rearing activities are detected, work may commence. Prior to and during work activities, the Project Biologist will locate any individual least Bell's vireos on-site and direct operators to begin in an area away from the birds. The pattern of brushing/grubbing activities will be designed to optimize opportunities for flushed birds to be directed towards the open space areas in the vicinity of the impact area.*
- c) During construction, no activity will occur within approximately 150 m (500 ft) of active nests.*

Measure TE 22.

- a) To minimize indirect disturbance of nesting least Bell's vireos, the Contractor will not engage in any construction activities within 61 m (200 ft) of occupied least Bell's*

vireo habitat between the hours of 0600 and 1100 every day during the peak nesting period of 1 April to 15 July of any given calendar year if said construction activities result in noise readings greater than 60 dBA measured at the edge of the territory of the vireo in the area.

- b) For construction, temporary or permanent noise barriers may be installed under the direction of the Project Biologist and USFWS to reduce noise levels. The Project Biologist shall be responsible for monitoring the noise level.*
- c) The Project Biologist shall be responsible for all noise monitoring reports which shall include, at a minimum, (1) baseline noise measurements at known least Bell's vireo nesting sites within riparian communities within the impacts area, prior to construction, (2) the effect construction noise has on nesting pairs in the vicinity of construction, (3) baseline noise measurements at known nesting adjacent to the alignment, prior to traffic, and (4) the effect traffic noise has on nesting pairs in the vicinity of the selected alignment. These reports will be submitted to the TCA or other implementing agencies.*

4.3.7 Discussion of Pacific Pocket Mouse

The Pacific pocket mouse is listed as endangered under the FESA. This subspecies is largely restricted to fairly open scrub communities and sandy substrates. The species is known from four locations. From the most north-westerly location moving to the south and east, the locations are: 1) Dana Point Headlands, 21 km (13 miles) west of the SOCTIIP area, 2) San Mateo North (next to the A7C-FEC-M alignment), 3) San Mateo South, and 4) Oscar-1 (Santa Margarita River area). The last three locations are all within Camp Pendleton. It should be noted that due to the exceptional capture success at the Oscar 1 PPM monitoring site, trapping was halting early. Also the total of number unique of PPM captures at this site was 711 per data provided by USFWS. Trapping efforts for the Pacific pocket mouse carried out in 1995 and 1996 identified one putative population of this subspecies in the action area near the I-5 and Cristianitos Road interchange at a location referred to as San Mateo North (Figure 4.11-5). The A7C-FEC-M is adjacent to the only known occupied habitat for the San Mateo North population for the Pacific pocket mouse. After the species was identified at the San Mateo North location, the TCA (in coordination with the USFWS) modified the alignment at this location to avoid directly areas that were deemed occupied by the species. Nearly 60,000 trap nights were set in the 1995 and 1996 time-frame 33 and 22 mice were captured, respectively in those years. In 1999, 6,400 trap nights were set with two individuals captured. In 2001, an additional 3,400 trap nights were set just at the occupied habitat location; in adjacent areas, three individuals were captured. In 2003, 2,500 trap nights yielded four animals captured. The future of the population at the San Mateo North location is likely in question given several historical and existing environmental factors, independent of the SOCTIIP. The San Mateo North location is currently fragmented by natural and man-made features, and is immediately adjacent to residential areas resulting in indirect affects such as habitat disturbance by residents and predation by feral cats. In addition, the results of trapping for this species are that the numbers have declined during progressive years as shown above.

The mapping efforts from 1995 through to 2003 identified an approximate area of occupied habitat of 18.6 acres (7.5 hectares), compared to the 16.06 acres (6.5 hectares) documented for this area in the Pacific Pocket Mouse Studies Program Phase I Report (Spencer, January 2000). The area of 18.6 acres of currently known occupied habitat for this species is avoided by modification in the project designed for the alternative in the vicinity of San Mateo North population.

The most current data available for this species in the San Mateo North area indicate that adjacent areas are unoccupied. Areas between the San Mateo South population and the San Mateo North population were trapped during the 1995 program with negative results. Additional trapping lines were sampled to the north and south of the occupied habitat to determine the outer limits of the occupied site as directed by the USFWS (MBA 1999). Potential genetic exchange between these two populations is likely precluded by existing vegetative cover (to dense in chaparral covered slopes or lack there of in the agricultural areas), active agricultural operations (discing/pesticide and herbicide use), roadway and manufactured surfaces and traffic of Cristianitos Road and San Onofre State Beach Camp Ground, open water within San Mateo Creek/Lagoon, length of distance to cover (approximately 1.5 miles [2.41 km]) and other factors.

Although it is acknowledged that A7C-FEC-M may incrementally decrease the connectivity between the San Mateo South and San Mateo North population, a corridor in this area would not entirely preclude connectivity and may allow for future genetic exchange. As stated in the Recovery Plan for the Pacific pocket mouse, "Any movement occurring between these two groups probably is naturally sporadic and infrequent." The Recovery Plan also stated that "Consistent occupation of the San Mateo Creek wash or a "connecting corridor" is unlikely to occur under current conditions as Pacific pocket mice are not likely strong colonizers and probably could not maintain a presence in areas subject to periodic overwash/flooding or other continual disturbances (i.e., agricultural) (M. Pavelka, pers. comm., 1998). Nevertheless, periodic movement between populations would be necessary to maintain genetic integrity and provide for natural recolonization should one group become extirpated." This is consistent with the Pacific Pocket Mouse Studies Program Phase I Report (Spencer, January 2000), which states the following: "Two other small sites (San Mateo North and San Mateo South) have limited opportunity to serve as sources of natural recolonization due to the dispersal barriers and distance to other potentially suitable habitats." Transitory habitat will remain within the State Park open space areas to the west of the A7C-FEC-M, south towards 1-5. After construction of the A7C-FEC-M, this habitat area will be contiguous with the natural open space bluffs and wash of San Mateo Creek, in a similar condition as currently exists, because of the proposed San Mateo Creek bridge structure. Pacific pocket mice that may attempt to cross the existing barriers in this area (e.g., Cristianitos Road) would be subject to similar limitations with or without the A7C-FEC-M. An additional wildlife crossing is proposed for a small canyon within Pacific pocket mouse habitat for the San Mateo North population (see Mitigation Measure TE 23 of the NES). Pacific pocket mice from the San Mateo North population could proceed north along natural open space within the State Park and cross under the A7C-FEC-M using the wildlife crossing. The toll road would not preclude an opportunity to improve habitat or practice additional controlled burn to the habitat.

Preliminary results of Pacific pocket mouse monitoring activities undertaken by the USFWS within Oscar-1 training areas of the MCAS Pendleton during 2003 indicated that approximately 730 unique PPM were captured. The results of the monitoring activities are summarized in the tables below. It should be noted that due to the exceptionally high capture rate on Grid D, the outer four trap lines, comprising 96 traps, were removed from the grid during the final trapping period.

**Table 1
Grid A**

Trapping Bout	No. of Trap Nights	Small Mammal Species Captured	Total No. Captures	No. of Captures of PPM	No. of unique PPM
May 14-23	5,400	<i>Chaetodipus californicus</i> , <i>C. fallax</i> , <i>Microtus californicus</i> , <i>Perognathus longimembris</i> , <i>Peromyscus californicus</i> , <i>Peromyscus maniculatus</i>	45	25	17
July 13-21	4,800	<i>Chaetodipus californicus</i> , <i>C. sp.</i> , <i>Perognathus longimembris</i> , <i>Peromyscus eremicus</i> , <i>Peromyscus eremicus</i> , <i>Peromyscus maniculatus</i> , <i>Reithrodontomys megalotis</i>	248	91	33
Sept. 7-17	6,000	<i>Chaetodipus californicus</i> , <i>C. fallax</i> , <i>Perognathus longimembris</i> , <i>Peromyscus californicus</i> , <i>Peromyscus maniculatus</i> , <i>Reithrodontomys megalotis</i>	1,191	725	152
Cumulative	16,200	See above	1,484	841	179

Note: The number of unique captures shown should total 202. The total number of unique PPM captures would then be 734.

**Table 2
Grid D**

Trapping Bout	No. of Trap Nights	Small Mammal Species Captured	Total No. Captures	No. of Captures of PPM	No. of unique PPM
May 14-23	5,400	<i>Chaetodipus californicus</i> , <i>Microtus californicus</i> , <i>Perognathus longimembris</i> , <i>Peromyscus eremicus</i> , <i>Peromyscus maniculatus</i> , <i>Reithrodontomys megalotis</i>	262	215	100
July 7-17	6,000	<i>Chaetodipus californicus</i> , <i>C. fallax</i> , <i>Perognathus longimembris</i> , <i>Peromyscus longimembris</i> , <i>Peromyscus maniculatus</i> , <i>Reithrodontomys megalotis</i>	703	647	172
Sept. 2-10	4,512	<i>Chaetodipus californicus</i> , <i>Perognathus longimembris</i> , <i>Peromyscus eremicus</i> , <i>Peromyscus maniculatus</i> , <i>Reithrodontomys megalotis</i>	1,213	986	260
Cumulative	15,912	See above	2,178	1848	532

4.3.7.1 CRITICAL HABITAT/RECOVERY PLAN

Critical Habitat

The USFWS has not designated critical habitat for this species. The USFWS concluded that critical habitat designation is not prudent, since this species would not benefit from designation, and designation would increase threats to the population, because of the potential for human collection and other activities.

Recovery Plan

In 1998, a recovery plan was approved by the USFWS for Pacific pocket mouse. The Recovery Plan strategy for the Pacific pocket mouse consists of two components:

- (1) stabilize the existing populations by protecting currently occupied habitat and searching for additional populations, and providing protection to any that are found; and
- (2) establish additional populations through: (a) natural colonization/recolonization into nearby and adjacent habitats, coupled with habitat management in these areas, and (b) translocation and/or the release of captive-bred individuals.

The recovery plan identified 7 criteria that are required to reclassify the Pacific pocket mouse to Threatened or to de-list the species. A brief summary of these criteria, and their relationship with the A7C-FEC-M, are discussed below:

Criteria to Reclassify to Threatened

Criteria 1. Ten (10) populations are independently viable, protected, and stable or increasing. The TCA is committed to the recovery of the Pacific pocket mouse. As an illustration of this commitment, the TCA, along with the USFWS, CDFG, MCB Camp Pendleton and other technical experts, initiated a series of focused research tasks designed to help recover populations of the Pacific pocket mouse which directly assists in the recovery efforts related to Criteria 1. The first two studies were completed in 2000, and the third study was completed in 2001. The A7C-FEC-M has been designed, in consultation with the USFWS, to avoid the occupied habitat and provide for connections to the San Mateo South population through the establishment of bridges and culverts.

It should be noted that although the Criteria identified the need for 10 viable populations; the San Mateo North Population may in fact not represent a viable population, as stated by Dr. Wayne Spencer in the Pacific Pocket Mouse Studies Program Phase I Report (Spencer, January 2000) as follows -- "a conservative assessment would suggest that the three smaller PPM (Pacific pocket mouse) sites (San Mateo North, San Mateo South, and Dana Point), may not represent viable population areas, at least in the long term."

Criteria 2. Identify and preserve a minimum of 2,000 ha (4,940 ac) of occupied habitat. The A7C-FEC-M could provide for a limited amount of preservation of occupied habitat at the San Mateo North population within the right-of-way. In addition, the TCA can explore the establishment of additional occupied habitat within its right-of-way in the vicinity of the San Mateo North population in consultation with the USFWS. However, because all of the existing known locations of the Pacific pocket mouse that occur within MCB Camp Pendleton and on the Dana Point Headlands are subject to preserve/take provisions by the USFWS, additional options at this time for habitat preservation and/or expansion are limited.

Criteria 3. Pacific pocket mouse populations are managed to maintain genetic diversity. The TCA will work with the USFWS and MBC Camp Pendleton to identify any additional project design features to assist in meeting this criteria. Possible actions include but are not limited to, increasing the potential movement opportunities between the San Mateo North population and the San Mateo South population and translocation, if determined to be appropriate.

Criteria 4. Pacific pocket mouse populations and essential habitat are managed so that each population is not at risk of extinction. The TCA will work with the USFWS and MBC Camp Pendleton to identify any additional project design features to increase the avoidance and/or minimization of impacts to this species, which may include adaptive management measures for the population within the right-of-way to increase the likelihood of long term survival in this area.

Criteria to De-list

Criteria 5. All actions necessary for reclassification to threatened have been implemented. Refer to TCA commitment to Criteria 1 through 4 above.

Criteria 6. Any necessary protection, restoration, and enhancement activities are successfully completed. The TCA is committed to protection, restoration, and enhancement activities for the Pacific pocket mouse in relation to areas within the TCA right-of-way for the San Mateo North population. In addition, TCA has been, and can be in the future, of assistance in the development of technical studies that assist in the recovery actions for the Pacific pocket mouse.

Criteria 7. Pacific pocket mouse populations should be representative of the existing genetic variability, historical geographic range, and habitat distribution identified for this species. TCA's commitment to Criteria 1 through 4 and 6 above would assist in the USFWS reaching this goal for this species.

As shown by the discussion above, the A7C-FEC-M would not preclude attainment of any of the seven Recovery Criteria and could contribute positively to the species. The A7C-FEC-M does not remove occupied habitat, and it does not significantly prevent any natural opportunities that might contribute to maintaining genetic diversity. In addition, through design features and avoidance and minimization measures, TCA would contribute to recovery through habitat preservation, habitat restoration and/or enhancement, and funding studies to increase scientific knowledge of the species.

4.3.7.2 PROJECT IMPACTS/EFFECTS OF THE ACTION

The A7C-FEC-M will not impact the Pacific pocket mouse as discussed above. At the southern end of the alignment, direct impacts to known occupied habitat for the Pacific pocket mouse have been avoided by shifting the alignment away from the occupied habitat and limiting the grading in the area by use of retaining walls. Indirect impacts to the Pacific pocket mouse from construction would result from noise, lighting, and other edge effects along the A7C-FEC M.

4.3.7.3 CUMULATIVE EFFECTS

The A7C-FEC-M has been designed to avoid Pacific pocket mouse habitat, and will have no direct impacts to the Pacific pocket mouse. There are no other projects within the action area that will impact the species, therefore, the proposed A7C-FEC-M action and future actions will not have adverse cumulative effects on the Pacific pocket mouse.

4.3.7.4 CONSERVATION MEASURES

Within the EIS/SEIR, several minimization and avoidance measures were identified that relate directly or indirectly to potential impacts the Pacific pocket mouse. These measures are provided in Appendix C.

Within Section 4.12 of the EIS/SEIR, *Affected Environment, Impacts, and Mitigation Measures Related to Threatened and Endangered Species*, Measures TE 23 and 24 have been addressed for those issues critical to the biological resource needs of the Pacific pocket mouse. Measures TE 23 and 24 have been included below:

Measure TE 23. During final project design, an undercrossing shall be provided in the vicinity of the San Mateo North population of the Pacific pocket mouse for any alternative selected that occurs within this area. The undercrossing shall allow for potential movement of Pacific pocket mice under the alignment. The exact placement and design of the undercrossing shall be determined by the Project Biologist, in consultation with MCB Camp Pendleton and the USFWS.

Measure TE 24. Prior to the initiation of construction in areas within or proximal to known sites occupied by the Pacific pocket mouse, a Pacific Pocket Mouse Resource Management Plan shall be prepared and submitted to the USFWS for review and approval and incorporated into the BRMP. This plan shall identify the strategies available for minimizing impacts and measures to restore impacted suitable habitat.

4.4 Federally Listed/Proposed Plant Species

4.4.1 Discussion of Thread-leaved Brodiaea

Status of the Species/Critical Habitat

Thread-leaved brodiaea is federally listed as a threatened species and state listed endangered. Thread-leaved brodiaea occurs in mesic habitats associated with clay, sand, or silt substrates, often in association with vernal pools (USFWS 1998b). The species range includes portions of Los Angeles, San Bernardino, Orange, Riverside, and San Diego counties and extends into northwestern Baja, Mexico. Urbanization, agricultural development, and discing for fire and weed control have contributed to population declines and a threatened listing. In the action area, this species is associated with clay soils that support purple needlegrass grassland.

On December 8, 2004, the USFWS issued a proposed rule for the designation of critical habitat for the thread-leaved brodiaea. It was determined that approximately 3,805 ha (9,403 ac) of eligible habitat exists for the brodiaea in Los Angeles, San Bernardino, Orange, Riverside, and San Diego counties (USFWS 2004). However, approximately 1,898 ha (4,690 ac) of the total eligible habitat in 10 units in Los Angeles, San Bernardino, Orange, and San Diego counties have been proposed for designation as critical habitat for the brodiaea (USFWS 2004). Suitable habitat in Riverside and portions of San Diego counties covered by approved and/or pending Habitat Conservation Plans (HCPs) is being excluded from critical habitat. No areas outside the geographic range occupied by the thread-leaved brodiaea were included in the proposed critical habitat designation. All lands being proposed for critical habitat designation are within the historical range of the species (USFWS 2004).

Features of Entire Critical Habitat that are Essential to Conservation/Primary Constituent Elements

The primary constituent elements (PCEs) for the thread-leaved brodiaea are appropriate soils and associated vegetation at suitable elevations of clay soil series, silty loam soil series, clay loam soil series, or sandy loam soils; and areas with an intact surface and subsurface structure not altered by anthropogenic land use activities.

Role of Individual Units

There are currently 23 known occurrences of thread-leaved brodiaea in Orange County. Thirteen have been determined to have the primary constituent elements essential to conservation of the species (USFWS 2004). Thirty-four populations of thread-leaved brodiaea with over 4,400 individuals were identified in the SOCTIIP action area in 2001 and 2003 as follows:

- On the ridgeline directly west of the Cañada Gobernadora mitigation area.
- On the eastern edge of the SOCTIIP action in the vicinity of the clay mines.
- Near the western edge of the action area, west of Cristianitos Creek Road and north of Avenida Pico.
- Near Talega west of the Donna O'Neill Land Conservancy.
- North of Ortega Highway in Cañada Gobernadora and Cañada Chiquita.
- Talega Canyon

Total eligible habitat and total critical habitat proposed for the species in Orange County is 814 ha (2,011 ac). Unit 4 (Orange County) contains 753 ha (1,861 ac) of proposed critical habitat divided into nine subunits; the action area affects two subunits.

Environmental Baseline

The action area is located within Unit 4, in Subunits 4g and 4h. Subunit 4g (Cristianitos Canyon) consists of 238 ha (588 ac) in Cristianitos Canyon on privately owned Rancho Mission Viejo in southern Orange County. The soil is clay and sandy loam supporting annual grassland and needlegrass grassland. There are three occurrences of brodiaea, totaling about 3,000 plants, as well as several smaller occurrences.

Subunit 4h (Cristianitos Canyon South) consists of 29 ha (72 ac) also in Cristianitos Canyon on Rancho Mission Viejo (USFWS 2004). The soil is clay, clay-loam, and loam supporting annual grassland. An occurrence of approximately 2,600 plants may provide gene flow to other occurrences in Orange and San Diego Counties.

4.4.2 Project Impacts/Effects of the Action

The A7C-FEC-M would directly impact three populations, totaling 23 individuals. Direct impacts on plant communities involve the temporary or permanent loss of such communities resulting from their direct removal due to site preparation activities such as clearing, grubbing, and grading.

Populations outside of grading limits would be indirectly impacted from dust; changes in hydrology; erosion, siltation, and increased runoff; and invasion by non-native species introduction and spreading. These indirect impacts would potentially prevent successful seed dispersal and continued persistence of these populations. Design measures required by the RMP would reduce the magnitude of impacts associated with erosion, turbidity, and sedimentation.

Effects on PCEs

The A7C-FEC-M would directly impact 26.87 ha (66.39 ac) of proposed critical habitat for the thread-leaved brodiaea (Figure 16a). This constitutes 0.7% of the 3,805 ha (9,403 ac) proposed

for designation, an extremely small area. The limited acreage of critical habitat and low number of locations affected by the A7C-FEC-M indicate that there will be only minimal effects on the PCEs.

Net Habitat Value

The A7C-FEC-M is expected to result in no net loss of habitat value for the thread-leaved brodiaea. The net habitat value equation takes into consideration habitat gains (through preservation/relocation) and loss (project impacts).

The Proposed Designation of Critical Habitat refers to the Southern Subregion NCCP/HCP in Orange County as one of the several pending HCPs whose areas will be excluded from the critical habitat designation. The Rule describes the benefits of excluding such HCPs, including the comprehensive planning, treatment of unlisted species and preservation of conservation partnerships with public and private participants. Cumulative or subregional impacts on the gnatcatcher will be comprehensively addressed by the NCCP/HCP.

The 1993 NCCP Conservation Guidelines state "subregional NCCPs will designate a system of reserves designed to provide for no net loss of habitat value from the present, taking into account management and enhancement. No net loss of habitat value means no net reduction in the ability of the subregion to maintain viable populations of target species over the long-term." According to the April 2003 Draft NCCP/HCP Planning Guidelines, the "combination of a property formulated Habitat Reserve and a comprehensive Adaptive Management Program will allow the NCCP/HCP program to maintain net habitat value on a long-term basis for species ultimately receiving regulatory coverage under the program." The net habitat value equation takes into consideration habitat gains (through preservation and/or restoration) and loss (project impacts). The habitat gains by the proposed project (i.e., relocation within the Upper Chiquita Canyon Conservation Area) offset the habitat losses to result in no net loss of habitat values. Corm-bearing soils containing at least 23 mature plants will be relocated to the Upper Chiquita area. Additional restoration will be implemented at the Upper Chiquita area, including planting native perennial grassland and herbaceous-dominated plant communities.

The project will affect only a small portion of the proposed critical habitat in Subunits 4g and 4h, and will not substantially reduce the habitat components that are essential for the primary biological needs of the species. Under the proposed designation of critical habitat, fewer than 26.87 ha (66.39 ac) out of 3,805 ha (9,403 ac) proposed for designation will be affected. This reduction in available acreage is unlikely to affect the biological needs of the species. The plant can be relocated and preserved in the Upper Chiquita Canyon Conservation Area and other areas in which development impacts will be mitigated. With implementation of the mitigation measures, there will be a net increase in primary constituent elements for the thread-leaved brodiaea.

4.4.3 Cumulative Effects

There are two future projects that are reasonably certain to occur within the action area: the RMV project and the southern subregion NCCP/HCP. Both of these projects will involve a Federal action requiring separate consultation with the USFWS (unrelated to the proposed action), and thus, in accordance with the USFWS regulations, are not considered in the cumulative effects. There are no other cumulative effects on the species.

4.4.4 Conservation Measures/Benefits of Mitigation Within CH

Within the EIS/SEIR, several minimization and avoidance measures were identified that relate directly or indirectly to potential impacts on the thread-leaved brodiaea. These measures are provided in Appendix C.

Within Section 4.12 of the EIS/SEIR, *Affected Environment, Impacts, and Mitigation Measures Related to Threatened and Endangered Species*, Measures TE 3, 7, 2 5, 27, 28, and 29 have been developed to avoid and minimize impacts to brodiaea.

Measure TE 3. A Biological Resources Management Plan (BRMP) shall be prepared prior to construction. The BRMP shall provide specific design and implementation features of the biological resources mitigation measures outlined in the resource agency approval documents. Issues to be discussed in the BRMP shall include, but are not limited to, resource avoidance, minimization, and restoration guidelines, performance standards, and monitoring requirements. The Draft BRMP shall be submitted to the USFWS, NMFS, CDFG, USACOE, RWQCB, FHWA, and Caltrans for review and approval.

The primary goal of the BRMP will be to ensure the long term perpetuation of the existing diversity of habitats in the project area and adjacent urban interface zones and prevent offsite or indirect effects. The BRMP shall contain at a minimum specific construction monitoring programs for thread-leaved brodiaea, arroyo toad, coastal California gnatcatcher, least Bell's vireo, and Pacific pocket mouse.

Measure TE 7.

- a) *Prior to construction (i.e., clearing, grubbing or grading), focused surveys for the thread-leaved brodiaea shall be conducted during the flowering period for this species (approximately May through July). The locations of plants identified within the disturbance limits shall be recorded with a Global Positioning System (GPS) unit with sub-meter accuracy. The soils containing thread-leaved brodiaea shall be tested to determine soil texture, and organic matter, and transported to a native plant nursery for germination and propagation.*
- b) *Prior to construction, soil containing thread-leaved brodiaea corms shall be collected from the specific locations where thread-leaved brodiaea plants were observed the prior spring by personnel experienced in the salvage of corms. Areas of soil 0.6 m by one m by 0.6 m (two ft by three ft by two ft) deep or one m by 1.3 m by 0.6 m (three ft by four ft by two ft) deep shall be collected and transported for placement in an appropriate translocation site selected by the Project Biologist. The translocation site shall be located in a conservation area within an open space dedication area within the region and shall have similar soils, aspect, slope, and hydrology to the donor site (i.e., the site where thread-leaved brodiaea will be collected).*
- c) *Relocation success will be monitored for five years. The number of relocated plants that will emerge in any one year is variable and will depend on seasonal rainfall. Relocation will be considered successful when 10 percent of the relocated population emerges and sets viable seed in any monitoring year. The success criteria may vary as determined by the Project Biologist in consultation with botanists and USFWS staff with recent experience in brodiaea transplantation methodologies in the region.*

Measure TE 25. To partially mitigate impacts, the TCA has identified additional habitat preservation and restoration activities in the Upper Chiquita Canyon Conservation Area. The Upper Chiquita Canyon Conservation Area consists of approximately 478.7 ha (1,182 ac) created by the TCA to mitigate biological impacts resulting from construction of the FTC-N. Of these 478.7 ha (1,182 ac), 327 credits have been set aside as a mitigation bank for future project impacts. The Conservation Area was originally under substantial threat for development and the resources within the Area have been conserved, but otherwise would have been lost or substantially degraded. In addition, the Upper Chiquita Canyon Conservation Area provides opportunities for preservation activities consisting of additional habitat for oak woodland and sensitive plant species. There are also opportunities for restoration activities on site that would include additional acres of oak woodland, nonwetland drainages, coastal sage scrub, coastal sage scrub/native perennial grassland ecotone, and native perennial grassland habitats. These opportunities for preservation and restoration activities would also serve to mitigate impacts on sensitive plants for the SOCTIIP Alternatives.

- a) Impacts to scrub communities (and all sub-types thereof except floodplain sage scrub) shall be mitigated through the use of scrub mitigation credits in the Upper Chiquita Canyon Conservation Easement area and additional preservation (if necessary). The Upper Chiquita Canyon Conservation Easement area currently contains 327 mitigation credits approved by the USFWS and CDFG. The scrub areas impacted by the selected alternative will be mitigated at a credit to hectare ratio of 1:0.40 (one Upper Chiquita Canyon Conservation Easement mitigation credit for every 0.40 ha impact or one Upper Chiquita Canyon Conservation Easement mitigation credit for every 1.0 ac lost).
- b) Any additional scrub areas restored within the Upper Chiquita Canyon Conservation Easement area may be added to the credit total, with the approval of the USFWS, and applied to the mitigation ratio accordingly. The TCA or other implementing agencies and the USFWS shall determine the criteria for the establishment of the new credits for the restored areas pursuant to the Upper Chiquita Canyon Conservation Bank Agreement which was entered into with the USFWS and the CDFG.
- c) Any scrub areas that are impacted by the selected alignment and that have not been mitigated by the use of the Upper Chiquita Canyon Conservation Easement mitigation credits (i.e., impact area exceeds mitigation credits available) shall be mitigated through preservation at a ratio of 1:1.

Measure TE 27. Impacts to floodplain sage scrub, riparian herb and other sub-types within the Vernal Pools, Seeps, and Wet Meadows and Marsh plant communities (as defined in Section 5.0 of the NES) shall be mitigated at a 1:1 ratio or other ratio that compensates for function and values. Mitigation shall consist of creating the above mentioned community types in the approximate proportions in which they currently exist within the impact area or as otherwise required by the resource agencies. Creation areas shall occur within dedicated open space areas including, but not limited to, the Upper Chiquita Canyon Conservation Easement area. The creation program for the above areas shall be included in the BRMP and shall include the following measures.

- Site analysis for appropriate soils and hydrology.
- Site preparation specifications based on site analysis, including but not limited to grading and weeding.

- *Soil and plant material salvage from impact areas, as appropriate to the timing of impact and restoration as well as the location of restoration sites.*
- *Specifications for plant and seed material appropriate to the locality of the mitigation site.*
- *Specifications for site maintenance to establish the habitats, including but not limited to weeding and temporary irrigation.*

Creation areas shall be considered successful if the following standards are achieved:

- *The site does not require substantial maintenance for at least two consecutive years during the monitoring period.*
- *The site must exhibit evidence of natural recruitment of native species, including plant reproduction and/or setting of seeds.*
- *Absolute percent cover of native species is comparable to the absolute cover of native species at an appropriate reference site within an 80 percent confidence limit.*
- *An index of species diversity of the restored and/or created habitat areas is statistically comparable to an appropriate reference site within an 80 percent confidence limit.*

Monitoring shall be conducted for five years (or less if success criteria are met as designated above earlier) to ensure successful establishment of hydrophytic vegetation within the restored/created areas by wetland species. If success standards are not met, remedial measures, seeding, or introduction of container stock shall be implemented as directed by the Project Biologist.

Measure TE 28. Impacts to riparian scrub, woodland, and forest communities (as defined in Section 5.0 of the NES) shall be mitigated by mitigation of such communities at a 1:1 ratio or other ratio that compensates for functions and values. Mitigation areas shall occur within dedicated open space areas including, but not limited to, the Upper Chiquita Canyon Conservation Easement area as determined by the Project Biologist. The restoration program shall be detailed with the BRMP.

Prior to restoration of these communities, hydrological testing and monitoring of the creation site shall be conducted to determine that sufficient hydrology exists to support the community. If necessary, a temporary irrigation program shall be incorporated into the mitigation design to ensure successful establishment of the community.

The following performance standards shall apply for the restoration of these areas (except for southern coast live oak riparian forest). Restoration shall be considered successful if:

- *The site does not require substantial maintenance for at least two consecutive years during the monitoring period.*
- *The site must exhibit evidence of natural recruitment of native species, including plant reproduction and/or setting of seeds.*
- *Absolute percent cover of native upper and mid canopy species is 70 percent.*

- *An index of species diversity of the restored areas is statistically comparable to an appropriate reference site within an 80 percent confidence limit.*

For southern coast live oak riparian forest, the following standards shall apply:

- *The site does not require substantial maintenance and meets the success criteria established for this community for at least two consecutive years during the monitoring period.*
- *The site must exhibit evidence of natural recruitment of native species, including plant reproduction and/or setting of seeds.*
- *Absolute percent cover of native upper and mid canopy species is 50 percent, with five percent cover from oak trees.*
- *An index of species diversity of the restored areas is statistically comparable to an appropriate reference site within an 80 percent confidence limit.*

Monitoring shall be conducted for a minimum of five years to ensure successful establishment of the restored areas. If success standards are not met, remedial measures including introduction of additional container stock and adjusting of irrigation shall be implemented as directed by the Project Biologist.

APPENDIX A
TECHNICAL STUDIES AND COMMUNICATIONS

- BonTerra Consulting. 2001. *Results of the Habitat Assessment and Focused Surveys for the Steelhead for the South Orange County Transportation Infrastructure Improvement Project (SOCTIIP)*.
- Brown, P., Dr. 1996. *Draft Results of Bat Surveys for the Foothill Transportation Corridor-South*.
- Elvin, M. 1995. Personal communication concerning intergrading varieties of *Calochortus weedii intermedius* and *Calochortus weedii weedii*. (Mr. Elvin is a research associate at Rancho Santa Ana Botanic Garden as well as at the University of California, Irvine performing studies on genetic fitness with the genus *Calochortus*.)
- Emmel. 1995. Personal communication concerning Quino checkerspot butterfly.
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APPENDIX B
PLANT COMMUNITY DESCRIPTIONS

Scrub Communities (2.0)

Scrub communities typically consist of low-growing perennial shrubs generally less than two meters (6.6 feet) high. The predominant species are mesophyllous (soft-leaved) and drought deciduous, although some evergreen sclerophyllous (hard-leaved) species may be locally common. The associations and subassociations that comprise this type of habitat typically occur on the foothills, close to the coast, and on a variety of substrates, slopes, and aspects.

Southern Coastal Bluff Scrub (2.1)

Southern coastal bluff scrub occurs in a limited portion of the SOCTIIP action area immediately adjacent to and on either side of San Mateo Marsh, in the southeasternmost portion of the action area. This community occurs on exposed bluffs overlooking or in close proximity to the ocean. Vegetative cover is typically low to prostrate. Dominant species in the SOCTIIP action area include California sagebrush, bluff buckwheat, lemonadeberry, California bush sunflower, coyote brush, and non-native plants, including hottentot fig and Australian saltbush. Understory components consist of purple needlegrass and non-native grasses, including oats, bromes, and barleys.

Venturan-Diegan Transitional Coastal Sage Scrub (2.3)

Venturan-Diegan transitional coastal sage scrub is the dominant scrub association throughout the action area. This association is dominated by low, mesophyllous, drought deciduous species that are generally less than 1.2 meters (four feet) tall. This transitional association often contains elements of two recognized geographical associations of coastal sage scrub: Venturan and Diegan. The OCHCS recognizes 12 subassociations of Venturan-Diegan transitional coastal sage scrub, 10 subassociations of which occur in the SOCTIIP action area and are described in the NES. In addition to the subassociations, this association often integrates with grassland and chaparral communities. This association typically includes California sagebrush, California buckwheat, white sage, black sage, California bush sunflower, narrow-leaved bedstraw, California wishbone bush, and coastal goldenbush. Two woody shrubs that can also be common components include lemonadeberry and laurel sumac. Native bunchgrasses, including purple needlegrass, foothill needlegrass, and coast range melic, often occur as understory in the spaces between the shrubs.

Southern Cactus Scrub (2.4)

Southern cactus scrub occurs in limited locations, primarily in the northern portion of the SOCTIIP action area along the corridor alignments. Vegetative cover is typically dense, approaching 100 percent. Coastal prickly pear comprises a minimum of 25 percent relative cover with other sage scrub species including California sagebrush, California buckwheat, black sage, white sage, blue elderberry, and California brickellbush. In some areas, coast range melic is a subdominant in this community.

Floodplain Sage Scrub (2.6)

In the SOCTIIP action area, floodplain sage scrub is associated with San Juan, Cristianitos, and San Mateo creeks. This community is commonly associated with alluvial floodplains and can also be found colonizing sandbars and terraces in the more active parts of the channel. Vegetative cover is typically open, and dominant species include scalebroom, California buckwheat, and California brickellbush. Additional species include wild tarragon, deerweed, mule fat, sand-wash groundsel, bristly golden aster, bicolored cudweed, Sonora everlasting,

and cotton-batting plant. This association is highly dynamic, depending on the flooding regimes associated with the large drainages with which it is typically associated.

Chenopod Scrub (2.7)

Chenopod scrub is limited to the southern portion of the SOCTIIP action area, on south-facing slopes above the San Onofre State Beach campground and near the intersection of Avenida Pico and Calle Frontera. This association is dominated by Brewer's saltbush, with California sagebrush and coyote brush also present.

Sage Scrub-Grassland Ecotone/Sere (2.8)

Sage scrub-grassland ecotone/sere occurs in the SOCTIIP action area along the corridor alignments and Antonio Parkway. This association is dominated by native and/or non-native annual grasses with a sage scrub component that is generally less than 15 percent cover. Component shrubs include California sagebrush, California buckwheat, black sage, white sage, narrow-leaved bedstraw, coastal goldenbush, and cudweed aster. Native bunchgrasses include purple needlegrass, which is typically dominant, along with subdominants coast range melic, mesa three-awned grass, cane bluestem, and leafy bentgrass. Non-native grasses include wild oats, slender oats, soft chess, Italian ryegrass, nitgrass, and rattail fescue. Forbs are also common, particularly in the spring, and include smooth cat's ear, common goldenstar, splendid mariposa lily, blue dicks, blue-eyed grass, many-stemmed dudleya, southern rosinweed, and Turkish rugging.

Chaparral Communities (3.0)

Chaparral communities are characterized by evergreen shrubs up to four meters (13 feet) high. The vegetation is predominantly sclerophyllous, and occurs most commonly on north-facing slopes of the foothills, often extending to the coast. In the SOCTIIP action area, chaparral often integrates with coastal sage scrub.

Coastal Sage-Chaparral Scrub Ecotone/Sere (3.1)

Coastal sage-chaparral scrub ecotone/sere represents a gradation or intermingling of components of these scrub communities. The association is ecotonal where mature coastal sage scrub and chaparral communities intergrade such that no components of either community are clearly dominant. In other instances, the presence of both sage scrub and chaparral elements is indicative of a seral or successional site where early successional elements (sage scrub) are being replaced by later successional elements (chaparral).

Southern Mixed Chaparral (3.2)

Southern mixed chaparral in the SOCTIIP action area is located north of Ortega Highway. This association is comprised of chamise, laurel sumac, toyon, and lemonadeberry. It is typically found on north-facing slopes with vegetative cover that is usually dense, approaching 100 percent. The understory is usually sparse and includes herbs such as common chickweed and California thread-stem. This association integrates with toyon-sumac chaparral (3.12) or various subassociations of coastal sage scrub.

Chamise Chaparral (3.3)

Chamise chaparral is limited in distribution in the SOCTIIP action area to an area north of Ortega Highway. This association is dominated by chamise, which often forms dense

monotypic stands. Vegetative cover varies from somewhat open to dense, approaching 100 percent cover. Associated species, which are present as scattered individuals, include black sage, lemonadeberry, and scrub oak. Understory species include peak rush-rose, California fluffweed, intermediate mariposa lily, Weed's mariposa lily, and canchalagua.

Scrub Oak Chaparral (3.7)

Scrub oak chaparral is limited in distribution in the SOCTIIP action area to an area north of Ortega Highway. This association, which is typically associated with north-facing slopes, is dominated by scrub oak that often forms dense, monotypic stands. Vegetative cover varies from somewhat open to dense, approaching 100 percent cover. Other species that may share dominance include toyon, lemonadeberry, and laurel sumac. Where canopy cover is dense, understory is sparse. In areas that are more open, the understory includes poison oak and California goldenrod. This association often integrates with toyon-sumac chaparral (3.12).

Toyon-Sumac Chaparral (3.12)

Toyon-sumac chaparral occurs in the SOCTIIP action area along the corridor alignments and along I-5. This association occurs primarily on north- and east-facing slopes and is dominated in the action area by lemonadeberry, laurel sumac, and, to a lesser extent, toyon. Occasional individuals of scrub oak are also present. Vegetative cover is typically dense, approaching 100 percent cover with little or no understory.

Grassland Communities (4.0)

Grassland communities are characterized both by native bunchgrasses and by non-native annual grasses. Native bunchgrasses may occur in nearly pure stands, or stands may contain a significant component of non-native annual grasses. Where native bunchgrasses comprise at least 10 percent of the relative cover, the area is mapped as native grassland (Keeley 1989). Both the native and non-native grasslands support a large number of native and non-native forbs.

Annual Grassland (4.1)

Annual grassland is the most common vegetation association in the SOCTIIP action area, occurring along the corridor alignments and Antonio Parkway. The presence of annual grassland is generally indicative of past disturbance that has resulted in the conversion of native habitats, such as coastal sage scrub, chaparral, or native bunchgrass, into annual grasslands dominated by grasses and forbs that are of Mediterranean origin. Non-native annual grasses include wild oats, slender oats, riggut grass, soft chess, and hare barley. These species germinate in December and January, and set seed by March during the period of highest soil moisture. Later in the season, Italian ryegrass becomes dominant, forming dense monocultures previously occupied by the oats and bromes.

Annual forbs make up a significant component of the annual grassland in the SOCTIIP action area. Common forbs include Indian milkweed, tocalote, common fiddleneck, rusty popcornflower, black mustard, field mustard, common catchfly, stickwort, miniature lupine, whitewhorl lupine, California burclover, bristled clover, red-stemmed filaree, white-stemmed filaree, and fluellin. San Diego tarweed, fascicled tarweed, and dove weed are dominant in late summer and fall.

Large parts of the annual grassland south of Ortega Highway are dominated by dense stands of the invasive exotic cardoon.

Leymus Grassland (4.2)

Leymus grassland, dominated by beardless wild-rye or giant wild-rye, is limited in distribution to a few locations in the SOCTIIP action area. This association typically consists of dense, often monotypic, stands of beardless wild-rye or giant wild-rye.

Southern Coastal Needlegrass Grassland (4.3)

Southern coastal needlegrass grassland occurs in the SOCTIIP action area along the corridor alignments and Antonio Parkway. This association occurs as small pockets in coastal sage scrub or as large open grasslands dominated by purple needlegrass. Although this association is typically dominated by purple needlegrass, more disturbed grasslands or relict grasslands, which are comprised of 10 percent cover of purple needlegrass or associated bunchgrasses, are considered to meet the criteria for this association. Associated bunchgrass species, which are sometimes locally dense but not dominant over large areas, include leafy bentgrass, junegrass, cane bluestem, and coast range melic. Non-native grasses include wild oats, slender oats, soft chess, Italian ryegrass, nitgrass, and rattail fescue. Forbs are also common, particularly in the spring, and include smooth cat's ear, common goldenstar, splendid mariposa lily, blue dicks, blue-eyed grass, many-stemmed dudleya, and southern rosinweed. San Diego tarweed, fascicled tarweed, and dove weed are predominant in late summer and fall.

Deergrass Grassland (4.4)

Deergrass grassland is restricted to one occurrence in the SOCTIIP action area approximately 200 meters (656 feet) south of the intersection of Clay Pile Road and San Juan Ridge Road along the FEC alignment. The deergrass grassland, dominated by deergrass, occurs in a swale surrounded by purple needlegrass grassland. Associated species include Mexican rush, wrinkled rush, creeping spikerush, and needle spikerush.

Ruderal (4.6)

Ruderal habitat occurs throughout the SOCTIIP action area except along the A7C-OHV and A7C-ALPV Alignments, and is typically associated with areas subject to substantial disturbance. The species present can vary according to the nature and severity of the disturbance and generally include black mustard, shortpod mustard, tocalote, Russian thistle, cardoon, milk thistle, Australian saltbush, and cheeseweed. Non-native annual grasses such as oats, bromes, and barleys are often a substantial component of ruderal areas. However, ruderal areas can be distinguished from annual grassland (4.1) by a greater dominance of species such as mustard rather than grass species.

Vernal Pools, Seeps, and Wet Meadows (5.0)

Vernal pools, seeps, and wet meadows comprise a variety of wetland associations/subassociations with distinctively different hydrological conditions. All these wetland habitats support hydrophytic (water-loving) vegetation that is adapted to survive prolonged periods of inundation or saturation in the root zone. In general, these habitats tend to be small in areal extent, usually less than 0.4 ha (1.0 ac), with the exception of the wet meadow area immediately south of Oso Parkway.

Southern Hardpan Vernal Pool (5.1) and Vernal Pool-Like Ephemeral Pond

Vernal pools are depressions that pond shallow water following winter and spring rains due to an impervious hardpan that prevents percolation of the ponded water. In coastal southern

California, vernal pools are often associated with heavy clay soils in which the clay provides the impervious hardpan. Vernal pool-like ephemeral ponds and human-made ponds are also included in this category. Slump pools or human-made pools are small swales or basalt-flow depression basins with a grainy or muddy bottom topography located in upland grassland habitats. These ponds are derived from geological activity such as faulting or landscape movement. In the SOCTIIP action area, vernal pools are distinguished from other seasonal wetland habitats by basin topography and the presence of indicator plant species (Zedler 1987). For this survey, a basin was defined as a vernal pool if it contains at least one indicator species from Zedler (1987).

Southern hardpan vernal pool habitat occurs in limited locations in the SOCTIIP action area along the corridor alignments. Vernal pools were observed along Chiquita Ridge, on the upper floodplain of San Juan Creek, and on MCB Camp Pendleton near Basilone Road. The vernal pool on Chiquita Ridge contains bracted vervain, creeping spikerush, marsh cudweed, and curly dock. The vernal pools above San Juan Creek support marsh cudweed and hyssop loosestrife. The vernal pool near Basilone Road supports dwarf woolly heads.

Alkali Meadow (5.2)

Alkali meadow occurs in the SOCTIIP action area along the corridor alignments, and is most predominant along Cañada Chiquita in the northern portion of the action area. Alkali meadow also occurs in Prima Deshecha and Segunda Deshecha creeks. This habitat is associated with seeps, floodplains, and other vernal wet areas with saline or alkaline soils. Salinities range between 0.5 and 5.0 parts per thousand (ppt) with electroconductivity (micromhos, μMhos) between 800 and 8,000. This community often integrates with freshwater marsh, but occurs where lack of flooding or flushing allows buildup of saline or alkaline conditions. Vegetation consists of herbaceous perennial species and some annuals. In the action area, characteristic species include saltgrass, low barley, yerba mansa, rabbitsfoot grass, western ragweed, southern tarweed, Mexican rush, and bermuda grass.

Seeps (5.3)

One freshwater seep was observed in the SOCTIIP action area near the southern end of Sulfur Canyon. Dominant hydrophytic species include cut-leaf water parsnip, creeping spikerush, needle spikerush, Mexican rush, wild celery, and Olney's bulrush.

In addition, alkali seeps are present, but limited in distribution to the northern portions of the SOCTIIP action area, primarily adjacent to Cañada Chiquita. In the action area, this habitat is associated with isolated perennial sources of water that have salinities between 0.5 and 5.0 ppt and electroconductivity between 800 and 8,000 μMhos . The vegetation is dense and consists of hydrophytic species including clustered field sedge, beaked spikerush, needle spikerush, Mexican rush, wild celery, marsh fleabane, salt spring checkerbloom, southern tarweed, and Olney's bulrush.

One freshwater swale was observed in the SOCTIIP action area near I-5 northwest of the intersection of Avenida Vista Hermosa with I-5. A swale is a broad drainage with no clear beds or banks and is vegetated on the bottom. Typical species include beard grass, rush, celery, cocklebur, and western ragweed.

Southern Vernal Marsh (5.5)

Southern vernal marsh habitat occurs in limited locations in the SOCTIIP action area along the corridor alignments. There is a high concentration of small vernal marshes between San Juan

Creek and Ewles Materials on the terrace above and adjacent to San Juan Creek along the FEC alignment. The vernal marshes occur in basins often created inadvertently by earthmoving and borrow activities. Hydrologically, these basins are similar to vernal pools; however, they are often deeper and, therefore, longer-lived. This habitat is distinguished from vernal pool habitat by the lack of vernal pool indicator species, specifically species from Table 6A of Zedler (1987), such as dwarf wooly heads, marsh cudweed, or hyssop loosestrife. In the action area, vernal marsh habitat is dominated by needle spikerush, rabbitsfoot grass, curly dock, and mule fat.

Marsh Communities (6.0)

Marsh communities occur in the SOCTIIP action area along all of the FEC and the A7C-FECV alignments and include marshes with saline, brackish, and freshwater conditions. These habitats are supported by a variety of hydrological regimes. Vegetation consists primarily of herbaceous perennial hydrophytes with occasional annual hydrophytes.

Southern Coastal Salt Marsh (6.1)

Southern coastal salt marsh is limited in distribution in the SOCTIIP action area near the northwest corner of San Mateo Marsh. The area is dominated by fleshy jaumea, pickleweed, and saltgrass. No other salt marsh species were observed.

Coastal Brackish Marsh (6.2)

Coastal brackish marsh is limited in distribution to one location at the southern end of the SOCTIIP action area at Trestles Natural Wetland Preserve. This area is dominated by fleshy jaumea, yerba mansa, Mexican rush, and saltgrass.

Cismontane Alkali Marsh (6.3)

Cismontane alkali marsh is limited in the SOCTIIP action area to portions of Cañada Chiquita near Oso Parkway along the corridor alignments and in Prima Deshecha and Segunda Deshecha creeks. In Cañada Chiquita, this habitat integrates with alkali meadow and forms a larger wetland complex. This association is present where groundwater is high (at or near the surface) and is characterized by emergent wetlands vegetation with an understory of hydrophytic grasses and sedges. In the marsh in Cañada Chiquita, emergents include southern cattail, narrow-leaved cattail, Olney's bulrush, rough vervain, and California bulrush. Understory elements include clustered field sedge, creeping spikerush, needle spikerush, Mexican rush, wild celery, marsh fleabane, rabbitsfoot grass, saltgrass, and yerba mansa.

Coastal Freshwater Marsh (6.4)

Coastal freshwater marsh occurs in the SOCTIIP action area along the corridor alignments and I-5. Coastal freshwater marsh is found in areas that are seasonally or permanently flooded or inundated. This association occurs in low lying areas, such as at San Mateo Marsh, as well as along many of the drainages in the action area, such as San Juan, San Mateo, and Cristianitos creeks, and Cañada Chiquita. Vegetation is open to dense and includes a high diversity of emergent hydrophytes such as southern cattail, narrow-leaved cattail, California bulrush, Olney's bulrush, alkali bulrush, common bulrush, small-fruited bulrush, creeping spikerush, needle spikerush, iris-leaved rush, wrinkled rush, tall umbrella-sedge, brown umbrella sedge, fragrant umbrella sedge, and yellow umbrella sedge.

Forbs include marsh fleabane, rough vervain, common monkeyflower, scarlet monkeyflower, willow smartweed, water smartweed, whorled dock, willow dock, willow-herb, yellow waterweed,

cut-leaf water parsnip, slender aster, rosilla, western goldenrod, white watercress, and giant nettle.

Grasses include rabbitsfoot grass, knot grass, water bent, dense-flowered sprangletop, and western witchgrass.

Riparian Communities (7.0)

Riparian communities are associated with the bottoms, banks, and occasionally the floodplains of various drainages throughout the SOCTIIP action area. Included are both perennial and intermittent drainages. Vegetation consists of trees, shrubs, perennial herbs, and annual species.

Riparian Herb (7.1)

Riparian herb is limited in distribution in the SOCTIIP action area to a few drainage ditches along the corridor alignments and Antonio Parkway. Dominant vegetation includes tall nutsedge, rabbitsfoot grass, Bermuda grass, Mexican rush, and cocklebur.

Southern Willow Scrub (7.2)

Southern willow scrub is limited in distribution to one drainage south of Ortega Highway. This association is generally dense and is dominated by arroyo willow with an understory of herbaceous hydrophytes.

Mule Fat Scrub (7.3)

Mule fat scrub occurs throughout the SOCTIIP action area along and in numerous intermittent drainages. The association varies from open to dense and is dominated by mule fat with occasional individuals of arroyo willow, red willow, and narrow-leaved willow. Understory varies from sparse to dense and may include Bermuda grass, saltgrass, cocklebur, rabbitsfoot grass, Mexican tea, and western ragweed. In wetter areas, the understory is composed of wrinkled rush, creeping spikerush, and Mexican rush.

Southern Sycamore Riparian Woodland (7.4)

Southern sycamore riparian woodland, which is dominated by western sycamore, occurs in the SOCTIIP action area along the corridor alignments and I-5 and is typically associated with the floodplains and upper terraces of larger streams such as San Juan, Cristianitos, and San Mateo creeks. Associated species include coast live oak, blue elderberry, arroyo willow, red willow, and black willow. Understory shrubs include poison oak, which often forms dense monocultures, along with mule fat, Douglas' nightshade, and mugwort. This association often integrates with southern coast live oak riparian forest (7.5) and southern arroyo willow riparian forest (7.6).

Southern Coast Live Oak Riparian Forest (7.5)

Southern coast live oak riparian forest occurs in the SOCTIIP action area along the corridor alignments and is often associated with the floodplains and upper terraces of larger streams such as San Juan, Cristianitos, and San Mateo creeks, and along smaller intermittent drainages. Associated species include western sycamore, blue elderberry, arroyo willow, red willow, and black willow. Understory components include poison oak, mule fat, Douglas'

nightshade, and mugwort. This association often integrates with southern sycamore riparian woodland (7.4) and southern arroyo willow riparian forest (7.6).

Southern Arroyo Willow Riparian Forest (7.6)

Southern arroyo willow riparian forest occurs in the SOCTIIP action area along the corridor alignments and I-5 and is associated with lower floodplains and channel banks of intermittent or perennial streams. The association is dominated by arroyo willow; often red willow and black willow are also present in smaller numbers. Vegetative cover varies from open to dense with the willows often forming dense, impenetrable thickets. Understory varies according to wetness. In wetter areas, the understory consists of southern cattail, California bulrush, tall umbrella-sedge, whorled dock, willow dock, and cut-leaf water-parsnip. The southern arroyo willow riparian forest associated with San Mateo Creek, east of the I-5 bridge, contains scattered stands of bur reed and dense stands of giant nettle. Drier areas contain poison oak, mugwort, and nightshade as dominants in the understory with occasional individuals of mule fat.

Southern Black Willow Riparian Forest (7.7)

Southern black willow riparian forest is limited in distribution in the SOCTIIP action area along the corridor alignments. This association is dominated by black willow, with arroyo willow present in smaller numbers in the uppermost canopy. This forest type has a multilayered structure and typically consists of arroyo willow and mule fat in the second canopy layer, with coast live oak and sycamore occasionally present. Common understory components of this community include poison oak, nettle, mugwort, western ragweed, and nightshade.

Southern Cottonwood-Willow Riparian Forest (7.8)

Southern cottonwood-willow riparian forest is limited in distribution to two areas in the San Mateo Marsh: one east and one west of the I-5 bridge. This association is dominated by black willow, black cottonwood, and Fremont cottonwood. The canopy is typically fairly dense to closed, and the understory is dense, consisting of mule fat, giant nettle, and hydrophytes such as California bulrush and spreading rush in low wetter areas, and poison oak and Douglas' nightshade in drier areas.

Bramble Thicket (7.11)

Bramble thicket is limited in distribution to one location in the SOCTIIP action area in Cristianitos Creek, where it co-occurs with southern arroyo willow riparian forest. This thicket is dominated by perennial vines and shrubs, including California blackberry and California wild rose.

Woodland Communities (8.0)

Woodland communities occur throughout the SOCTIIP action area and are distinguished from forest habitats by having generally less than 60 percent canopy cover. Understory species include shrubs, grasses, and forbs.

Coast Live Oak Woodland (8.1)

Coast live oak woodland occurs throughout the SOCTIIP action area. The canopy is open and dominated by coast live oak with occasional individuals of blue elderberry. Associated shrubs include toyon, California coffeeberry, fuchsia-flowered gooseberry, and occasional thickets of poison oak. Understory components include non-native grasses such as oats and bromes as well as native grasses including giant wild-rye, coast range melic, and alkali dropseed. Forbs

include California goldenrod, miners lettuce, common chickweed, common eucrypta, and common phacelia.

Blue Elderberry Woodland (8.4)

Blue elderberry woodland is limited in distribution in the SOCTIIP action area to a few locations in Cañada Chiquita, where it is associated with ravine tributaries to Cañada Chiquita, and to two stands near San Mateo Marsh. The ravine-associated stands in Cañada Chiquita are typically linear, following the ravine, with coastal sage scrub understory components such as California sagebrush, California buckwheat, and lemonadeberry. One stand in the San Mateo Marsh area occurs on a south-facing slope with an understory of coastal sage scrub components, while the other stand occurs along the margin of an agricultural field and is associated with arroyo willow and western sycamores with an understory dominated by ruderal species, including black mustard and castor bean.

Cliff and Rock Communities (10.0)

Rock Outcrops and Xeric Cliff Faces (10.3)

Rock outcrops, consisting of exposures of Cienega complex sandstones, occur in the SOCTIIP action area along the corridor alignments. These outcrop areas support a diversity of sage scrub species as well as a high diversity of forbs and grasses. Shrubs include narrow-leaved bedstraw, white sage, California sagebrush, cudweed aster, and lemonadeberry. Forbs include southern rosinweed, many-stemmed dudleya, Turkish rugging, ladies-fingers, California plantain, sapphire woolly star, artemisia-leaved pincushion, Weed's mariposa lily, intermediate mariposa lily, California fluffweed, and Bigelow's spikemoss. Grasses include mesa three-awned grass, giant needlegrass, cane bluestem, foothill needlegrass, and littleseed muhly. This habitat integrates with chaparral, coastal sage scrub, and most often with sage scrub-grassland ecotone.

Marine and Coastal Communities (11.0)

Beach (11.4)

Sandy beach occurs at the southernmost limit of the SOCTIIP action area. These areas are generally unvegetated and are used as recreational areas.

Lakes, Reservoirs, and Basins (12.0)

A variety of basins that have standing water either year-round or for the majority of the year occur throughout the SOCTIIP action area. These areas are distinguished from the more ephemeral basins such as vernal pools, which tend to have water only during high rainfall years, and then for a short duration (typically less than 60 days).

Open Water (12.1)

A number of ponds, generally associated with ranching and agricultural practices, are located in the SOCTIIP action area along the corridor alignments. Many of these ponds are seasonal, filling in spring as a result of runoff and drying through summer or fall. Other ponds are kept full throughout the year, with spring runoff augmented by pumping. Vegetation includes aquatic species such as fennel-leaved pondweed, common water nymph, and hornwort; emergent hydrophytes such as southern cattail, California bulrush, tall umbrella-sedge, knot grass, and

creeping spikerush; and terrestrial species such as swamp Timothy, toad rush, hyssop loosestrife, and cocklebur.

Basins (12.3)

A detention basin is located in the southern part of the SOCTIIP action area east of I-5 in the vicinity of the San Onofre Nuclear Generating Station (SONGS). Vegetation at the perimeter of the basin is dominated by non-native species, including shortpod mustard, Russian thistle, riggut grass, and tocalote.

Watercourses (13.0)

Open water and unvegetated areas associated with the various drainages in the SOCTIIP action area were mapped separately from those areas that support riparian vegetation (7.0).

Perennial Streams and Rivers (13.1)

Perennial streams and rivers include San Juan, San Mateo, and Cristianitos creeks, Cañada Chiquita, Prima Deshecha Cañada, and Segunda Deshecha Cañada. Parts of these drainages are unvegetated and mapped as 13.1 that, in this case, designate unvegetated portions of these drainages. Because these are dynamic, high-energy systems, the active portion of the channel may periodically move, with subsequent changes in the vegetation. Vegetation maps for these systems may change dramatically from year to year based on annual rainfall.

Intermittent Streams and Creeks (13.2)

Intermittent streams and creeks are present in the SOCTIIP action area along the corridor alignments. Where such features are vegetated, they are covered as a separate habitat type such as mule fat scrub (7.3). Where these features support little or no vegetation, they are mapped as 13.2. Because these areas are subject to scouring by flood events during high rainfall years, periodic changes in the vegetation may occur. Vegetation maps for these systems may change dramatically from year to year based on such flooding.

Ephemeral Drainages and Washes (13.3)

Ephemeral drainages and washes are present in the SOCTIIP action area along the corridor alignment. Where such features are vegetated, they are covered as a separate habitat type such as riparian herb (7.1). Where these features support little or no vegetation, they are mapped as 13.3. Because these areas are subject to scouring by flood events during high rainfall years, periodic changes in the vegetation may occur. Vegetation maps for these systems may change from year to year based on such flooding.

Agriculture (14.0)

A variety of agricultural areas that support both food crops and nursery stock were mapped throughout the SOCTIIP action area. These non-natural communities include: Dryland Field Crops (14.1); Irrigated Row and Field Crops (14.2); Vineyards and Orchards (14.3); Dairies, Stockyards, and Stables (14.4); and Nurseries (14.6).

Developed (15.0) and Disturbed (16.0) Areas

Areas identified as developed occur in the SOCTIIP action area along all of the alternatives and primarily include urban areas and roads. These non-natural communities include: Urban (15.1);

Rural (15.2); Non-urban Commercial/Industrial/Institutional (15.3); Transportation (15.4); and Ornamental Landscaping (15.5) areas.

The vegetation in disturbed areas has been altered such that native species do not represent a dominant feature. These non-natural communities include: Cleared or Graded Areas (16.1); Other Disturbed Areas (16.2); and Mined Areas (16.4).

APPENDIX C
GENERAL MITIGATION MEASURES

The conservation measures will be implemented by the TCA during and after construction. Caltrans will maintain these conservation measures within the right-of-way. No further off-site measures will be required to offset impacts as a result of the Caltrans maintenance activities.

Within Section 4.12 of the EIS/SEIR, *Affected Environment, Impacts, and Mitigation Measures Related to Threatened and Endangered Species*, Measures TE 3, 7, 25, 27, and 28 have been developed to avoid and minimize project effects to brodiaea, arroyo toad, coastal California gnatcatcher, least Bell's vireo and Pacific pocket mouse.

Measure TE 3. A Biological Resources Management Plan (BRMP) shall be prepared prior to construction. The BRMP shall provide specific design and implementation features of the biological resources mitigation measures outlined in the resource agency approval documents. Issues to be discussed in the BRMP shall include, but are not limited to, resource avoidance, minimization, and restoration guidelines, performance standards, maintenance criteria, and monitoring requirements. The Draft BRMP shall be submitted to the USFWS, NMFS, CDFG, USACOE, RWQCB, FHWA, and Caltrans for review and approval.

The primary goal of the BRMP will be to ensure the long term perpetuation of the existing diversity of habitats in the project area and adjacent urban interface zones and prevent offsite or indirect effects. The BRMP shall contain at a minimum specific construction monitoring programs for thread-leaved brodiaea, arroyo toad, coastal California gnatcatcher, least Bell's vireo, and Pacific pocket mouse.

Measure TE 7.

- a) Prior to construction (i.e., clearing, grubbing or grading), focused surveys for the thread-leaved brodiaea shall be conducted during the flowering period for this species (approximately May through July). The locations of plants identified within the disturbance limits shall be recorded with a Global Positioning System (GPS) unit with sub-meter accuracy. The soils containing thread-leaved brodiaea shall be tested to determine soil texture, and organic matter, and transported to a native plant nursery for germination and propagation.*
- b) Prior to construction, soil containing thread-leaved brodiaea corms shall be collected from the specific locations where thread-leaved brodiaea plants were observed the prior spring by personnel experienced in the salvage of corms. Areas of soil 0.6 m by one m by 0.6 m (two ft by three ft by two ft) deep or one m by 1.3 m by 0.6 m (three ft by four ft by two ft) deep shall be collected and transported for placement in an appropriate translocation site selected by the Project Biologist. The translocation site shall be located in a conservation area within an open space dedication area within the region and shall have similar soils, aspect, slope, and hydrology to the donor site (i.e., the site where thread-leaved brodiaea will be collected).*
- c) Relocation success will be monitored for five years. The number of relocated plants that will emerge in any one year is variable and will depend on seasonal rainfall. Relocation will be considered successful when 10 percent of the relocated population emerges and sets viable seed in any monitoring year. The success criteria may vary as determined by the Project Biologist in consultation with botanists and USFWS staff with recent experience in brodiaea transplantation methodologies in the region.*

Measure TE 25. To partially mitigate impacts, the TCA has identified additional habitat preservation and restoration activities in the Upper Chiquita Canyon Conservation Area. The Upper Chiquita Canyon Conservation Area consists of approximately 478.7 ha (1,182 ac) created by the TCA to mitigate biological impacts resulting from construction of the FTC-N. Of these 478.7 ha (1,182 ac), 327 credits have been set aside as a mitigation bank for future project impacts. The Conservation Area was originally under substantial threat for development and the resources within the Area have been conserved, but otherwise would have been lost or substantially degraded. In addition, the Upper Chiquita Canyon Conservation Area provides opportunities for preservation activities consisting of additional habitat for oak woodland and sensitive plant species. There are also opportunities for restoration activities on site that would include additional acres of oak woodland, nonwetland drainages, coastal sage scrub, coastal sage scrub/native perennial grassland ecotone, and native perennial grassland habitats. These opportunities for preservation and restoration activities would also serve to mitigate impacts on sensitive plants for the SOCTIIP Alternatives.

- a) *Impacts to scrub communities (and all sub-types thereof except floodplain sage scrub) shall be mitigated through the use of scrub mitigation credits in the Upper Chiquita Canyon Conservation Easement area and additional preservation (if necessary). The Upper Chiquita Canyon Conservation Easement area currently contains 327 mitigation credits approved by the USFWS and CDFG. The scrub areas impacted by the selected alternative will be mitigated at a credit to hectare ratio of 1:0.40 (one Upper Chiquita Canyon Conservation Easement mitigation credit for every 0.40 ha impact or one Upper Chiquita Canyon Conservation Easement mitigation credit for every 1.0 ac lost).*
- b) *Any additional scrub areas restored within the Upper Chiquita Canyon Conservation Easement area may be added to the credit total, with the approval of the USFWS, and applied to the mitigation ratio accordingly. The TCA or other implementing agencies and the USFWS shall determine the criteria for the establishment of the new credits for the restored areas pursuant to the Upper Chiquita Canyon Conservation Bank Agreement which was entered into with the USFWS and the CDFG.*
- c) *Any scrub areas that are impacted by the selected alignment and that have not been mitigated by the use of the Upper Chiquita Canyon Conservation Easement mitigation credits (i.e., impact area exceeds mitigation credits available) shall be mitigated through preservation at a ratio of 1:1.*

Measure TE 27. *Impacts to floodplain sage scrub, riparian herb and other sub-types within the Vernal Pools, Seeps, and Wet Meadows and Marsh plant communities (as defined in Section 5.0 of the NES) shall be mitigated at a 1:1 ratio or other ratio that compensates for function and values. Mitigation shall consist of creating the above mentioned community types in the approximate proportions in which they currently exist within the impact area or as otherwise required by the resource agencies. Creation areas shall occur within dedicated open space areas including, but not limited to, the Upper Chiquita Canyon Conservation Easement area. The creation program for the above areas shall be included in the BRMP and shall include the following measures.*

- *Site analysis for appropriate soils and hydrology.*
- *Site preparation specifications based on site analysis, including but not limited to grading and weeding.*

- Soil and plant material salvage from impact areas, as appropriate to the timing of impact and restoration as well as the location of restoration sites.
- Specifications for plant and seed material appropriate to the locality of the mitigation site.
- Specifications for site maintenance to establish the habitats, including but not limited to weeding and temporary irrigation.

Creation areas shall be considered successful if the following standards are achieved:

- The site does not require substantial maintenance for at least two consecutive years during the monitoring period.
- The site must exhibit evidence of natural recruitment of native species, including plant reproduction and/or setting of seeds.
- Absolute percent cover of native species is comparable to the absolute cover of native species at an appropriate reference site within an 80 percent confidence limit.
- An index of species diversity of the restored and/or created habitat areas is statistically comparable to an appropriate reference site within an 80 percent confidence limit.

Monitoring shall be conducted for five years (or less if success criteria are met as designated above earlier) to ensure successful establishment of hydrophytic vegetation within the restored/created areas by wetland species. If success standards are not met, remedial measures, seeding, or introduction of container stock shall be implemented as directed by the Project Biologist.

Measure TE 28. Impacts to riparian scrub, woodland, and forest communities (as defined in Section 5.0 of the NES) shall be mitigated by mitigation of such communities at a 1:1 ratio or other ratio that compensates for functions and values. Mitigation areas shall occur within dedicated open space areas including, but not limited to, the Upper Chiquita Canyon Conservation Easement area as determined by the Project Biologist. The restoration program shall be detailed with the BRMP.

Prior to restoration of these communities, hydrological testing and monitoring of the creation site shall be conducted to determine that sufficient hydrology exists to support the community. If necessary, a temporary irrigation program shall be incorporated into the mitigation design to ensure successful establishment of the community.

The following performance standards shall apply for the restoration of these areas (except for southern coast live oak riparian forest). Restoration shall be considered successful if:

- The site does not require substantial maintenance for at least two consecutive years during the monitoring period.
- The site must exhibit evidence of natural recruitment of native species, including plant reproduction and/or setting of seeds.
- Absolute percent cover of native upper and mid canopy species is 70 percent.

- *An index of species diversity of the restored areas is statistically comparable to an appropriate reference site within an 80 percent confidence limit.*

For southern coast live oak riparian forest, the following standards shall apply:

- *The site does not require substantial maintenance and meets the success criteria established for this community for at least two consecutive years during the monitoring period.*
- *The site must exhibit evidence of natural recruitment of native species, including plant reproduction and/or setting of seeds.*
- *Absolute percent cover of native upper and mid canopy species is 50 percent, with five percent cover from oak trees.*
- *An index of species diversity of the restored areas is statistically comparable to an appropriate reference site within an 80 percent confidence limit.*

Monitoring shall be conducted for a minimum of five years to ensure successful establishment of the restored areas. If success standards are not met, remedial measures including introduction of additional container stock and adjusting of irrigation shall be implemented as directed by the Project Biologist.

APPENDIX D
STUDY METHODS
CHAPTER 3 OF THE NES



SECTION 3.0 STUDY METHODS

3.1 STUDIES REQUIRED

The United States Army Corps of Engineers (USACOE) Engineer Research and Development Center (ERDC) prepared an analysis of the Waters of the U.S. and Riparian Ecosystems for the alternatives. It is located in its entirety in Appendix A to this Natural Environment Study (NES). Due to the complexities of this report, the summary of methodology and findings of that report are found in Section 8.0. Formal wetland delineations and the Biological Assessment will be after a preferred alternative is selected.

3.2 METHODS

The data provided in this NES have been collected from comprehensive biological studies, including sensitive species surveys conducted for the NES in 2001 and 2003. Information from studies conducted in 1994 through 1997 was incorporated into the 2001 database, as appropriate. The incorporation of information from prior surveys is discussed in Section 3.2.1.1 for plant communities and in Section 3.2.1.2 for sensitive plant species. Other pertinent information was obtained from studies and other documentation prepared by biologists who have previously conducted research in the survey area and immediate vicinity, particularly for the Orange County Southern Subregion Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP) program and Marine Corps Base (MCB) Camp Pendleton (MBA 1998).

The biological surveys were conducted under the guidance of technical experts for a variety of natural resources issues. The following technical experts were selected for their respective area(s) of study based on advanced levels of technical training, extensive experience, and familiarity with the specific subject matters:

- Botanical and Jurisdictional Resources: L. Anthony (Tony) Bomkamp, Glenn Lukos & Associates (GLA), Senior Project Manager, Wetland Regulatory Services.
- Amphibians, Reptiles, and Raptors: Peter H. Bloom, Independent Consultant.
- Fish: Dr. Camm Swift, Independent Consultant.
- Invertebrates: Tony Bomkamp, GLA.
- Birds (Nonraptors): Douglas R. Willick, P&D Consultants (P&D).
- Mammals: Stephen J. Montgomery, Independent Consultant, and Dr. Patricia Brown, Independent Consultant.

The technical experts for each area of study were responsible for the development of methods, the daily implementation of those methods, the scientific integrity of data collected by assigned staff, and the preparation of sections of technical reports pertaining to their specialties. A list of all biologists who participated in the biological surveys is provided in Section 13.0 (List of Preparers). Resumes for these biologists are provided in Appendix B.1. Surveys included plant community mapping and descriptions, general plant and wildlife surveys, wildlife corridor analysis, and focused surveys for sensitive species. A detailed discussion of each survey is

presented below. As requested by the United States Fish and Wildlife Service (USFWS), focused surveys were conducted for a variety of plant and wildlife species. (See correspondence in Appendix C.) A list of plants and wildlife (common and scientific names) is provided in Tables 3.2-1 and 3.2-2, respectively. To make the document easier to read, scientific (Latin) names for all the species are provided in Appendix D. Common names are generally used throughout the text. A wildlife corridor study was prepared for the 1998 NES (MBA 1998) and the findings of that study were incorporated in this analysis, as well as data for the Orange County Southern Subregion NCCP/HCP.

3.2.1 VEGETATION SURVEY

3.2.1.1 Plant Community Mapping and Nonsensitive Plant Inventory

Plant community mapping was conducted between 17 January and 2 August 2001. Appendix B.2 lists the plant community mapping survey dates and the biologists who performed the surveys. All plant community mapping was performed in the field on 122-meter (400-foot) scale color aerial photographs using visible landmarks and followed the Orange County Habitat Classification System (OCHCS) (Gray and Bramlet 1992). Plant community mapping was conducted in the field using 122-meter (400-foot) scale color aerial photographs flown in 2000. Mapping was conducted for previously unsurveyed areas for expanded SOCTIIP build alternatives and was updated for areas that were surveyed in 1995/1996 (Appendix B).

Due to access restrictions, 2001 surveys were not conducted on MCB Camp Pendleton or on the Donna O'Neill Land Conservancy. Therefore, plant communities on MCB Camp Pendleton and on the Donna O'Neill Land Conservancy were mapped using aerial photographic interpretation and were not ground-truthed. The 1995/1996 polygons in all other areas were corrected to the 2000 aerials. Adjustments were made to some of the 1995/1996 polygons based on changes in these plant communities based on aerial photographic interpretation. Polygon data were then digitized by Psomas & Associates (Psomas) into the GIS database for analysis. This level of information is adequate for analysis and impact evaluation and for the purpose of selecting a preferred alternative.

Plant communities in the survey area were mapped to the level of subassociation. In some instances, community descriptions in the OCHCS did not adequately describe or correspond to subassociations encountered in the field. In such cases, descriptions of these additional subassociations were prepared and were included in the community descriptions. Mr. Tony Bomkamp and botanists/ecologists Ms. Shelly Feeney Austin, Mr. Scott Holbrook, and Mr. Jeff Crain conducted the plant community mapping in 2001.

The GIS database and associated plant community maps provided an important and highly accurate analytical tool for the determination of impacts on plant communities and sensitive species in the survey area. As such, the plant community maps were intended to accurately characterize the type and extent of mapped vegetation. However, for habitats subject to jurisdiction of the U.S. Army Corps of Engineers (USACOE) and California Department of Fish and Game (CDFG), an additional layer of information for wetlands and riparian habitats was included in the database.

During field reconnaissances for the plant community mapping, focused surveys for sensitive plant species, and wetlands delineation and functional assessment (Smith 2003; See Appendix A) were conducted. Field biologists also recorded inventories of all plant species observed while conducting other botanical surveys (e.g., sensitive plant surveys, plant

community mapping, and wetlands delineations). In general, plant community mapping and focused surveys for sensitive plant species were conducted by the same crew.

The mapping effort was concentrated in the beginning of the field survey season in 2001, though refinements to the mapping were made throughout the season, particularly as native grass species setting seed enabled the mapping of native grassland communities. Focused sensitive plant surveys were conducted during the appropriate time of year for each species by botanists. In general, a separate crew with expertise in wetlands delineation and functional habitat assessments conducted this portion of the field surveys later in the season in 2001. A representative list of flora species in each habitat type that occurs in the survey area was compiled from observations made during the field surveys and is provided in Appendix D.

3.2.1.2 Sensitive Plant Surveys

To identify and map populations of sensitive plant species in the survey area, a comprehensive survey program was developed. The sensitive plant survey program included: (1) determination of target species (species known to occur or with the potential to occur in the survey area), (2) development of a survey protocol, and (3) field surveys. Table 3.2-1 lists the sensitive plant species, by common name and scientific name, that were surveyed in the SOCTIIP study area.

Determination of Target Species

The determination of target species included two tasks: (1) habitat characterization and (2) literature search. Habitat characterization was conducted using 122-meter (400-foot) scale color aerial photographs. Suitable habitat for the sensitive plant species is shown later in Table 5.3-1. On determination of the habitat types and areal extent of each habitat type in the survey area, a literature review was performed to determine species known to occur in the survey area and its vicinity or with the potential to occur in the survey area based on habitat requirements. The following references and sources were consulted:

1. The California Natural Diversity Database (CNDDDB) Special Plants List (CDFG 2001a and 1996a).
2. The California Native Plant Society (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California (Skinner and Pavlik 1994), Version 1.5.2 (1994-2000), and the CNPS Inventory of Rare and Endangered Plants of California (2001).
3. CNPS Orange County Chapter's Plant Species of Special Interest in Orange County (Bramlet 1995).
4. A Checklist of the Vascular Plants of Orange County, California, Second Edition (Roberts 1998).
5. Rare Plants of San Diego County (Reiser 1994).
6. CNDDDB Rarefind Database (CDFG 2001b and 1995).
7. Federal Register (United States Fish and Wildlife Service (USFWS) 1998b, 1997a, 1994c, 1993b, and 1992).
8. Recommendations of USFWS and state parks personnel (Roberts 1995, Riefner 1995).

9. Documented results of botanical surveys on adjacent or nearby sites including Whispering Hills (Final Biological Resources Technical Report, BonTerra Consulting, March 2, 2000), Prima Deshecha Sanitary Landfill (Draft General Development Program EIR No. 575, January 2001), Talega (SEIR for the Talega Specific Plan Amendment/General Plan Amendment (SPA/GPA), September 25, 2000), Forster Ranch (SPA Subsequent EIR, September 23, 1997), Antonio Parkway EIR (MBA 1995d and 1994), Upper Chiquita Canyon (MBA 1995c), Horno Planning Area (MBA 1992), MCB Camp Pendleton (MCB Camp Pendleton Natural Resources Office 1994), and San Onofre and San Clemente State Beach (California State Parks 1983, 1973).
10. Botanical surveys associated with specialized habitats (e.g., vernal pools) that were found in the vicinity of the survey area (MBA 1995a and 1995b).

Based on the initial habitat evaluation and the cited references and sources, a list of target plant species was developed. In addition, during various habitat evaluations and associated field surveys, as well as when new information became available during the survey period, additional target species were added to the list as shown on Table 3.2-3.

Survey Protocol

A general survey protocol was developed based on plant habitat preferences, including microhabitat preferences where appropriate, and flowering period. Based on flowering times, the following three survey periods were established: March-May, June-July, and August-December. Table 3.2-3 lists the target species according to actual survey periods. Surveys were extended through December 1995 because many target species were in bloom well beyond their documented survey windows. For example, individuals of southern tarplant and salt spring checkerbloom were flowering in late December 1995 in the survey area as were individuals of Santa Catalina Island desert thorn at San Clemente State Beach (Bomkamp 1995).

The 2003 rare plant surveys were conducted during flowering seasons for the special status plants known from the area. Surveys for rare plant species were floristic in nature, consistent with conservation ethics, and systematically covered all habitat types in the 2003 SOCTIIP study area. Surveys were conducted from 22 March to 19 June 2003. Possible surveys for fall include thread-leaved brodiaea and southern tarplant. Southern tarplant could be in or near the irrigated wetlands in the northern part of the 2003 survey area in which a day survey would be appropriate.

Plants were identified using keys, descriptions, and illustrations in Hickman (1993), Munz (1974), Abrams (1923-1960), and other regional references. All species noted on the site are listed in the species list. All surveys were in conformance with CDFG guidelines (2000). Voucher specimens were deposited at Rancho Santa Ana Botanic Garden.

Where feasible, field personnel visited existing populations of target species both inside and outside the survey area prior to initiating surveys to develop a "search image" for the target species. In some cases, field personnel visited Rancho Santa Ana Botanic Garden (RSABG) to examine herbarium specimens prior to initiating surveys. For species such as Gambel's watercress, which is currently known from only the San Luis Obispo area, this was the most efficient way for field personnel to become familiar with diagnostic characters for such species. In the case of the Los Angeles sunflower, last seen in 1937, herbarium specimens provided the only means of viewing the species. Finally, occurrences of some species are poorly documented, and surveys were performed based solely on habitat preferences. The

identification of beaked spikerush in the study area was made based on documented habitat requirements (Mason 1957), which resulted in a careful search of alkali and freshwater seeps for this species. Mr. Bomkamp, Mr. Moskovitz, Ms. Feeney Austin, Mr. Crain, Mr. Holbrook, and Ms. Hrdlicka conducted the focused plant surveys in 2001. Study locations during 2003 plant surveys included east- and west-facing slopes of Cañada Gobernadora, Narrow Canyon, West Fork Cañada Chiquita, and Thomas F. Riley Wilderness Park. Mr. Scott White, Ms. Amanda Duchardt, and Mr. Michael Honer conducted focused surveys in 2003. Appendix B.2 lists the sensitive plant survey dates and biologists who performed the surveys.

Field Surveys

Field surveys were conducted in accordance with the guidelines in the Inventory of Rare and Endangered Vascular Plants of California (Skinner and Pavlik 1994). These guidelines have been adopted by the CNPS and the CDFG, and include:

- Plant surveys are to be conducted at the proper time of year when target species are both evident and identifiable. Field surveys are to be scheduled to coincide with known flowering periods and/or during periods of phenological development that are necessary for species identification.
- Plant surveys are to be floristic in nature. Every species noted in the field will be identified to the extent necessary to determine whether it is a sensitive species.
- Surveys are to be conducted consistent with conservation ethics. Collections of voucher specimens or rare plants will be made only when such an action will not jeopardize the continued existence of the population. Any collections are to be made in accordance with applicable state and federal laws. Voucher specimens, if collected, are to be deposited at a herbarium for future use (Ferren et al. 1995). All voucher specimens collected in the SOCTIIP survey area were deposited at the RSABG.
- Surveys are to be conducted in a systematic manner using field techniques that ensure a reasonably thorough coverage of all habitats potentially supporting special-status plant species.

To maximize coverage and depending on the habitat type, both transect and meander methods were used during surveys (Nelson 1987). Habitats such as grassland were more conducive to transects, whereas areas of dense scrub or chaparral were better surveyed by the meander method. In both cases, microhabitats such as sand or rock outcrops that have high potential for supporting sensitive species were given special attention.

Focused surveys for sensitive plants were conducted in 1995 within the study area for the original project alternatives (previously referred to as the BX and CP), roughly corresponding to the Central and Far East alignments. Focused surveys for all sensitive plants were conducted in 2001 in all areas within the study area that had not previously been surveyed in 1995, including all Alignment 7 Corridor Alternatives, the Far East Corridor – Talega Variation Alternatives, the I-5 Widening Alternative, and the arterials associated with the Arterial Improvements Only (AIO) and Arterial Improvements Plus HOV and Spot Mixed Flow Lanes on I-5 (AIP) Alternatives. For the remainder of the study area, updated focused surveys were conducted in 2001 and 2003 for selected, higher sensitivity plant species, including thread-leaved brodiaea, southern tarplant, Coulter's saltbush, and mud nama. Populations mapped in 1995 were incorporated into this NES for the rest of the sensitive plant species.

Due to access restrictions, 2001 sensitive plant species surveys were not conducted on MCB Camp Pendleton or the Donna O'Neill Land Conservancy. Some sensitive plant species populations were observed within the Donna O'Neill Land Conservancy during 1995 surveys; these populations have been incorporated into this NES. No sensitive plant species were noted within the study area on MCB Camp Pendleton during 1995 surveys and no information was provided by MCB Camp Pendleton on sensitive plant species populations occurring within the study area on the base.

Sensitive plant populations and/or individuals observed were mapped on the appropriate 122-meter (400-foot) scale color aerial photograph while in the field. Populations that could be reached on foot were also located with a Garmin 12 Global Positioning System (GPS) unit. Field notes included a count or estimate of the population size, biological setting, associated species, and level of disturbance as appropriate. Exact counts were determined by counting each individual plant, where feasible. However, the population count for prostrate spineflower was made by counting plants in randomly chosen grids and extrapolating the grid counts to the larger areas occupied by the species. Populations of western dichondra occur in dense mats and counting was not practical. Therefore, the areal extent of each population was recorded.

To satisfy the need to comply with Executive Order 13112, Invasive Species (3 February 1999) and the Federal Highway Administration (FHWA) Guidance on Invasive Species (10 August 1999) for a National Environmental Protection Act (NEPA) analysis, the State of California List of Noxious Weed Species was reviewed. In addition, though not required as part of Executive Order 13112 or the FHWA Guidance, the Exotic Pest Plants of Greatest Ecological Concern in California List (California Exotic Pest Plant Council, CalEPPC) was also reviewed. During field surveys, the frequency of occurrence of the species on either of these lists was documented for each plant community in which they were observed. The purpose of this documentation was to determine the potential impact the project may have on the spread of such invasive species.

3.2.2 WILDLIFE SURVEYS

3.2.2.1 General Wildlife Surveys

An inventory of nonsensitive amphibians, reptiles, birds, and mammals was obtained during the course of focused surveys for sensitive species and incidentally while performing other field tasks, such as vegetation mapping, nonspecific pitfall trapping, and transect-walking.

During the focused surveys, searches for nonsensitive reptiles and amphibians were accomplished by lifting, overturning, and carefully replacing rocks, logs, and debris in all appropriate habitats and by flushing basking or otherwise hidden individuals during transect walking. All observations of nonsensitive and sensitive amphibian and reptile species were recorded in the field and analyzed by the technical expert.

Surveys for nonsensitive birds were conducted in each habitat type during focused surveys for sensitive avifauna. Birds were taxonomically identified down to species or subspecies through visual and/or auditory recognition, and the number or relative abundance of each species was noted. The presence of nests or other evidence of breeding activity for raptors was documented in the field and a bird checklist was completed at the end of each survey day by the investigating biologists. The presence of use areas, which are areas where any life stage (such as fledgling, juvenile, adult, or breeding pair) is observed during a survey for avian species other than raptors, was also documented.

Surveys for nonsensitive mammals were conducted simultaneously with searches for sensitive mammals; however, other incidental data on small mammals were also gathered during pitfall trapping. Diurnal surveys included searches for diagnostic signs, including scat, footprints, scratch-outs, dust bowls, burrows, and trails. All habitat types were visited and evaluated for their potential to support common mammal species, and all mammal species observed or detected during the course of the surveys were documented in field notes and summarized by the technical expert.

Pitfall Arrays

Several species of amphibians and reptiles (herptiles) that occur in southwestern California are small, fossorial, nocturnal, or generally difficult to detect by traditional survey methods. For these secretive species, such as banded gecko, silvery legless lizard, rosy boa, southwestern blind snake, long-nosed snake, black-headed snake, and patch-nosed snake, the pitfall method is often necessary to evaluate potentially suitable habitats. Pitfall surveys within the study area were conducted by installing 23 separate arrays, each consisting of seven 18.9-liter (five-gallon) buckets arranged in three arms of 35.5-centimeter (14-inch) high drift fence measuring 15.0 meters (49.2 feet) (Figure 5.3-3). Actual pitfall array locations were nonrandomly chosen throughout the survey area based on relative habitat quality/dominant vegetation, topography, aspect, soil moisture, substrate, and/or other habitat/microhabitat correlates that are known or presumed to be associated with the potentially occurring herptiles within the survey area. However, care was taken to ensure that all representative habitat types were included within the study.

The pitfalls were opened for 10 consecutive days (24 hours/day) during two intervals, from 4 to 13 June 2001 and again from 2 to 11 July 2001, and checked each morning. All organisms were immediately released after they were recorded. The pitfall buckets were capped when not in use.

Herptile Transects

Twenty herptile transects, primarily designed to detect the orange-throated whiptail and San Diego horned lizard, were placed in coastal sage scrub (CSS) and riparian habitat areas using NCCP Southern Coastal Sage Scrub Scientific Review Panel (SRP) Guidelines (CDFG 1992) (Figure 5.3-3). These guidelines stipulate that a minimum of four surveys per transect be conducted between April and September, with ambient temperatures ranging from 25 to 50 °C (Centigrade) (77 to 122 °F (Fahrenheit)). Surveys were diurnal and completed no sooner than one day apart.

Previous intense surveys (NES 1998) of the study area suggest that orange-throated whiptails are abundant across the study area and occur in low to high numbers in essentially all CSS, riparian, and ecotone areas bordering native grasslands and woodlands. Non-native grasslands and ruderal vegetation were generally the only terrestrial habitats avoided by herptiles. The 2001 transects were located in areas of optimum habitat for orange-throated whiptails, but were conducted more for the detection of other sensitive herptiles such as the red-diamond rattlesnakes, coastal patch-nosed snakes, San Bernardino ring-necked snakes, and California glossy snakes. Since the FEC and CC alignments had been extensively surveyed in 1995, the emphasis on this survey was the A7C alternative.

Surveys commenced on 19 June and ended on 16 July 2001. Field surveys were conducted under the guidance of Mr. Bloom. Additional biologists who completed the 20 transect surveys

were Mr. Kidd and Ms. Niemela. Transects were no less than 200 meters (656 feet) in transect length by 10 meters (32.8 feet) in width. All 20 transects were placed south of San Juan Creek in areas not previously surveyed. A total of four kilometers (2.5 miles) of transects were walked including 1,000 meters (3,322.5 feet) of riparian/oak woodland and 3,000 meters (9,967.5 feet) of pure or mixed CSS with variable dominant plants. The transect locations are shown later in this NES on Figure 5.3-3.

During 2003, presence/absence surveys were conducted, rather than focused surveys with pitfalls or formal transects. Most herptile locations were noted during focused raptor surveys where previous surveys had been conducted in past years in an attempt to observe western spadefoot toad, orange-throated whiptails, San Diego horned lizards, pond turtles, red racers, and red diamond rattlesnakes. While serious efforts to locate herptiles in appropriate habitats were made, focused surveys could not be conducted due to vast expanses of habitat. Observations were made on only the sensitive herptile species and active raptor nests. Once a species was confirmed in a location, a return trip was not made. Essentially, these surveys were attempts to confirm previous records and visit places where species gaps were noticed in the study area. Raptor nest surveys were accomplished by looking at known locations within and adjacent to the study area and searching areas in between known active nest sites.

3.2.2.2 Surveys for Sensitive Wildlife Species

A comprehensive list of all wildlife species in which surveys were conducted in the SOCTIIP study area is provided in Table 3.2-2. Sensitive wildlife species surveys conducted in 2001 and 2003 are presented in Table 3.2-4. The following sections are a brief description of the sensitive species that were the subjects of recent and previous focused searches.

Sensitive Invertebrate Species

Quino Checkerspot

Surveys for the Quino checkerspot were conducted in Spring 1995. At the time the surveys were conducted, the Quino checkerspot was proposed for listing as endangered by the USFWS. A final rule, listing the Quino checkerspot as endangered, was published on January 16, 1997 (Federal Register Vol. 62, No. 11 – USFWS 1997b).

Based on the negative results of this previous survey effort and subsequent discussions with the USFWS, it determined that there was a low likelihood of Quino checkerspot occurring in the SOCTIIP study area. Consequently, additional focused surveys for this species were not required (USFWS 2000).

Fairy Shrimp

USFWS protocol fairy shrimp surveys were conducted between 25 January and 15 May 2001 and 20 March through 8 April 2003. Data collected in 1997 and 1996 were also incorporated. Specifically, surveys were conducted for the federally listed endangered Riverside fairy shrimp and federally listed endangered San Diego fairy shrimp. Surveys performed in 2001 and 2003 were conducted in accordance with the USFWS survey protocols for wet season sampling, published 19 April 1996 as: *Interim Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for Listed Vernal Pool Branchiopods* (USFWS 1996a). Prior surveys were conducted in accordance with guidelines established at the time of the surveys.

The locations of vernal marshes, vernal pools, seasonal ponds, and stockponds in the SOCTIIP study area were identified and mapped during the jurisdictional wetlands delineation (Smith 2003). Prior to initiating protocol surveys, the vernal marshes, vernal pools, seasonal ponds, and stockponds were monitored for ponding. Following the first significant rainfall of the season, each basin was monitored weekly thereafter for ponding until the initiation of protocol surveys. During the 2001 survey season, sampling began on 25 January and ended on 15 May. Sampling was conducted by Mr. Bomkamp, Mr. Zimmitti, and Mr. Crain. During the 2003 survey season, sampling began on 20 March and ended on 8 April. Sampling was conducted by Mr. Zimmitti.

In conducting protocol surveys for the Riverside, vernal pool, and San Diego fairy shrimp, the basin bottom, edges, and entire water column were sampled using a 20-centimeter (eight-inch) triangular dip net with a 91-centimeter (36-inch) handle for the 2001 surveys. In addition to the date and time, the following information was also gathered for each basin:

- All aquatic invertebrates observed in each basin, identified to at least order or family.
- All aquatic vertebrates observed in each basin, identified to at least order or family.
- Dominant plant species, identified at least to genus.
- Water temperature.
- Electroconductivity.
- Turbidity.

In addition to conducting surveys for the listed vernal pool branchiopods, control sites in the vicinity of the study area known to support Riverside and San Diego fairy shrimp were monitored throughout the survey season to ensure that conditions were conducive for emergence of the target species of listed fairy shrimp. Monitored sites included three basins on Chiquita Ridge, immediately adjacent to the study area, and two vernal pools at Fairview Park in Costa Mesa.

Additional fairy shrimp surveys were also conducted by DUDEK and Associates and PCR in Rancho Mission Viejo (RMV) between 27 February and 1 May 2001. This independent study focused on seven vernal pools/depressions that were identified along Chiquita Ridge and a north facing slope located between Trampas Canyon and La Pata Road (Figure 5.3-2). Surveys were performed in accordance with USFWS survey protocols, and all voucher materials collected were accessioned at the Los Angeles County Natural History Museum.

With the exception of pools monitored by DUDEK on RMV, the results of all fairy shrimp surveys are based upon the completion of two wet season surveys within a five year period, as discussed in the Interim Survey Guidelines published by USFWS. Unoccupied pools on RMV (RMV5, 6, and 8) surveyed only once are expected to be reevaluated next season by RMV.

Unoccupied Vernal Pools 5, 6, and 8, identified in 2001 by Dudek and Associates and PCR, were surveyed in 2003. The March 2003 surveys were conducted to be similar to previous years and were in accordance with federal protocols. A fine mesh net and clear plastic container were used to survey for fairy shrimp, similar to the materials used during the 2001 surveys. Additional areas of Trampas Canyon were surveyed for the presence of vernal pools not previously

mapped or surveyed. These areas were surveyed by driving and walking to potential low-lying depressions which could hold water during the rainy season. Vernal pools that were identified were mapped, and all pertinent information relating to the vernal pools, such as information collected in 2001, was recorded.

Sensitive Fish Surveys

No directed searches for sensitive fish species were performed in 2001. However, fish surveys were conducted in 1995 to characterize fish habitats in the SOCTIIP study area and determine whether any sensitive species, including but not limited to the arroyo chub, Santa Ana speckled dace, and tidewater goby, were present. A technical report documenting recent surveys was prepared and is located in Appendix F. Based on other prior surveys (MBA 1994 and Swift et al. 1994), both the arroyo chub and tidewater goby have been known to occur in the streams and lagoons in the SOCTIIP study area. Fish surveys in the SOCTIIP study area were conducted in fall 1995, and a preliminary survey was conducted on 30 October 1995, to determine current stream levels and ascertain an overall status of potential habitat for sensitive fish species and sample areas. San Mateo and Cristianitos creeks were surveyed on 31 October 1995; Cañada Gobernadora on 2 and 18 November 1995, San Mateo Lagoon on 3 and 18 November 1995; Cañada Chiquita on 7 November 1995; and San Juan Creek on 16, 17, and 18 November 1995. Surveys were conducted under the direction of Mr. Johnston. Ecologists Mr. Ramirez and Ms. Leverett assisted Mr. Johnston during the field efforts. Appendix B.2 lists the sensitive fish survey dates and biologists who performed the surveys. Additional surveys were conducted by MCB Camp Pendleton in October and November 1996.

Stream sampling was conducted by making visual observations and using small hand-held dip nets and a larger five-meter (16.4-foot) long and one-meter (3.3-foot) high nets constructed of three-millimeter (0.12-inch) square knotless mesh with lead weights along the bottom edge and attached to polyvinyl chloride (PVC) tubing on each end. Two nets were used to collect fish in streams and ponded areas. First, the collecting net was set down-current by stretching the net across the stream and embedding the PVC tubes in the bottom. Second, the crouder net was stretched across the stream 10 to 20 meters (33 to 66 feet) up-current from the first net and slowly walked downstream toward the collecting net. The two nets were then brought together, and the fish trapped between the two nets were removed to a holding bucket using hand-held dip nets.

Each targeted stream was divided into one-kilometer (0.6-mile) sections on United States Geological Survey (USGS) quadrangle maps, ranging from five sections for San Mateo Creek to 10 sections for Cristianitos Creek. Each section was then divided into ten 100-meter (328-foot) long segments. Sample locations were picked randomly for each section, and the biologist then sampled areas suitable for seining. Position and sample locations were labeled according to the section and block number. For example, the label "Section 5.2" refers to Section 5 and Block 2. In streams, two to three samples of between 10 to 20 meters (33 to 66 feet) long were typically collected per one-kilometer (0.6-mile) section. Some areas were seined more than once if the biologist determined that the sample was not representative of the fish fauna at that location. Due to large amounts of herbaceous cover, some sample locations were moved to a more suitable location in the 100-meter (328-foot) block. However, every opportunity was made to collect representative samples of all types of habitat and cover present. Each targeted stream was visually surveyed over its entire length in areas where samples were not collected.

A total of 68 samples was collected from streams and watercourses in the study area. In Cristianitos Creek, seven samples were collected from four sections; Cañada Chiquita,

19 samples from six sections; Cañada Gobernadora, nine samples from four sections; San Juan Creek, 21 samples from eight sections; and San Mateo Creek, 12 samples from four sections. Samples were not collected from every section, due to the seasonal absence of water in many areas.

Lagoon sampling was conducted using a 10-meter (33-foot) long and two-meter (seven-foot) high net with three-millimeter (0.12-inch) square knotless mesh attached to wooden poles on each end with weights along the foot rope and floats along the head rope. Samples were collected by carrying the net to the sample location and then stretching it out 10 meters (33 feet) perpendicular to the intended path with the weighted line on the bottom. The net was then dragged approximately 10 meters (33 feet) through a previously undisturbed area, over approximately a 100-square meter (120-square foot) area. At the end of the path, the net was then raised quickly in a scooping motion to entrap the fish in the bag portion of the net.

San Mateo Lagoon was divided into two sections, inner and outer lagoons, as divided by the Amtrak railroad bridge. A total of 15 samples was collected in the lagoon, eight from the outer lagoon and seven from the inner lagoon. All hauls were made parallel with lagoon orientation. Salinity readings were taken in two locations: one in the outer lagoon and one in the inner lagoon. The readings were taken both near the surface and bottom with a hand-held American optical refractometer.

Each catch was immediately sorted to species and counted. Specimens were returned to the stream or lagoon, with the exception of unusual species and those of uncertain identification. These were preserved in a 10-percent formalin-freshwater solution and returned to the laboratory for positive species identification and, if warranted, retained as a voucher specimen. Sensitive fish species that were identified in the field were immediately released at the capture site.

At the time of the initiation of the 1995 surveys, bridge structures on the Far East alignment at San Onofre Creek were not anticipated. However, after further alignment refinements, impacts to San Onofre Creek are now expected. Surveys of San Onofre Creek were conducted by MCB Camp Pendleton in October and November 1996. See Appendix F for a summary of data on sensitive fishes.

Focused surveys were conducted in 2000 by Bonterra Consulting for the presence of southern steelhead trout in San Mateo Creek (Bonterra Consulting 2001). Four study sites were surveyed using three different methods on 2, 9, and 22 April 2000. Visual observations using polarized glasses while snorkeling, common sense seine netting, and electrofishing using a Smith-Root backpack electrofisher were used to determine if southern steelhead trout were present in San Mateo lagoon and/or upstream.

Initially, the suitable habitat in all study sites was evaluated. Water quality was measured using a Horiba U10 meter following breaching of the barrier berm after high flow events. Observations of southern steelhead trout would be the greatest following breaching of the lagoon berm. However, it has been reported to have broken once from 1998 to 2000 in February 2000 and for only a short time.

The four study sites were located at the San Mateo Lagoon, the southern segment of the San Mateo Creek, Cristianitos Creek, and the northern segment of the San Mateo Creek (Bonterra Consulting 2001).

Sensitive Herptile Surveys

California Red-Legged Frog

California red-legged frog surveys were performed by Mr. Bloom. California red-legged frogs once occupied much of the available habitat in this study area prior to 1970, but have now apparently been extirpated. All wetlands were considered and evaluated for the presence of red-legged frogs. Only appropriate habitat consisting of small ponds, reservoirs, and stream pools with water deeper than 0.6 meter (two feet) was surveyed using USFWS survey protocols for red-legged frogs. Each plausible location was surveyed four times between sunset and midnight and again during the day between 15 March and 15 July 2001 and between 8 May and 26 May 1994. Surveys consisted of listening for vocalizations in March and early April, as well as visual searches at any time for larvae and adults, including the use of flashlights at night to detect adult eye shine. While shallow watercourses had limited potential for California red-legged frogs, all stream habitats were also surveyed simultaneously when surveying for arroyo toads. No California red-legged frogs were observed during any of the surveys.

No focused surveys during 2003 for California red-legged frog were conducted, however, focused surveys for arroyo toads included simultaneously surveying for this species. The locations of the sensitive amphibian species observed are shown in Figure 5.3-3.

Arroyo Toad

Surveys were performed by Mr. Bloom, Mr. Kidd, and Mr. Niemela in 2001. Despite repeated yearly surveys for arroyo toads in southern Orange County and northern San Diego County, the species has only been detected in San Juan Creek, Gabino Creek, Cristianitos Creek, San Mateo Creek, and Talega Creek. Arroyo toad USFWS-protocol surveys were conducted in 2001 only in known occupied arroyo toad habitat, including all of San Juan Creek between the western edge of the Casper's Wilderness Park boundary and Interstate 5 (I-5), lower Gabino Canyon Creek, Cristianitos Creek, and San Mateo Creek in areas where the creeks parallel an alignment of a SOCTIIP build alternative. Other streams including upper Cristianitos Creek, Cañada Chiquita, and Cañada Gobernadora had been surveyed repeatedly between 1987 and 2000 with no arroyo toad encounters. Six surveys were performed on each reach of known occupied streams, unless that segment became seasonally dry, in which case it was presumed occupied due to the positive results of previous surveys. Data obtained from the Marine Corps Base (MCB), Camp Pendleton were also incorporated into this analysis.

Preserve/absence surveys in 2003 were conducted by Mr. Bloom and Mr. Zimmitti in separate surveys. Three surveys were conducted in 2003. Mr. Bloom surveyed on 06 March and 17 May 2003 and Mr. Zimmitti surveyed on 23 April 2003. Following USFWS protocol, all arroyo toad surveys were only conducted in known occupied habitat such as those areas surveyed in previous years. Arroyo toad populations were confirmed, as in past years, in Cristianitos and Gabino Canyons and along portions of San Juan Creek in Trampas Canyon. The locations of sensitive amphibian species observed are shown in Figure 5.3-3.

Orange-Throated Whiptail

The distribution and abundance of orange-throated whiptails in the SOCTIIP study area were determined by transect surveys and pitfall trapping conducted in 2001. The Scientific Review Panel (SRP) guidelines stipulate that a minimum of four surveys per transect be conducted

between April and September, with ambient temperatures ranging from 25 to 50 °C (77 to 122 °F).

Focused surveys for orange-throated whiptail were performed between 28 May and 20 September 1994, and between 19 June and 16 July 1995. Field surveys were conducted under the guidance of Mr. Bloom. Additional biologists who conducted orange-throated whiptail surveys included Ms. Dickerson, Mr. Johnston, Ms. Kinney, and Mr. Ramirez. Mr. Bloom, using the 1994 habitat characterization mapping and color aerial photographs, identified areas of suitable habitat within broader habitat classifications. Transect lengths were then placed in suitable habitat, with no less than 200 meters (656 feet) in transect length by 10 meters (32.8 feet) in width for each four hectares (9.9 acres) of suitable habitat (scrub communities). As recommended by the SRP guidelines, each transect was walked once in each direction during each survey, with no more than 60 minutes expended to complete each 200-meter (656-foot) transect. In addition, although not known to be preferred habitat, representative examples of grassland and riparian vegetation communities were sampled in a similar fashion.

Transects were placed using three deciding factors: (1) proposed alignment, (2) habitat type, and (3) road versus nonroad. Some transect lengths in the survey boundary were extended beyond the limits of the study area in the event that suitable habitats were contiguous with the survey area. This was done to reasonably determine whether the species was present or absent.

Surveys were conducted primarily in scrub communities, as these have been identified as being the most suitable habitat for orange-throated whiptails. As mentioned above, other habitat types were also surveyed. In 2001, under the guidance of Mr. Bloom, 20 transect surveys were performed by Mr. Kidd and Ms. Niemela. Transects were no less than 200 meters (656 feet) in transect length by 10 meters (32.8 feet) in width. All 20 transects were placed south of San Juan Creek. Transects were placed in various habitat types, including a total of four kilometers (2.5 miles) of transects which were walked, including 1,000 meters (3,322.5 feet) of riparian/oak woodland and 3,000 meters (9,967.5 feet) of pure or mixed CSS with variable dominant plants. These transects are shown later in this NES on Figure 5.3-3.

The location of each observed lizard was plotted on topographic maps. Biologists recorded four separate temperatures, which included two ambient, one soil, and one ground (sun) at the beginning and end of each transect survey. In addition to the weather conditions and survey time periods recorded for each transect, data included dominant shrubs, slope, aspect, elevation, presence of roads, and other reptile species observed.

Weather conditions during surveys were always favorable for reptile activity. Orange-throated whiptail surveys were halted if survey conditions became unsatisfactory (temperature, wind, or other factors), and an attempt was made another day. Surveys began at various times during the day, depending on the initial ambient temperature.

Presence/absence surveys in 2003 for herptiles were conducted by Mr. Bloom during focused raptor surveys. Six surveys were conducted from 9 May to 18 June in Donna O'Neill Land Conservancy, upper and lower Cañada Gobernadora, San Juan Creek, and Cristianitos Canyon. Surveys were conducted in scrub and riparian areas north and south of Ortega Highway along ridgelines, slopes of canyons, and along riparian corridors. Locations of individuals were recorded on aerial and topographic maps and field data sheets. The locations of sensitive amphibian species observed are shown in Figure 5.3-3.

Other Herptiles

Surveys for other sensitive amphibians and reptiles, such as western spadefoot toad, San Diego horned lizard, and red-diamond rattlesnake, were conducted concurrently with other focused surveys and during herptile transect walking. Western pond turtle sites were surveyed during arroyo toad and red-legged frog surveys, and also opportunistically during other visits to ponds or other suitable wetland features onsite. The locations of sensitive amphibian species observed are shown in Figure 5.3-3.

Sensitive Bird Surveys

Surveys for 14 sensitive (nonraptor) bird species, as well as other common species, were conducted in the survey area in 2001. Focused surveys for threatened and endangered bird species were conducted in 2003, along with those for other sensitive and nonsensitive avian species. The methods and results of sensitive raptor surveys are discussed separately below. These surveys were conducted at various levels of intensity, depending on the species, habitat type, and USFWS protocol. While conducting sensitive bird surveys, common birds were taxonomically identified down to species or subspecies through standard visual and auditory recognition. Biologists estimated the relative abundance of each species observed and noted any evidence of breeding activity. During the 2001 and 2003 surveys, use areas were observed and recorded. A use area is an area where the presence of any life stage (such as fledgling, juvenile, adult, or breeding pair) is observed during surveys for avian species other than raptors. A representative list of bird species within all habitat types was compiled from field notes taken during sensitive species surveys. Data from the 1998 NES were reviewed. Data from southwestern willow flycatcher surveys (1999) and least Bell's vireo surveys (2000) conducted on MCB Camp Pendleton by AC/S Environmental Security were also incorporated into the analysis.

Riparian and Freshwater Marsh Bird Surveys

Riparian and freshwater marsh habitats within the study area were surveyed for the presence/absence of seven sensitive species: least Bell's vireo, southwestern willow flycatcher, western yellow-billed cuckoo, western least bittern, yellow warbler, yellow-breasted chat, and tricolored blackbird. Due to a general overlap in habitat suitability, the potential status of each of the above species in the study area was assessed during the focused surveys for the least Bell's vireo and southwestern willow flycatcher. Riparian and freshwater marsh bird surveys were conducted under the direction of Mr. Willick.

Least Bell's Vireo Survey. Survey methods for the least Bell's vireo (LBV) were consistent with protocol recommended for this species by the USFWS, as amended on 19 January 2001. Surveys for the LBV were conducted between 10 April and 27 July during the 2001 season and between 11 April and 14 July during the 2003 season. LBV surveys were conducted in Cañada Chiquita, Cañada Gobernadora, in San Juan and Cristianitos canyons, and along portions of San Diego, Aliso, and Oso creeks adjacent to I-5. Surveys were initiated in San Mateo Creek, but were discontinued when it was learned that this area was being monitored in association with biological studies being conducted on MCB Camp Pendleton. All areas in the study area known to support suitable habitat for the LBV were surveyed, as well areas considered to be marginally suitable for this species. Suitable habitat for the LBV includes dense, lowland riparian vegetation, often of early to middle successional stages. Willows typically provide the dominant tree cover, although a dense understory consisting of mule fat, young willows or various riparian shrub species are critical for nest placement. Marginal habitat included those areas where one

or more components typical of LBV breeding habitat, such as vegetative composition, and the extent and structure of the habitat, was either missing or poorly represented.

All areas were surveyed eight times, with minimum intervals of ten days between visits. The surveys were conducted by avian biologists with experience in field identification of the LBV and other southern California riparian birds, as well as experience with LBV song and calls, breeding habitat characteristics and nesting habits. Suitable habitat was surveyed on foot by walking slowly and methodically along predetermined routes. Frequent stops were made to listen for diagnostic songs and calls of this species, although no taped-recorded vocalizations were played (as restricted by federal survey protocol for the LBV). If LBVs were recorded during the surveys, field investigators attempted to determine whether these detections represented pairs, unpaired territorial males, transient individuals, or fledglings. Information on general habitat characteristics was recorded on field forms and marked on color aerial photographs.

The surveys were conducted during weather conditions considered favorable to bird activity and were suspended whenever conditions became less than optimal for bird detection (e.g., periods of rain or dense fog, strong winds, or exceptionally hot or cold temperatures). Surveys were performed during morning hours, or rarely into early afternoon if weather conditions were suitable. LBV survey dates and personnel are included in Appendix B.

Southwestern Willow Flycatcher Survey. Surveys for the southwestern willow flycatcher (SWF) were completed in the study area during 2001 in areas of potentially suitable habitat. Surveys were also conducted in 2003 for SWF in suitable habitat in RMV. Suitable habitat for the SWF includes dense, well-developed riparian vegetation with surface water or saturated soils occurring in the immediate vicinity. It typically includes an overstory of willows and occasionally other riparian trees, with a mosaic of dense, understory species. Marshy openings are often present, with such vegetation as sedges, rushes, nettles and other herbaceous wetland species. Nesting SWFs are not known to occupy linear riparian habitats that are less than 10 meters (32.8 feet) in width. Due to overlap in habitat suitability, the SWF surveys were conducted in conjunction with those for LBV. However, due to the somewhat more specific habitat characteristics preferred by the SWF (e.g., broad riparian corridors and presence of surface waters), some of the areas considered marginally suitable for the LBV were not considered to be suitable breeding habitat for the SWF. Surveys that conformed to both SWF and LBV survey protocol were conducted in portions of Cristianitos Canyon, San Juan Creek, and Cañada Gobernadora.

The SWF surveys were performed by biologists in possession of permits authorizing survey activity for this species. Survey methods conformed to protocol guidelines established for this species by the USFWS, as amended on 11 July 2000. To satisfy survey protocol for the SWF, five surveys are conducted between 15 May and 17 July 2001. The protocol survey is broken into three survey periods, with three of the site visits completed during the last period (21 June to 17 July 2001). During each survey, recordings of SWF vocalizations are occasionally played to assist in the detection of this species. If any SWFs are detected, recordings are immediately discontinued.

Site visits were conducted during weather conditions considered favorable to bird activity and were suspended whenever conditions became less than optimal for bird detection (e.g., periods of rain or dense fog, strong winds, or exceptionally hot or cold temperatures). Surveys were generally started between 5:30 and 6:00 a.m. and completed by 10:00 to 10:30 a.m. All SWF surveys in 2001 were conducted by Mr. Moore, whose survey dates are included in Appendix B.

During 2003, surveys for SWF in RMV were conducted from 22 May through 28 August 2003. Surveys were conducted in riparian areas along Cañada Gobernadora and San Juan Creek. In Cañada Gobernadora, six surveys were made from 6:00 to 10:30 AM and along San Juan Creek from 5:45 or 6:00 to 10:30 AM. These surveys were in conjunction with LBV surveys, since these two species inhabit similar habitats.

Scrub Community Bird Surveys

Scrub habitats within the study area were surveyed for the presence/absence of four sensitive bird species: coastal California gnatcatcher, coastal cactus wren, Bell's sage sparrow, and southern California rufous-crowned sparrow. Due to a general overlap in habitat suitability, the potential status of each of the above scrub community species in the study area was assessed during the focused surveys for the California gnatcatcher.

Coastal California Gnatcatcher. Surveys for the California gnatcatcher (CG) were conducted during 2001 in areas of suitable habitat throughout the study area by biologists permitted to conduct surveys for this species. Surveys in 2003 for the CG were confined to areas not previously surveyed and in accordance with the potential locations of new alignments such as Donna O'Neill Land Conservancy, Trampas Canyon, new portions of San Juan Creek, lower Cañada Gobernadora, and lower Cañada Chiquita. Field surveys were conducted under the direction of Mr. Willick. Survey methodology followed protocol established for this species by the USFWS, as revised on 28 July 1997, for jurisdictions participating in the NCCP interim section 4(d) process. According to this protocol, all suitable habitat is surveyed a minimum of three times, with minimum intervals of at least seven days between visits. No more than 40 hectares (100 acres) of potential CG habitat is surveyed per day by each biologist. As with the other focused bird surveys, site visits were conducted during weather conditions considered favorable to bird activity and were suspended whenever conditions became less than optimal for bird detection (e.g., periods of rain or dense fog, strong winds, or exceptionally hot or cold temperatures).

Suitable habitat for the CG includes coastal sage scrub that is typically dominated by California sagebrush and/or California buckwheat. Prickly pear cactus and several other small to medium sized shrubs are also frequently present (e.g., California bush sunflower, white sage, coyote brush, broom baccharis and laurel sumac). In general, the height of the dominant plant species in scrub subassociations occupied by the CG is one meter (3.3 feet) or less. CG surveys covered all scrub community subassociations that were considered suitable for this species, including many areas considered marginally suitable. Marginal habitat for the CG included those areas where one or more components typical of CG breeding habitat, such as vegetative composition and the extent and structure of the habitat, was either missing or poorly represented.

Biologists surveyed areas of potential habitat by walking slowly and stopping occasionally to play recordings of CG vocalizations. Recordings were generally played at intervals of approximately 60 meters (200 feet) or less, depending on topography and vegetative structure, to achieve maximum coverage. When CGs were found, recordings were immediately discontinued. All CG detections were recorded and their use areas mapped in the field on color aerial photographs. During each CG encounter, attempts were made to determine whether these represented adult pairs, family groups, unpaired individuals or fledglings. No attempt was made to determine the territorial boundaries of CGs detected during this survey. Information on general habitat characteristics was recorded on field forms. CG survey dates and personnel are included in Appendix B.

Grassland Bird Surveys

During 2001, grasslands within the study area were surveyed for the presence/absence of three sensitive bird species: California horned lark, loggerhead shrike, and grasshopper sparrow. As grasslands in the study area are typically in close proximity to scrub communities, the status of grassland birds was generally assessed during the completion of scrub community surveys. Vocalizations and observations of grassland birds were mapped in the field on color aerial photographs. Surveys were conducted during weather conditions considered favorable to bird activity and were suspended whenever conditions became less than optimal for bird detection (e.g., periods of rain or dense fog, strong winds, or exceptionally hot or cold temperatures). The primary biologists conducting grassland bird surveys during 2001 included Mr. Willick, Ms. Hertzog, Mr. Leatherman, and Mr. Pike. During 2003, surveys were conducted for presence/absence of previously surveyed species and in new locations throughout RMV.

Sensitive Mammal Surveys

Pacific Pocket Mouse

Focused trapping surveys for the Pacific pocket mouse were conducted in 1995, 1996, 2001, and 2003 (Table 3.2-2). In 2001, 3,750 trap-nights were completed. A trap-night is defined as one trap set out for one night, thus, a line of 100 traps set out for one night equals 100 trap-nights. The trapping effort in 2001 included approximately 59,000 trap-nights (the total number of traps set during the entire survey period) in 1995 and 1996. Appendix B lists the survey dates and biologists who performed the small mammal trapping effort. All individuals collected during this survey effort were recorded.

SJM Biological Consultants (SJMBC) inspected available project maps prior to the 2001 survey program to determine what segments of the SOCTIIP build alternatives occur inside an approximately 6.4-kilometer (four-mile) distance from the Pacific Ocean. Pacific pocket mice have not been reliably reported more than 4.0 kilometers (2.5 miles) from the ocean (USFWS 1998a). However, it is not unreasonable to assume that unknown populations could potentially occur somewhat farther inland than this known distance. Therefore, an additional distance of 2.4 kilometers (1.5 miles) (total 6.4 kilometers (four miles)) was included in the survey area for the current SOCTIIP assessment, as a conservative guard against missing extant populations of this species.

Alignments occurring within the 6.4-kilometer (four-mile) limit were inspected in the field for potentially suitable Pacific pocket mouse habitat, during driving and walking surveys on 27 April and 29 May 2001. These alternatives included the westward segment of the southwest leg of the CC Alternative, which encompasses habitats along Avenida Pico; and the southerly segment of the FEC Alternative, which encompasses habitats west of Cristianitos Road, excluding the FEC-CV and FEC-AFV alignments.

Potentially suitable Pacific pocket mouse habitat was considered to generally include the following features (USFWS 1998a):

- Fine-grain sandy, loamy-sand, or sandy-loam soils.
- Sage scrub or grassland vegetation, coastal strand or coastal dune habitats, and river alluvium habitats.

- Level to gently sloping topography, possibly with steeper slopes adjacent to the more level terrain.

Following the determination of those segments of the SOCTIIP build alternatives considered to exhibit at least some potential for Pacific pocket mice, a trapping program was initiated at the San Mateo North Pacific Pocket Mouse Population site, which is immediately west of Cristianitos Road and approximately 0.6 kilometer (1/3 mile) east of I-5. The purpose of this initial trapping effort was (a) to confirm that Pacific pocket mice were active aboveground at the time of the proposed summer 2001 trapping effort in potentially suitable habitats, and (b) to determine the current limit of population distribution at the known occupied (i.e., San Mateo North) Pacific pocket mouse site. It was concluded that, if this trapping effort at the known occupied site confirmed Pacific pocket mouse activity to be low (or produced very low numbers of the species), then trapping for presence/absence at other sites not previously found to harbor this species (e.g., see MBA 1997) would be inconclusive.

A total of 520 Sherman collapsible standard-size live-traps was set out at a total of 11 localities in and near the known Pacific pocket mouse population, between 4 and 9 June 2001. Within the general trapping area, all traps were placed in microhabitats considered most likely to harbor Pacific pocket mice. Traps were baited with a millet-dominated commercial birdseed and set in the late afternoon, checked for the first time near midnight, and checked and closed the following morning by approximately 8 AM. All captured animals except Pacific pocket mice were identified to species and released unharmed at the point of capture. Captured Pacific pocket mice were identified, marked (by toe clipping), and released where trapped. These general methods follow established USFWS trapping protocol. Trapping was conducted by Stephen J. Montgomery and Shana C. Dodd, both permitted by the USFWS and CDFG to trap and handle Pacific pocket mice.

This initial trapping effort, comprising a total of 2,600 trap-nights, produced only two Pacific pocket mouse individuals, confirming one or more of the following: (1) Pacific pocket mice were minimally active aboveground during the June trapping effort; (2) Pacific pocket mice were very low in numbers during the June trapping effort; and/or (3) Pacific pocket mice were minimally attracted to traps during the June trapping effort. Due to the small number of Pacific pocket mouse captures, a follow-up trapping effort were performed in July, to reconfirm the status of Pacific pocket mice activity at the known occupied site; the results of this trapping effort were similarly inconclusive.

A simultaneous (June 2001) five-night (5,000-trap-night) trapping effort was conducted at the Dana Point Headlands occupied Pacific pocket mouse site by the USFWS. This study also produced very few Pacific pocket mice, suggesting that Pacific pocket mouse activity might be low throughout the range of the species (Mark Pavelka, USFWS, personal communication, 2001).

During a subsequent meeting of Pacific pocket mice biologists at the USFWS office in Carlsbad (13 June 2001), the low trap results at Dana Point and San Mateo North were discussed. It was agreed that a July follow-up trapping effort was warranted at both sites, to assess the status of Pacific pocket mice during a second time period in 2001.

The follow-up four-night trapping survey at the San Mateo North Pacific pocket mice site was conducted 2 to 6 July 2001, in the area encompassed by Trap Area 1 during the initial (June 2001) trapping study. This effort used a total of 225 Sherman live-traps set out for four nights (total of 900 trap-nights) at the previously trapped Trap Site 1. The purpose of this trapping

effort was to reconfirm the level of Pacific pocket mouse activity in the habitat area known to be occupied by this species. It was assumed that if this trapping effort found Pacific pocket mice to be more active/abundant/trappable, then additional presence/absence trapping surveys would be carried out in the potential Pacific pocket mouse habitats previously identified along the Far East and Central alternatives. Methods used in this trapping study were identical to those described above for the initial June 2001 trapping study.

The follow-up July 2001 trapping effort resulted in the capture of one of the Pacific pocket mice captured in the initial June trapping study. This result confirmed that Pacific pocket mice activity/abundance/trappability was still extremely low in July, and that additional presence/absence trapping would be inconclusive.

A subsequent trapping study was conducted in the recently (spring 2001) burned area immediately south of the known occupied Pacific pocket mice population site. This burn site trapping area was not encompassed by either the initial June 2001 or the follow-up July 2001 trapping studies described above. The burn site trapping effort was part of a long term Pacific pocket mice habitat manipulation (controlled burn) monitoring study conducted by MCB Camp Pendleton. Trapping in the burn area occurred between 9 and 14 July 2001, utilizing a total of 250 Sherman live-traps set for five nights. No Pacific pocket mice were captured during this effort.

The very low number of Pacific pocket mouse captures during the two SOCTIIP trapping studies, as well as the absence of captures in the subsequent burn area trapping study, confirmed that Pacific pocket mouse activity was extremely low at the known San Mateo North Pacific pocket mouse population site. As a result, additional trapping studies in 2001 for the SOCTIIP were considered unwarranted and were abandoned.

In the absence of additional trapping studies, a habitat assessment was conducted in the coastal parts of the potentially occupiable areas of the CC and FEC alternatives. The only localities in the SOCTIIP study area considered to be potentially occupied by PPM were those within approximately 6.4 kilometers (four miles) of the coastline, in the CC and FEC alternatives. All of these localities were inspected in the field for habitat conditions suitable for PPM. Only those areas exhibiting sandy-loam or loamy-sand soils, at least some localities with bare ground, and relatively gentle topography, were considered potentially occupiable by PPM. Thus, habitats with loam- or clay-dominated soils, or areas with a complete thatch (persistent and dense growth) of nonnative grasses and no open ground, were considered generally unsuitable for this species. Very steep topography also was not considered suitable for PPM during the habitat assessment.

The most suitable habitat for PPM within the SOCTIIP area occurs in the area around and immediately north of Cristianitos Road, in the more coastal portion of the Far East Alignment. Habitats in this region exhibit at least some areas of the sandy-loam or loamy-sand soils typically preferred by PPM. With the exception of the known San Mateo North PPM population, previous trapping efforts failed to locate PPM in both the Far East and the Central Alternatives.

Natural Resources Assessment, Inc. (NRA) conducted surveys in 2003 in the southernmost portion of the SOCTIIP survey area. NRA conducted a site reconnaissance with USFWS to refine the geographic area to conduct trapping. A total of 12 trap sites was selected during this assessment. Two trapping sessions (a total of 10 nights) began on 4 September and continued until 14 September 2003.

Sherman traps baited with a mixture of birdseed and mullet were placed in a trap line. Each trap line consisted of 30 to 40 traps of 30 centimeters (12 inches) which were placed five meters (16.4 feet) apart. Traps were baited, opened, and results were recorded each night. Records were kept on a daily basis and included the location of traps, topography, soil, weather conditions, and overall habitat.

Owl Pellet Analysis

In 1994, the presence of the Pacific pocket mouse was evaluated by examining owl pellets in the survey area of the previously evaluated Far East and Central alignments. Regurgitated owl pellets were collected from 27 barn owl nests and roost sites within 3.2 kilometers (two miles) of the Far East and Central centerlines (as defined in 1994), and their contents were analyzed for the presence of Pacific pocket mouse. Most owl pellet collections occurred in the vicinity of the Far East alignment, due to the historical presence of barn owl nests and roost sites in this area. A total of 2,035 owl pellets were examined to determine the presence of Pacific pocket mouse.

Bat Habitat Evaluation

The potential of the SOCTIIP survey area to support sensitive bat species was evaluated by Dr. Patricia E. Brown of Brown-Berry Biological Consulting (BBBC). Surveys for bats were conducted in 1996 and 2001. Survey sites were selected that represented the range of habitat types in the FTC-S study area, with more emphasis placed on water sources and riparian areas that would provide better foraging opportunities. Consideration was also given to ease of access via roads and hiking trails, because the areas needed to be safe to walk in after dark by field personnel carrying mist net poles, computers, and bat detectors. Please see Appendix G for details regarding bat surveys and the methodologies employed.

In addition to visually observing suitable foraging and roosting sites in the survey area, an electronic, ultrasonic, bat detector (Anabat) was used to record any bat species present during the field visits. The Anabat was placed in appropriate bat foraging habitat and under potential bat roost trees. The Anabat, when coupled with a delay switch and tape recorder, allowed for the remote recording of real-time bat signals with a time stamp. Mist nets were also employed during the surveys; these were spread across water sources or potential bat flight corridors. Dr. Brown also used a computer system linked to the Anabat detector to directly analyze and store bat signals.

During the 1996 survey, Anabats were placed throughout appropriate habitats during May, June, and July. Mist netting was also performed in May and July.

Most of the 2001 survey effort was concentrated in areas not sampled in the 1996 surveys (Alignment 7) or in those areas on the Far East alignment where bat activity had been concentrated during the 1996 surveys. These surveys were updated in 2001. Surveys conducted in 2001 took place between 8 May and 15 July and were supervised by Ms. Brown and Ms. Remington.

3.2.2.3 Surveys for Wildlife Corridors

The general purpose of the 1995 wildlife corridor study was to identify wildlife corridors (Figure 5.2-1) within or adjacent to the proposed alignments and determine any impacts that each alignment could have on wildlife movements in the area. Impacts to wildlife corridors are discussed for each alignment in Section 7.0 (Table 7.1-1).

Study Objectives

Specific objectives of the study included the following:

- Confirm and monitor the use of known or suspected wildlife corridors (particularly those of mountain lions) as identified by Beier and Barrett (Beier and Barrett 1993), located within or adjacent to any of the alignments.
- Identify and evaluate other possible wildlife corridors within or adjacent to any of the alternatives that have not been previously identified.
- Determine the target species using these areas and quantify overall movement by these species during the study period.
- Determine the overall value of known or suspected wildlife corridors based on target species movement and use, overall habitat linkage, and various geomorphological and biological factors (e.g., vegetative cover, width/length, topography, presence of water).
- Evaluate overall regional habitat linkage between permanent open space areas adjacent to or in the vicinity of any of the alignments.
- Identify which known or suspected wildlife corridors exist between permanent open space areas, given expected future habitat conversion and fragmentation in the study area as a result of proposed development, including any of the alignments.
- Determine how the implementation of any of the alignments will affect known or suspected wildlife corridors within or adjacent to the study area.
- Develop measures to mitigate potential impacts on these wildlife corridors.

Study Assumptions

The study area within which wildlife corridors were identified and evaluated, and in which regional habitat linkage of permanent open spaces was analyzed, includes the area roughly bounded by the Rancho Santa Margarita development to the north, the cities of Mission Viejo and San Juan Capistrano to the west and northwest, the City of San Clemente and MCB Camp Pendleton to the south, the border between Orange and San Diego counties to the east, and Cleveland National Forest to the northeast. The wildlife corridor study was conducted under the following assumptions:

- Ongoing development continues to convert natural habitats and reduce open space areas in the immediate region surrounding the study area. However, enough relatively undisturbed open spaces exist between the permanent open space areas in the region (Casper's, O'Neill, and Thomas F. Riley parks; Audubon Starr Ranch Sanctuary; Donna O'Neill Land Conservancy; MCB Camp Pendleton; and Cleveland National Forest) that wildlife corridors do not presently exist.
- In the absence of wildlife corridors between open space and large habitat areas, the target wildlife species tend to use wildlife corridors with landscape features that provide some amount of cover, food, and water, and the least amount of topographical resistance to the movement. Wildlife, especially the larger and more mobile species, also tend to move

between open space areas in the most direct route possible, given the availability of suitable land features. Landscape features within the study region that generally tend to be used by the species include ridgelines, canyons, drainages, and riparian areas (creeks, rivers, and streams).

- Mammal movement in this region of the state is not migratory; therefore, within the study area, terrestrial wildlife movement is generally associated with animal dispersal into and out of home range areas, as well as general movement within home ranges.
- Within the study area, certain landscape features are known to serve as wildlife corridors for mountain lions, one of the largest target species for the study. This information is based on a five year radio telemetry study on these animals conducted in Orange County (Beier and Barrett 1993). These wildlife corridors served as the basis for this study.
- Because Cañada Chiquita, Cañada Gobernadora, and San Juan Creek are geographically large and have been previously identified as major wildlife corridors, camera and/or track plate stations were located within these landscape features on smaller drainages that were not previously documented or well known as movement areas.
- Not all wildlife species require habitat linkages or wildlife corridors to remain viable, and the study of wildlife corridors must identify target species that the presence/preservation of wildlife corridors is intended to serve and/or benefit. The eight target species identified for this study (bobcat, coyote, deer, grey fox, mountain lion, opossum, raccoon, and striped skunk) were selected because (1) they are the most common of the more mobile mammals likely to use the existing or future wildlife corridors in the region, (2) the movement patterns of these species were representative of the patterns of most other relatively mobile animal species likely to use the wildlife corridors on a regular basis, and (3) measures taken to provide for the movement and habitat linkage needs of these species will likely benefit numerous other species as well.
- A more thorough identification and evaluation of wildlife corridors in the project region would require a more extensive study than was possible under current constraints and resources. Some animal species with very large home ranges, such as the mountain lion, may only pass through the project area or use certain wildlife corridors a few times a year. However, it is assumed that the data obtained from this relatively short-term study provide a “snapshot” of wildlife movement in those areas potentially affected by the project that, in addition to information from other movement studies of the area, can be used to project long-term use.

Data Collection

Two methods were used to characterize and quantify wildlife corridors at selected locations within the study area. These methods included the use of remote movement triggered cameras and track plate collection stations (Figure 5.2-1). Both methods were used, because one method by itself may not be as effective in recording the presence of target species likely to use the study area. Each data collection method is described below.

Because one of the objectives of the study was to verify and quantify the use of known or suspected wildlife corridors, the camera and track plate stations were placed in locations within wildlife corridors (ravines, drainages, canyons) previously identified by Beier and Barrett (Beier and Barrett 1993) and MBA (MBA 1992) as used by mountain lions and other target species.

This study, along with other related studies (NCCP 2003), focused on those wildlife corridors most likely to be affected by any of the SOCTIIP alignments.

Camera Stations

Eight camera stations were set within the study area. Each station was equipped with a Trail Master TM1500 infrared transmitter, a monitor/receiver, and a weatherproof automatic Olympus camera. The transmitters and receivers were set up at distances between nine to 18 meters (30 to 39 feet) from each other at the stations. When an animal passed through the infrared light beam between the transmitter and receiver, the broken beam triggered the camera to take a photograph and directed the monitor/receiver to record the "event", specifying time and date. The camera and monitor/receiver automatically reset after two minutes.

An open can of cat food was staked underneath the infrared light beam at each camera station to lure animals that might be passing through the wildlife corridor to the station. Data (number of events and time/date for each event) were collected from the monitor/receivers approximately two times per week. The film was collected from the cameras when the roll was complete or when the number of pictures taken had reached 20, whichever came first.

Track Stations

Eleven track plate stations were set within the study area. Nine of the track stations were placed near the camera stations (at a distance of at least 30 meters) (98 feet) within previously identified wildlife corridors; the remaining two plates were placed in other potential wildlife corridors (ravines, drainages, canyons) that were not previously identified as such.

Each track station consisted of an aluminum plate (one by one meter) (3.3 by 3.3 feet) coated with blue chalk and alcohol solution sprayed evenly on top of the plate. These plates were placed on the ground in a location relatively free of blowing grass and branches that would otherwise scrape the coated surface of the plates. If necessary, the ground was raked and cleared of debris before the plate was placed on the ground. An open can of cat food was nailed to the center of the plate to attract wildlife using the wildlife corridor to the track station. Animals attempting to sniff or eat the cat food left a distinct track print in the chalk. Tracks that could not be identified in the field were lifted off the track plate with the use of clear tape and adhered to the back of the data sheets for later identification and reference. Data from the track plate stations were collected at the same time as collection for the camera stations. The track plates were reset after each data collection period by dusting off the chalk and recoating each plate.

3.3 SURVEY DATES AND PERSONNEL

3.3.1 PLANT COMMUNITY MAPPING AND NONSENSITIVE PLANT INVENTORY

Plant community mapping was conducted between 3 July and 20 December 1995, on 2 January 1996, between 17 January and 2 August 2001, and between 22 March and 19 June 2003. Appendix B.2 lists the plant community mapping survey dates and the biologists who performed the surveys. An inventory of plant communities and coverage in the biological survey area was assessed using GIS software (Table 5.0-1).

3.3.2 SENSITIVE PLANT SURVEYS

Sensitive plant surveys were conducted between 22 March and 29 December 1995, 17 January and 1 May 1996, between 13 March and 31 August 2001, and between 22 March and 19 June 2003. Appendix B.2 lists the sensitive plant survey dates and the biologists who performed the surveys.

3.3.3 NONSENSITIVE WILDLIFE SURVEYS

Surveys for nonsensitive wildlife species were conducted during focused searches for sensitive wildlife. Refer to Appendix B.2 for the dates and times when these surveys were conducted.

3.3.4 SENSITIVE WILDLIFE SURVEYS

Focused searches for sensitive wildlife species were conducted in 2003 and 2001, and also 1995 and 1994. Appendix B.2 lists the survey dates, the species searched for, and the biologist(s) that performed the survey.

3.4 LIMITATIONS AND CONSTRAINTS

The analyses performed here are intended to be detailed enough to permit informed decision making and public participation relative to the selection of a SOCTIIP preferred alternative. There are three SOCTIIP build alternatives (FEC with six variations, CC with three variations, A7C with seven variations, arterial improvements, arterial improvements with I-5 improvements, and I-5 widening) with 19 permutations. In turn, each of the corridor alternatives has an initial (four-lane) and ultimate (six- to eight-lane) alternative. Given the scale of the study area, the biological resources present, and the number of alternatives considered, the assessment required a flexible yet focused study design. This challenge was further compounded by the need to assess the entire lengths of all build alternatives. The study methods used were designed to effectively identify and address these issues and the potential constraints they presented.

The first and most crucial element of the study design was the need to establish an appropriate and meaningful survey area based on biological criteria. Although the survey area varies in width and extent, in no case was the survey area boundary less than 0.40 kilometer (0.25 mile) on either side of the centerline of all corridor alignments. The survey area boundary for the arterial improvements was 151 meters (500 feet) from the edge of future projected improvements and the survey area boundary for the I-5 widening was 60 meters (200 feet) and, in some cases where native habitat was present adjacent to I-5, 151 meters (500 feet). From a biological perspective, this was established as the minimum survey width for which all biological resources and potential impacts were likely to be addressed. In many cases, however, a biological survey area extended well beyond 0.40 kilometer (0.25 mile) on either side of the centerline so that other biological resources, such as wildlife corridors, can be evaluated on a landscape level. This was done to include an examination of potentially far-reaching and long-term impacts such as habitat fragmentation or downstream effects, which must be addressed in a broader spatial and temporal context. In this regard, the study provides a thorough and focused assessment of the entire area potentially affected.

Next, the survey methods considered the benefits of multiseasonal analysis, between 1994 and 2001. In 1994, a habitat characterization was conducted followed by focused spring surveys for selected amphibian, reptile, bird, and mammal species. This provided not only the opportunity to

collect multiple years of data on the selected species, but it also allowed for in-depth evaluation of habitats for each of their respective taxonomic groups, as well as plants. In turn, the 1994 efforts provided a highly accurate basis for scoping subsequent work. In 1995, 1996, part of 1997, and 2001 an extremely comprehensive survey was accomplished using intensive survey methods. These surveys included detailed plant community identification and mapping, general plant and wildlife surveys, wildlife corridor analysis, and focused surveys for sensitive species. Further, these surveys were conducted at optimal times of the year, on a species-specific basis, when detectability was highest. This approach minimized potential errors in the assessment that could otherwise result from variations in biological activity over time.

Surveys in 1995 and 2001 were conducted in below average rainfall years (1996 and 1997 were above average rainfall years). This could provide a limitation to the assessment of project impacts on biological resources. However, rainfall in 2001 was slightly below average and was substantially higher than during the two years that preceded the 2001 surveys. Based on the number and diversity of rare plant populations and common annual plant species observed in 2001, in particular when compared with the paucity of common annual plants observed in the general project vicinity in 2000 and 2002, the below average precipitation does not appear to be a serious limitation to the study. Rather, the biological resources information obtained from surveys conducted from 1994 through 2001 provides a comprehensive baseline for the determination of biological constraints of each alternative (e.g., there is a clear understanding of the sensitive biological resources for which focused preconstruction surveys would need to be conducted for the selected preferred alternative).

In addition, the focused surveys sought information on the presence and absence of an extremely wide range of sensitive species. These were identified using a wide range of up-to-date sources including literature, individual researchers' expertise and experience, and consultations with Caltrans, CDFG, and USFWS biologists. In cases where established survey protocols existed, they were adhered to. For species that lacked formal survey protocols, proposed methods were approved by Caltrans, CDFG, and USFWS prior to implementation. There are no established USFWS or CDFG survey protocols for plant species. However, USFWS general guidelines for conducting surveys for listed, proposed, and candidate plants were followed (<http://ventura.fws.gov/SurveyProt/Botanicalsurv.htm>). In addition, CDFG and CNPS guidelines for conducting sensitive plant species field surveys were also followed, as mentioned previously in Section 3.2.1.2. By virtue of this focused, comprehensive approach to sensitive species, the assessment was able to consistently rely on factual, empirically derived data with data extrapolation being minimized.

Lastly, the assessment was guided by the leadership of recognized experts in each of the component survey efforts. In turn, the participants under the direction of experts were each highly qualified and experienced in their individual tasks. This allowed the assessment to achieve a very high degree of scientific integrity.

GIS was used for all direct impact calculations and habitat quantification. As described above, GIS coverages of the biological resources were prepared. The areas of project impact are based on an evaluation of 50-meter (164-foot) scale maps depicting road and remedial grading, right-of-way, and new ranch and utility roads for the alternatives provided in a digital format by the Corridor Design Management Group (CDMG). An impact analysis was conducted by intersecting the impact area with individual coverages, or multiple coverages, as necessary. Use of GIS as a tool for this purpose greatly enhanced the accuracy and power of the assessment.

This survey effort sought to minimize survey limitations and problems typically encountered in an assessment of this magnitude and nature; however, survey limitations are intrinsic to nearly any scientific investigation and are often unavoidable in such a broad study. Indeed, the collection of biological field data is normally subject to environment phenomena that cannot be controlled or reliably predicted. Consequently, the interpretation of field data must be conservative and consider the uncertainties and limitations necessarily imposed by the environment. However, because of the experience and qualifications of the field investigators involved, and the general availability of repeated survey data collected over different years/seasons, these limitations are not expected to markedly influence the survey's findings or profoundly change the determinations based upon them.

The 2003 surveys were conducted according to all appropriate USFWS protocols. Due to location of new alternatives proposed in RMV north and south of Ortega Highway, surveys were conducted in upper and lower Cañada Gobernadora, and Trampas, Talega, Cristianitos, and Gabino canyons. New placement of alignments was not determined at the time of surveys, therefore, locations of 2003 surveys followed methods of previous years and the RMV database of observed sensitive species locations. Transects were decided from initial driving through potential habitat, then surveys were conducted in suitable and potential habitat. Additionally, due to procedures and accessibility into RMV, surveys may have been postponed and rescheduled or completed at variable times. The vast expanse of habitat not previously surveyed also resulted in more presence/absence surveys, rather than focused quantitative surveys.

3.5 DEFINITIONS

Adjacent	Bordering, contiguous, or neighboring. Wetlands separated from other waters of the U.S. by man-made dikes or barriers, natural river berms, beach dunes and the like are "adjacent wetlands."
Annual	An organism that completes its life cycle from birth or germination to death within a year.
Assemblage	A set of organisms whose pattern of organization (with respect to competition, predation, mutualism, etc.) is unknown.
Association	A particular type of plant community that has been described sufficiently and repeatedly in several locations such that it is considered to have (1) a relatively consistent floristic (species) composition, (2) a characteristic physiognomy (growth form or structure), and (3) a distribution that is characteristic of a particular habitat (Barbour et al. 1987).
Biodiversity	(1) The variety of life forms, the ecological roles they perform, and the genetic diversity they contain; (2) the variety from molecular, population, and interspecific levels up to the heterogeneity of ecosystems and landscapes (syn. biological diversity).
Biogeography	The study of the geographic distributions of organisms, both past and present.

Biological Resources	Includes genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity, e.g., breeding animals and plants, trees used for forestry, game animals gathered by hunters, herbs harvesting, and fishing. Some biological resources are the components of biological diversity of natural ecological systems (tree and ground flora species in forest ecosystems and fishes in aquatic ecosystems). Others are bred in isolation from the open ecological systems (farm and laboratory breeding).
Boulder	Rock fragments larger than 60.4 centimeters (24 inches) in diameter.
Brackish	Marine and Estuarine waters with Mixohaline salinity. The term should not be applied to inland waters.
Broad-Leaved Deciduous	Woody angiosperms (trees or shrubs) with relatively wide, flat leaves that are shed during the cold or dry season.
Broad-Leaved Evergreen	Woody angiosperms (trees or shrubs) with relatively wide, flat leaves that generally remain green and are usually persistent for a year or more.
California Fully Protected Species	Those species protected by special legislation for various reasons, such as the mountain lion and white-tailed kite.
California Native Plant Society (CNPS)	<p>The CNPS is a local resource conservation organization that has developed an inventory of California's sensitive plant species (Skinner and Pavlik 1994). This inventory is the summary of information on the distribution, rarity, and endangerment of California's vascular plants. This rare plant inventory is comprised of the following lists.</p> <ul style="list-style-type: none">• List 1A plant species are extinct in California because they have not been seen in the wild for many years. CNPS considers List 1B plants as rare, threatened, or endangered throughout their range.• List 2 plant species are considered rare, threatened, or endangered in California but more common in other states.• Plant species for which CNPS needs additional information are included on List 3.• List 4 plant species are those of limited distribution in California whose susceptibility to threat appears low at this time.
Channel	Open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water.
Codominant	Two or more species providing about equal areal cover which in combination control the environment.

Community	A group of organisms, generally of wide taxonomic affinities, occurring together. Many will interact within a framework of horizontal and vertical linkages such as competition, predation, and mutualism.
Competition	An interaction between members of two or more species that, as a consequence either of exploitation of a shared resource or of interference related to that resource, has a negative effect on fitness-related characteristics of at least one of the species.
Connectedness	The structural links between habitat patches in a landscape; can be described from mappable features.
Connectivity	A parameter of landscape function that measures the processes by which a set of populations is interconnected into a metapopulation.
Contract Manager	The person within Caltrans who is responsible for evaluating and monitoring the work of the consultant.
Core Reserve	See Ecological Reserve.
Corridor	A spatial linkage that facilitates movements of organisms among habitat patches in a landscape.
Creation	Method used in conservation and restoration biology to convert a disturbed habitat into a natural habitat and which requires monitoring and intervention from humans to become a self-sustaining system.
Critical Habitat	<p>When a species is proposed for listing as endangered or threatened under the Endangered Species Act (FESA), the United States Fish and Wildlife Service (USFWS) must consider whether there are areas of habitat they believe are essential to the species' conservation. Those areas may be proposed for designation as "critical habitat".</p> <p>Critical habitat is a term defined and used in the FESA. It is a specific geographic area(s) that is essential for the conservation of a threatened or endangered species and that may require special management and protection. A critical habitat may include an area that is not currently occupied by the species, but that will be needed for its recovery. An area is designated as "critical habitat" after the USFWS publishes a proposed Federal regulation in the Federal Register, and then they receive and consider public comments on the proposal. The final boundaries of the critical habitat area are also published in the Federal Register.</p> <p>Federal agencies are required to consult with the USFWS on actions they carry out, fund, or authorize to ensure that their actions will not destroy or adversely modify a critical habitat. In this way, a critical habitat designation protects areas that are necessary for the conservation of the species.</p>
Deciduous Stand	A plant community where deciduous trees or shrubs represent more than 50 percent of the total areal coverage of trees or shrubs.

Density	The number of units (e.g., individuals, pairs, groups, nests) per unit area.
Dispersal	The movement of organisms away from the place of birth or from centers of population density.
Disturbance	Any relatively discrete event in time that disrupts ecosystem, community, or population structure and changes resources, substrate availability, or the physical environment.
Diversity	Typically used in relation to species, a single index that incorporates the number of species and relative abundances of species (evenness). For example, a collection is said to have high diversity if it has many species and their abundances are relatively even. There are many types of diversity.
Dominant	The species controlling the environment.
Ecological Reserve	A parcel of land that is legally protected and managed primarily for the benefit of biodiversity, or the plants, animals, other organisms, natural communities, physical features, and ecological processes that are naturally found there. Neither timber nor other resources are taken from the land, and natural ecological processes (including fire) are allowed to occur when they do not endanger human life. Recreation may be allowed as long as it is compatible with the primary goal of protecting biodiversity. Typically the recreational activities that are allowed include hiking, hunting, and fishing. Motorized vehicles are generally not compatible with the protection of biodiversity, so they are allowed only when necessary to conduct occasional management activities. An ecological reserve can be owned by any agency, organization, or individual who has the resources and knowledge to manage it properly. Legal protection can take many forms, including ownership by a conservation organization or public agency that is committed to protecting biodiversity in perpetuity and forever wild easements on private land.
Ecosystem	The totality of components of all kinds that make up a particular environment; the complex of biotic community and its abiotic, physical environment.
Ecotone	A habitat created by the juxtaposition of distinctly different habitats; an edge habitat; a zone of transition between habitat types or adjacent ecological systems having a set of characteristics uniquely defined by space and time scales and by the strength of the interactions.
Edge Effect	(1) Changes in a community due to the rapid creation of abrupt edges in large units of previously undisturbed habitat; (2) tendency for increased variety and density of organisms at community or habitat junctions.
Edge Species	Species preferring the habitat created by the abutment of distinctive vegetation types.
Endangered	A species whose prospects of survival and reproduction are in immediate

Species	jeopardy (State of California).
Endangered Species Act	1973 Act of U.S. Congress, amended several times subsequently. The act provides for identifying (listing) endangered and threatened species or distinct segments of species, monitoring candidate species, designating critical habitat, preparing recovery plans, consulting by federal agencies to ensure that their actions do not jeopardize the continued existence of listed species or adversely modify critical habitats, restricting importation and trade in endangered species or products made from them, restricting the taking of endangered fish and wildlife. The act also provides for cooperation between the federal government and the states.
Endemic	Confined and native to a certain terrestrial and/or aquatic region.
Enhancement	A management technique (using seeding, transplantation, fencing, watershed manipulations, etc.) that attempts to restore to predisturbance conditions those areas that are only partially disturbed by human influence.
Environmental Gradient	A continuum of conditions, such as the gradation from hot to cold environments.
Extinction	(1) The complete disappearance of a species from the earth; (2) the total disappearance of a species from an island (this does not preclude later recolonization).
Extirpation	The elimination of a species from an island, local area, or region.
Federally Endangered Species	A species facing extinction throughout all or a significant part of its geographic range.
Federally Threatened Species	A species likely to become endangered within the foreseeable future throughout all or a significant part of its range.
Feral	Escaped from domestication. Feral individuals may be descendants of the original escapees.
Fine-Grained	Referring to qualities of the environment that occur in small patches with respect to the activity patterns of an organism. This results in the organism's inability to distinguish qualities usefully.
Fully Protected Species (FPS)	Designation by CDFG to identify and provide protection to species that faced possible extinction. Most FPS have already been listed as threatened or endangered by recent endangered species laws and regulations.
Geographic Information System (GIS)	A set of computer hardware and software for analyzing and displaying spatially referenced features (i.e., points, lines, and polygons) with nongeographic attributes such as species and age.

Gravel	A mixture composed primarily of rock fragments two millimeters (0.08 inch) to 7.6 centimeters (three inches) in diameter. Usually contains much sand.
Habitat	The place where an animal or plant usually lives, often characterized by a dominant plant community or any physical characteristic.
Habitat Fragmentation	The alteration of a large habitat patch to create isolated or tenuously connected patches of the original habitat that are interspersed with an extensive mosaic of other habitat types.
Habitat Linkage	An area of natural habitat that functions to join two larger patches of habitat. It serves as a connection between habitat patches and helps reduce the adverse effects of habitat fragmentation by providing a potential route for gene flow and long term dispersal. Habitat linkages may serve both as "live-in" habitat and avenues of gene flow for small animals such as reptiles, amphibians, and rodents. Habitat linkages also provide for the transit of larger species, but as contrasted with wildlife corridors, as defined below, also may be a "live-in" habitat for larger species (i.e., support breeding sites, frequent use areas, etc.). Habitat linkages also may be represented by a continuous habitat or by closely spaced habitat "islands" that function as stepping stones for dispersal and movement, especially for birds and flying insects. Linkages facilitate the dispersal by smaller, less mobile species and frequent movement (e.g., daily, weekly, etc.) by larger mammal species such as mountain lion, mule deer, coyote and bobcat. It can be reasonably assumed that habitat linkages that function for large mammals also function for many other species.
Habitat Patches	Areas distinguished from their surroundings by environmental discontinuities. Patches are organism-defined (i.e., the edges or discontinuities have biological significance to an organism).
Herbaceous	With the characteristics of an herb; a plant with no persistent woody stem above ground.
High Tide Line	The line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.
Indirect Effect	(1) The impact on a species caused by affecting the species' competitors, predators, or mutualists; (2) the impact of toxic chemicals on a species by directly affecting interactions between species. Examples are disruptions in food resources

or habitat changes that affect competitive interactions, biomagnification up the food chain, and impacts on populations parasites, symbionts, pollinators, etc.

Introduced Species	Species present in an area due to deliberate release by humans (including reintroductions, transplants, and restocked species) or due to accidental release through escape or indirect assistance (syn. exotic species).
Landscape Features	The landforms of a region in the aggregate; the land surface and its associated habitats at scales of hectares to many square kilometers (for most vertebrates); a spatially heterogeneous area; a mosaic of habitat types occupying a spatial scale intermediate between an organism's normal home-range size and its regional distribution (cañada, ridgeline, canyon, valley, creek, river, stream).
Mesic	Moderately moist.
Mitigation	The lessening of project impacts by avoidance, minimizing impacts, rectifying the impact, reducing or eliminating the impact over time, or compensating for the impact.
Navigable Waters of the U.S.	Those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the water body, and is not extinguished by later actions or events which impede or destroy navigable capacity. Precise definitions of navigable waters of the United States or navigability are ultimately dependent on judicial interpretation and cannot be made conclusively by administrative agencies. (Source: <u>33 CFR 328.3.</u>)
Non-Tidal Waters of the U.S.	The limits of jurisdiction in non-tidal waters: (1) In the absence of adjacent wetlands, the jurisdiction extends to the ordinary high water mark, or (2) when adjacent wetlands are present, the jurisdiction extends beyond the ordinary high water mark to the limit of the adjacent wetlands. When the water of the United States consists only of wetlands, the jurisdiction extends to the limit of the wetland.
Obligate Hydrophytes	Species that are found only in wetlands, as opposed to ubiquitous species that grow either in wetland or on upland.
Ordinary High Water Mark	That line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.
Preservation	Form of passive management that does not advocate any form of intervention or habitat manipulation by humans for a specific purpose.

Project	Any action that has potential effects on the environment.
Project Development Team (PDT)	An interdisciplinary team composed of individuals from the various Caltrans units that have major responsibility for the development of the project (i.e., Right-of-Way, Environmental, Construction, Project Development). The PDT acts as a steering group in directing the course of studies and in making recommendations to top District management.
Protected Area	A geographically defined area which is designated or regulated and managed to achieve specific conservation objectives.
Rare Species	A species present in such small numbers throughout its range that it may become endangered if its present environment worsens (State of California).
Recovery Plan	A plan published by USFWS that details actions or conditions necessary to delineate reasonable actions believed to be required for protection and recovery of listed species.
Reserve	See Ecological Reserve.
Restoration	Management of a disturbed and/or degraded habitat that results in the recovery of its original state.
Saline	General term for waters containing various dissolved salts. We restrict the term to inland waters where the ratios of the salts often vary; the term haline is applied to coastal waters where the salts are roughly in the same proportion as found in undiluted sea water.
Scope of Work	The list of specific technical studies to be performed by the consultant.
Sensitive Habitats	<p>Vegetation communities, associations, or subassociations that support concentrations of sensitive plant or wildlife species, are of relatively limited distribution, or are of particular value to wildlife (CDFG 1995). Although sensitive habitats are not afforded legal protection unless they support protected species, potential impacts on them may increase concerns and mitigation suggestions by resources agencies. Designated critical habitats may afford legal protection to habitats in</p> <p>that Federal Agencies should consult with the USFWS/NMFS on their actions that may affect designated critical habitats.</p>
Shrub	A woody plant which at maturity is usually less than six meters (20 feet) tall and generally exhibits several erect, spreading, or prostrate stems and has a bushy appearance.
Special Area Management Plan (SAMP)	Under Section 404 of the Clean Water Act (CWA), the Army Corps of Engineers is authorized to regulate discharge of dredge or fill material into waters of the United States. The SAMP approach allows the Corps to take into account indirect and cumulative effects on aquatic resources in a way not possible in the project-by-project process. With the SAMP approach,

potential impacts are analyzed in order to identify priority areas for preservation, identify potential restoration areas, and determine the least environmentally damaging locations for proposed projects. The SAMP consists of identification and characterization of aquatic resources, evaluation of alternatives for proposed impacts to aquatic resources, and identification of an aquatic reserve program within the watersheds.

Species of
Special Concern

CDFG status that applies to species not listed under either the CESA or FESA, but which are declining at a rate that could result in listing, or have historically occurred in low numbers due to existing threats. Criteria include:

1. Occur in small, isolated populations or in fragmented habitat, and are threatened by further isolation and population reduction.
2. Show marked population declines.
3. Depend on a habitat that has shown substantial historical or recent declines in size, such as wetlands, alluvial fan sage scrub, and coastal sage scrub.
4. Occur only in or adjacent to an area where habitat is being converted to land uses incompatible with the animal's survival.
5. Have few California records, or which historically occurred here but for which there are no recent records.
6. Occur largely on public lands, but where current management practices are inconsistent with the animal's persistence.

Subassociation

An additional division of an association into more discrete units based on floristic composition.

Technical Monitor

The person within Caltrans who provides day-to-day guidance to the consultant. The technical monitor may or may not be the same person as the Contract Manager.

Territorial Seas

The limit of jurisdiction in the territorial seas is measured from the baseline in a seaward direction a distance of three nautical miles. (See 33 CFR 329.12.)

Threatened
Species

A species present in such small numbers throughout its range that it is likely to become an endangered species in the near future in the absence of special protection or management (State of California).

Tidal Waters

Those waters that rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by hydrologic, wind, or other effects.

Tidal Waters of

The landward limits of jurisdiction in tidal waters: (1) Extends to the high

the U.S.	tide line, or (2) when adjacent non-tidal waters of the United States are present, the jurisdiction extends to the limits identified in Non-Tidal Waters of the United States.
Transportation Engineer	The FHWA principal person of contact for project development and construction matters.
Tree	A woody plant which at maturity is usually six meters (20 feet) or more in height and generally has a single trunk, unbranched for one meter or more above the ground, and a more or less definite crown.
Use Area	Any area where the presence of any life stage (such as fledgling, juvenile, adult, or breeding pair) is observed during surveys for avian species other than raptors.
Vegetation Type	An assemblage of plants that is relatively homogeneous in its physiognomy, floristic composition, and environmental requirements. As used in these guidelines, generally synonymous with plant community. Caltrans has accepted the community classification system used by the CNDDDB (Holland 1986). More detailed community classifications may be appropriate under special circumstances.
Vernal Pool	<p>Vernal pools are seasonally flooded depressions found on ancient soils with an impermeable layer such as a hardpan, claypan, or volcanic basalt. The impermeable layer allows the pools to retain water much longer than the surrounding uplands; nonetheless, the pools are shallow enough to dry up each season. Vernal pools often fill and empty several times during the rainy season.</p> <p>Only plants and animals that are adapted to this cycle of wetting and drying can survive in vernal pools over time.</p>
Waters of the U.S.	<p>(1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.</p> <p>(2) All interstate waters including interstate wetlands.</p> <p>(3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:</p> <ul style="list-style-type: none">• Which are or could be used by interstate or foreign travelers for recreational or other purposes; or• From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or• Which are used or could be used for industrial purpose by industries

in interstate commerce.

(4) All impoundments of waters otherwise defined as waters of the United States under the definition.

(5) Tributaries of waters identified in paragraphs (a)(1)-(4) of this section.

(6) The territorial seas.

(7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in Definitions (1) through (6) above.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 123.11(m) which also meet the criteria of this definition) are not waters of the United States.

Wetland

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (USACOE and Environmental Protection Agency (EPA) definition). Wetlands generally include swamps, marshes, bogs and similar areas.

Wildlife Corridor

Wildlife corridors link together areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. The fragmentation of open space areas by urbanization tends to create isolated islands of wildlife habitat. Several studies have shown that in the absence of habitat linkages, some wildlife species will not likely persist over time. This is because fragmentation and/or the isolation of habitat areas can prohibit the infusion of new individuals and genetic information (MacArthur and Wilson 1967; Soule 1987; Harris and Gallagher 1989; Bennett 1990). Wildlife corridors can often mitigate the effects of this fragmentation by:

- Allowing animals to move between remaining habitats, thereby allowing depleted populations to be replenished.
- Providing escape routes from fire, predators, and human disturbances, thus reducing the risk that catastrophic events such as fire or disease will result in population or local species extinction.
- Serving as wildlife corridors for individual animals as they move within their home ranges in search of food, water, mates, and other needs (Noss 1983; Farhig and Merriam 1985; Simberloff and Cox 1987; Harris and Gallagher 1989).

Wildlife movement activities usually fall into one of three movement

categories:

- Dispersal (defined as juvenile animals moving from natal areas and individuals extending range distributions).
- Seasonal migration.
- Movements related to home range activities such as foraging for food or water; defending territories; or searching for mates, breeding areas, or cover.

A number of terms have been used in various wildlife movement studies, such as wildlife corridor, wildlife corridor, habitat linkage, and wildlife crossing, to refer to areas in which wildlife move from one area to another. (See related definitions.)

Wildlife Bridge/
Undercrossing

Part of a wildlife corridor constituting a small, narrow area, relatively short in length and generally constricted, that allows wildlife to pass under or through an obstacle or barrier that otherwise hinders or prevents movement. These wildlife corridors typically are human made and include culverts, bridges/underpasses, drainage pipes, and tunnels to provide access across or under roads, highways, pipelines, or other physical obstacles. These often represent choke points along a wildlife corridor.

Woody Plant

A seed plant (gymnosperm or angiosperm) that develops persistent, hard, fibrous tissues, basically xylem; e.g., trees and shrubs.

Xerophyte,
Xerophytic

Any plant growing in a habitat in which an appreciable portion of the rooting medium dries to the wilting coefficient at frequent intervals. (Plants typically found in very dry habitats.)

**TABLE 3.2-1
PLANT SPECIES SURVEYED IN THE SOCTIIP SURVEY AREA
(1994-2003)**

Scientific Name	Common Name
<i>Artemisia palmeri</i>	San Diego sagewort
<i>Astragalus brauntonii</i>	Braunton's milkvetch
<i>Atriplex coulteri</i>	Coulter's saltbush
<i>Atriplex pacifica</i>	Pacific saltbush
<i>Atriplex parishii</i>	Parish's saltbush
<i>Batis maritima</i>	saltwort
<i>Berberis nevinii</i>	Nevin's barberry
<i>Berberocactus emoryi</i>	golden-spined cereus
<i>Brodiaea filifolia</i>	thread-leaved brodiaea
<i>Brodiaea jolonensis</i>	mesa brodiaea
<i>Calochortus catalinae</i>	Catalina mariposa lily
<i>Calochortus weedii</i> var. <i>intermedius</i>	intermediate mariposa lily
<i>Centromadia</i> { <i>Hemizonia</i> } <i>parryi</i> ssp. <i>australis</i>	southern tarplant
<i>Centromadia</i> { <i>Hemizonia</i> } <i>pungens</i> ssp. <i>laevis</i>	smooth tarplant
<i>Chorizanthe procumbens</i>	prostrate spineflower
<i>Comarostaphylis diversifolia</i> ssp. <i>diversifolia</i>	summer holly
<i>Convolvulus simulans</i>	small-flower morning glory
<i>Crassula aquatica</i>	water pigmy-stone crop
<i>Dichondra occidentalis</i>	western dichondra
<i>Dudleya blochmanae</i> ssp. <i>blochmanae</i>	Blochman's dudleya
<i>Dudleya multicaulis</i>	many-stemmed dudleya
<i>Dudleya viscida</i>	sticky dudleya
<i>Echinodorus berteroi</i>	upright burhead
<i>Eleocharis parula</i>	small spikerush
<i>Eleocharis rostellata</i>	beaked spikerush
<i>Euphorbia misera</i>	cliff spurge
<i>Harpagonella palmeri</i>	Palmer's grapplinghook
<i>Helianthus nuttallii</i> ssp. <i>parishii</i>	Los Angeles sunflower
<i>Holocarpha virgata</i> ssp. <i>elongata</i>	graceful tarplant
<i>Hordeum intercedens</i>	vernal barley
<i>Horkelia cuneata</i> ssp. <i>cuneata</i>	hedge-leaved horkelia
<i>Horkelia cuneata</i> ssp. <i>puberula</i>	hedge-leaved horkelia
<i>Isocoma menziesii</i> ssp. <i>decumbens</i>	decumbent goldenbush
<i>Juncus acutus</i> ssp. <i>leopoldii</i>	southwestern spiny rush
<i>Juncus textilis</i>	basket rush
<i>Juniperus californica</i>	California juniper
<i>Lycium brevipes</i> var. <i>hassei</i>	Santa Catalina Island desert thorn
<i>Microseris douglasii</i> ssp. <i>platycarpa</i>	small-flowered microseris
<i>Myosurus minimus</i> ssp. <i>apus</i>	little mousetail
<i>Nama stenocarpum</i>	gray mud nama
<i>Navarretia fossalis</i>	spreading navarretia
<i>Navarretia prostrata</i>	prostrate navarretia

Scientific Name	Common Name
<i>Nolina sp. novo {cismontana}</i>	Santa Ana Mountains beargrass
<i>Orcuttia californica</i>	Orcutt's grass
<i>Phacelia nashiana</i>	Charlotte's phacelia
<i>Pilularia americana</i>	American pillwort
<i>Polygala cornuta var. fishiae</i>	Fish's milkwort

**TABLE 3.2-1
PLANT SPECIES SURVEYED IN THE SOCTIIP SURVEY AREA
(1994 - 2003)**

Scientific Name	Common Name
<i>Quercus dumosa</i>	Nuttall's scrub oak
<i>Romneya coulteri</i>	Coulter's matilija poppy
<i>Rorippa gambelii</i>	Gambel's watercress
<i>Sibara neomexicana</i>	Virginia rockcress
<i>Sidalcea neomexicana</i>	salt spring checkerbloom
<i>Suaeda taxifolia</i>	wooly sea-blite
<i>Viguiera laciniata</i>	San Diego County viguiera

**TABLE 3.2-2
WILDLIFE SPECIES SURVEYED IN THE SOCTIIP SURVEY AREA
(1994 - 2003)**

Scientific Name	Common Name
Invertebrates	
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp
<i>Branchinecta sandiegoensis</i>	San Diego fairy shrimp
<i>Euphydrias editha quino</i>	Quino checkerspot
<i>Streptocephalus woottoni</i>	Riverside fairy shrimp
Fish	
<i>Eucyclogobius newberryi</i>	tidewater goby
<i>Gila orcutti</i>	arroyo chub
<i>Oncorhynchus mykiss</i>	southern steelhead trout
<i>Rhinichthys osculus</i>	Santa Ana speckled dace
Amphibians	
<i>Aneides lugubris</i>	arboreal salamander
<i>Bufo californicus</i>	arroyo toad
<i>Ensatina eschscholtzi eschscholtzi</i>	ensatina
<i>Rana aurora draytonii</i>	California red-legged frog
<i>Scaphiopus hammondii</i>	western spadefoot toad
Reptiles	
<i>Anniella pulchra</i>	silvery legless lizard
<i>Arizona elegans occidentalis</i>	California glossy snake
<i>Clemmys marmorata pallida</i>	southwestern pond turtle
<i>Cnemidophorus hyperthrus beldingi</i>	orange-throated whiptail

Scientific Name	Common Name
<i>Cnemidophorus tigris multiscutatus</i>	coastal western whiptail
<i>Coleonyx variegatus abbotti</i>	San Diego banded gecko
<i>Coluber constrictor mormon</i>	western yellow belly racer
<i>Crotalus exsul</i>	red diamond rattlesnake
<i>Diadophis punctatus modestus</i>	San Bernardino ringneck snake
<i>Eumeces gilberti rubricauda</i>	western red tail skink
<i>Eumeces skiltonianus interparietalis</i>	Coronado Island skink
<i>Hypsiglena toquata klauberi</i>	San Diego night snake
<i>Leptotyphlops humilis</i>	southwestern blind snake
<i>Lichanura trivirgata roseofusca</i>	coastal rosy boa
<i>Phrynosoma coronatum blainvillei</i>	San Diego horned lizard
<i>Rhinocheilus lecontei lecontei</i>	western long nose snake
<i>Salvadora hexalepis virgultea</i>	coast patch-nosed snake
<i>Tantilla planiceps</i>	California black-headed snake
<i>Thamnophis hammondi</i>	two-striped garter snake
<i>Trimorphodon biscutatus vandenburghi</i>	California lyre snake
Birds	
<i>Agelaius tricolor</i>	tricolored blackbird
<i>Aimophila ruficeps</i>	rufous-crowned sparrow
<i>Ammodramus savannarum</i>	grasshopper sparrow
<i>Amphispiza belli belli</i>	Bell's sage sparrow
<i>Ardea herodias</i>	great blue heron
<i>Campylorhynchus brunneicapillus couesi</i>	San Diego cactus wren
<i>Carduelis lawrencei</i>	Lawrence's goldfinch
<i>Coccyzus americanus occidentalis</i>	western yellow-billed cuckoo

TABLE 3.2-2
WILDLIFE SPECIES SURVEYED IN THE SOCTIIP SURVEY AREA
(1994 – 2003)

Scientific Name	Common Name
<i>Dendroica petechia</i>	yellow warbler
<i>Empidonax traillii extimus</i>	southwestern willow flycatcher
<i>Eremophila alpestris actia</i>	California horned lark
<i>Icteria virens</i>	yellow-breasted chat
<i>Ixobrychus exilis hesperius</i>	western least bittern
<i>Lanius ludovicianus</i>	loggerhead shrike
<i>Poliophtila californica californica</i>	coastal California gnatcatcher
<i>Vireo bellii pusillus</i>	least Bell's vireo
Raptors	
<i>Accipiter cooperi</i>	Cooper's hawk
<i>Accipiter striatus</i>	sharp-shinned hawk
<i>Ardea herodias</i>	great blue heron
<i>Asio otus</i>	long-eared owl
<i>Aquila chrysaetos</i>	golden eagle
<i>Athene cunicularia hypogea</i>	burrowing owl
<i>Bubo virginianus</i>	great horned owl
<i>Buteo jamaicensis</i>	red-tailed hawk
<i>Buteo lineatus</i>	red-shouldered hawk
<i>Buteo regalis</i>	ferruginous hawk
<i>Buteo swainsoni</i>	Swainson's hawk
<i>Circus cyaneus</i>	northern harrier
<i>Elanus leucurus</i>	white-tailed kite
<i>Falco columbarius</i>	merlin
<i>Falco mexicanus</i>	prairie falcon
<i>Falco peregrinus</i>	peregrine falcon
<i>Pandion haliaetus</i>	osprey
<i>Tyto alba</i>	common barn owl
Mammals	
<i>Antrozous pallidus</i>	pallid bat
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat
<i>Euderma maculatum</i>	spotted bat
<i>Eumops perotis californicus</i>	western mastiff bat
<i>Lepus californicus bennettii</i>	San Diego black-tailed jackrabbit
<i>Myotis ciliolabrum</i>	small-footed myotis
<i>Myotis yumanensis</i>	Yuma myotis
<i>Neotoma lepida intermedia</i>	San Diego desert woodrat
<i>Nyctinomops femorosaccus</i>	pocketed free-tailed bat
<i>Nyctinomops macrotis</i>	big free-tailed bat
<i>Perognathus longimembris pacificus</i>	Pacific pocket mouse

**TABLE 3.2-3
SENSITIVE PLANT SURVEY PERIODS**

Blooming Period	Target Plant Species	Actual Survey Dates ^a
March-May	Aphanisma, Braunton's milk-vetch, Coulter's saltbush*, Pacific saltbush, Nevin's barberry, golden-spined cereus, thread-leaved brodiaea, mesa brodiaea, Catalina mariposa lily, prostrate spineflower, summer holly, small-flowered morning glory*, water pigmy stonecrop**, western dichondra, Blochman's dudleya, many-stemmed dudleya, sticky dudleya, small spikerush, cliff spurge, Palmer's grapplinghook, vernal barley**, California juniper, small-flowered microsotis**, little mousetail**, spreading navaretia, prostrate navaretia**, Santa Ana Mountains grass, Orcutt's grass, Charlotte's phacelia, American pillwort**, Nuttall's scrub oak, Coulter's matilija poppy, Virginia rock-cress**, salt spring checkerbloom	21 March – 27 May 2003, 13 March – 15 June 2001, 22 March – 31 May 1995
June-July	Parish's saltbush, intermediate mariposa lily, upright burhead, Fish's milkwort, basket rush	5 June – 19 June 2003, 5 June – 3 July 2001, 1 June – 31 July 1995
August-December	San Diego sagewort, saltwort, southern tarplant, smooth tarplant, beaked spikerush, Los Angeles sunflower, graceful tarplant, hedge-leaved horkelia, decumbent goldenbush, southwestern spiny rush, Santa Catalina Island desert thorn, Gambel's watercress, San Diego County viguiera	3 August – 31 August 2001 1 August – 29 December 1995

* Coulter's saltbush and small-flowered morning glory were first identified on 13 March 1997 by Mr. Roberts and Mr. Bomkamp.
** Several species not identified during the 1995 survey effort were recorded in the survey area during plant community mapping and the wetlands delineation in spring 1996.

**TABLE 3.2-4
SENSITIVE WILDLIFE SPECIES SURVEYS*
(2001 AND 2003)**

Species	Status
Amphibians	
Arroyo toad	Federally endangered
California red-legged frog	Federally threatened
Reptiles	
Orange-throated whiptail	NCCP target species
San Diego horned lizard	NCCP target species
Birds	
Least Bell's vireo	Federally and state endangered
Coastal California gnatcatcher	Federally threatened
Southwestern willow flycatcher	Federally endangered
San Diego cactus wren	NCCP target species
Mammals	
Pacific pocket mouse	Federally endangered (2001 only)
Invertebrates	
San Diego fairy shrimp	Federally endangered
Riverside fairy shrimp	Federally endangered

* Protocol surveys for other sensitive species were not conducted based on the following: (1) No potential habitat was identified in the biological survey area; (2) species not federally or State listed, and therefore no protocol surveys were required; or (3) species does not breed in the region (occurs as a migrant or nonbreeding winter visitor only, such as several of the raptor species). This list is located in Appendix C.

APPENDIX E
EXCLUSION FROM CRITICAL HABITAT

Exclusion of Areas Governed by HCPs and by other Management Plans from Critical Habitat

Under ESA section 4(b)(2), the Service “shall designate critical habitat ...after taking into consideration ... any other relevant impact,” such as existing HCPs or other management plans. 16 U.S.C. § 1533(b)(2).

Areas governed by HCPs and other conservation arrangements may properly be excluded from critical habitat under ESA section 4(b)(2). Habitat areas governed by HCPs and other management arrangements are effectively given a higher level of protection than would be provided by inclusion of these areas in critical habitat. HCPs allow the Service and landowners, including local governments, to address habitat issues on a large scale and to include the entire suite of species that may rely upon sensitive habitat types. This is particularly true of HCPs that explicitly base planning on habitats rather than on individual species. In contrast, critical habitat designation does not provide any large-scale planning. The difference is significant, as the treatment of habitat protections at a landscape level is likely to have better protective value for both listed and unlisted species.

Additionally, HCPs allow protection of lands unaffected by a critical habitat designation. Designation as critical habitat affects private lands only through ESA section 7 consultations, limiting the effect of designation to individual projects and single species. See 16 U.S.C. § 1536(a).

One of the criteria necessary for land to be designated as critical habitat is the need for special management considerations. See 16 U.S.C. § 1532(5)(A)(i). However, critical habitat designation alone does not provide any management structure or management measures. Comprehensive consideration of management measures simply waits for development of a recovery plan.

Exclusion of areas subject to existing or proposed management arrangements from critical habitat may also be justified on the basis of enhancing the spirit of cooperation and partnership with the participants and encouraging others to work cooperatively with the Service to develop conservation arrangements. See Proposed Designation of Critical Habitat for *Brodiaea filifolia* (thread-leaved brodiaea), 69 Fed. Reg. 71,284, 71,298 (Dec. 8, 2004) (“Imposing additional regulatory review after an HCP is completed solely as a result of the designation of critical habitat may undermine conservation efforts and partnerships....”). See also Final Designation of Critical Habitat for Four Vernal Pool Crustaceans and Eleven Vernal Pool Plants in California and Southern Oregon, 68 Fed. Reg. 46,684, 46,748 (Aug. 6, 2003); Final Rule to Designate Critical Habitat for the Santa Ana Sucker, 69 Fed. Reg. 8839, 8847 (Feb. 26, 2004). See also *Center for Biological Diversity v. Norton*, 240 F.Supp.2d 1090 (D. Ariz. 2002) (upholding the Service’s determination that preserving conservation relationships is a “relevant impact” under ESA section 4(b)(2) justifying exclusion of certain land from critical habitat).

The Service may use these factors to determine that the benefits of not designating areas that are subject to management arrangements outweigh the benefits of specifying such areas as part of designated critical habitat. See, e.g., Final Rule to Designate Critical Habitat for the Buena Vista Lake Shrew (*Sorex ornatus relictus*), 70 Fed. Reg. 3,438, 3,453-57 (Jan. 24, 2005) (excluding the Kern National Wildlife Refuge, a wetlands restoration and enhancement project, a City of Bakersfield Management Plan, and land subject to a conservation easement); Proposed Designation of Critical Habitat for *Brodiaea filifolia* (thread-leaved brodiaea), 69 Fed. Reg. 71,284, 71,296-99 (proposing exclusion of HCP lands from proposed critical habitat on the basis of ESA section 4(b)(2) balancing); Proposed Designation of Critical Habitat for Southwestern Willow Flycatcher (*Empidonax traillii extimus*), 69 Fed. Reg. 60,706, 60,724-27

(same); Proposed Designation of Critical Habitat for the Arroyo Toad (*Bufo californicus*), 69 Fed. Reg. 23,254, 23, 269-73 (same); Proposed Designation of Critical Habitat for the Riverside Fairy Shrimp (*Streptocephalus woottoni*), 69 Fed. Reg. 23,024, 23, 030-33 (same); Proposed Designation of Critical Habitat for the Coastal California Gnatcatcher (*Poliioptila californica californica*), 68 Fed. Reg. 20,228, 20,234-37 (same); Proposed Designation of Critical Habitat for the San Diego Fairy Shrimp (*Branchinecta sandiegonensis*), 68 Fed. Reg. 19,888, 19,891-95 (same).

The SOCTIIP area should be excluded from critical habitat under ESA section 4(b)(2) because of the habitat values, protection and management provided in the Upper Chiquita area through the Chiquita Canyon Conservation Bank Agreement (1996) and because of the management arrangements proposed in the Biological Assessment. The Bank Agreement meets the USFWS criteria for adequate protection as follows: 1) the Bank Agreement is in place and provides a conservation benefit to the species; in addition, additional restoration is proposed which will increase coastal sage scrub habitat by 241 acres, 2) the area is being managed to preserve habitat values and adequate funding is being provided and, 3) the plan provides assurances and includes monitoring to achieve biological goals. (See, e.g., Final Rule to Designate Critical Habitat for the Buena Vista Lake Shrew (*Sorex ornatus relictus*), 70 Fed. Reg. 3,438, 3,453 (Jan. 24, 2005.)) The benefits of excluding the SOCTIIP area exceed the benefits of including it.

Exclusion of Areas from Critical Habitat Based on Economic Impact

The ESA allows the Service to “tak[e] into consideration the economic impact ... of specifying any particular area as critical habitat.” 16 U.S.C. § 1533(b)(2). The SOCTIIP area should be excluded from critical habitat designation due to the tremendous cost that would result to TCA.

The results of an economic impact analysis of critical habitat designation for the coastal California gnatcatcher indicated that the cost of mitigation and permit acquisition, as well as the effect on financing of the project, could be as much as \$525 million. See David L. Sunding, Economic Impacts of Critical Habitat Designation for the Coastal California Gnatcatcher, at 19 (Aug. 15, 2003). See *id.* The designation, along with other sources of potential delay, caused delay to TCA in completing the roads in the amount of \$450 million (without considering gnatcatcher mitigation costs). See *id.* at 20. Of this amount, an unknown share can be allocated to delay caused by gnatcatcher critical habitat designation. See *id.*

The coastal California gnatcatcher is only one of the species for which critical habitat is proposed in the SOCTIIP area; there are eight others for which an independent economic impact analysis has not yet been performed.¹ When the economic impacts of the critical habitat designation for these eight species are considered, the cost to the SOCTIIP area are likely to be exorbitant. On the other hand, the benefits of inclusion are likely to be small, as the SOCTIIP area is only a tiny percentage of the total area proposed or designated. Therefore, the benefits of excluding the SOCTIIP area from critical habitat exceed the benefits of its inclusion.

Exclusion of Military Lands from Critical Habitat

Under ESA section 4(b)(2), the Service “shall designate critical habitat ... after taking into consideration ... the impact on national security....” 16 U.S.C. § 1533(b)(2). The interests of

¹ These other species are tidewater goby, southwestern willow flycatcher, southwestern arroyo toad, Riverside fairy shrimp, San Diego fairy shrimp, Pacific pocket mouse (no critical habitat has been proposed or designated yet), least Bell's vireo, and thread-leaved brodiaea.

national security require that combat training areas that are essential to the mission of military bases are not compromised by a critical habitat designation.

Little benefit arises to the species from critical habitat designation on military lands if the military has already taken steps to protect the species and its on-base habitat. On the other hand, the benefits of excluding military lands from critical habitat are great. The military's ability to train its personnel for combat would be adversely affected by the requirements for ESA section 7 consultation, if triggered through designation of critical habitat. The Service has used these factors to determine that the benefits of not designating military lands as critical habitat outweigh the benefits of specifying such areas as part of designated critical habitat. See, e.g., Proposed Designation of Critical Habitat for *Brodiaea filifolia* (thread-leaved brodiaea), 69 Fed. Reg. 71,284, 71,299-300 (proposing exclusion of military lands from proposed critical habitat on the basis of ESA section 4(b)(2) balancing); Proposed Designation of Critical Habitat for Southwestern Willow Flycatcher (*Empidonax traillii extimus*), 69 Fed. Reg. 60,706, 60,727-28 (same); Proposed Designation of Critical Habitat for the Arroyo Toad (*Bufo californicus*), 69 Fed. Reg. 23,254, 23, 275-76 (same); Proposed Designation of Critical Habitat for the Riverside Fairy Shrimp (*Streptocephalus woottoni*), 69 Fed. Reg. 23,024, 23,034 (same); Proposed Designation of Critical Habitat for the Coastal California Gnatcatcher (*Poliophtila californica californica*), 68 Fed. Reg. 20,228, 20,238 (same); Proposed Designation of Critical Habitat for the San Diego Fairy Shrimp (*Branchinecta sandiegonensis*), 68 Fed. Reg. 19,888, 19,895-96 (same).

All lands on Camp Pendleton should be excluded from critical habitat because the benefits of excluding these lands outweigh the benefits of including them. The interests of national security require that future uses of Camp Pendleton are not compromised by a critical habitat designation. The Marine Corps is implementing measures to avoid jeopardy of the listed species on its land and is developing a set of programmatic instructions to avoid adverse impacts on the species, for which it is in programmatic consultation with the Service. Moreover, the Marine Corps has prepared an Integrated Natural Resources Management Plan ("INRMP") pursuant to the Sikes Act (16 U.S.C. § 670 *et seq.*), which issues ongoing benefits to listed species on the base. Therefore, there is little benefit to designating critical habitat on Camp Pendleton land, because the Marine Corps has already taken, and will continue to take, action to protect the listed species and their habitat.

On the other hand, the benefits of excluding Camp Pendleton land from a critical habitat designation are great. The Marine Corps' ability to train its personnel for combat would be adversely affected by the requirements for ESA section 7 consultation, if triggered. It is appropriate for the Service to use these factors to determine that the benefits of not designating Camp Pendleton areas as critical habitat outweigh the benefits of specifying such areas as critical habitat.

Alternatively, the Service "shall not designate as critical habitat any lands ... owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan [INRMP]...." 16 U.S.C. § 1533(a)(2)(B)(i). Such a document is prepared pursuant to the Sikes Act (16 U.S.C. § 670 *et seq.*) to further protect the species and its habitat on military land. See, e.g., Proposed Designation of Critical Habitat for Southwestern Willow Flycatcher (*Empidonax traillii extimus*), 69 Fed. Reg. 60,706, 60,728 (same); Proposed Designation of Critical Habitat for the Arroyo Toad (*Bufo californicus*), 69 Fed. Reg. 23,254, 23,274-75 (discussing potential exclusion of military lands from proposed critical habitat if species protected by INRMP); Proposed Designation of Critical Habitat for the Riverside Fairy Shrimp (*Streptocephalus woottoni*), 69 Fed. Reg. 23,024, 23,033 (proposing exclusion of military lands from proposed critical habitat because species protected by INRMP); Proposed Designation of Critical Habitat for the Coastal California Gnatcatcher (*Poliophtila*

californica californica), 68 Fed. Reg. 20,228, 20,237-38 (proposing exclusion of military lands from proposed critical habitat because species protected by INRMP); Proposed Designation of Critical Habitat for the San Diego Fairy Shrimp (*Branchinecta sandiegonensis*), 68 Fed. Reg. 19,888, 19,895 (same).