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## **CHAPTER 13: CONSERVATION AND IMPACT ANALYSES FOR SPECIES PROPOSED TO RECEIVE STATE AND FEDERAL REGULATORY COVERAGE AND FOR AREAS SUBJECT TO CDFG JURISDICTION**

### **SECTION 13.1 OVERVIEW OF STATE AND FEDERAL REGULATORY FRAMEWORK**

#### **13.1.1 Statutory Standards Proposed to be Addressed in the Covered Species and Conserved Vegetation Communities Analyses in this Chapter**

This Chapter is intended to address the various state and federal statutory requirements applicable to proposed Covered Species and proposed Conserved Vegetation Communities, generally referred to as “regulatory coverage.” The substantive requirements of the various statutes have differing emphases and standards and are summarized in this *Section 13.1.1* to present an overview of statutory considerations. Conserved Vegetation Communities are addressed because the Conserved Vegetation Communities provide the habitat essential to conservation of the proposed Covered Species and because the conservation and management of these vegetation communities provide the basis for several provisions of the IA.

Because the Southern NCCP/MSAA/HCP has followed a comprehensive multi-species, multi-habitat approach to conservation planning, it has been necessary to define an “umbrella” framework for the proposed Covered Species and Conserved Vegetation Communities that both incorporates all of the applicable substantive statutory requirements while still maintaining a straightforward analytic framework that can be followed with relative ease. The broad analytic framework selected to address these substantive requirements is outlined in this subsection and in *Section 13.1.2*.

Regulatory coverage proposed for the NCCP/MSAA/HCP, as specifically reviewed in this Chapter, addresses the following state/federal statutory requirements.

#### ***a. NCCP – State Law***

Under Section 2835 of the NCCP Act of 1991, coverage would be provided for “the taking ... of any identified species whose conservation and management is provided for in a department approved natural communities conservation plan.” CESA Section 2081 is also addressed pursuant to Section 2825 (c) of the NCCP Act of 1991 and the 1998 NCCP Process Guidelines. Take of identified species (termed Covered Species under this draft NCCP/MSAA/HCP) and impacts to associated habitat includes both listed and unlisted species.

***b. MSAA – State Law***

Long-term streambed alteration agreements would be finalized under California Fish and Game Section 1600 *et seq.* and would address resources, including riparian vegetation communities within the jurisdiction of CDFG, under this statute. This Chapter addresses “conservation” and “management” of these resources in *Section 13.4*.

***c. FESA – Federal Law***

1. FESA Section 9/Section 10(a)(1)(B) – Fish and Wildlife Species

Section 9 prohibitions on the Take of threatened and endangered fish and wildlife species can be addressed under an HCP/permit issued pursuant to Section 10(a)(1)(B) of FESA which requires that any authorized Incidental Take of fish and wildlife species “will not appreciably reduce the likelihood of survival and recovery of the species in the wild.” As explained below, this Chapter addresses this standard under the “conservation and management” provisions of FESA Section 3, the NCCP Act and the Draft Southern Planning Guidelines and Draft Watershed Planning Principles, as well as the Section 10(a)(1)(B) standard.

2. FESA Section 7 – “Jeopardy” and “Adverse Modification”

Section 7 of FESA requires consultation to assure that federal agency actions “are not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of” critical habitat. The Section 7 “jeopardy” and “adverse modification” requirements extend to all listed species. The courts have held that the “jeopardy” standard for Section 7 is the same as the standard for Incidental Take authorization under Section 10(a)(1)(B). The Section 7 “adverse modification” standard for existing critical habitat designations that would be impacted by proposed Covered Activities is addressed in this Chapter.

3. FESA Section 3 – Critical Habitat Standards

FESA Section 3(5)(A)(i and ii) set forth standards to be employed in designating critical habitat for federally listed species. With regard to occupied habitat, FESA Section 3(5)(a)(i) requires that **(1)** occupied habitat essential to the conservation of the species must be identified; **(2)** any special management considerations must be identified; and **(3)** any special protection must be identified. FESA Section 3(5)(A)(ii) requires that unoccupied habitat essential to the conservation of the species must also be identified. The analyses presented in this Chapter are intended to provide the basis for regulatory coverage provisions regarding: **(a)** any future modifications to existing critical habitat designations; **(b)** future critical habitat designation for

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any presently unlisted species treated “as if listed” as a Covered Species under the final NCCP/MSAA/HCP; and (c) any future “adverse modification” determinations under Section 7.

As noted above, the FESA jeopardy standard is the same under both FESA sections 7 and 10. However, as interpreted by the courts, FESA Section 3 critical habitat designation criteria present broader standards than the Section 7 and 10 jeopardy standards. The Draft Southern Planning Guidelines set forth in *Chapter 4* recognize that the FESA critical habitat designation criteria correspond with the conservation planning approach followed under the NCCP Act as applied in the Southern Subregion. *Chapter 4* defines a conservation planning goal of meeting FESA critical habitat standards as follows:

*With regard to federally-listed species and other species ultimately designated as Covered Species in the final Southern NCCP/MSAA/HCP, a main purpose of the final Conservation Strategy is to provide for the protection of those physical and biological features essential to the conservation of Covered Species in a manner consistent with the definitions set forth in FESA Section 3(5)(A)(i) and (ii). . . . the Draft Southern NCCP/MSAA/HCP Guidelines have been formulated to identify key locations for listed and other species that are deemed necessary for the conservation of the species in the Subregion. These key location determinations [see discussion in subsection 13.1.2 below], as well as specific connectivity, management and restoration recommendations, are provided for each planning area sub-basin, as well as for the overall planning area. In relation to FESA critical habitat considerations, the Southern NCCP/MSAA/HCP thus provides the opportunity for a more focused analysis of species protection needs, including a more detailed analysis of special management considerations and habitat protection, consistent with FESA Section 3(5)(A)(i), than that which can be undertaken on a species-wide critical habitat designation.*

Consistent with the above conservation planning goal, and in order to provide a unified analytic approach to regulatory coverage addressing all of the above state and federal regulatory requirements, this Chapter employs the following “conservation” and “management” analytical framework:

- (1) **Conservation** - The identification of Conserved Vegetation Communities that contain habitat suitable for proposed Covered Species, including both occupied and unoccupied habitat, which provides the physical and biological features essential to the conservation of proposed Covered Species, with protection assured through inclusion in the proposed Habitat Reserve and Supplemental Open Space in Subarea 1.
- (2) **Management** - The identification of special management considerations, including specific management and enhancement/restoration measures that would contribute to the recovery of listed species or prevent the need for future listing of other presently unlisted

Covered Species. Management also would include the compliance and effectiveness monitoring measures identified as a component of the HRMP.

Given the purposes of FESA to protect the ecosystems upon which listed species depend and the natural communities protection goals of the NCCP Act (as well as the wetlands/riparian natural community focus of California Fish and Game Code 1600 *et seq.*...), “conservation” and “management” analyses are presented both for the proposed Covered Species and proposed Conserved Vegetation Communities.

The manner in which the proposed Conservation Strategy for the NCCP/MSAA/HCP, as analyzed in this Chapter, addresses “conservation” and “management” in relation to the above statutory standards is reviewed in *Subsection 13.1.2* below.

### **13.1.2 NCCP/MSAA/HCP Guidelines for Addressing “Conservation and Management” of Proposed Covered Species and Proposed Conserved Vegetation Communities**

*Chapters 4* and *5* present the Draft Southern Planning Guidelines and Draft Southern Watershed Planning Principles that have been used in all aspects of conservation planning for the NCCP/MSAA/HCP, including application at both the geographic-specific sub-basin level and at the broader landscape scale in *Chapters 8* and *9*. The Guidelines set forth in these Chapters, as well as the comprehensive management program set forth in *Chapter 7*, provide the substantive guidance that is employed in the “conservation” and “management” analyses as reviewed in this Chapter. The assessment criteria are summarized below and further amplified in *Sections 13.2* and *13.3*.

#### ***a. Conservation and Management Standards and Criteria***

##### **1. Criteria Used in Addressing the “Conservation” of Proposed Covered Species**

General Policy 2 of the Draft Southern Planning Guidelines set forth in *Chapter 4* was formulated to provide a set of review standards for NCCP/MSAA/HCP planning species that would allow for an assessment as to whether alternative Habitat Reserve designs, in conjunction with a proposed HRMP, would provide for the conservation and management of these species. These standards are significant for several reasons:

- The standards were formulated to encompass all applicable state and federal statutory standards summarized above;
- The Guidelines incorporate the results of Species Accounts for the planning species (see *Appendix E*) that provided a significant set of criteria for assessing the Habitat Reserve

alternatives, including the selection of the B-12 Alternative for inclusion in the proposed Conservation Strategy;

- 22 of the 32 species proposed as Covered Species are planning species; and
- The methodology used in formulating the conservation and management standards for the planning species was applied to the other proposed Covered Species that are not planning species.

*Chapter 4* sets forth the criteria used in defining species habitat protection requirements that are used in this Chapter for purposes of assessing the adequacy of the proposed Habitat Reserve to provide for habitat essential to the conservation of proposed Covered Species. The Species Accounts and Conservation Analyses (*Appendix E*) and associated sub-basin guidelines for NCCP/MSAA/HCP planning species set forth in *Chapter 4* and applied in this Chapter are based on:

- the species' regional and subregional distribution,
- the relative importance of the Southern Subregion for the continued survival or recovery of the species,
- habitat affinities (including edaphic requirements) and characteristics of the species,
- life history characteristics (*e.g.*, plant pollinators, dispersal, response to fire), and
- response to management (including enhancement and restoration).

As stated in *Chapter 4*:

*With the above information, major populations and important populations of the planning species are identified. Major populations are those considered sufficiently large to be self-sustaining with a minimum of active or intensive management intervention or that at least support enough breeding individuals to contribute reliably to the overall metapopulation stability of the species. Important populations may not meet the relative size standards of major populations, but may nonetheless be important to the species' long-term survival. . . .*

*To facilitate reserve design, key locations are defined for some planning species. For planning purposes, key locations are those locations that are deemed necessary for the conservation of the species in the subregion. For example, populations of a species that are concentrated in a single or few locations would be key locations. Key locations may not be identifiable for some species that are widely scattered and lack population concentrations. . . . Portions of major or important populations that are not identified*

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*as key locations may be impacted consistent with the conservation of the species within the subregion.*

As noted above, these criteria are applied in this Chapter to the 22 planning species and to ten additional species proposed as Covered Species in assessing the “conservation” of these species. Consistent with Draft Southern Planning Guidelines General Policy 2, *Appendix E* provides Species Accounts and key habitat components for listed and other selected planning species and the other proposed Covered Species in the planning area. This Chapter further elaborates on other aspects of conservation relating to habitat connectivity (see *Chapter 4*, General Policy 3), a “refined” habitat block analysis and other “conservation” considerations.

## 2. Criteria Used in Addressing the “Conservation” of Proposed Conserved Vegetation Communities

The adequacy of protection provided for the proposed Conserved Vegetation Communities is essentially a question of the conservation provided by the Habitat Reserve design included in the proposed Conservation Strategy. Building on the sub-basin analyses of *Chapter 8*, analyses of the consistency of three Habitat Reserve Design Alternatives are presented in *Chapter 9* with landscape level tenets and principles used to assess the “conservation” of the existing vegetation communities. The review criteria employed in *Chapter 9* comprise the Draft Southern Planning Guidelines and Draft Watershed Planning Principles, which include relevant SAMP Tenets, the SRP Conservation Guidelines, the SRP/Science Advisors Tenets of Reserve Design and the Baseline Conditions Watershed Planning Principles. *Chapter 9* also reviews the extent to which alternative Habitat Reserve designs provide for the conservation of planning species. *Chapter 9* presents the rationale for selecting the B-12 Habitat Reserve as part of the proposed Conservation Strategy. *Chapter 10* further reviews the significant vegetation community conservation attributes of the B-12 Habitat Reserve design. *Section 13.3* presents conservation and impact analyses for the ten vegetation communities proposed as Conserved Vegetation Communities in relation to overall conservation levels and to the aforementioned tenets and principles.

## 3. Criteria Used in Addressing “Management” of Proposed Covered Species and Proposed Conserved Vegetation Communities

The purpose of “management” within the framework of the Southern California NCCP/HCP Program established through the 4(d) rule for the gnatcatcher is to maintain and, where feasible, enhance long-term net habitat value within a subregion. This purpose was first stated and defined in the SRP Conservation Guidelines and subsequently incorporated into the Draft Southern Planning Guidelines. Establishing the Habitat Reserve is clearly the necessary pre-condition for maintaining net habitat value and for enhancing net habitat value over the long-

term. However, it is the Habitat Reserve Management Program (HRMP) that creates the implementation mechanism for both maintaining and increasing net habitat value of resources within the Habitat Reserve on a long-term basis. In this context, the long term management of the Habitat Reserve helps mitigate the impacts of Covered Activities on proposed Covered Species and proposed Conserved Vegetation Communities by maintaining and increasing habitat values and functions.

As reviewed in *Chapter 7*, the overall Habitat Reserve will be managed and monitored according to the collective HRMP. There will be three tiers of management applied to the Habitat Reserve depending on whether designated Habitat Reserve lands are:

1. existing County parklands where regulatory coverage is not being requested and management is funded through the County’s annual budget and planning process for the County HBP;
2. existing County parklands where adaptive management activities would be implemented and funded by the optional Subarea 3 impact fees related to new development on remaining residential lots in Coto de Caza if the “opt-in” program reviewed in Section 13.5 is selected, or by the RMV Adaptive Management Program (AMP) for adaptive management measures related to stressors on parklands identified through the AMP monitoring program and that affect Covered Species and conserved Vegetation Communities within RMV Habitat Reserve Lands; and
3. previously protected RMV conservation easement area lands and future RMV dedication lands in response to regulatory coverage and that are committed to adaptive management funded by Participating Landowners as mitigation for impacts on Covered Species.

Lands included in the first management tier will be managed and monitored according to the Ongoing Management Program (OMP) element of the HRMP in order to maintain net habitat value on County parklands. For example, the County would continue with its management relating to ongoing impacts caused by public recreational use. Under the the second management tier, portions of County Parks Habitat Reserve lands will be managed and monitored according to the AMP element of the HRMP (as specified in *Chapter 7*) with the goal of both maintaining and enhancing net habitat value of lands addressed pursuant to the AMP.

Criteria for assessing proposed management measures for species and vegetation communities focus on contributions to the value and function of specific habitats, vegetation communities and geomorphic/hydrologic processes. Mitigation of impacts on proposed Covered Species and proposed Conserved Vegetation Communities derives *both* from *maintaining* and *enhancing* habitat values within the Habitat Reserve lands by: **(1)** responding to “environmental stressors”

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that have the potential to diminish habitat values and functions, and (2) carrying out specific enhancement and restoration measures. These two aspects of “management” are summarized as follows:

(a) Adaptive Management Measures Relating to Environmental Stressors

*Chapter 7* describes the Southern NCCP/MSAA/HCP AMP focus on “environmental factors known or thought to be directly or indirectly responsible for ecosystem changes.” *Chapter 7* goes on to indicate that “these factors, called ‘environmental stressors,’ may have both adverse and beneficial effects on ecosystem characteristics such as vegetation communities and species.” Stressors may adversely affect both proposed Covered Species and proposed Conserved Vegetation Communities.

By addressing “environmental stressors,” the Southern NCCP/MSAA/HCP AMP focuses on factors that influence the long-term habitat value of the Habitat Reserve. For example, in the absence of an AMP, anthropogenic influences such as the presence and expansion of invasive plant and animal species could severely impact habitat values (as evidenced by presently existing giant reed habitat impacts within San Juan Creek); in many cases, such stressors pre-date future development proposed to be allowed as Covered Activities and would cause impacts to habitat values that otherwise could be addressed only with public funds. Stressors on County Habitat Reserve lands would also be addressed through proposed mitigation for impacts involving County projects and in certain circumstances outlined in *Chapter 7*, pursuant to the AMP (portions of the County Parks budget are also allocated to stressor management, such as invasive species control). Thus, the AMP provides an institutional mechanism, funded by prior regulatory approvals and by proposed Covered Activities, for responding to such stressors (*e.g.*, through the Invasive Species Control Plan, *Appendix J*) thereby mitigating the impacts of Covered Activities (in combination with the creation of the Habitat Reserve).

The detailed species conservation analyses presented in *Section 13.2.5* typically include a list of known or potential environmental stressors for each species proposed for regulatory coverage. These lists of stressors are based on either (1) known stressors affecting species in Subarea 1 (*e.g.*, giant reed impacts on arroyo toad breeding habitat) where specific management/restoration measures are identified as priority management actions in the HRMP, or (2) “generic” stressors identified for a species in the scientific literature (*e.g.*, rodenticide impacts on prey for snakes), that, although not documented to be operating in Subarea 1, should be considered nonetheless as a potential management issue. Because of the differing applicability of these stressors to the proposed Habitat Reserve, not all identified stressors are recommended by the initial AMP to be addressed by proposed management measures. Additionally, although some stressors that have been identified as primary stressors on some species (*e.g.*, effects of water diversions on least Bell’s vireo, southwestern willow flycatcher, and arroyo toad), these are highly unlikely to be management issues in Subarea 1, but are retained on the lists because they have been

documented as important known stressors and they need to be acknowledged as potential stressors. Finally, “natural” stressors that have been identified for some species, such as predation by native species (*e.g.*, native snakes preying on bird nests) or resource competition among native species (*e.g.*, competition among raptor species for nest sites), are not included on the lists of stressors to be considered for management because under no management scenario would these types of stressors be directly addressed.

The “management” analyses presented in *Sections 13.2* and *13.3* set forth specific measures to adaptively manage the Conserved Vegetation Communities that provide the habitats for proposed Covered Species.

(b) Adaptive Management Measures Relating to Enhancement and Restoration of Habitat Values and Functions

Mitigation of Covered Activities’ impacts on proposed Covered Species and proposed Conserved Vegetation Communities involving creation of the Habitat Reserve, implementation of the HRMP and establishment of the funding and administrative mechanisms under the IA serves to enhance the net habitat value provided within the Habitat Reserve through enhancement and restoration actions carried out pursuant to the AMP and specific measures identified for County projects (the Prima Deshecha Landfill GDP and Avenida La Pata Improvement Projects). In this way, increased habitat value can be achieved and maintained within the Habitat Reserve to offset the impacts of Covered Activities on proposed Covered Species and proposed Conserved Vegetation Communities. *Section 13.2* reviews specific enhancement and restoration measures identified in *Chapter 7* that would benefit proposed Covered Species, including measures that would contribute to the recovery of listed species and help prevent the need for listing presently unlisted Covered Species.

Habitat restoration is broadly defined as the process of intentionally altering a degraded habitat area or creating new habitat to re-establish a defined pre-existing habitat or ecosystem or enhance the functioning of a degraded habitat or ecosystem. The goal of restoration is to emulate the structure, function, diversity and dynamics of the habitat or ecosystem. This goal generally will be achieved through implementation of several coordinated/integrated restoration plans and related management plans (the management plans listed below are also central elements or tools to be used by the AMP in response to future “stressors” of vegetation communities identified over time), including:

- A Habitat Restoration Plan addressing both uplands habitats and wetlands/riparian habitats (*Appendix H*);
- A Wildland Fire Management Plan (*Appendix N*);
- An Invasive Species Control Plan (*Appendix J*); and
- A Translocation, Propagation and Management Plan for Special-status Plants (*Appendix I*).

Elements of the initial enhancement and restoration program are responses to past and present “stressors,” including prior conversion of coastal sage scrub and native grasslands to non-native annual grasslands, the conversion of riparian habitat due to the impacts of giant reed and erosion in portions of lower Gobernadora Creek resulting from excessive surface and subsurface water supplies from upstream areas. Enhancement and restoration measures are reviewed in *Section 13.2* with respect to individual species and often include the integration of two or more management plan elements in relation to specific restoration actions (e.g., invasive species control in San Juan Creek in combination with measures to increase water supplies for arroyo toad and least Bell’s vireo habitat).

Restoration sites capable of contributing to the long-term enhancement of net habitat values of different vegetation communities within the Habitat Reserve are identified in the Habitat Restoration Plan. Although some elements of the Habitat Restoration Plan are specifically committed and timed to satisfy regulatory standards (i.e., mitigation for impacts to USACE jurisdictional wetlands and non-wetlands waters vegetated with aquatic habitat and to CDFG jurisdictional wetlands; see *Section 13.4*), in general the timing, location and type of restoration actions will be established through the overall process for prioritizing AMP actions reflecting the technical and priority recommendations of the Science Panel and decisions of the Reserve Manager (see discussion in *Chapter 7*). Given the long duration of the AMP (more than 75 years), the costs and funding program identified in *Chapter 12*, it is reasonable to conclude that the enhancement/restoration measures identified in the Habitat Restoration Plan, or equivalent measures will be implemented over the life of the permit.

#### 4. Monitoring Actions Necessary to Measure the Effectiveness of the Adaptive Management

The AMP is comprised of four steps to maximize the likelihood of the persistence of a native-dominated vegetation mosaic in the planning area: (1) preparation of conceptual stressor models and conceptual management plans for vegetation communities; (2) periodic assessment of the status of the vegetation communities; (3) management of the vegetation communities; and (4) evaluation of the effect of the management actions. Completion of steps 2 through 4 rely on implementation of compliance and effectiveness monitoring as discussed in the monitoring strategies set forth in *Chapter 7* for each major vegetation community and related focal species. These monitoring measures are an important contributing element that supports regulatory coverage for proposed Covered Species and impacts to the proposed Conserved Vegetation Communities addressed by the proposed NCCP/MSAA/HCP.

The stressor models discussed in *Chapter 7* address monitoring of biotic and abiotic resources at three fundamental scales: (1) natural community landscape mosaic; (2) specific vegetation communities and habitats; and (3) species and species assemblages. Although there is overlap,

dependence and interaction among the different scales, clearly stated conceptual relationships and coordinated management objectives at all three scales will need to be articulated in order to help maintain and, where feasible, increase net habitat value. For example:

- *Landscape-level monitoring* will focus on the dynamic and interacting biotic natural communities and abiotic factors (*i.e.*, natural processes) within the subregion that maintain the condition and dynamics of the natural communities.
- *Monitoring of specific vegetation communities* refers to the site-specific dynamic interaction of biotic and abiotic processes. Vegetation communities would be monitored to assess changes in *net habitat value* (*i.e.*, defined as “no net reduction in the ability of the subregion to maintain populations of target species over the long term), thus providing recognition of, and flexibility in, the management of natural stressor-induced changes (*i.e.*, intrinsic drivers) that occur in vegetation community associations that alter the relative amounts of the community at any give time (*e.g.*, natural succession, fire, flooding, *etc.*). This scale of monitoring is closely associated with maintaining species populations.
- *Monitoring of species and species assemblages* will focus on focal species populations, including Covered Species. Monitoring of these species and populations will be important for both permit compliance monitoring for Covered Species and effectiveness monitoring within the Habitat Reserve.

Because the monitoring program is extensively discussed in *Chapter 7*, specific monitoring measures are not addressed in the following analyses of proposed Covered Species and Conserved Vegetation Communities. However, the *Chapter 7* monitoring measures constitute an important element of the rationale for regulatory coverage for species and vegetation communities that is being requested.

### **13.1.3 Organization of Regulatory Coverage Analyses**

#### ***a. Proposed Covered Species***

*Section 13.2* presents analyses of “conservation” and “management” for species proposed to receive regulatory coverage. “Conservation” and “management” are reviewed for each proposed Covered Species under the following topics:

- Rangewide and Planning Area Status
- Conservation Analysis
  - Impacts
  - Conservation

- Management
- Rationale for Regulatory Coverage

### ***b. Proposed Conserved Vegetation Communities***

*Section 13.3* presents analyses of “conservation” and “management” for vegetation communities in the Habitat Reserve that provide habitat for Covered Species.

- Conservation of Conserved Vegetation Communities – Acreage
- Impacts on Conserved Vegetation Communities – Acreage
- Reserve Design Tenets – Conservation Criteria
  - Planning Species
  - Habitat Blocks and Contiguity
  - Diversity and Representativeness
- Management – Habitat Reserve Management Program

## **SECTION 13.2 CONSERVATION AND IMPACT ANALYSES FOR SPECIES PROPOSED TO RECEIVE REGULATORY COVERAGE**

This section presents an analysis of the Covered Species proposed for regulatory coverage under the proposed Conservation Strategy for Subarea 1 of the B-12 Alternative (simply referred to herein as Subarea 1). This section includes: **(1)** a brief review of the hierarchical approach to identifying species considered for regulatory coverage that was presented in *Chapter 7*; **(2)** the set of Covered Species proposed to receive state and federal regulatory coverage under the proposed Conservation Strategy for Subarea 1; **(3)** a general discussion of potential indirect effects on proposed Covered Species; and **(4)** a summary of the complete conservation analysis contained in *Appendix E* for each proposed Covered Species, including a brief coverage rationale that relates coverage to the key elements of the Conservation Strategy.

### **13.2.1 Hierarchical Analysis of Species that Were Considered to Receive Regulatory Coverage**

The Conservation Strategy approach to identifying species that should be considered for regulatory coverage involves applying a set of rigorous review criteria to a list of prospective species. The list of prospective species included about 86 species taken from the Group 1, 2 and 3 species identified by the Southern Subregion Science Advisors, California Native Plant Society (CNPS) List 1B and List 2 plant species (see explanation of CNPS Lists in legend for *Table 13-*

I), and other species identified by RMV consultants and regulatory agency staff based on the more than 10 years of species and habitat surveys conducted in the subregional planning area.

A hierarchical evaluation of these prospective Covered Species was conducted to guide the determination as to whether regulatory coverage should be sought by NCCP/MSAA/HCP participants. The first step in this evaluation focused on answering four key questions in relation to each of the prospective species being considered for coverage.

- Question 1: Does the species occur in the planning area or is it likely to occur in the planning area as a result of the beneficial effects of the HRMP?
- Question 2: Is the species already listed or likely to be listed during the term of the program?
- Question 3: Is the species likely to be impacted by permitted Covered Activities, including adaptive management measures, implemented under the NCCP/MSAA/HCP and associated HRMP?
- Question 4: If impacts to the species are likely within the subregion, can the impacts be effectively mitigated and managed?

If the answer to all of the above questions was “yes,” then regulatory coverage generally would be sought for that species as part of the proposed Conservation Strategy (*e.g.*, the coastal California gnatcatcher). If the answer to all questions was “no,” then regulatory coverage either would not be needed or would be a low priority. However, if the answer to Question 1 was “yes,” but then either a “no” or “not clear at this time” to one or more of the other three questions, the participants in the NCCP/MSAA/HCP are essentially involved in a “risk management” exercise of whether coverage for the species would be warranted over the life of the permit.

The second step in the hierarchical analysis of species proposed for coverage focused on the “risk management” evaluation. This step involved evaluating several additional subjective, and sometimes competing, considerations. These considerations included, but were not limited to, the potential:

- For species to be listed in the future at either the state or federal levels;
- Costs of fieldwork necessary to justify regulatory coverage;
- Costs for ongoing management and monitoring associated with regulatory coverage for the species;
- Costs related to changes in the Habitat Reserve size and configuration that could be necessary if regulatory coverage is requested for a species or group of species; and

- Impacts of a future listing for a particular species on “Covered Activities” permitted as part of the NCCP/MSAA/HCP and permitted activities under the SAMP and the GPA/ZC.

Based on these five additional factors, a final evaluation was conducted by the Participating Landowners/Permittees to determine their willingness to weigh the risk related to failing to obtain regulatory coverage for a particular species against the projected costs associated with ongoing management and monitoring necessary to justify regulatory coverage for the species. The discussion below in *Section 13.2.2* below identifies the species that are proposed under these criteria to receive regulatory coverage under the proposed Conservation Strategy for Subarea 1.

In addition to the species selected for regulatory coverage using the selection method described in this section, two oak species are proposed for coverage: coast live oak (*Quercus agrifolia*) and California scrub oak (*Quercus berberidifolia*). These two oak species are proposed for coverage because of the passage of California SB 1334 pertaining to oak woodlands conservation in 2004. This act adds Section 21083.4 to the Public Resources Code and requires a county to conduct a CEQA analysis to “determine whether a project in its jurisdiction may result in the conversion of oak woodlands that will have a significant effect on the environment, and would require the county, if it determines there may be a significant effect to oak woodlands, to require one or more specified mitigation alternatives to mitigate the significant effect of the conversion of the oak woodlands.” (SB 1334 [1]). By providing for conservation and management of oak species in the Habitat Reserve at a level adequate for regulatory coverage, the NCCP/MSAA/HCP would achieve the intent of SB 1334 and allow the County of Orange to address oak species in the Joint Programmatic EIR/EIS.

### **13.2.2 Species Proposed to Receive State and Federal Regulatory Coverage**

This subsection describes the state and federal regulatory coverage provided for by the proposed Conservation Strategy for Subarea 1. Listed and unlisted species that were selected to receive coverage under the regulatory component of the proposed Conservation Strategy of the Southern NCCP/MSAA/HCP are referred to as “Covered Species.” Based on the size, configuration, and biological diversity of the Habitat Reserve, as described in detail in *Chapter 9* and also briefly summarized below in *Section 13.3*, and the adaptive management measures set forth in *Chapter 7*, the proposed Conservation Strategy for Subarea 1 would provide regulatory coverage under FESA and CESA for a total of **32** Covered Species in Subareas 1 and 3, including all seven of the state/federally-listed that occur in the planning area and **25** other species, as presented in *Table 13-1*.

**TABLE 13-1**  
**SOUTHERN NCCP/MSAA/HCP PROPOSED COVERED SPECIES**

Common Name <sup>1</sup>	Scientific Name	Federal/State/CNPS (Plants)/ Science Advisors Group
<b>Birds</b>		
Burrowing Owl	<i>Athene cunicularia</i>	FSC, BCC/CSC/3
<b>Coastal Cactus Wren</b>	<i>Campylorhynchus brunneicapillus couesi</i>	BCC/CSC/2
<b>Coastal California Gnatcatcher</b>	<i>Polioptila californica californica</i>	FT/CSC/2
<b>Cooper's Hawk</b>	<i>Accipiter cooperii</i>	None/CSC/2
<b>Grasshopper Sparrow</b>	<i>Ammodramus savannarum</i>	None/None/2
<b>Least Bell's Vireo</b>	<i>Vireo bellii pusillus</i>	FE/SE/3
Long-eared Owl	<i>Asio otus</i>	None/CSC/3
<b>Southwestern Willow Flycatcher</b>	<i>Empidonx trallii extimus</i>	FE/SE/3
<b>Tricolored Blackbird</b>	<i>Agelaius tricolor</i>	FSC, BCC/CSC/3
<b>White-tailed Kite</b>	<i>Elanus leucurus</i>	FSC, MNBMC/FP/3
<b>Yellow-breasted Chat</b>	<i>Icteria virens</i>	None/CSC/3
<b>Yellow Warbler</b>	<i>Dendroica petechia</i>	None/CSC/3
<b>Amphibians</b>		
<b>Arroyo Toad</b>	<i>Bufo californicus</i>	FE/CSC/3
<b>Western Spadefoot Toad</b>	<i>Spea [=Scaphiophus] hammondi</i>	FSC/CSC/3
<b>Reptiles</b>		
California Glossy Snake	<i>Arizona elegans occidentalis</i>	None/None/3/
Coast Patch-nosed Snake	<i>Salvadora hexalepis virgultea</i>	None/CSC/2
Northern Red-diamond Rattlesnake	<i>Crotalus ruber ruber</i>	None/CSC/3
<b>Orange-throated Whiptail</b>	<i>Aspidoscelis hyperythra [=Cnemidophorus hyperythrus] beldingi</i>	None/CSC/2
Red Coachwhip	<i>Masticophis flagellum piceus</i>	None/None/None
<b>"San Diego" Coast Horned Lizard</b>	<i>Phrynosoma coronatum</i> (blainvillei population)	FSC/CSC/2
<b>Southwestern Pond Turtle</b>	<i>Emys [=Clemmys] marmorata pallida</i>	FSC/CSC/3
<b>Fish</b>		
Arroyo Chub	<i>Gila orcutti</i>	FSC/CSC/3
Partially-armored Stickleback	Threespine <i>Gasterosteus aculeatus</i> ssp. <i>Microcephalus</i>	None/None/3
<b>Invertebrates</b>		
<b>Riverside Fairy Shrimp</b>	<i>Streptocephalus woottoni</i>	FE/None/3
<b>San Diego Fairy Shrimp</b>	<i>Branchinecta sandiegonensis</i>	FE/None/3

**TABLE 13-1**  
**SOUTHERN NCCP/MSAA/HCP PROPOSED COVERED SPECIES**

Common Name <sup>1</sup>	Scientific Name	Federal/State/CNPS (Plants)/ Science Advisors Group
<b>Plants</b>		
California Scrub Oak	<i>Quercus berberidifolia</i>	None
<b>Chaparral Beargrass</b>	<i>Nolina cismontana</i>	None/None/List 1B.2
Coast Live Oak	<i>Quercus agrifolia</i>	None
<b>Coulter's Saltbush</b>	<i>Atriplex coulteri</i>	None/None/List 1B.2
<b>Many-stemmed Dudleya</b>	<i>Dudleya multicaulis</i>	None/None/List 1B.2
<b>Southern Tarplant</b>	<i>Centromadia parryi</i> var. <i>australis</i>	None/None/List 1B.1
<b>Thread-leaved Brodiaea</b>	<i>Brodiaea filifolia</i>	FT/SE/List 1B.1

<sup>1</sup> NCCP/MSAA/HCP planning species are shown in **boldface** print.

#### Federal & State Status

BCC	U.S. Fish and Wildlife Service Bird of Conservation Concern
FE	Federally Listed Endangered Species
FSC	Federal Species of Concern
FP	State Fully Protected
FT	Federally Listed Threatened Species
MNBMC	U.S. Fish and Wildlife Service Migratory Nongame Birds of Management Concern
CSC	California Species of Special Concern
SE	State Listed Endangered
ST	State Listed Threatened

#### Science Advisors Categories

1. Species whose conservation is minimally affected by the reserve planning process
2. Species conserved most effectively at the habitat or landscape level.
3. Species requiring species-level conservation action.

#### CNPS (California Native Plant Society)

##### Lists

1B: Rare or Endangered in California and Elsewhere

##### Threat Code Extension

- .1: Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
- .2: Fairly endangered in California (20-80% occurrences threatened)

The “No Surprises Rule” published by the USFWS (1998a) provides a definition of “adequately covered” and provides for assurances to HCP participants.

*Adequately covered means, with respect to species listed pursuant to Section 4 of the ESA, that a proposed conservation plan has satisfied the permit issuance criteria under section 10(a)(2)(B) of the ESA for the species covered by the plan, and, with respect to unlisted species, that a proposed conservation plan has satisfied the permit issuance criteria of section 10(a)(2)(B) of the ESA that would otherwise apply if the unlisted species covered by the plan were actually listed.*

(63 Federal Register, 8870, 2/3/98)

The information provided in the following detailed conservation analysis in *Section 13.2.5* regarding the justification for regulatory coverage applies the criteria used by the USFWS and CDFG to establish the adequacy of the Southern NCCP/MSAA/HCP to address conservation needs of a particular species, thereby allowing it to receive regulatory coverage under FESA, the NCCP Act and, as appropriate, CESA.

All 32 of the proposed Covered Species have been analyzed in accordance with the above standards. This analysis demonstrates that implementation of the Habitat Reserve and HRMP would provide for the conservation and management of unlisted Covered Species sufficiently to avoid the need to elevate unlisted Covered Species to a listed status within the planning area and help avoid the need for listing on a rangewide basis. The analysis demonstrates that implementation of the NCCP/MSAA/HCP would contribute to and provide for survival and provide for recovery of all listed Covered Species consistent with FESA. For the same reasons, the NCCP/MSAA/HCP would provide for conservation and management of listed species as required by Section 2835 of the NCCP Act in effect on December 31, 2001.

The Covered Species listed in *Table 13-1*, and discussed below in *Section 13.2.4*, are proposed for coverage under both Section 10 of the FESA and the NCCP Act. Each of these species is designated a Covered Species for one or more of the following reasons:

- Regional- or landscape-level considerations, such as healthy population levels, widespread distribution throughout the planning area, and life history characteristics that respond to habitat-scale conservation and management actions;
- Regional- or landscape-level considerations with site-specific conservation and management requirements that are clearly identified in the plan for species that are generally well-distributed, but have core habitats within the planning area that must be conserved;
- Site-specific considerations, including locations of *major* and *important populations* in *key locations*, and the identification of specific conservation and management conditions for species within a narrowly defined habitat or limited geographic area within the planning area; or
- The species is widely distributed beyond the NCCP subregion and the Habitat Reserve and HRMP provide fully adequate conservation measures for this subregion.

### **13.2.3 Indirect Impacts of the Proposed Covered Activities**

This subsection provides an analysis of potential indirect impacts on proposed Covered Species and proposed Conserved Vegetation Communities which may result from implementation of the

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proposed Covered Activities. Measures to minimize these potential indirect effects are also described.

### ***a. Impacts***

Potential indirect impacts are impacts which occur after implementation of the proposed Activities and involve impacts on natural areas from Covered Activities located within adjacent development areas. Indirect impacts can manifest themselves immediately after implementation of the proposed Covered Activities (*e.g.*, introduction of invasive species) or can occur at a time remote to the proposed Covered Activities (*e.g.*, trespass into the proposed Habitat Reserve). Potential indirect impacts that could occur as a result of the proposed Covered Activities include: **(1)** impacts related to the introduction of invasive species into native vegetation communities in the proposed Habitat Reserve; **(2)** the introduction of artificial lighting into areas previously unlit; **(3)** the use of pesticides and herbicides adjacent to the Habitat Reserve; **(4)** the illegal introduction (trespass) of people into the proposed Habitat Reserve; and **(5)** the increased fire risk due to accidental and intention ignitions along the Habitat Reserve-urban interface (including roads). These potential indirect impacts are discussed in more detail below.

#### **1. Invasive Species**

The proposed Covered Activities may introduce invasive species. The proposed Covered Activities could introduce invasive plants through the installation of ornamental landscaping whose seeds may escape to natural areas and degrade the native vegetation communities. In addition, the proposed Covered Activities have the potential to increase the existing population of invasive invertebrate/vertebrate species onsite or introduce new invasive species to previously undisturbed areas. Three invasive invertebrate species are known to occur within the planning area, including Argentine ant (*Linepithema humile*), red imported fire ant (*Solenopsis invicta*), and crayfish (*Procambrus* spp.). These species pose direct and indirect threats to native species at the urban-natural interface, including direct predation of native vertebrates and competition/displacement of important invertebrate prey of native species. Vertebrate species including introduced fishes, bullfrog, brown-headed cowbird, European starling, and urban-related mesopredators such as opossums, cats, and dogs also have the potential to become problematic within the proposed Habitat Reserve.

#### **2. Artificial Light**

The proposed Covered Activities may introduce artificial light into areas that were previously unlit. This is particularly the case with the development uses proposed by RMV and less so with the activities proposed by the County or SMWD. The GPA/ZC EIR prepared by the County for the Ranch Plan project noted that lighting could result in an indirect effect on the behavioral

patterns of nocturnal and crepuscular (*i.e.*, active at dawn and dusk) wildlife. The GPA/ZC EIR further noted that “of greatest concern is the effect on small ground dwelling animals that use the darkness to hide from predators, and the effect on owls, which are specialized night foragers relying on the darkness for cover” (Page 4.9-153, GPA/ZC EIR 2004). Of the proposed Covered Species, the potential introduction of night lighting could potentially affect arroyo toad, western spadefoot toad, long-eared owl, California glossy snake, and red-diamond rattlesnake.

### 3. Pesticides and Herbicides

The application of pesticides and/or herbicides has the potential to result in impacts to proposed Conserved Vegetation Communities and proposed Covered Species within the Habitat Reserve. The literature on the potential impacts of pesticides and herbicides and pesticides is relatively large and beyond the scope of review here, but some specific examples of potential impacts to proposed Covered Species are as follows:

- impacts on the prey base and rodent burrows for the burrowing owl;
- a potential cause of nesting failures in tricolored blackbirds;
- impacts (specifically rodenticides) on rodent prey of snakes such as glossy snake, coast patch-nosed snake, red-diamond rattlesnake, red coachwhip and raptors such as white-tailed kite and long-eared owl;
- potential impacts on aquatic species including arroyo toad, western spadefoot toad, Riverside and San Diego fairy shrimp, southwestern pond turtle, partially-armored threespine stickleback and arroyo chub; and
- potential impacts on plants such as thread-leaved brodiaea.

### 4. Trespass

Trespass into the proposed Habitat Reserve by unauthorized persons and the general increase in human activity would increase the disturbance of the Habitat Reserve. Human disturbance could disrupt normal foraging and breeding behavior of wildlife in the proposed Habitat Reserve, diminishing value of the habitat in the proposed Habitat Reserve. Wildlife stressed by noise, in particular nesting raptors such as white-tailed kite and long-eared owl, may abandon nest sites in the proposed Habitat Reserve in areas adjacent to proposed development, leaving only wildlife tolerant of human activity.

## 5. Increased Fire Risk

Increased fire risk will occur as a result of the increased Habitat Reserve-urban development edge (including roads) and increased human activity adjacent to and within the Habitat Reserve. The proximity of urban development to the Habitat Reserve provides the opportunity for increased accidental and deliberate ignitions. Increased fire frequency can stress species and habitats temporarily, and potentially permanently, both in the short term (*e.g.*, wildlife fleeing wildfires) and the long-term (*e.g.*, recovery of habitat and potential state-transition from shrublands to annual grasslands). For example, it takes many years for severely burned cactus patches to recover adequately to support cactus wrens.

### ***b. Minimization of Indirect Impacts***

The Draft Southern Planning Guidelines contain a general policy relating to long-term indirect impacts to the proposed Habitat Reserve. This general policy (General Policy 5) is set forth below.

**General Policy 5: Long-term indirect impacts to the Habitat Reserve and other areas being preserved for species protection shall be managed through creation of an urban/wildlands interface zone separating the Habitat Reserve and the non-reserve/urban areas. Management within the interface zone would:**

- Create fuel management zones combining irrigated and non-irrigated native plantings separating the Habitat Reserve from adjacent urban uses.
- To the extent that fuel management zones are composed of native vegetation and can support Covered Species and other species, or be enhanced or managed to support Covered Species and other species, this should be encouraged. For example, using prickly-pear in the fuel management zone may provide habitat for the cactus wren, as well as enhance the buffering effect between the Habitat Reserve and developed areas.
- Fuel management zones and practices will be set forth in a “fuel management plan” as part of the NCCP/MSAA/HCP and aquatic resources protection program.
- Prohibit plants identified by the California Exotic Pest Plant Council as an invasive risk in Southern California from development and fuel management zones adjoining the Habitat Reserve.
- Manage pesticide and herbicide use and fertilizer application techniques in landscaped areas, including golf courses, located adjacent to the Habitat Reserve or preserved wetlands and provide comprehensive water quality treatment, which may include, but not

be limited to, the use of natural treatment systems, prior to discharge of urban runoff into the Habitat Reserve.

- Shield and/or direct lighting away from habitat areas through the use of low-sodium or similar intensity lights, light shields, native shrubs, berms, and other shielding methods.
- Provide barriers, fencing, signs, walls, etc. to manage and direct access by the public and domestic animals (*e.g.*, pets) to protect sensitive habitat and species.

To address this policy and minimize the potential effects of indirect impacts, the following design features have been incorporated into the proposed Covered Activities or minimization measures have been either adopted by the County of Orange through the Ranch Plan GPA/ZC EIR or are proposed by the USACE as part of the SAMP EIS.

### 1. Fuel Modification Zones

The development planning areas proposed by RMV to be Covered Activities include a 110-foot fuel modification zone inside the development boundary shown on *Figure 192-M*.

This 110-foot fuel modification zone will separate the proposed Habitat Reserve from adjacent urban uses. Plantings within the fuel modification zone will be per the Orange County Fire Authority Fuel Modification Plant List (as modified per the measures set forth below). The following types of cactus are allowed and encouraged within fuel modification zones: prickly pear, oracle and coast cholla.

### 2. Invasive Species

Multiple minimization measure have been either adopted by the County of Orange through the GPA/ZC EIR or are proposed by the USACE as part of the SAMP EIS to address the potential indirect effect of invasive species, as follows:

- The permittee shall conduct an exotic aquatic animal removal program to remove cowbirds, bullfrogs, non-native fishes, etc., as set forth in the Invasive Species Control Plan (*Appendix J*) and per USACE Permit Special Condition III.6.
- The permittee shall refrain from using invasive exotic vegetation within fuel modification zones. Invasive exotic plants are those rated as medium or high by the California Exotic Plant Council in terms of their invasiveness per USACE Permit Special Condition I.D.8.
- All plants identified by the California Exotic Pest Plant Council as an invasive risk in southern California shall be prohibited from development and fuel management zones adjacent to the RMV Open Space (termed Habitat Reserve in this NCCP/MSAA/HCP).

- The plant palette for fuel management zones adjacent to the RMV Open Space shall be limited to those species listed on the Orange County Fire Authority Fuel Modification Plant List. Plants native to RMV shall be given preference in the plant palette.
- Prior to issuance of fuel modification plan approvals, the County of Orange shall verify that: (1) plants identified by the California Exotic Pest Plant Council as an invasive risk in Southern California are not included in plans for fuel management zones adjacent to the RMV Open Space; and (2) the plant palette for fuel management zones adjacent to RMV Open Space is limited to those species listed on the Orange County Fire Authority Fuel Modification Plant List.
- Prior to the recordation of a map for a tract adjacent to the RMV Open Space, the County of Orange shall verify that the CC&Rs contain language prohibiting the planting of plants identified by the California Exotic Pest Plant Council as an invasive risk in Southern California in private landscaped areas (GPA/ZC EIR MM 4.9-27).

### 3. Lighting

Similar to invasive species, multiple minimization measure have been either adopted by the County of Orange through the GPA/ZC EIR or are proposed by the USACE as part of the SAMP EIS to address the potential indirect effect of lighting, as follows:

- The permittee shall minimize light-spillover associated with the development to minimize indirect impacts to wildlife. Lighting shall be directed away from habitat areas through the use of low-sodium or similar intensity lights, light shields, native shrubs, berms, placement low near the ground, or other shielding methods per USACE Permit Special Condition I.D.7.
- Prior to the issuance of building permits for a tract with public street lighting adjacent to RMV Open Space habitat areas, the County of Orange shall verify that measures to shield such lighting have been incorporated in the building plans (GPA/ZC EIR MM 4.9-28).

### 4. Pesticide/Herbicide Application

*Appendix K* to this NCCP/MSAA/HCP contains the Water Quality Management Plan which sets forth both site design Best Management Practices (BMPs), including a combined control system, and source control BMPs, such as Integrated Pest Management, to minimize the impacts of pollutants of concern, including pesticides/herbicides.

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## 5. Access

To minimize the potential impacts resulting from unauthorized access to what is termed RMV Open Space, (*i.e.*, NCCP/MSAA/HCP Habitat Reserve), the County of Orange adopted the following minimization measure.

- Access to the RMV Open Space shall be managed and directed as specified in the Open Space Agreement between the County of Orange and RMV. Where potential conflicts between development and open space are identified per the agreement the following shall occur:

Prior to the issuance of building permits for a tract adjacent to the RMV Open Space, the County of Orange shall verify that measures, such as fencing, signs etc., to direct the public to public access points within the RMV Open Space have been incorporated into the building plans. To the extent that public access points are not identified, the County of Orange shall verify that measures, such as fencing, signs etc., to prohibit public access have been incorporated into the building plans (GPA/ZC EIR MM 4.9-29).

### **13.2.4 Conservation and Impact Analysis Summaries for Species Proposed to Receive Regulatory Coverage**

This subsection provides summaries of the conservation and impacts for species proposed to receive regulatory coverage under the proposed Covered Activities, including:

- Separate tabular summaries of conservation and impacts for proposed Covered Species (*Table 13-2* for wildlife and *Table 13-3* for plants);
- Separate breakouts of the conservation and impacts for proposed Covered Species by Participating Landowner and Project (*Tables 13-4* and *13-5* for wildlife and a narrative summary for plants); and
- Separate tabular summaries for temporary impacts on proposed Covered Species (*Table 13-6* for wildlife and *Table 13-7* for plants).

**TABLE 13-2  
CONSERVATION AND IMPACT SUMMARY FOR PROPOSED COVERED WILDLIFE SPECIES IN SUBAREA<sup>1</sup>**

Proposed Covered Wildlife Species <sup>1</sup>	Total Habitat Acres and Locations in Subarea 1		Total Habitat Acres and Locations in Habitat Reserve		Total Habitat Acres and Locations in SOS		Total Habitat Acres and Locations in Habitat Reserve and SOS		Total Habitat Acres and Locations Impacted	
	Habitat	Locations	Habitat (%)	Locations (%)	Habitat (%)	Locations (%)	Habitat (%)	Locations (%)	Habitat (%)	Locations (%)
Burrowing Owl	12,626	0	7,568 (60%)	NA	957 (8%)	NA	8,525 (68%)	NA	4,199 (33%)	NA
Coastal Cactus Wren	16,811	1,171	12,191 (73%)	853 (73%)	2,196 (13%)	98 (8%)	14,387 (86%)	951 (81%)	2,242 (14%)	216 (18%)
Coastal California Gnatcatcher	16,811	518	12,191 (73%)	400 (77%)	2,196 (13%)	28 (5%)	14,387 (86%)	428 (83%)	2,242 (14%)	90 (17%)
Cooper's Hawk	6,233	41	4,537 (73%)	30 (73%)	929 (15%)	5 (12%)	5,466 (88%)	35 (85%)	750 (12%)	6 (12%)
Grasshopper Sparrow	12,626	658	7,568 (60%)	382 (58%)	957 (8%)	8 (1%)	8,525 (68%)	390 (59%)	4,199 (33%)	267 (41%)
Least Bell's Vireo	698	53	615 (88%)	43 (81%)	10 (1%)	3 (6%)	625 (89%)	46 (87%)	72 (10%)	7 (13%)
Long-eared Owl	NA <sup>2</sup>	8	NA	3	NA	3	NA	6	NA	2
Southwestern Willow Flycatcher	698	6	615 (88%)	6 (100%)	10 (1%)	0 (0%)	625 (89%)	6 (100%)	72 (10%)	0 (0%)
Tricolored Blackbird	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
White-tailed Kite	6,233	31	4,537 (73%)	26 (84%)	929 (15%)	3 (10%)	5,466 (88%)	29 (94%)	750 (12%)	2 (6%)
Yellow Warbler	3,980	26	3,119 (78%)	26 (100%)	576 (14%)	0 (0%)	3,695 (93%)	26 (100%)	186 (5%)	0 (0%)
Yellow-breasted Chat	3,980	116	3,119 (78%)	99 (85%)	576 (14%)	0 (0%)	3,695 (93%)	99 (85%)	186 (5%)	14 (12%)
Arroyo Toad	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
California Glossy Snake	28,433	4	20,989 (74%)	4 (100%)	2,300 (8%)	0 (0%)	23,289 (82%)	4 (100%)	5,115 (18%)	0 (0%)
Coast Patch-nosed Snake	32,729	3	23,111 (71%)	1 (33%)	3,461 (11%)	1 (33%)	26,572 (81%)	2 (67%)	6,254 (19%)	1 (33%)

**TABLE 13-2**  
**CONSERVATION AND IMPACT SUMMARY FOR PROPOSED COVERED WILDLIFE SPECIES IN SUBAREA<sup>1</sup>**

Proposed Covered Wildlife Species <sup>1</sup>	Total Habitat Acres and Locations in Subarea 1		Total Habitat Acres and Locations in Habitat Reserve		Total Habitat Acres and Locations in SOS		Total Habitat Acres and Locations in Habitat Reserve and SOS		Total Habitat Acres and Locations Impacted	
	Habitat	Locations	Habitat (%)	Locations (%)	Habitat (%)	Locations (%)	Habitat (%)	Locations (%)	Habitat (%)	Locations (%)
Northern Red-diamond Rattlesnake	32,729	16	23,111 (71%)	9 (56%)	3,461 (11%)	1 (6%)	26,572 (81%)	10 (63%)	6,254 (19%)	6 (37%)
<b>Orange-throated Whiptail</b>	25,812	169	18,803 (73%)	115 (68%)	2,860 (11%)	6 (4%)	21,663 (84%)	121 (72%)	4,149 (16%)	48 (28%)
Red Coachwhip	32,729	3	23,111 (71%)	2 (67%)	3,461 (11%)	0 (0%)	26,572 (81%)	2 (67%)	6,254 (19%)	1 (33%)
<b>San Diego Horned Lizard</b>	23,479	48	17,385 (74%)	36 (75%)	2,507 (11%)	0 (0%)	19,892 (85%)	36 (75%)	3,585 (15%)	12 (25%)
<b>Southwestern Pond Turtle</b>	NA	8	NA	6 (75%)	NA	0 (0%)	NA	6 (75%)	NA	2 (25%)
<b>Western Spadefoot Toad</b>	NA	24	NA	19 (79%)	NA	1 (4%)	NA	20 (83%)	NA	4 (17%)
Arroyo Chub	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Partially-armored Threespine Stickleback	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Riverside Fairy Shrimp</b>	NA	3	NA	3 (100%)	NA	0 (0%)	NA	3 (100%)	NA	0 (0%)
<b>San Diego Fairy Shrimp</b>	NA	5	NA	5 (100%)	NA	0 (0%)	NA	4 (100%)	NA	0 (0%)

<sup>1</sup> NCCP/MSAA/HCP planning species are shown in **boldface** print.

<sup>2</sup> NAs for habitat indicate that a landscape-level of analysis is not applicable or appropriate either because the species does not reliably occur in relation to the distribution of its preferred habitat (e.g., long-eared owl) or that the species is associated with specific microhabitats that are not captured at the landscape-level habitat associations, such as fairy shrimp and western spadefoot toad that are associated with vernal pools and ephemeral wetlands. The rationale for the habitat-level analysis is provided in the conservation analyses for each of the proposed Covered Species presented below. Similarly "NAs" for locations indicate that species occurrences are not reliably reflected by point locations, such as arroyo toad, arroyo chub and threespine stickleback. The spatial distributions of these species are better portrayed by stream reaches rather than point locations. The treatment of spatial distributions of tricolored blackbird colonies also is deferred to the detailed species conservation analysis below because of the ephemeral nature of the species and its reliance not only on wetland microhabitats for breeding, but also on large areas of grassland and agriculture for foraging.

**TABLE 13-3**  
**CONSERVATION AND IMPACT SUMMARY FOR PROPOSED COVERED PLANT SPECIES IN SUBAREA<sup>1</sup>**

Proposed Covered Plant Species <sup>1</sup>	Total Locations and Individuals in Subarea 1		Total Locations and Individuals in Habitat Reserve		Total Locations and Individuals in SOS		Total Locations and Individuals in Habitat Reserve and SOS		Total Locations and Individuals Impacted	
	Locations	Individuals	Locations (%)	Individuals (%)	Locations (%)	Individuals (%)	Locations (%)	Individuals (%)	Locations <sup>5</sup> (%)	Individuals (%)
California Scrub Oak <sup>2</sup>	2,782 ac	NA	2,233 ac (80%)	NA	265 ac (10%)	NA	2,588 ac (90%)	NA	284 ac (10%)	NA
<b>Chaparral Beargrass</b>	6	6	5 (83%)	5 (83%)	0 (0%)	0 (0%)	5 (83%)	5 (83%)	1 (17%)	1 (17%)
Coast Live Oak <sup>2</sup>	3,712 ac	NA	2,572 ac (69%)	NA	517 ac (14%)	NA	3,089 ac (83%)	NA	629 ac (17%)	NA
<b>Coulter's Saltbush<sup>3</sup></b>	33	2,752	29 (88%)	2,475 (90%)	0 (0%)	0 (0%)	29 (88%)	2,475 (90%)	4 (12%)	277 (10%)
<b>Many-stemmed Dudleya</b>	386	63,666	236 (61%)	44,024 (69%)	1 (0%)	1 (0%)	237 (61%)	44,025 (69%)	149 (39%)	19,642 (31%)
<b>Southern Tarplant<sup>4</sup></b>	37	142,571	30 (81%)	129,984 (91%)	0 (0%)	0 (0%)	30 (81%)	129,984 (91%)	7 (19%)	12,587 (9%)
<b>Thread-leaved Brodiaea</b>	33	9,395	20 (61%)	9,248 (98%)	0 (0%)	0 (0%)	20 (61%)	9,248 (98%)	13 (39%)	147 (2%)

<sup>1</sup> NCCP/MSAA/HCP planning species are shown in **boldface** print.

<sup>2</sup> Acreages are provided for coast live oak and California scrub oak because the data are from the NCCP vegetation database and do not represent individuals or discrete locations.

<sup>3</sup> The Coulter's saltbush totals exclude three mapped locations and 336 individuals in existing orchards in Chiquita Canyon.

<sup>4</sup> The southern tarplant totals exclude three mapped locations and 3,105 individuals in existing orchards in Chiquita Canyon.

<sup>5</sup> The number of impacted locations refers to the locations that would be considered 100 percent lost. It does not reflect impacted locations where there would be adequate conservation of the remaining population at the location to remain viable. See text for full discussion of the conservation analysis methods.

**TABLE 13-4  
BREAKDOWN OF CONSERVATION OF PROPOSED COVERED WILDLIFE SPECIES  
BY PARTICIPATING LANDOWNERS OR PROJECT**

Proposed Covered Wildlife Species <sup>1</sup>	Conservation in Habitat Reserve								Conservation in SOS					
	Proposed RMV		Prior RMV <sup>2</sup>		County Parks <sup>3</sup>		CDFG <sup>4</sup>		Starr Ranch		Prima Deshecha		Ladera Ranch <sup>5</sup>	
	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations
Burrowing Owl	3,913	0	1,933	0	1,694	0	29	0	624	0	331	0	2	0
Cactus Wren	5,411	324	1,276	156	5,493	372	10	2	2,061	96	133	2	0	0
California Gnatcatcher	5,411	167	1,276	143	5,493	87	10	3	2,061	21	133	7	2	0
Cooper's Hawk	1,859	17	442	5	2,218	8	7	0	915	5	15	0	0	0
Grasshopper Sparrow	3,913	334	1,933	45	1,694	2	29	0	624	1	331	8	2	0
Least Bell's Vireo	435	30	121	9	41	1	7	3	0	0	10	3	0	0
Long-eared Owl	NA	2	NA	0	NA	1	NA	0	NA	3	NA	0	NA	0
Willow Flycatcher	435	6	121	0	41	0	7	0	0	0	10	0	0	0
Tricolored Blackbird	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
White-tailed Kite	1,859	12	442	4	2,218	10	7	0	915	3	15	0	0	0
Yellow Warbler	1,232	17	325	3	1,545	6	7	0	563	0	14	0	0	0
Yellow-breasted Chat	1,232	63	325	21	1,545	11	7	7	563	0	14	0	0	0
Arroyo Toad	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
California Glossy Snake	10,040	1	2,163	0	9,248	3	10	0	2,472	0	32	0	0	0
Coast Patch-nosed Snake	11,072	1	2,914	0	9,084	1	39	0	2,971	1	492	0	2	0
Red-diamond Rattlesnake	11,072	5	2,914	4	9,084	0	39	0	2,971	1	492	0	2	0
Orange-throated Whiptail	8,778	98	1,794	13	8,218	4	10	0	2,701	6	162	0	0	0
Red Coachwhip	11,072	1	2,914	0	9,084	2	39	0	2,971	0	492	0	2	0

**TABLE 13-4  
BREAKDOWN OF CONSERVATION OF PROPOSED COVERED WILDLIFE SPECIES  
BY PARTICIPATING LANDOWNERS OR PROJECT**

Proposed Covered Wildlife Species <sup>1</sup>	Conservation in Habitat Reserve								Conservation in SOS					
	Proposed RMV		Prior RMV <sup>2</sup>		County Parks <sup>3</sup>		CDFG <sup>4</sup>		Starr Ranch		Prima Deshecha		Ladera Ranch <sup>5</sup>	
	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations
<b>San Diego Horned Lizard</b>	8,151	31	1,677	4	7,546	1	10	0	2,349	0	161	0	0	0
<b>Southwestern Pond Turtle</b>	NA	6	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0
<b>Western Spadefoot Toad</b>	NA	10	NA	5	NA	1	NA	0	NA	1	NA	0	NA	0
Arroyo Chub	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Threespine Stickleback	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Riverside Fairy Shrimp</b>	NA	1	NA	1	NA	0	NA	0	NA	0	NA	0	NA	0
<b>San Diego Fairy Shrimp</b>	NA	2	NA	2	NA	0	NA	0	NA	0	NA	0	NA	0

<sup>1</sup> NCCP/MSAA/HCP planning species are shown in **boldface** print.

<sup>2</sup> Prior RMV includes Ladera Ranch Open Space, Upper Chiquita Canyon Conservation Area, and Donna O'Neill Land Conservancy.

<sup>3</sup>County Parks includes O'Neill Regional Park, General Thomas F. Riley Wilderness Park and Caspers Wilderness Park.

<sup>4</sup>CDFG is a conservation easement associated with Arroyo Trabuco Golf Course Open Space dedications.

<sup>5</sup>Ladera SOS is the Horno water quality treatment basin.

**TABLE 13-5  
BREAKDOWN OF IMPACTS OF PROPOSED COVERED WILDLIFE SPECIES  
BY PARTICIPATING LANDOWNER OR PROJECT**

Proposed Covered Wildlife Species <sup>1</sup>	Permanent Impacts									
	RMV		Ortega Rock Quarry		Prima Deshecha		Avenida La Pata		SMWD	
	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations
Burrowing Owl	5,166	0	0	0	484	0	250	0	46	0
Cactus Wren	2,158	198	63	9	122	7	52	1	23	1
California Gnatcatcher	2,158	75	63	0	122	8	52	3	23	4
Cooper's Hawk	717	6	1	0	17	0	9	0	3	0
Grasshopper Sparrow	5,166	218	0	0	484	17	250	30	46	1
Least Bell's Vireo	54	1	0	0	6	6	9	0	3	0
Long-eared Owl	NA	2	NA	0	NA	0	NA	0	NA	0
Willow Flycatcher	54	0	0	0	6	0	9	0	3	0
Tricolored Blackbird	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
White-tailed Kite	717	2	1	0	17	0	9	0	3	0
Yellow Warbler	156	0	1	0	16	0	9	0	3	0
Yellow-breasted Chat	156	11	1	0	16	2	9	1	3	0
Arroyo Toad	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
California Glossy Snake <sup>1</sup>	4,679	0	63	0	21	0	312	0	39	0
Coast Patch-nosed Snake	5,176	0	63	0	649	0	302	0	37	0
Red-diamond Rattlesnake	5,176	5	63	0	649	0	302	0	37	0
Orange-throated Whiptail	3,831	48	63	0	166	0	52	0	23	0
Red Coachwhip	5,176	0	63	0	649	0	302	0	37	0

**TABLE 13-5  
BREAKDOWN OF IMPACTS OF PROPOSED COVERED WILDLIFE SPECIES  
BY PARTICIPATING LANDOWNER OR PROJECT**

Proposed Covered Wildlife Species <sup>1</sup>	Permanent Impacts									
	RMV		Ortega Rock Quarry		Prima Deshecha		Avenida La Pata		SMWD	
	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations
<b>San Diego Horned Lizard</b>	3,270	12	63	0	165	0	52	0	23	0
<b>Southwestern Pond Turtle</b>	NA	2	NA	0	NA	0	NA	0	NA	0
<b>Western Spadefoot Toad</b>	NA	2	NA	0	NA	2	NA	0	NA	0
Arroyo Chub	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Threespine Stickleback	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Riverside Fairy Shrimp</b>	NA	0	NA	0	NA	0	NA	0	NA	0
<b>San Diego Fairy Shrimp</b>	NA	0	NA	0	NA	0	NA	0	NA	0

<sup>1</sup> NCCP/MSAA/HCP planning species are shown in **boldface** print.

**TABLE 13-6  
TEMPORARY IMPACTS ON PROPOSED COVERED WILDLIFE SPECIES**

Proposed Covered Species <sup>1</sup>	RMV Temporary Impacts				SMWD Temporary Impacts				Combined Temporary Impacts				Total Temporary Impacts	
	Habitat Reserve		SOS		Habitat Reserve		SOS		Habitat Reserve		SOS			
	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations
Burrowing Owl	109	0	11	0	85	0	6	0	194	0	17	0	212	0
Cactus Wren <sup>2</sup>	46	4	3	1	17	1	5	2	63	5	8	3	71	8
California Gnatcatcher	46	0	3	0	17	3	5	0	63	3	8	0	71	3
Cooper's Hawk	55	0	2	0	25	0	3	0	80	0	5	0	85	0
Grasshopper Sparrow	109	6	11	0	85	9	6	0	194	15	17	0	212	15
Least Bell's Vireo	25	2	0	0	9	0	2	0	34	2	2	0	36	2
Long-eared Owl	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0
Southwestern Willow Flycatcher	25	0	0	0	9	0	2	0	34	0	2	0	36	0
Tricolored Blackbird	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
White-tailed Kite	55	0	2	0	25	0	3	0	80	0	5	0	85	0
Yellow Warbler	44	1	1	0	19	0	2	0	63	1	3	0	66	1
Yellow-breasted Chat	44	3	1	0	19	0	2	0	63	3	3	0	66	3
Arroyo Toad	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
California Glossy Snake	177	0	17	0	80	0	14	0	257	0	31	0	288	0
Coast Patch-nosed Snake	123	0	16	0	56	0	10	0	179	0	26	0	205	0
Red-diamond Rattlesnake	123	1	16	0	56	1	10	0	179	2	26	0	205	2
Orange-throated Whiptail	63	6	6	0	26	2	6	0	89	8	12	0	101	8
Red Coachwhip	123	0	16	0	56	0	10	0	179	0	26	0	205	0
San Diego Horned Lizard	51	0	5	0	20	0	5	0	71	0	10	0	81	0
Southwestern Pond Turtle	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0
Western Spadefoot Toad	NA	1	NA	0	NA	0	NA	0	NA	1	NA	0	NA	1
Arroyo Chub	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Threespine Stickleback	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Riverside Fairy Shrimp	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0
San Diego Fairy Shrimp	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0

**TABLE 13-6  
TEMPORARY IMPACTS ON PROPOSED COVERED WILDLIFE SPECIES**

Proposed Covered Species <sup>1</sup>	RMV Temporary Impacts				SMWD Temporary Impacts				Combined Temporary Impacts				Total Temporary Impacts	
	Habitat Reserve		SOS		Habitat Reserve		SOS		Habitat Reserve		SOS			
	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations	Habitat	Locations

<sup>1</sup> NCCP/MSAA/HCP planning species are shown in **boldface** print.

<sup>2</sup> The temporary impact estimate for the cactus wren acknowledges that recovery of cactus patches capable of supporting cactus wrens can take several years. The loss of this habitat for several years will be offset to a large extent by the use of cactus plantings, and potentially translocation of disturbed cactus patches to the extent feasible, in fuel modification zones and within the Habitat Reserve, where appropriate, along the urban-Habitat Reserve edge to provide additional habitat for the cactus wren.

**TABLE 13-7  
TEMPORARY IMPACTS ON PROPOSED COVERED PLANT SPECIES**

Proposed Covered Species <sup>1</sup>	RMV Temporary Impacts				SMWD Temporary Impacts				Combined Temporary Impacts				Total Temporary Impacts	
	Habitat Reserve		SOS		Habitat Reserve		SOS		Habitat Reserve		SOS			
	Locs.	Indivs.	Locs.	Indivs.	Locs.	Indivs.	Locs.	Indivs.	Locs.	Indivs.	Locs.	Indivs.	Locs.	Indivs.
Coast Live Oak	18 ac	NA	1 ac	NA	11 ac	NA	2 ac	NA	29 ac	NA	3 ac	NA	32 ac	NA
<b>Coulter's Saltbush</b>	2	92	0	0	2	19	0	0	4	111	0	0	4	111
<b>Many-stemmed Dudleya</b>	17	145	3	55	9	890	0	0	26	1,305	3	55	29	1,360
California Scrub Oak	1.7 ac	NA	0 ac	NA	0.15 ac	NA	0 ac	NA	1.85 ac	NA	0 ac	NA	1.85 ac	NA
<b>Southern Tarplant</b>	12	4,159	0	0	4	380	0	0	16	4,539	0	0	16	4,539
<b>Thread-leaved Brodiaea</b>	1	4	0	0	0	0	0	0	1	4	0	0	1	4

<sup>1</sup> NCCP/MSAA/HCP planning species are shown in **boldface** print.

***a. General Overview of Conservation and Impacts for Proposed Covered Species***

A landscape-level conservation and impact summary for the 32 proposed Covered Species and their associated habitats in the Habitat Reserve and Supplemental Open Space (SOS) in Subarea 1 is provided in *Table 13-2* for wildlife and *Table 13-3* for plants. SOS in Subarea 1 totals about 4,458 acres, consisting of NAS Starr Ranch (3,890 acres), Prima Deshecha Landfill (530 acres), and Ladera Ranch (38 acres). Permitted Activities within these SOS areas are discussed in *Chapter 10*. The impacts reported in *Tables 13-2* and *13-3* include:

- RMV permanent impacts that would occur as a result of development within the eight RMV Planning Areas (PAs) and conceptual infrastructure permanent impacts within the Habitat Reserve resulting from the construction of roads, road culverts, trails, existing and proposed water and sewer lines and associated pump stations (all lift stations are within the PAs), wells, existing RMV reservoirs (*e.g.*, stock ponds), ground and elevated water storage tanks, drainage culverts, and drainage basins (note that portions of the proposed road and trails system covered by the NCCP/MSAA/HCP extend beyond the Subarea 1 boundary [*Figure 166-M*] and that these impacts are included in all relevant tables in this Chapter as proposed Covered Activities for RMV);
- temporary impacts on RMV Habitat Reserve lands associated with the construction and maintenance/repair of infrastructure (reported separately);
- impacts from implementation of the Ortega Rock quarry site expansion;
- SMWD permanent and temporary impacts resulting from construction, operations and maintenance/repair of SMWD facilities, including construction of the upper Chiquita Canyon Reservoir and Gobernadora Multi-purpose Basin (note that the existing SMWD system covered by the NCCP/MSAA/HCP extends beyond the Subarea 1 boundary [*Figure 166-M*] and that these impacts are included in all relevant tables in this Chapter as proposed Covered Activities for SMWD);
- County of Orange impacts that would occur from implementation of the 2001 General Development Plan (GDP), as amended in October 2002, for the Prima Deshecha Landfill GDP (see *Appendix M*) (*Figures 163-M* and *164-M*); and
- County of Orange impacts resulting from the Avenida La Pata Improvement Project north and south of the landfill (*Figure 165-M*).

RMV is responsible for the first three sets of impacts. SMWD is responsible for impacts resulting from operation and maintenance/repair of their existing water system and construction of the upper Chiquita Canyon Reservoir and Gobernadora Multi-purpose Basin facilities. The

County is responsible for impacts associated with the Prima Deshecha Landfill GDP and Avenida La Pata Improvement Project.

The permanent impact footprints in the PAs, and for conceptual infrastructure, were provided by RMV. Impact estimates for PAs 4, and 6-8 are based on the outer boundary envelopes for residential and commercial development in PAs 4 and 8, and potential orchards in PAs 6 and 7. Precise habitat impacts for these PAs cannot be calculated until additional studies are completed to refine the actual impact areas (*e.g.*, arroyo toad habitat use studies adjacent to PA 8). Thus, the habitat conservation and impact estimates reported in this section are conservative, with ultimate habitat conservation being understated and impact estimates being overstated. Based on the B-12 Alternative Project Description, ultimate impacts and conservation in PAs 4 and 6-8 are:

- 550 acres of residential/commercial development and 175 acres of reservoir impacts and 402 acres of conservation in PA 4;
- 50 acres of orchard and 381 acres of conservation in PAs 6 and 7; and
- 500 acres of impact and 849 acres of conservation in PA 8.

Therefore, although the RMV portion of the Habitat Reserve used for the conservation analysis is 14,904 gross acres (note: this gross acreage total does not account for infrastructure impacts within the Habitat Reserve; see *Section 13.3*), the ultimate RMV portion of the Habitat Reserve will be 16,536 gross acres<sup>1</sup>. Combined with the non-RMV portion of the Habitat Reserve, which totals 16,283 acres, the total ultimate Habitat Reserve would be approximately 32,818 gross acres. Likewise, the amount of impacts reported in this Chapter will ultimately be reduced by 1,632 acres as follows: (a) 402 acres in PA 4; (b) 849 acres in PA 8; and (c) 381 acres in PAs 6 and 7.

Impacts for the Ortega Rock Quarry Expansion Project previously were estimated in 1992 by Pacific Southwest Biological Services, Inc. (described in *Appendix S*). The permanent impacts footprints for the SMWD upper Chiquita and Gobernadora facilities were provided by SMWD. The permanent impact footprints associated with the Prima Deshecha Landfill GDP and Avenida La Pata Improvement Project were provided by the County.

Finally, it should be noted that overall conservation and impacts reported for species locations in *Tables 13-2* and *13-3* include project design features to avoid impacts as required by the Ranch Plan General Plan Amendment/Zone Change (GPA/ZC) EIR and/or the SAMP USACE Permit Special Conditions. For example, vernal pools and their local contributing hydrological sources

<sup>1</sup> Certain GPA/ZC permitted uses included in the gross open space for Alternative B-12 are not included in the Habitat Reserve acreage because they provide no or little habitat value and will not be managed under the HRMP, including existing and proposed orchards, the relocated Ranch Headquarters, the SOLAG facility, the relocated Ranch housing, and improvements related to existing structures and facilities, including the O'Neill ranch house and the Amantes and Portola camp facilities.

in PA 5 that support the Riverside fairy shrimp, San Diego fairy shrimp and western spadefoot toad will be avoided by careful project siting as required by GPA/ZC EIR MM 4.9-35. Likewise, a location supporting 2,000 individuals in the *major population* of the thread-leaved brodiaea located along the eastern edge of PA 2 will be avoided per SAMP USACE Permit Special Condition I.A.3. The species- and site-specific avoidance measures will be discussed below for each of the relevant proposed Covered Species.

## 1. Overall Conservation of Proposed Covered Wildlife Species

### (a) Habitats

As shown in *Table 13-2*, the overall conservation levels of habitat of wildlife species proposed for regulatory coverage in the Habitat Reserve is very high, ranging from a low of 60 percent for the burrowing owl and grasshopper sparrow (grassland and agricultural habitats) to a high of 88 percent of southern willow riparian scrub and forest for the least Bell's vireo and southwestern willow flycatcher. For coastal sage scrub obligate species – the California gnatcatcher and cactus wren – 73 percent of coastal sage scrub is conserved in the Habitat Reserve. For riparian and woodland raptor species – the Cooper's hawk and white-tailed kite – 73 percent of habitat is conserved in the Habitat Reserve. For species that are more upland habitat generalists, such as the coast patch-nosed snake, northern red-diamond rattlesnake, orange-throated whiptail, red coachwhip and San Diego horned lizard, 71 to 74 percent of habitat is conserved in the Habitat Reserve. When the Habitat Reserve is combined with the SOS in Subarea 1 (primarily NAS Starr Ranch and Prima Deshecha Landfill), the conservation percentages are significantly increased: grassland and agriculture habitat conservation for the burrowing owl and grasshopper sparrow is increased to 68 percent; willow riparian scrub and forest conservation for the least Bell's vireo and southwestern willow flycatcher is increased to 89 percent; coastal sage scrub habitat for the gnatcatcher and cactus wren is increased to 86 percent; riparian and woodland habitat conservation for the Cooper's hawk and white-tailed kite is increased to 88 percent; and upland habitat conservation for the coast patch-nosed snake, northern red-diamond rattlesnake, orange-throated whiptail, red coachwhip and San Diego horned lizard is increased to 81 to 85 percent.

### (b) Species Locations

Also as shown in *Table 13-2*, the overall conservation levels of species locations in the Habitat Reserve is generally very high. For species with significant numbers of locations in the subarea (*i.e.*, more than 25 locations), the range is 58 percent conservation of locations for the grasshopper sparrow to 100 percent for the yellow warbler. Notably, the Habitat Reserve conservation percentage for the California gnatcatcher is 77 percent of locations, 81 percent for the least Bell's vireo, 73 percent for the cactus wren, 73 percent for the Cooper's hawk, and 84

percent for the white-tailed kite. For the Riverside and San Diego fairy shrimp, the conservation levels are 100 percent. Vernal Pool 7 that supports both species is within the PA 5 development area, but this vernal pool and its contributing hydrological sources necessary to support the pool, will be avoided in accordance with MM 4.9-35 of the Ranch Plan GPA/ZC EIR, resulting in 100 percent conservation of the Riverside and San Diego fairy shrimp.

When the SOS species locations in Subarea 1 are combined with the Habitat Reserve locations, the conservation percentages for several of the proposed Covered Species are significantly increased. Notably, the gnatcatcher percentage increases to from 77 percent of locations to 83 percent; the cactus wren percentage from 73 percent to 81 percent; the vireo percentage from 81 percent to 87 percent; the Cooper's hawk from 73 percent to 85 percent; and the white-tailed kite from 84 percent to 94 percent.

## 2. Impacts on Proposed Covered Wildlife Species

### (a) Habitats

*Table 13-2* shows the impact on habitats of the proposed Covered Species. Consistent with the generally high conservation of habitats in the Habitat Reserve and SOS in Subarea 1, the impacts levels are generally low, ranging from a high of 33 percent of grassland and agricultural habitats for the burrowing owl and grasshopper sparrow to a low of 5 percent of riparian habitat for the yellow warbler and yellow-breasted chat. For grassland, approximately an additional 300 acres would be conserved in PAs 6 and 7, for an ultimate impact of less than 31 percent of grassland and agricultural habitat. For the coastal sage scrub obligate species—the California gnatcatcher and cactus wren—14 percent of coastal sage scrub would be impacted. For the vireo and willow flycatcher, 10 percent (only 72 acres) of southern willow scrub and forest would be impacted. For the raptors—Cooper's hawk and white-tailed kite—12 percent of riparian and woodland habitat would be impacted. For upland habitat generalists, including coast patch-nosed snake, northern red-diamond rattlesnake, orange-throated whiptail, red coachwhip and San Diego horned lizard, 15 percent to 19 percent of habitat would be impacted.

### (b) Species Locations

Impacts to species locations also are generally low. For species with significant documented locations (at least 25 locations), impacts include 17 percent of California gnatcatcher locations, 18 percent of cactus wren locations, 12 percent of Cooper's hawk locations, 41 percent of grasshopper locations, 13 percent of vireo locations, 6 percent of white-tailed kite locations, 12 percent of yellow-breasted chat locations, 0 percent of yellow warbler locations, 28 percent of orange-throated whiptail locations, and 25 percent of San Diego horned lizard locations.

### 3. Overall Conservation of Proposed Covered Plant Species

*Table 13-3* presents the conservation analyses for plant species proposed for regulatory coverage. Conservation of plants in the Habitat Reserve ranges from a low of 61 percent of locations and 69 percent of individuals for many-stemmed dudleya to highs of 88 percent of locations and 90 percent of individuals of Coulter's saltbush and 98 percent of thread-leaved brodiaea individuals. Southern tarplant has a similarly high conservation level of 81 percent of locations and 91 percent of individuals.

For the two vegetation community-based species—coast live oak and California scrub oak—conservation levels also are very high in the Habitat Reserve, with 69 percent conservation of coast live oak-dominated vegetation communities (coast live oak riparian forest, coast live oak woodland and coast live oak forest) and 80 percent conservation of California scrub oak-dominated communities (scrub oak chaparral and scrub oak-sage brush). Combined with SOS, the conservation level for coast live oak is 83 percent and the conservation level for California scrub oak is 90 percent.

### 4. Impacts on Proposed Covered Plant Species

*Table 13-3* shows the impact on plant species proposed for regulatory coverage. Impacts of individuals range from a low of 2 percent of the thread-leaved brodiaea to a high of 31 percent for many-stemmed dudleya.

#### ***b. Conservation and Impacts for Proposed Covered Species by Participating Landowners***

*Tables 13-4* and *13-5* provide a breakout of the conservation and impact estimates, respectively, for wildlife species proposed for regulatory coverage for the Participating Landowners.

#### 1. Conservation of Habitat and Wildlife Species

As illustrated in *Table 13-4* the proposed RMV portion of the Habitat Reserve accounts for about 41 percent (riparian and woodland) to 70 percent (willow riparian) of the habitats for wildlife species in the overall Habitat Reserve, with most habitat types for wildlife species in the 41 percent to 50 percent range. For example, 44 percent of the coastal sage scrub habitat for the California gnatcatcher and cactus wren in the Habitat Reserve would be dedicated by RMV. Prior RMV dedications (*i.e.*, Ladera Ranch, Upper Chiquita Canyon Conservation Area and Donna O'Neill Land Conservancy) account for 10 percent to 28 percent of the habitats in the Habitat Reserve. For example, 10 percent of the habitat for the San Diego horned lizard (coastal

sage scrub and chaparral) is from prior RMV dedications. Both the proposed and prior RMV portions of the Habitat Reserve would be adaptively managed under the HRMP.

County parklands account for 8 percent (willow riparian) to 49 percent (riparian and woodland) habitats in the Habitat Reserve. County parklands tends to have higher percentages of shrubland habitats, such as coastal sage scrub (45 percent) and chaparral/sage scrub combinations (43 percent) and lower percentages of grassland/agriculture (22 percent), reflecting the generally higher elevations and more rugged topography of the parklands, as well as different historic land uses.

Consistent with habitat types, the proposed RMV portion of the Habitat Reserve supports the greatest percentages of the wildlife species proposed for regulatory coverage, with the exception of the cactus wren. Mostly this is due to the natural distributions of the wildlife species (*e.g.*, California gnatcatchers are more common in lower elevation coastal sage scrub, grasshopper sparrows inhabit grasslands and fallow barely fields, and vireos inhabit willow riparian that is relatively uncommon on the parklands), but is in part also due to more intensive surveys on RMV compared to County parklands. For example, orange-throated whiptails may be relatively common throughout the sage scrub, chaparral and woodlands on County parklands, but 85 percent of the documented conserved locations are on the proposed RMV portion of the Habitat Reserve.

## 2. Impacts on Habitat and Wildlife Species

*Table 13-5* summarizes the impacts on the habitats and locations of wildlife species proposed for regulatory coverage broken out by Participating Landowner and project. Overall RMV proposes the largest impacts on habitats and species locations, reflecting the much larger footprint of the RMV Covered Activities area.

## 3. Conservation and Impacts for Plant Species Proposed for Regulatory Coverage

The large majority of locations and individuals of plant species proposed for regulatory coverage, with the exception of the coast live oak and California scrub oak, occur and will be conserved on the proposed RMV portion of the Habitat Reserve. Conservation and impacts by ownerships are as follows:

- ***Chaparral beargrass*** – All 5 locations and individuals conserved in the Habitat Reserve are located in proposed RMV Habitat Reserve lands. The one potentially impacted location and individual also is located on RMV in PA 8.

- ***Coulter’s saltbush*** – All 29 locations and 2,475 individuals conserved in the Habitat Reserve are located in proposed RMV Habitat Reserve lands. All four locations and 277 individuals impacted are located on RMV.
- ***Many-stemmed dudleya*** – Of the 236 locations and 44,024 individuals conserved in the Habitat Reserve, 152 locations and 30,167 individuals are located on RMV and 84 locations and 13,857 individuals are located on the Donna O’Neill Land Conservancy. All 149 locations and 19,642 individuals impacted are on RMV.
- ***Southern tarplant*** – All 30 locations and 129,984 individuals conserved in the Habitat Reserve are located in proposed RMV Habitat Reserve lands. All seven locations and 12,857 individuals impacted are located on RMV.
- ***Thread-leaved brodiaea*** – Of the 21 locations and 9,248 individuals conserved in the Habitat Reserve, 20 locations and 9,168 individuals are located in proposed RMV Habitat Reserve lands and one location and 80 individuals are located in previously dedicated Ladera Open Space that is part of the Habitat Reserve. Of the 13 locations and 147 individuals impacted, 10 locations and 144 individuals are on RMV and three locations and three individuals are on the Prima Deshecha Landfill GDP site.

Substantial areas of coast live oak and California scrub oak occur on both RMV and County parklands and would be conserved and impacted as follows:

- ***Coast live oak*** – Of the total of 2,572 acres of coast live oak-dominated vegetation communities conserved, 1,137 acres (44 percent) are on proposed RMV Habitat Reserve lands, 1,144 acres (44 percent) are on County parklands and 291 acres (11 acres) are on prior RMV dedicated lands. All 65 acres of impacts to coast live oak communities are on RMV lands.
- ***California scrub oak*** – Of the total of 2,233 acres of California scrub oak communities conserved, 1,001 acres (45 percent) are on proposed RMV Habitat Reserve lands, 1,185 acres (53 percent) are on County parklands and 48 acres (2 percent) are on prior RMV dedicated lands. All 284 acres of California scrub oak communities impacted are on RMV.

### ***c. Temporary Impacts on Habitats and Proposed Covered Species***

*Table 13-6* provides a summary of temporary impacts for wildlife species proposed for regulatory coverage and their habitats stemming from infrastructure construction, operation, and maintenance/repair by RMV and SMWD. The RMV component of temporary impacts includes impacts associated with the construction of bridges, trails, water storage ground and elevated tanks, and drainage culverts, as well as maintenance of existing RMV water lines, wells and reservoirs (e.g., stock ponds). The SMWD component of the temporary impacts includes

operation and maintenance/repair of existing and future water and sewer lines. The assumptions for calculating temporary impacts include:

- Varying widths and lengths of bridges ranging from 140 feet wide to 250 feet wide and 230 feet long to 1,400 feet long (see *Figure 187-R*) (RMV);
- 34-foot temporary impact zone for construction of trails (*i.e.*, 17 feet from edge of trail) (RMV);
- Temporary impacts of 4 acres around new ground water storage tanks (RMV);
- 2,500 square feet for temporary impacts to wells (RMV);
- 30-foot wide temporary impact area for existing and future domestic and non-domestic water/sewer pipeline operation and maintenance/repair (SMWD);
- 40-foot wide temporary impact area for maintenance/repair of the existing RMV water system (RMV); and
- 50-foot wide temporary impact area for construction of drainage culverts (RMV).

It should be noted that County impact estimates for the Avenida La Pata Improvement Project do not include a separate calculation of temporary impacts because the conceptual impact area for the project is large enough to contain all temporary impacts. The impact estimate is thus an over-stated estimate of all potential permanent and temporary impacts related to the project.

All temporary impacts will be restored to equivalent or better conditions compared to the existing condition at the time of the impact.

All temporary impacts to wildlife species and habitats are considered to occur within the zones described above.

### 1. Wildlife Species

Temporary impacts to wildlife species proposed for regulatory coverage and their habitats are relatively small. The largest impacts are to grassland and agricultural habitat used by burrowing owl and grasshopper sparrow (21 locations), with 206 acres subject to temporary impacts. Other species using grasslands, such as patch-nosed snake, red-diamond rattlesnake, and red coachwhip, are also subject to substantial temporary impacts. All temporary impacts to wildlife species and habitats are considered to occur within the zones indicated above.

Note that temporary impacts are not presented in *Table 13-6* for several wildlife species for which landscape-level habitat and/or discrete point location impacts analyses are not applicable. For the tricolored blackbird, arroyo toad, arroyo chub, and threespine stickleback both landscape-level habitat and location summary analyses are not applicable because of their limited

distribution in the subarea and because their populations cannot be portrayed as discrete point locations (*i.e.*, distributions of the arroyo toad and fish are better depicted as stream reaches as, for example, shown for the toad in *Figure 173-M*). Similarly, landscape-level habitat analyses are not appropriate for the long-eared owl, southwestern pond turtle, western spadefoot toad, Riverside fairy shrimp and San Diego fairy shrimp; however, site-specific locations for these species can be analyzed. As shown in *Table 13-6*, of these five species, only the spadefoot toad would be subject to temporary impacts.

## 2. Plant Species

Temporary impacts to plant species proposed for regulatory coverage are shown in *Table 13-7*. Many-stemmed dudleya and southern tarplant are subject to the greatest levels of temporary impacts. However, southern tarplant establishes well in highly disturbed areas and temporary impacts should not be a significant issue for this species.

### ***d. Ranch Cattle Grazing Operations and Species Proposed for Regulatory Coverage***

As described in *Chapter 10*, RMV Covered Activities include ongoing and limited expanded Ranch operations, including the existing cattle grazing operation. The following policies, as stated in the Grazing Management Plan (GMP; *Appendix G*), include provisions from General Policy 6 of *Chapter 4* setting forth the Draft Southern Planning Guidelines and additional policy guidance developed through the NCCP/MSAA/NCCP planning process:

- Cattle grazing shall be permitted within the Rancho Mission Viejo portion of the Habitat Reserve provided that grazing activities are consistent with a “grazing management plan” approved as part of the certified NCCP/HCP.
- The Grazing Management Plan (GMP) approved as part of the NCCP/MSAA/HCP shall identify suitable grazing areas and allowable grazing practices that are: **(a)** consistent with light/moderate grazing levels comparable to past grazing practices, and **(b)** that are consistent with the avoidance of specified sensitive habitat areas under specified time duration or other conditions (*e.g.*, exclusion of cattle from arroyo toad breeding habitat during the breeding season, exclusion of cattle from vernal pools, limitations on grazing in recently burned coastal sage scrub habitat areas until vegetation has re-generated) consistent with NCCP/MSAA/HCP policies. The GMP will address current grazing practices and grazing practices following transfer of lands to the Habitat Reserve.
- Additionally, the GMP will identify grazing management techniques that would be implemented on a voluntary basis by RMV following a request from the RMVLC that are designed to, promote perennial grasses, further other restoration measures identified pursuant to the AMP over time and, where appropriate, reduce fuel loads for fire.

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The details of the grazing operation are described in the GMP (*Appendix G*). Included in the GMP is a discussion of the role of grazing in the restoration and maintenance of native grasslands. While over-grazing appears to cause adverse impacts on habitats and species, managed grazing is considered by some experts to be an important management measure for the maintenance and restoration of native grasses. Menke (1996) considers “Prescribed grazing to constitute the primary component of the first phase of a perennial grass restoration program.” (p. 23).

RMV has grazed cattle since 1882 and in recent times has practiced a rotational grazing program that takes into account available water, forage productivity and a desire to maintain an average of 25 percent residual dry matter (RDM) for “natural” or “unimproved” pastures; *i.e.*, pastures not artificially improved through planting of a forage crop such as barley. Water, forage and the 25 percent RDM criteria dictate the appropriate stocking levels on the Ranch and historically these criteria have resulted in a light/moderate foraging regime. A review of the sensitive species spatial distribution (see *Figures 25-R* through *30-R* and *34-R* through *40-R* for the San Juan Creek and San Mateo Creek watersheds, respectively) shows that this light/moderate grazing regime is compatible with extensive species occupation of the Ranch, and for some species such as the grasshopper sparrow, tricolored blackbird and raptors in general, grazing at the levels practiced by the Ranch is a net benefit in terms of creating and maintaining high quality foraging habitat. At the same time, there is evidence that in some cases cattle may have a limited effect on a particular species. For example, Ramirez (2003) documented trampling along the edges of arroyo toad breeding pools in San Juan Creek that may have affected recruitment of this species. Likewise, when vernal pools are ponded and cattle are grazing in the same location at the same time, the cattle may have limited effects on the pools and associated species such as fairy shrimp and western spadefoot toad through direct crushing of fairy shrimp cysts and toad metamorphs and impacts on water quality in the pools.

Although limited cattle-related impacts may occur, these impacts are offset by the overall benefit of grazing to the Habitat Reserve. For example, grazing can help control invasive annual grasses and weeds within and adjacent to vernal pools, but may also result in trampling of fairy shrimp cysts and hatchlings. Similarly, while grasshopper sparrows may benefit from a light/moderate grazing regime that produces a heterogeneous habitat preferred by the species, cattle may also occasionally trample a nest. The GMP takes into consideration both the positive and negative effects of grazing and sets forth a plan that provides measurable criteria to assure the continuation of a light/moderate rotational grazing regime while providing seasonal exclusions for particular species where demonstrable impacts are identified.

*Table 13-8* provides a summary of the potential impacts of the grazing operation based on a review of the literature. *Table 13-8* then notes the observed conditions on RMV, as described in the GMP, on species proposed for regulatory coverage and associated vegetation communities.

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More detailed discussions of cattle-related impacts are provided in the individual species conservation analyses below and in the Species Accounts and Conservation Analyses in *Appendix E*. For this analysis, it is assumed that all grassland and barley field agriculture in the RMV portion of the Habitat Reserve is subject to grazing.

For most proposed Covered Species, light/moderate grazing effects range from non-significant adverse effects (*e.g.*, riparian and woodland nesting species) to likely net positive effects (*e.g.*, grasshopper sparrow). The determination that grazing is having a non-significant adverse effect on a particular species is in large part based on the documented continued presence of that species in areas that have been historically grazed at light/moderate levels. For example, severe over-grazing has been documented to have a clear adverse effect on riparian nesting habitat for a number of neotropical migrants. The light/moderate grazing regime on the Ranch has not had this effect on species such as the least Bell's vireo, yellow-breasted chat and yellow warbler. These species have persisted in fair numbers locally in Chiquita and San Juan creeks under the low/moderate grazing regime in these areas. For other species, such as the arroyo toad and the Riverside and San Diego fairy shrimp, there is a clearer link between grazing and potential impacts on the species. Although these impacts are anticipated to be limited, nonetheless, for these species, specific management recommendations are included in the GMP to protect these species during sensitive periods of their life cycles, such as seasonal exclusions of cattle from sensitive areas during the breeding season. Finally, for other species there is a potential for grazing to have limited effects, but these effects have not been documented on the Ranch. For example, crushing of cryptogamic soils supporting Coulter's saltbush has been identified as a potential stressor. For species such as the saltbush where there is a potential for adverse effects, as summarized in *Table 13-8*, cattle grazing will be closely monitored for impacts, and, if necessary, cattle may be excluded by fencing.

Grazing is proposed to be reintroduced to three pastures in the future, as depicted in *Figure G-5* of the GMP (*Appendix G*):

- The portion of the Upper Chiquita Pasture located south of Oso Parkway and east of Tesoro High School. This pasture totals about 204 acres of which 61 acres are former barley field. This pasture includes about 88 acres of coastal sage scrub, 5 acres of alkali meadow, 10 acres of chaparral, 11 acres of woodland and 4 acres of riparian. Covered Species locations in this pasture include 10 California gnatcatcher locations, 18 cactus wren locations, 8 grasshopper sparrow locations, 1 least Bell's vireo location, 21 orange-throated whiptail locations, and 4 San Diego horned lizard locations. The potential cattle-related impacts on these species are reviewed in *Table 13-8*. It is important to note that most of the sensitive species data for this pasture were collected before the cattle were removed during construction of Tesoro High School; thus cattle grazing in this area is consistent with species persistence.

- The eastern portion of River Pasture located within and adjacent to San Juan Creek totals about 272 acres, including 22 acres of grassland, 41 acres of agriculture, 92 acres of coastal sage scrub, 15 acres of chaparral, 27 acres of woodland and forest, and 37 acres of riparian. Covered Species locations in this pasture include arroyo toad (although much of the riparian is now dominated by giant reed and thus marginal for toad occupation), 5 orange-throated whiptail locations, 4 yellow warbler locations and 6 yellow-breasted chat locations. Potential impacts to the arroyo toad is the main issue in this pasture. There is evidence of limited cattle-related impacts along San Juan Creek with documented trampling of breeding pool banks along San Juan Creek in 2001 which may have affected recruitment of this species (Ramirez 2003). As for the western portion of River Pasture currently grazed, cattle will be seasonally excluded from arroyo toad breeding habitat in the eastern portion of River Pasture once such areas are dedicated to the Habitat Reserve.
- TRW Pasture is approximately 435 acres, including 194 acres of grassland, 129 acres of coastal sage scrub, 6 acres of chaparral, 13 acres of woodland and forest, 17 acres of riparian, and 77 acres of development. Covered Species locations in this pasture include arroyo toad, 5 locations California gnatcatcher, 11 locations of cactus wren, 1 historic nest location for Cooper's hawk, 14 locations of grasshopper sparrow, two locations for least Bell's vireo, 1 location for yellow warbler and 2 locations for yellow-breasted chat. As with River Pasture, potential impacts of cattle on the arroyo toad is the main issue for reintroduction of cattle to this area. These impacts are not considered significant because Cristianitos Creek adjacent to TRW Pasture will be fenced to prevent cattle from accessing the breeding areas (see *Figure G-7* of the GMP).

Cattle-related impacts on Covered Species and their habitats are reviewed in *Table 13-8*. Because Covered Species have persisted in other areas of RMV currently subject to grazing, no additional significant impacts to Covered Species through reintroduction of cattle to these three pastures is anticipated. As noted above, arroyo toad breeding habitat will be protected from cattle-related impacts through seasonal exclusion fencing once such areas are dedicated to the Habitat Reserve.

In order to manage fuel loads within Middle Gabino and La Paz Canyons, RMV periodically grazes goats in these areas. Once every five years RMV will graze goats in these areas in the summer months (June through August) and once every three years RMV will graze goats in these areas in the fall/winter months (September through January). In order to maximize fuel load reduction, the goat grazing is highly managed through the use of temporary electric fencing or hog wire and a shepherd and herding dogs to confine the goats to a specific area. The primary target for fuel load reduction in Middle Gabino and La Paz canyons is the chaparral vegetation community. Given the location of known arroyo toads in the Gabino and La Paz sub-basins, the target vegetation community for fuel load reduction and the highly managed nature of the goat grazing, potential conflicts between goat grazing and arroyo toads are minimal and non-significant. No exclusions are proposed for goat grazing.

**TABLE 13-8  
POTENTIAL CATTLE-RELATED IMPACTS ON SPECIES PROPOSED FOR REGULATORY COVERAGE**

<b>Proposed Covered Species<sup>1</sup></b>	<b>Potential for Impacts to Habitat and/or Individuals in the Habitat Reserve (acres are gross acres in Habitat Reserve) Based on Review of the Literature</b>	<b>Observed Conditions on RMV</b>
Burrowing Owl	3,129 acres of grassland and 1,089 acres of barley field agriculture	Light/moderate grazing is compatible, and may even be beneficial, to the burrowing owl. The GMP will help to maintain high quality grassland.
<b>Coastal Cactus Wren</b>	Minimal non-significant direct impacts to coastal sage scrub	Cattle tend to avoid southern cactus scrub and coastal sage scrub within which cactus patches occur, so any impacts are anticipated to be minimal and non-significant. The abundance of cactus wrens throughout the RMV portion of the Habitat Reserve indicates that low to moderate levels of grazing are compatible with maintaining habitat for the cactus wren. The 25 percent RDM, planted forage, and timed rotational grazing patterns described in the GMP will help to minimize cattle entering coastal sage scrub.
<b>Coastal California Gnatcatcher</b>	Minimal non-significant direct impacts to coastal sage scrub	Cattle tend to avoid coastal sage scrub so any impacts are anticipated to be minimal and non-significant. The abundance of California gnatcatchers throughout the RMV portion of the Habitat Reserve indicates that low to moderate levels of grazing are compatible with maintaining habitat for the gnatcatcher. The 25 percent RDM, planted forage, and timed rotational grazing patterns described in the GMP will help to minimize cattle entering coastal sage scrub. An adaptive management hypothesis discussed in <i>Chapter 7</i> is the potential relationship between fire and grazing in maintaining suitable gnatcatcher habitat.
<b>Cooper's Hawk</b>	Some limited potential for impacts in riparian and woodland areas.	The GMP addresses potential impacts to riparian and woodland habitats by identifying sensitive habitat areas where cattle grazing may be excluded seasonally or permanently. Currently there is no apparent significant conflict between grazing and Cooper's hawk.
<b>Grasshopper Sparrow</b>	3,129 acres of grassland and 1,089 acres of barley field agriculture. Potential for occasional direct disruption of nests.	Based on the documented distribution of the grasshopper sparrow in Chiquita and Cristianitos canyons, light/moderate grazing is compatible, and may even be beneficial, to the grasshopper sparrow, which requires a heterogeneous habitat and bare ground for foraging. The GMP will help to maintain high quality grassland.
<b>Least Bell's Vireo</b>	Some limited potential for impacts in riparian areas in San Juan Creek, Chiquita Creek and lower Cristianitos Creek.	The GMP addresses potential impacts to riparian habitats by identifying sensitive habitat areas where cattle grazing may be excluded seasonally or permanently. Currently there is no apparent significant conflict between grazing and least Bell's vireo. One of the two <i>important populations</i> is in GERA, which is fenced to exclude grazing. Grazing would occur in GERA once every three years for fuel modification outside the breeding season (February 15-July 15). No grazing occurs in the lower Arroyo Trabuco, which supports the other <i>important population</i> .
Long-eared Owl and <b>White-tailed Kite</b>	3,129 acres of grassland and 1,089 acres of barley field agriculture foraging habitat. Primary habitat areas likely used by the long-eared owl are Cristianitos and upper Gabino canyons due their proximity to historic nest sites. Some limited potential for impacts in riparian and woodland nesting areas.	Light/moderate grazing is compatible with maintaining foraging habitat for the long-eared owl and white-tailed kite. The GMP will help to maintain high quality grassland. They key is maintaining adequate cover for rodents such as voles which are primary prey for both the owl and the kite. The GMP also addresses potential impacts to riparian and woodland habitats by identifying sensitive habitat areas where cattle grazing may be excluded seasonally or permanently. Currently there is no apparent significant conflict between grazing and the long-eared owl and white-tailed kite.

**TABLE 13-8  
POTENTIAL CATTLE-RELATED IMPACTS ON SPECIES PROPOSED FOR REGULATORY COVERAGE**

<b>Proposed Covered Species<sup>1</sup></b>	<b>Potential for Impacts to Habitat and/or Individuals in the Habitat Reserve (acres are gross acres in Habitat Reserve) Based on Review of the Literature</b>	<b>Observed Conditions on RMV</b>
Southwestern Willow Flycatcher	Some limited potential for impacts in riparian areas.	The single <i>important population</i> is in GERA, which is fenced to exclude cattle. Grazing would occur in GERA once every three years for fuel modification outside the breeding season (February 15-July 15). Otherwise, the GMP addresses potential impacts to riparian habitats by identifying sensitive habitat areas where cattle grazing may be excluded seasonally or permanently. Currently there is no apparent significant conflict between grazing and the southwestern willow flycatcher.
Tricolored Blackbird	3,129 acres of grassland and 1,089 acres of barley field agriculture foraging habitat. Some limited potential for impacts at nesting colonies.	Light/moderate levels of cattle grazing should not have a negative effect on the tricolored blackbird. On RMV, the grasslands and barley field pastures are important foraging areas for tricolored blackbirds. Only a regime of over-grazing would have a potential adverse effect on tricolored blackbirds, primarily through impacts on its primary prey such as grasshoppers. There is no reported evidence that cattle pose a direct risk to nesting colonies (typically cattail-dominated ponds or marshes).
Yellow-breasted Chat	Some limited potential for impacts in riparian areas in San Juan Creek, Chiquita Creek and lower Cristianitos Creek.	The GMP addresses potential impacts to riparian habitats by identifying sensitive habitat areas where cattle grazing may be excluded seasonally or permanently. Currently there is no apparent significant conflict between grazing and yellow-breasted chat. Of the four <i>important populations</i> one is in GERA, which is fenced to exclude grazing and the other is in lower Arroyo Trabuco, where no grazing occurs. Grazing would occur in GERA once every three years for fuel modification outside the breeding season (February 15-July 15). Two of the <i>important populations</i> are in San Juan Creek from which grazing will be excluded in the breeding season specifically to protect the arroyo toad, upon dedication of San Juan Creek to the Habitat Reserve. The fifth <i>important population</i> is in lower Cristianitos Creek.
Yellow Warbler	Some limited potential for impacts in riparian areas in San Juan Creek and Chiquita Creek.	The GMP addresses potential impacts to riparian habitats by identifying sensitive habitat areas where cattle grazing may be excluded seasonally or permanently. Currently there is no apparent significant conflict between grazing and yellow warbler. Of the four <i>important populations</i> one is in GERA, which is fenced to exclude grazing, and one is in lower Arroyo Trabuco, where no grazing occurs. Grazing would occur in GERA once every three years for fuel modification outside the breeding season (February 15-July 15). Two of the <i>important populations</i> are in San Juan Creek from which grazing will be excluded in the breeding season specifically to protect the arroyo toad, upon dedication of San Juan Creek to the Habitat Reserve.
Arroyo Toad	Potential impacts to breeding pools and adjacent habitat along drainages and adjacent uplands. Potential for trampling.	Heavy cattle use can have a significant adverse effect on toads without management and monitoring, including degradation of riparian habitat and direct impacts by trampling of individuals and burrows, direct impacts on water quality (e.g., turbidity, urine and feces), and direct impacts on breeding pools such as disturbance of egg masses. There is evidence of limited cattle-related impacts along San Juan Creek with documented trampling of breeding pool banks along San Juan Creek in 2001 which may have affected recruitment of this species (Ramirez 2003). Cattle will be seasonally excluded from arroyo toad breeding habitat once such areas are dedicated to the Habitat Reserve.

**TABLE 13-8  
POTENTIAL CATTLE-RELATED IMPACTS ON SPECIES PROPOSED FOR REGULATORY COVERAGE**

<b>Proposed Covered Species<sup>1</sup></b>	<b>Potential for Impacts to Habitat and/or Individuals in the Habitat Reserve (acres are gross acres in Habitat Reserve) Based on Review of the Literature</b>	<b>Observed Conditions on RMV</b>
Western Spadefoot Toad	Potential impacts to breeding pools and trampling.	The spadefoot toad <i>important population</i> in the Radio Tower Road mesa vernal pools will be protected in conjunction with exclusion of cattle from pools to protect the Riverside and San Diego fairy shrimp during the winter/spring breeding season. Cattle are already excluded from vernal pools supporting the <i>important population</i> in Chiquita Ridge vernal pools in Ladera Open Space. The spadefoot toad <i>important population</i> in San Juan Creek will be protected in conjunction with exclusion of cattle from the creek to protect the arroyo toad once such areas are dedicated to the Habitat Reserve. The <i>important populations</i> in the upper Cristianitos stock pond and in lower Gabino will still be subject to potential cattle impacts. However, future impacts will not be any greater than under current conditions that support the spadefoot in these locations.
California Glossy Snake, Coast Patch-nosed Snake, Northern Red-diamond Rattlesnake, and Red Coachwhip	3,129 acres of grassland. Low potential for trampling.	Low to moderate levels of grazing are unlikely to have a significant impact on the California glossy snake, coast patch-nosed snake, red-diamond rattlesnake, and red coachwhip. Although there is the potential for occasional trampling of an individual, the general low density of these snakes suggests that this risk is low. Cattle impacts on prey of these snakes such as small rodents and lizards and/or their burrows perhaps would be a problem with over-grazing, but does not appear to be significant under light/moderate grazing levels which will help sustain grassland habitat quality.
Orange-throated Whiptail	Minimal non-significant impacts to coastal sage scrub, chaparral and woodland. Some limited potential to affect recruitment of oaks in woodland habitats.	Low to moderate levels of grazing are unlikely to have a significant impact on the orange-throated whiptail. Cattle tend to avoid coastal sage scrub and chaparral so any impacts are anticipated to be minimal and non-significant. The timed rotational grazing patterns described in the GMP will help to minimize cattle entering coastal sage scrub and chaparral. The GMP also addresses potential impacts to woodland habitats by identifying sensitive habitat areas where cattle grazing may be excluded seasonally or permanently.
"San Diego" Coast Horned Lizard	Minimal non-significant impacts to coastal sage scrub and chaparral. Low potential for trampling along edge of road or cattle trail.	Low to moderate levels of grazing are unlikely to have a significant impact on the San Diego horned lizard. Cattle tend to avoid coastal sage scrub and chaparral so any impacts are anticipated to be minimal and non-significant. The timed rotational grazing patterns described in the GMP will help to minimize cattle entering coastal sage scrub and chaparral. The greatest threat likely is occasional trampling of horned lizards along the edges of roads or paths, or along shrub-pasture boundaries because they are sit-and-wait predators that move slowly and also because they freeze as a defensive behavior. Also, they may occasionally be trampled when buried in "day burrows" to avoid hot midday temperatures.
Southwestern Pond Turtle	Potential limited impacts to ponds and adjacent upland habitat. Potential for trampling and impacts on water quality.	Low to moderate levels of grazing are unlikely to have a significant impact on southwestern pond turtles. The <i>important populations</i> in San Juan Creek will be protected in conjunction with cattle exclusions during the arroyo toad breeding season. The populations in the upper Cristianitos stock and in Jerome's Lake in upper Gabino Canyon will be subject to potential cattle impacts during the early part of the breeding season (February-May) but cattle are moved to the San Juan Creek Watershed in late May or early June (see GMP), about the general time of peak nesting of the species and thus minimizing impacts to the species. Although the upper Cristianitos and Jerome's Lake population still will be subject to potential

**TABLE 13-8  
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<b>Proposed Covered Species<sup>1</sup></b>	<b>Potential for Impacts to Habitat and/or Individuals in the Habitat Reserve (acres are gross acres in Habitat Reserve) Based on Review of the Literature</b>	<b>Observed Conditions on RMV</b>
		cattle impacts, they will not be any greater than under current conditions that support the pond turtle in these locations.
Arroyo Chub and Partially-armored Threespine Stickleback	Potential limited impacts to aquatic habitat.	Generally cattle can have impacts on the arroyo chub and threespine stickleback through habitat degradation, including direct impacts on water quality. Cattle urine and feces may increase ammonia and nitrate levels that can result in increased oxygen consumption by nitrifying bacteria and a concomitant decrease in oxygen available for fish. The chub and stickleback populations in Arroyo Trabuco are not affected because no grazing occurs in that area. The chub and stickleback populations in San Juan Creek will be protected in conjunction with exclusion of cattle to protect the arroyo toad during the breeding season once the area is dedicated to the Habitat Reserve.
<b>Riverside and San Diego Fairy Shrimp</b>	Managed grazing is thought to benefit vernal pool species by controlling non-natives and consequently improving pool hydrology for species. Cattle are also a potential dispersal vector between pools for fairy shrimp. However, potential limited impacts to Riverside and San Diego fairy shrimp through trampling.	Cattle will be excluded from vernal pools supporting fairy shrimp on the Radio Tower Road mesa during the breeding season following dedication of this area to the Habitat Reserve. Managed cattle grazing will be allowed during the non-breeding season, and may benefit the habitat quality in the pools and the contributing hydrological area by controlling non-native vegetation. Cattle are excluded from the Chiquita Ridge vernal pools that support the fairy shrimp.
California Scrub Oak	Low potential for direct impacts.	California scrub oak occurs typically occurs within dense chaparral that precludes cattle use.
<b>Chaparral Beargrass</b>	Low potential for direct impacts.	The chaparral beargrass is located in sage scrub/chaparral vegetation in the Talega sub-basin on the steep, south-facing slopes. This area is unlikely to be used by cattle.
Coast Live Oak	Potential limited impacts to seedlings, saplings and soils.	Coast live oak woodland and forest is vulnerable to cattle impacts, particularly browsing of mature trees, soil compaction and predation and trampling of seedlings and saplings. At this time, recruitment of oaks in the RMV portion of the Habitat Reserve appears to be good (T. Bomkamp, pers. comm. 2005) and cattle do not appear to be a significant stressor of oaks. Also, managed grazing can have a beneficial effect on recruitment by controlling annual grasses and weeds that compete with oak seedlings and saplings for surface water and nutrients, as well as reduce the risk of "laddering" fires that can kill mature oaks.
<b>Coulter's Saltbush</b>	Potential limited impacts from trampling of individuals and cryptogamic soils and soils salinity effects.	Many saltbush populations are associated with cryptogamic soils which could be adversely affected by cattle if crusts are broken up by trampling. Through implementation of the AMP, saltbush populations will be monitored, and, if necessary, exclusion fencing may be placed around some of these areas when cattle are in adjacent pastures. Soils samples will be taken to measure pH to ensure that soil alkalinity is within the appropriate range. See <i>Chapter 7</i> for more details.
<b>Many-stemmed Dudleya</b>	Potential impacts from trampling and soil impacts.	Cattle impacts on the dudleya have not been observed on RMV (T. Bomkamp, pers. comm. 2005). The dudleya tends to occur where annual grasses are less prevalent and less attractive to cattle. Because of the potential for trampling and soil impacts, however, cattle have been identified as a potential stressor on the Cristianitos and Gabino populations because grazing in these areas

**TABLE 13-8  
POTENTIAL CATTLE-RELATED IMPACTS ON SPECIES PROPOSED FOR REGULATORY COVERAGE**

<b>Proposed Covered Species<sup>1</sup></b>	<b>Potential for Impacts to Habitat and/or Individuals in the Habitat Reserve (acres are gross acres in Habitat Reserve) Based on Review of the Literature</b>	<b>Observed Conditions on RMV</b>
		coincides with the dudleya growing season and monitoring for potential cattle impacts is thus warranted. See <i>Chapter 7</i> for more details.
<b>Southern Tarplant</b>	Low potential for cattle-related impacts because this species is highly disturbance-adapted. May be sensitive to soil salinity.	Soils samples will be taken to measure pH to ensure that soil alkalinity is within the appropriate range. See <i>Chapter 7</i> for more details.
<b>Thread-leaved Brodiaea</b>	Potential impacts from foraging, trampling and soil impacts.	Cattle impacts on the thread-leaved brodiaea have not been observed on RMV (T. Bomkamp, pers. comm. 2005). Removal of cattle from Arroyo Trabuco appears to have had an adverse effect on the brodiaea population there because of subsequent proliferation of non-native grasses that compete for space, water and nutrients. Cattle, however, have been identified as a potential stressor, particularly on the lower Cristianitos <i>major population</i> because cattle graze in this area from October through May during the peak growing season of brodiaea. While the existing population appears to be healthy under the current grazing regime, this population will be monitored annually following dedication to determine whether grazing has a net adverse effect. If grazing is determined to be having a negative effect on the brodiaea population, some seasonal controls may be required.

<sup>1</sup> NCCP/MSAA/HCP planning species are shown in **boldface** print.

### 13.2.5 Detailed Analyses for Species Proposed to Receive Regulatory Coverage

This subsection provides a detailed analysis of the conservation and impact analyses for the proposed Covered Species under the B-12 Alternative that includes: (1) a brief description of the species' rangewide status; (2) the species' status in the planning area and Subarea 1; (3) proposed impacts and conservation of the species and/or its habitat in the Habitat Reserve and SOS in Subarea 1, including *major* and/or *important populations* in *key locations* or important habitat areas, if identified for the species; (4) reserve design considerations important for a particular species, such as habitat patch size, contiguity and connectivity; (5) adaptive management measures that would benefit the species (*e.g.*, fire management and invasive species control, etc.), including habitat restoration measures that would maintain or enhance habitat quality for the species; and (6) a rationale statement for regulatory coverage that includes a summary of the sites conserved, if applicable, and the amount of habitat conserved, if applicable. The rationale statement also considers the conservation and management of the species in the Southern Subregion in the context of its rangewide status and conservation in southern California by the other large-scale conservation plans, including the Central/Coastal NCCP/HCP, the San Diego MSCP and MHCP, and the Western Riverside County MSHCP (*e.g.*, is the species covered by other plans?) and/or occurrence on federal lands such as MCB Camp Pendleton and MCAS Miramar.

Because this subsection is intended to be a summary of the conservation analyses, the reader is directed to the Species Accounts and Conservation Analyses (*Appendix E*) for the expanded conservation accounts and analyses for the proposed Covered Species. The expanded conservation analyses include the following elements for each proposed Covered Species:

- Comprehensive species accounts
- Overall conservation goal(s)
- Conservation strategy
- Habitat and species conservation and impacts analysis, including reserve configuration issues if applicable
- Adaptive Management Program, including
  - Goals
  - Management and monitoring objectives
  - Conceptual models, if applicable
  - Uncertainties in management and monitoring
  - Levels of monitoring (*e.g.*, species-specific, habitat landscape or combination)

- Monitoring variables
- Management actions
- Potential target studies

As noted above, the analyses include a discussion of the species' rangewide and planning area status. This status section discusses the "sensitivity" of the species according to various state, federal and environmental organization (*e.g.*, CNPS designations). Two of the designations discussed are the California Natural Diversity Database (CNDDDB) "global" and "state" ranks which are "shorthand formulas that provide information on the rarity of a species or subspecies, both throughout its global range and its range within the State." (Appendix 1, CDFG, Wildlife and Habitat Data Analysis Branch, California Natural Diversity Database, January 2005). The global and state ranks, as well as subspecies ranks, use the terms "extremely endangered," "endangered," "restricted range, rare," "apparently secure," and "demonstrably secure," to describe the relative sensitivity of species both throughout its entire range and its range within California. These terms are defined in terms of the number of "viable occurrences, numbers or individuals, or acres of occupied habitat." For example, an "extremely endangered" species is defined as having <6 viable occurrences, <1,000 individuals, or <2,000 acres of occupied habitat. **It is important to understand that the CNDDDB ranks are not the same as the federal and state ESA listings of threatened and endangered species that provide statutory protection for species. The ranks are intended only to provide information about the rarity of a species or subspecies, not to indicate the need for regulatory protection.** For example, the Cooper's hawk has a CNDDDB rank of G5S3. G5 means that the Cooper's hawk is demonstrably secure and commonly found throughout its range. S3 means that it has a restricted range in California and falls under at least one of the three following categories: 21-100 viable occurrences, 3,000-10,000 individuals, and/or 10,000-50,000 acres of occupied habitat. Whenever the terms "endangered" or "threatened" are used in relation to the CNDDDB categories, the term must be used in this context.

Similarly, the CNPS provides rarity and endangerment ratings for sensitive plants similar to the CNDDDB rankings. The CNPS ranks sensitive species by "lists" and by a "threat code."<sup>2</sup> For example, "List 1B" plants are considered rare, threatened or endangered in California and elsewhere because they are "judged to be vulnerable under present circumstances or to have a high potential for becoming so because of their limited or vulnerable habitat, their low numbers of individuals per population (even though they may be wide ranging), or their limited number of populations." (CNPS 2001, p. 54). Likewise, "List 2" plants are rare, threatened, or endangered in California, but are more common elsewhere. All List 1B and List 2 plants are considered by

<sup>2</sup> In 2006 the CNPS began using a "threat code" extension to replace the E (Endangerment) value from the old RE-D Code.

the CNPS, which is not a governmental regulatory agency, to be eligible for state listing under the state ESA and Native Plant Conservation Act. The “threat code” addresses the status of populations of a species in California: a threat code of 0.1 indicates that the species is seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat); a threat code of 0.2 indicates that the species is fairly endangered in California (20-80 percent occurrences threatened); and a threat code of 0.3 indicates that the species is not very endangered (< 20 percent of occurrences threatened and no current threats known).

Also, as noted above, the conservation analysis for the proposed Covered Species includes reserve design considerations important for a particular species, such as habitat patch size, contiguity and connectivity. A “refined” habitat block analysis to support the focused species analyses was conducted by delineating large, relatively intact habitat areas (*i.e.*, lacking large areas of development) within the Habitat Reserve and SOS in Subarea 1 (*e.g.*, NAS Starr Ranch), as well as contiguous SOS in Coto de Caza in Subarea 3 (Subarea 3 was included in the block analysis because SOS in Subarea 3 is subject to conservation easement protection and significantly contributes to the function of the habitat blocks).<sup>3</sup> Because many terrestrial species movements are limited by roads (particularly slow-moving or sluggish snakes), the boundaries of the habitat blocks were defined by major existing roads (*e.g.*, Ortega Highway, Oso Parkway) or planned roads such as Cow Camp Road and Cristianitos Road/”F” Street where it extends north from PA 3 to Oso Parkway. The existing two-lane Cristianitos Road south of Ortega Highway was not included as a habitat block boundary because it will remain a private road and will have very low traffic volumes (although it is acknowledged that some species are inhibited from crossing any type of hardscape surface regardless of traffic volumes). Habitat blocks also were defined by the width of habitat areas and limited to areas where the habitat area is at least 2,000 feet wide, assuming that a 2,000-foot wide area would provide “live-in” habitat for most proposed Covered Species, with the recognition that what defines a “habitat block” is species-specific (*i.e.*, functional habitat blocks for species with small home ranges likely are smaller than functional blocks for species with large home ranges). The exception to the 2,000 feet guideline is the Arroyo Trabuco area where the arroyo is less than 2,000 feet wide in several locations. However, the arroyo is topographically buffered from adjacent development and thus is considered to maintain habitat block function.

The results of the refined habitat block delineation for the B-12 Alternative are presented in *Table 13-9* and depicted in *Figure 193-M*. The refined habitat blocks are comprised of seven discrete habitat blocks ranging in size from about 815 acres in the Radio Tower Road mesa block area to 13,987 acres in the Southeastern block and total more than 31,000 acres. Because of the

<sup>3</sup> The reader should note that the “refined” habitat block analysis is different from a separate habitat block analysis presented in *Section 13.3.2.c* to support the landscape-level vegetation community analysis. The vegetation community-focused block analysis is referred to as the “coarse” habitat block analysis to distinguish it from the “refined” habitat block analysis.

distribution of the existing and planned land uses under the B-12 Alternative, the largest blocks are in the eastern portion of the Habitat Reserve/SOS areas, with the Northeastern block containing over 9,000 acres and the Southeastern block containing almost 14,000 acres. The ultimate size of the Southeastern block likely will be at least 1,500 acres larger when PAs 4-8 are refined because as much as 402 acres from PA 4, 849 acres from PA 8, and 381 acres in PAs 6 and 7 likely will be included in the Habitat Reserve in this block (whether this additional acreage would all be included in the Habitat Block depends on its location and configuration in relation to adjacent Habitat Reserve lands). The amount of developed and disturbed habitat in the habitat blocks ranges from less than one percent in the Chiquita Ridge and Northeastern blocks to 6 percent in the Arroyo Trabuco block.

**TABLE 13-9  
CONSERVED VEGETATION COMMUNITIES AND LAND COVERS  
WITHIN THE B-12 ALTERNATIVE REFINED HABITAT BLOCKS**

Conserved Vegetation Community	Habitat Block Acres <sup>1</sup>						
	Arroyo Trabuco	Chiquita Ridge	Upper Chiquita	Wagon Wheel	Radio Tower Road	Northeastern	Southeastern
Coastal Sage Scrub	328	846	785	584	206	4,780	5,841
Chaparral	121	126	111	26	5	1,459	3,466
Grassland	552	632	30	197	521	987	2,678
Woodland & Forest	144	25	28	33	60	703	546
Riparian	616	69	81	75	17	1,149	1,163
<b>Non-Conserved Vegetation Community/Land Cover Type</b>							
Other Habitats/Land Covers <sup>2</sup>	32	711	468	283	0	12	76
Developed/Disturbed	109 (6%)	14 (<1%)	26 (2%)	70 (5%)	6 (1%)	36 (<1%)	217 (1%)
<b>Total Acres in Block</b>	<b>1,902</b>	<b>2,423</b>	<b>1,529</b>	<b>1,268</b>	<b>815</b>	<b>9,126</b>	<b>13,987</b>

<sup>1</sup> Acreage does not account for infrastructure impacts except for roads.

<sup>2</sup> Agriculture by far is the largest contributor to Other Habitats/Land Covers

The results of the refined block analysis are incorporated into the species conservation analyses presented in the following subsections.

**a. Burrowing Owl (*Athene cunicularia*)**

**Federal Status:** Federal Species of Concern, USFWS Bird of Conservation Concern

**State Status:** California Species of Special Concern

**Science Advisors:** Group 3

1. Rangewide and Planning Area Status

The burrowing owl is broadly distributed in western North America, with historic breeding populations in southern interior British Columbia (nearly extirpated), southern Alberta, southern

Saskatchewan, southern Manitoba, south through eastern Washington, central Oregon, and California to Baja California, east to western Minnesota, northwestern Iowa, eastern Nebraska, central Kansas, Oklahoma, eastern Texas, and Louisiana, and south to central Mexico. In California, the burrowing owl occurs throughout the state, except for the humid northwest coastal forests and high mountains. Although the burrowing owl is a geographically widespread species, its CNDDDB global and state rank for nest sites is G4S2, indicating a global rank of “apparently secure; some factors existing to cause some concern such as narrow habitat or continuing threats” and a state rank indicating endangered, defined as 6-20 viable occurrences, 1,000 to 3,000 individuals, or 2,000 to 10,000 acres of occupied habitat. A petition to list the subspecies “western” burrowing owl (*A. c. hypugea*) as threatened or endangered was submitted to the California Fish and Game Commission (FGC) by the Center for Biological Diversity in 2003. On February 4, 2004, based on the recommendation of CDFG, the FGC denied the petition, citing a lack of a reasonable amount of information to warrant the listing. Although the petition was denied, it appears likely that the debate about the status of burrowing owl will continue, raising the possibility of a state or federal listing in the future. The general rangewide decline of the burrowing owl is attributed to habitat conversion and other human-caused impacts. Much of its grassland and agricultural habitat in California and elsewhere has been converted to urban uses and it also has suffered from losses of rodent burrows that provide breeding dens due to rodent control. Vehicle collisions and pesticides (affecting the prey base) also are cited as sources of decline (Grinnell and Miller 1944; James and Espie 1997; Remsen 1978; Zarn 1974).

Although the burrowing owl is a rare breeder in southern Orange County, there are records for overwintering owls (*i.e.*, non-breeding) in the subregion. Bontrager reported individual burrowing owls in Cristianitos Canyon and east of the Prima Deshecha Landfill in 1989 and 1990, but neither was confirmed to be nesting. MBA (1996) reports that overwintering owls were observed in 1995 in upper Chiquita Canyon on both the SOCTIIP (FTC-S) BX and CP alignments and in recent years in upper Cristianitos Canyon and in grassland south of San Juan Creek west of the BX alignment. However, no active nest sites have been found along either alignment in over a decade of surveying. The lack of nesting records for the burrowing owl indicates that it is likely a rare to uncommon breeder in the planning area. However, burrowing owls have been known to breed on neighboring MCB Camp Pendleton (although there are no breeding records since 1997; Unitt 2004), thus providing a potential source of immigrants.

## 2. Conservation Analysis

The conservation analysis for the burrowing owl is based on habitat conservation and impacts, site-specific observations of wintering owls, and the refined habitat block analysis. There are no documented nesting sites in the planning area. For the purpose of the impact analysis, it is assumed that the burrowing owl could use any grassland and barley field habitat (*i.e.*, excludes

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existing orchards in Chiquita Canyon and Cristianitos Canyon and proposed orchard in PAs 6 and 7 in Cristianitos Canyon) in Subarea 1 for winter foraging.

(a) Impacts

The proposed Covered Activities would result in permanent impacts to 4,199 acres (33 percent) of grassland (2,669 acres including 3 acres of alkali meadow) and agriculture (1,530 acres) that provide suitable winter foraging habitat for the burrowing owl (*Table 13-2* and *Figure 194-M*). No nesting sites of the burrowing owl are known from the Subarea and no impacts would occur. The proposed Covered Activities also would result in temporary impacts to 212 acres of suitable habitat (*Table 13-6*).

(b) Conservation

A total of 7,568 acres (60 percent) of suitable grassland and agricultural habitat for the burrowing owl would be conserved and managed in the Habitat Reserve (*Table 13-2* and *Figure 194-M*). Notably, all of Chiquita Canyon bottom north of the treatment plant and grasslands on the Radio Tower Road mesa south of San Juan Creek where wintering owls have been observed in the recent past would be conserved and managed. In addition, the vast majority of grasslands in Cristianitos Canyon would be conserved and managed because the proposed orchards in PAs 6 and 7, which under the conservation analysis encompass 431 acres, would be limited to 50 acres.; approximately an additional 300 acres of grassland would be in the Habitat Reserve. An additional 957 acres (8 percent) of habitat would be in SOS, for an overall conservation of 8,525 acres (68 percent) of habitat.

The refined habitat block analysis shows that substantial grassland and agriculture habitat for the burrowing owl is conserved in habitat blocks, ranging from 477 acres in the Wagon Wheel block to 2,722 acres in the Southeastern block, which includes Cristianitos Canyon. The Chiquita Ridge block where owls have been observed contains 1,331 acres of suitable habitat.

Although nesting burrowing owls have not been documented in the planning area, an additional conservation measure will be to conduct pre-construction surveys for nesting owls for any construction-related clearing of grassland or agriculture initiated during the owl's typical breeding season (generally February 1 to August 31). Focused pre-construction surveys will be conducted according to a set of guidelines acceptable to the Wildlife Agencies. If nesting burrowing owls are found in impact areas, avoidance measures will be implemented, including no direct disturbance of active dens during the breeding season and maintaining approximately 6-7 acres of contiguous foraging habitat (or about a 300-foot radius) around the nest site throughout the breeding season. Post-construction, if the nest site is contiguous with the Habitat Reserve and no suitable existing burrow sites are available (*e.g.*, ground squirrel burrows), an

artificial burrow in suitable habitat will be constructed at least 165 feet from the impacted areas within the Habitat Reserve and such that at least 6-7 acres of suitable foraging habitat are contiguous with the new burrow. Passive relocation, as opposed to trapping and active relocation, will be used to the extent feasible. The reader is also directed to MMs 4.9-26 and 4.9-30 of the Ranch Plan GPA/ZC EIR for raptor-related construction monitoring and preparation of a Biological Resources Construction Plan (BRCP).

### 3. Management

Management of habitat for the burrowing owl will consider environmental stressors that generally have been identified for the species, including:

- Urbanization adjacent to Habitat Reserve
- Rodent controls
- Pesticides
- Crushing of burrows by heavy equipment
- Non-native urban-related predators (*e.g.*, dogs and cats)
- Roads (causing increased vehicle collisions)
- Human harassment of nest sites

Adaptive management actions in the Habitat Reserve that would benefit overwintering burrowing owls, and any future breeding populations, may include fire to help improve the quality of grassland. Although not part of the HRMP, the coordinated Grazing Management Plan (GMP; *Appendix G*) will help maintain high quality grassland habitat. Ground squirrel controls will be prohibited within the Habitat Reserve, and the use of chemical pesticides in areas adjacent to the Habitat Reserve (*e.g.*, golf courses) will be minimized to the extent feasible and will be used in accordance with an approved Integrated Pest Management Program designed to avoid and minimize effects on native species and habitats. Non-native, urban-related predators of burrowing owls (*e.g.*, cats and dogs) will be controlled in the Habitat Reserve, primarily through homeowner education, but also possibly through direct controls such as trapping if necessary and to the extent feasible. Public education to minimize human harassment of owls will be incorporated. Potential crushing of active burrows will be addressed by the BRCP.

Habitat restoration actions to benefit the burrowing owl include implementation of a Coastal Sage Scrub/Valley Needlegrass Grassland (CSS/VGL) restoration program (*Appendix H*) at the discretion of the Reserve Manager and Science Panel. Areas targeted for restoration include Chiquita Ridge, Chiquadora Ridge, in Sulphur Canyon and in upper Cristianitos Canyon to enhance habitat value and improve habitat connectivity. In addition, CSS/VGL restoration in

upper Gabino Canyon would enhance habitat value for the species, although it has not been observed in this area. As described in *Chapter 7*, the Reserve Manager and Science Panel will determine the timing and extent of the upland restoration actions that would best serve the Habitat Reserve over the long term.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the burrowing owl is warranted within Subarea 1 because the Habitat Reserve and HRMP would provide fully adequate conservation measures, including: (1) conservation of approximately 60 percent of suitable habitat in the Habitat Reserve and conservation of an additional 8 percent of habitat in SOS; (2) conservation of recent documented overwintering owl use sites in Chiquita Canyon, along Radio Tower Road and in Cristianitos Canyon; (3) fire management and the coordinated GMP; and (4) subject to Reserve Manager and Science Panel discretion, restoration of CSS/VGL on Chiquita Ridge, Chiquadora Ridge, in Sulphur Canyon, in upper Cristianitos Canyon, and in upper Gabino Canyon that would enhance habitat quality. In light of the lack of documented breeding activity in the subregion, and thus relatively little, if any, impact of the proposed Covered Activities on the range-wide viability of the burrowing owl, 68 percent of conserved habitat is adequate for coverage of this species. In conjunction with the conservation and management measures discussed above, restoration activities identified above also would provide significant benefits to the species. Finally, the burrowing owl and its habitat have already been substantially conserved in coastal southern California, having received regulatory coverage under the Western Riverside County MSHCP and the San Diego MSCP.

#### *b. Coastal Cactus Wren (*Campylorhynchus brunneicapillus couesi*)*

**Federal Status:** USFWS Bird of Conservation Concern  
**State Status:** California Species of Special Concern  
**Science Advisors:** Group 2  
**NCCP/MSAA/HCP Planning Species**

#### 1. Rangewide and Planning Area Status

The coastal cactus wren is one of the original target species of the NCCP planning effort, and is a high profile species for conservation planning in southern California. The full species of cactus wren occurs from southern California to southern Baja California, southern Nevada, southwestern Utah, western and central Arizona, southern New Mexico, and central Texas south to Mexico (Terres 1980). Historically, the California coastal populations of the coastal cactus wren were found continuously along the coastal slopes and lowlands of southern California in arid and semiarid regions with abundant cacti and were directly connected to desert populations

through the San Geronio Pass in the Banning/Beaumont and Cabazon areas of western Riverside County. Breeding populations of the coastal cactus wren currently are present in Ventura, Los Angeles, Orange, San Bernardino, Riverside and San Diego counties.

In the early 1990s there was a taxonomic debate about whether the coastal southern California population, including southern Orange and western San Diego counties, constituted a separate subspecies named “San Diego” cactus wren (*C. b. sandiegensis*) by Rea and Weaver (1990). The proposed subspecies “San Diego” cactus wren was petitioned for federal listing as endangered on September 21, 1990 due to its limited distribution and declining habitat. Subsequently the American Ornithologists’ Union (AOU) rejected this proposed subspecies as a valid taxon and the petition for the San Diego cactus wren was no longer valid. The currently accepted subspecies of cactus wren in coastal California is the relatively widespread coastal cactus wren (*C. b. couesi*). Based on the AOU findings rejecting the San Diego cactus wren as a valid taxon, the USFWS (1994a) made several determinations in their 1-year finding on the petition to list the Pacific coastal population of the cactus wren that are important for understanding the status of the species in southern California and establishing Conservation Recommendations for the Southern NCCP, including conclusions that:

- the coastal population of the cactus wren does not constitute a distinct population segment (59 Federal Register, 45660, 9/2/94);
- the habitat preference of coastal birds (coastal sage scrub) does not readily separate them from other members of the subspecies *C. b. couesi* (Federal 59 Register, 45660, 9/2/94); and
- cactus wrens occupying coastal southern California are not likely significant to the continued existence of wrens in other parts of the species’ range because the species is relatively common throughout much of its range (59 Federal Register, 45660-45661, 9/2/94).

However, the USFWS also stated that:

*This finding announced herein is not intended to discount the importance of the coastal sage scrub ecosystem in southern California, which is the subject of intense multi-species and ecosystem planning efforts... Cactus wrens living in southern California have declined in numbers and coastal sage scrub habitats are becoming increasingly depleted. Efforts to conserve these depleted habitats will be of benefit to cactus wrens residing in southern California.*

(59 Federal Register, 45661, 9/2/94)

The coastal cactus wren is widely distributed throughout the Southern NCCP/MSAA/HCP planning area. Although population numbers are not available for the northern portions of the coastal cactus wren's range (*i.e.*, Ventura, Los Angeles and western San Bernardino counties), the Southern NCCP/MSAA/HCP planning area clearly supports a substantial portion of the coastal cactus wren population; about 44 percent of the documented locations within Orange, Riverside and San Diego counties are in the Southern Subregion. Within the planning area the coastal cactus wren is widely distributed in the San Juan Creek and San Mateo Creek watersheds, with essentially continuous connectivity among occupied areas. Within the context of the coastal populations of the coastal cactus wren, the population in the planning area constitutes a *major population*. Because of its widespread distribution and abundance in the planning area, however, it was not appropriate to identify any specific portions of the population as *key locations* in the subregion. The population in the planning area is strategically located as a linkage between the San Diego County populations on Camp Pendleton and conserved populations in the Central and Coastal Subregion Habitat Reserve. Substantial conservation of this species in the planning area and maintaining connections both within the planning area and between the planning area population and conserved populations in the Central and Coastal Subregion Habitat Reserve and populations located on Camp Pendleton would contribute to and provide for conservation of the species in the subregion.

## 2. Conservation Analysis

The conservation analysis for the coastal cactus wren is based on site-specific information (*i.e.*, mapped locations) and landscape-level factors including overall habitat conservation, habitat blocks, and habitat contiguity and connectivity. Coastal sage scrub is used as the surrogate habitat for the cactus wren because the mapped distribution of southern cactus scrub does not correspond well with wren locations; within the NCCP planning area only about 10 percent of the cactus wren locations are within mapped southern cactus scrub. The refined habitat block analysis also is applied to the cactus wren because, as a relatively sedentary species, it may be more affected by the fragmenting effects of roads than other more mobile avian species such as the gnatcatcher, raptors and the migrants such as the least Bell's vireo, southwestern willow flycatcher, yellow-breasted chat and yellow warbler.

### (a) Impacts

The proposed Covered Activities would result in permanent impacts to 2,242 acres (14 percent) of coastal sage scrub and 216 cactus wren locations (18 percent) (*Table 13-2* and *Figure 195-M*). The proposed Covered Activities would also result in temporary impacts to 71 acres of habitat and eight locations (*Table 13-6*).

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(b) Conservation

A total of 12,191 acres (73 percent) of coastal sage scrub and 853 cactus wren locations (73 percent) would be conserved in the Habitat Reserve (*Table 13-2* and *Figure 195-M*). An additional 2,196 acres (13 percent) of coastal sage scrub and 98 locations (8 percent) are in Subarea 1 SOS, resulting in the total conservation of 14,387 acres (87 percent) of coastal sage scrub and 951 locations (81 percent). Of the 2,196 acres and 98 locations in SOS, 2,061 acres and 96 locations are on NAS Starr Ranch (*Table 13-4* and *Figure 195-M*).

Because the cactus wren is a relatively sedentary species and thus less likely to disperse between isolated habitat patches (*i.e.*, patches separated by urban landscape) compared to other more mobile avian species, habitat patch size, contiguity and connectivity are key reserve design considerations for this species. The results of the refined habitat block delineation used to analyze patch size are presented in *Table 13-9* and depicted in *Figure 193-M*. These habitat blocks combined include about 13,370 acres (including sage scrub in SOS in Coto de Caza in Subarea 3) of the 14,387 conserved coastal sage scrub that provides suitable habitat for the cactus wren. Patches of coastal sage scrub within the blocks range from 206 acres in the Radio Tower Road mesa block to 5,841 acres in the Southeastern block. A total of 853 of the 951 conserved (Habitat Reserve and SOS) cactus wren locations (90 percent) are contained within six of the seven habitat blocks: 19 locations in the Arroyo Trabuco block; 273 locations in the Southeastern block; 141 locations in the Chiquita Ridge block; 63 locations in the Upper Chiquita block; 82 locations in the Wagon Wheel block; and 275 locations in the Northeastern block. There are no documented cactus wren locations in the Radio Tower Road block.

There are no data on the minimum effective patch size for maintaining the viability of “local cactus wren populations” (*i.e.*, contiguous occupied habitat considered to be within the typical dispersal distance of wrens as opposed to rare dispersals between more disparate populations). As a generalization based on a review of the literature (Franklin 1980), it has been suggested that the minimum effective local breeding population to maintain genetic variation should be 50 individuals over the short term and 500 individuals over the long term. Using the refined habitat blocks as the functional habitat patch for each cactus wren local population, the smallest local population of cactus wrens within habitat blocks is in the Arroyo Trabuco block with 19 locations. The next smallest local population is 63 locations in the Upper Chiquita block. Although the number of locations cannot be strictly equated with population numbers, the documented locations do reflect at least the potential carrying capacity of an area or the number of sites potentially supporting breeding pairs. Using 50 individuals as a guideline to qualitatively estimate the relative risk of local extirpation, based on Franklin (1980), the Arroyo Trabuco local population, at 19 locations would be at the greatest risk due to its relatively small number of documented locations. Over the short-term it is possible that this local population could be extirpated as result of wildfire, for example. But because it is linked to larger populations in

Chiquita Canyon by contiguous natural habitat between Ladera Ranch and Las Flores that would allow lower frequency, long distance dispersal events, as described below, the long-term risk of permanent extirpation of the Arroyo Trabuco local population should be relatively low.

Although little is known about the dispersal of cactus wrens, it is assumed that this relatively sedentary species requires contiguous natural habitat for dispersal and that they are unlikely to disperse through urban landscapes (sightings of cactus wrens away from suitable habitat are rare; Unitt 1984 cites only two observations out of typical habitat). The Habitat Reserve would provide for habitat connectivity among local populations and dispersal of cactus wrens throughout the Habitat Reserve, including north-south connections along Chiquita and Chiquadora ridges (linkages C and G); east-west connectivity between Arroyo Trabuco and Caspers Wilderness Park (linkages B, D, and I); along the San Juan Creek floodplain (linkage J); and north-south connections west of and through the Trampas and Cristianitos sub-basins (linkages K and N).

### 3. Management

Long-term habitat management also will be important for the coastal cactus wren as it is particularly vulnerable to wildfires and edge effects such as predation by "edge" species (*e.g.*, cats). At a general habitat level, adaptive management goals and objectives for coastal sage scrub habitat include maintaining the physiographic diversity of coastal sage scrub and associated focal species in the Habitat Reserve, restoring coastal sage scrub and enhancing the quality of existing sage scrub in the Habitat Reserve, managing fire regimes to maintain a natural diversity of age-stands throughout the Habitat Reserve, and controlling exotic plant and animal invasions of coastal sage scrub along the Habitat Reserve-urban development interface.

Management for the cactus wren and its habitat will consider several environmental stressors identified for the species, including:

- Urbanization adjacent to Habitat Reserve
- Fire
- Cattle-related impacts
- Urban-related predators (*e.g.*, cats and dogs)
- Roads and trails
- Prolonged drought

Urban development under the proposed Covered Activities will increase the risk of both accidental and intentional human-caused fires in the planning area as the Habitat Reserve-urban

interface expands. As noted above, coastal cactus wrens and cactus scrub habitat are particularly vulnerable to intense fires because it takes several years for cactus stands to recover sufficiently to support nesting coastal cactus wrens, although cactus patches with less intense burns that do not kill the cactus may be utilized soon after the burn (e.g., Harmsworth Associates 1997, 1998a, 2001, 2003). The HRMP, described in *Chapter 7*, identifies frequent fire as an important stressor on coastal sage scrub habitat that could degrade the quality of sage scrub for the coastal cactus wren and other species. Thus fire management is a key component of the HRMP for the coastal cactus wren, other sage scrub species, and other vegetation communities and species in general. A Wildland Fire Management Plan (*Appendix N*) was prepared to address the issue of wildfires in the study area. The Fire Management Plan describes both a Short-term Tactical Fire Suppression Plan and a Long-term Strategic Fire Conservation Plan, which in tandem are designed to protect vegetation communities and species to the extent feasible and to maintain diverse age stands of the coastal sage scrub in the study area. By maintaining diverse age stands of sage scrub throughout the Habitat Reserve, suitable habitat for the coastal cactus wren and other species will always be available even if some areas have burned and will take several years to fully recover. Because coastal cactus wren populations are widely distributed throughout the Habitat Reserve and Subarea 1 SOS on Starr Ranch, only a truly catastrophic fire that burned virtually all of the sage scrub in the Habitat Reserve and Subarea 1 SOS could feasibly cause local extirpation of the coastal cactus wren. Even without the proposed Covered Activities, the risk of such a fire exists today, as was seen in the San Diego Cedar fire in 2003. The Wildland Fire Management Plan, as a component of the HRMP, should reduce the risk of such a catastrophic fire occurring in southern Orange County compared with existing conditions, but realistically, based on the fire history map (*Figure 20-M*), catastrophic fires are a likelihood over the long term.

The Tactical Fire Suppression Plan component of the Wildland Fire Management Plan includes guidelines for fire suppression in biologically sensitive areas, including bulldozer policy, new fire roads policy, backfiring policy, ground tactical units policy, off-road policy, grading techniques and erosion control policy and fire prevention techniques policy. The Long-Term Strategic Plan identifies Fire Management Compartments (FMCs) and Fire Management Units (FMUs) within the FMCs. The FMCs generally are based on broad physiographic features such as ridgelines, roads, key vegetation transitions, and water courses that define “natural” boundaries for fighting wildfires. Within the FMCs, the FMUs are defined by sub-basin watershed boundaries. The goal of the Strategic Plan is to confine all wildfires to a particular FMU if at all possible. While under severe wildland fire conditions, such as a Santa Ana wind condition, this may not always be possible, but it is a reasonable fire suppression guideline for all other average or above-average fire weather conditions.

The other important management action in Subarea 1 to benefit the coastal cactus wren is control of non-native, urban-related predators (e.g., cats and dogs) in the Habitat Reserve, primarily

through homeowner education, but also possibly through direct controls such as trapping if necessary and to the extent feasible.

Habitat restoration actions to benefit the coastal cactus wren include: (1) subject to Reserve Manager and Science Panel discretion, implementation of a CSS/VGL restoration program with targeted areas (Chiquita Ridge, Chiquadora Ridge and in Sulphur Canyon) to enhance habitat value and improve habitat connectivity; and (2) planting of cacti in fuel modification zones and within the Habitat Reserve, where appropriate, along the urban-Habitat Reserve edge to provide additional habitat for the coastal cactus wren and inhibit unauthorized intrusions into the Habitat Reserve by the public and non-native, urban-related predators.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the coastal cactus wren is warranted because approximately 73 percent of habitat and locations would be conserved and managed in the Habitat Reserve. An additional 13 percent of habitat and 8 percent of locations would be SOS, almost all of which are on NAS Starr Ranch, resulting in 86 percent conservation of habitat and 81 percent conservation of locations. Conserved locations and habitat include the areas with the highest population densities, including Chiquita Canyon/Chiquadora Ridge and Caspers Wilderness Park. Large, intact local populations (*i.e.*, at least 50 locations) would be conserved within five of the six refined habitat blocks that support cactus wrens, and all habitat blocks would be adequately connected by natural habitats to maximize the likelihood of sustaining local populations over the long term, including recolonization of the smaller local populations that are at higher risk of short-term, temporary extirpations. In addition to the wildlife corridors/habitat linkages provided within the Southern Subregion, important open space protection providing connectivity between the Southern Subregion and the Central Subarea portion of the Central/Coastal NCCP Subregion already is provided within Subarea 2. Based on cooperative actions involving the County, landowners in Subarea 2 and the Wildlife Agencies, important open space in Saddleback Meadows, Live Oak Plaza and the County-owned parcel located north of the Oso Reservoir and adjacent to the western boundary of O'Neill Regional Park has been protected to supplement previously protected open space. The County and Wildlife Agencies have determined that, cumulatively, these new open space areas provide important connectivity between the habitat blocks and species populations located within the adjacent NCCP Subregions. The County and Wildlife Agencies also agree that this enhanced connectivity contributes significantly to the conservation of the species. Furthermore, the coastal cactus wren and its habitat have already been substantially conserved in coastal southern California, having received regulatory coverage under the Central/Coastal NCCP/HCP, Western Riverside County MSHCP, and the San Diego MSCP and MHCP.

***c. Coastal California Gnatcatcher (Polioptila californica californica)***

**Federal Status:**        **Threatened**  
**State Status:**        **California Species of Special Concern**  
**Science Advisor:**    **Group 2**  
**NCCP/MSAA/HCP Planning Species**

1. Rangewide and Planning Area Status

The coastal California gnatcatcher is one of the original target species of the NCCP planning effort and, as federally-listed threatened species, can be considered a “flagship” species of conservation planning in southern California. Historically and currently, the range of California gnatcatcher extends from Baja California, Mexico at approximately 30 degrees North latitude near El Rosario northward through San Diego, Orange, Riverside, San Bernardino, and Los Angeles counties to southern Ventura County (Atwood 1990). The gnatcatcher was considered locally common in the mid-1940s; but by the 1960s, this subspecies had declined substantially in the United States due to widespread destruction of its habitat (Atwood 1990).

The gnatcatcher typically occurs in or near sage scrub habitat, which is a broad category of vegetation that includes the following plant communities as classified by Holland (1986): Venturan coastal sage scrub, Diegan coastal sage scrub, maritime succulent scrub, Riversidean sage scrub, Riversidean alluvial fan sage scrub, southern coastal bluff scrub, and coastal sage-chaparral scrub. Ninety-nine percent of all gnatcatcher locality records within coastal Orange and San Diego counties occur below an elevation of about 1,000 feet (Atwood 1990).

Within the planning area there are 737 locations for the California gnatcatcher, of which 518 locations are in Subarea 1. It is important to keep in mind that the gnatcatcher data are cumulative and include data compiled over more than 15 years since surveys began in the late 1980s. Thus, while this database provides a good representation of occupied and occupiable habitat in the Subregion (see *Chapter 3, Section 3.1.2* for the method used to incorporate new gnatcatcher data), at any given time, it is likely that only 60 to 70 percent of the locations shown on the distribution map (*Figure 171-M*) will be occupied (this estimate is based on comparing single-season survey “window” data with the cumulative database for the SOCTIIP survey corridor).

The California gnatcatcher is widely distributed throughout lower elevation coastal sage scrub in the Southern Subregion, with a *major population* in a *key location* in the Chiquita sub-basin and western portion of the Gobernadora sub-basin supporting about 55 percent of the documented locations in the subregion. Eleven additional *important populations* were identified in the subregion, ranging from the Foothill-Trabuco Specific Plan area in the northwest to habitat along

Avenida Pico in the south (*Figure 171-M*). Of the 11 identified *important populations*, eight are considered to be *key locations*.

## 2. Conservation Analysis

The conservation analysis for the coastal California gnatcatcher is based on site-specific information (*i.e.*, mapped locations) and landscape-level factors including overall habitat conservation, habitat blocks, and habitat contiguity and connectivity.

### (a) Impacts

The proposed Covered Activities would result in permanent impacts to 2,242 acres (14 percent) of coastal sage scrub and 90 locations (17 percent) (*Table 13-2* and *Figure 171-M*). The proposed Covered Activities would also result in temporary impacts to 71 acres of habitat and three locations (*Table 13-6*).

With regard to *major/important populations* in Subarea 1, the proposed Covered Activities would result in impacts to 60 locations within Subarea 1 *major/important populations* in *key locations*, including:

- 51 locations (15 percent) in the Chiquita Canyon/Wagon Wheel sub-basins and Chiquadora Ridge *major population/key location*, including 38 locations in proposed RMV development in PA 2, four locations in upper Chiquita for the SMWD reservoir project, and nine locations for infrastructure;
- two locations in the East San Juan Capistrano *important population/key location*, including one location on RMV and one location on the Prima Deshecha Landfill;
- five locations on the Prima Deshecha Landfill in the North San Clemente *important population/key location*;
- one location in the Trampas Canyon *important population/key location*; and
- one location in potential orchard in the upper Cristianitos *important population/key location*.

An additional three locations in Subarea 4 in the North San Clemente *important population/key location* would be impacted by the Avenida La Pata improvements.

A total of 27 additional locations outside *major/important populations* would be impacted, including 24 locations in proposed residential/commercial RMV development areas, one location in potential orchard and two locations in the Prima Deshecha Landfill.

Of the 2,653 acres of coastal sage scrub in the Chiquita Canyon/Wagon Wheel sub-basins and Chiquadora Ridge *major population/key location* area, 331 acres (12 percent) would be permanently impacted by proposed PA 2 development (265 acres) and proposed infrastructure construction, operation, and maintenance/repair (66 acres).

(b) Conservation

A total of 12,191 acres (73 percent) of coastal sage scrub and 400 California gnatcatcher locations (77 percent) would be conserved in the Habitat Reserve (*Table 13-2* and *Figure 171-M*). An additional 2,196 acres (13 percent) of coastal sage scrub and 28 locations (5 percent) are in Subarea 1 SOS, resulting in the total conservation of 14,387 acres (87 percent) of coastal sage scrub and 428 locations (83 percent). Of the 2,196 acres and 28 locations in SOS, 2,061 acres and 21 locations are on NAS Starr Ranch (*Table 13-4* and *Figure 171-M*).

Conservation of the California gnatcatcher includes 298 of 349 locations (85 percent) and 2,320 acres of 2,653 acres of coastal sage scrub (87 percent) within the *major population/key location* in the Chiquita Canyon/Wagon Wheel sub-basins and Chiquadora Ridge portion of the Gobernadora sub-basin that are in Subarea 1 (*Figure 171-M*). (Note that 44 locations and 441 acres of coastal sage scrub in this *major population/key location* are located in Subarea 3 [Coto de Caza], of which 26 locations are in SOS.)

Conservation of *important populations* is as follows:

- All 14 locations of the East Caspers Wilderness Park *important population* are in Habitat Reserve (note: one location is mapped in the Nichols Institute property and is not a part of the analysis);
- 14 locations of the East Coto de Caza/Starr Ranch *important population/key location* are in Habitat Reserve in Caspers Wilderness Park and 19 locations are in Subarea 1 SOS on NAS Starr Ranch (19 locations are in Subarea 3, of which seven are in SOS);
- six of seven locations of the Trampas Canyon *important population/key location* are in Habitat Reserve;
- 28 of 41 locations of the Arroyo Trabuco *important population* are in Habitat Reserve (six locations are in areas “Not a Part” of the plan and seven have no designated protection status);
- seven of 21 locations in the North San Clemente *important population/key location* are in Prima Deshecha SOS (eight locations are in SOS in Subarea 4);
- 11 of 13 locations in the upper Cristianitos *important population/key location* are in Habitat Reserve and one location is in Subarea 4 SOS; and

- two locations in the West Foothill-Trabuco Specific Plan *important population/key location* are in Habitat Reserve in O'Neill Regional Park and three are in SOS in the Foothill-Trabuco Specific Plan (FTSP).

Overall, of the 428 conserved locations, 399 locations (93 percent) are within *major/important populations*, and 29 locations are outside of *major/important populations*. The 399 conserved locations in *major/important populations*, of which 373 are in the Habitat Reserve and 26 are in Subarea 1 SOS, comprise 83 percent of the 483 total locations mapped in *major/important populations* in Subarea 1. Of the gnatcatcher locations outside *major/important populations* in Subarea 1, 29 of 56 locations (52 percent) would be conserved.

The results of the refined habitat block delineation used to analyze patch size are presented in *Table 13-9* and depicted in *Figure 193-M*. The seven habitat blocks each support all or portions of *major* and *important populations* and *key locations* of California gnatcatchers and combined include about 13,370 acres (including sage scrub in SOS in Coto de Caza in Subarea 3) of the 14,387 conserved coastal sage scrub that provides suitable habitat for the California gnatcatcher. Patches of coastal sage scrub within the blocks range from 206 acres in the Radio Tower Road mesa block to 5,841 acres in the Southeastern block. Of the 428 conserved gnatcatcher locations, 314 locations (73 percent) are contained within the seven habitat blocks as follows:

- 108 locations in the Chiquita Ridge block, 71 locations in the Upper Chiquita block, and 45 locations in the Wagon Wheel block, all of which are part of the Chiquita Canyon, Western Gobernadora/Chiquadora Ridge *major population/key location*;
- 17 locations in the Arroyo Trabuco block, of which 12 locations are in the Lower Arroyo Trabuco *important population*;
- 34 locations in the Southeastern block, of which 25 locations comprise the Upper Cristianitos *important population/key location* and East Caspers *important population*;
- four locations in the Radio Tower Road block, of which three locations comprise a portion of the Trampas Canyon *important population/key location*; and
- 35 locations in the Northeastern block, of which 23 locations are within the Coto de Caza/Starr Ranch *important population/key location*.

As discussed above for the cactus wren, as a guideline, local populations should include at least 50 individuals to be considered a self-sustaining viable population over the short-term (Franklin 1980). This was an issue for the cactus wren because of its relatively sedentary nature and likely limited dispersal capabilities. Although some of the local populations of California gnatcatchers in the defined habitat blocks number less than 50 locations, this species' dispersal capabilities are much greater than the cactus wren (*e.g.*, Bailey and Mock 1998) and all of the local populations

are linked by virtually contiguous natural habitat, as discussed below. Also, the 17 locations in the Arroyo Trabuco block are directly linked to 16 additional locations in the Habitat Reserve associated with Arroyo Trabuco Golf Course/Ladera Open Space that were not included in the habitat block.

Related to the habitat block analysis, a key issue for conservation of the coastal California gnatcatcher is Habitat Reserve configuration and particularly habitat connectivity to support dispersal between local populations. Subregional habitat connectivity for gnatcatcher dispersal within Subarea 1 would be maintained, including north-south connections along Chiquita and Chiquadora ridges (linkages C and G); east-west connectivity between Arroyo Trabuco and Caspers Wilderness Park (linkages B, D, and I); along the San Juan Creek floodplain (linkage J); and north-south connections west of and through the Trampas Canyon sub-basin (linkages K and N) and southern portion of the Chiquita sub-basin, connecting to the Donna O'Neill Land Conservancy and Cristianitos Canyon. All of these linkages, except B, J and K are at least 2,000 feet wide: linkage B, located between existing Las Flores and Ladera Ranch residential developments, has a minimum width of 1,500 feet; linkage J has a minimum width of about 1,000 feet and linkage K has minimum widths of 600 to 700 feet at its narrowest points. However, although these linkages have sections less than 1,000 feet wide, each maintains continuous habitat. With the documented capability of gnatcatchers to disperse through highly modified urban landscapes (Bailey and Mock 1998), and the fact that these relatively narrow linkages still contain continuous natural habitat, they will not significantly impede gnatcatcher dispersal throughout the Habitat Reserve and Subarea 1 SOS.

### 3. Management

Long-term habitat management of the California gnatcatcher and its habitat is an important component of the overall conservation strategy. At a general landscape habitat level, adaptive management goals and objectives for coastal sage scrub habitat include monitoring gnatcatcher population levels, maintaining the physiographic diversity of coastal sage scrub and associated focal species in the Habitat Reserve, restoring coastal sage scrub and enhancing the quality of existing sage scrub in the Habitat Reserve, managing fire regimes to maintain a natural diversity of age-stands throughout the Habitat Reserve, and controlling exotic plant and animal invasions of coastal sage scrub along the Habitat Reserve-urban development interface.

Adaptive management will consider a number of environmental stressors identified for the California gnatcatcher, including

- Urbanization adjacent to Habitat Reserve
- Short-interval fires

- 
- Low frequency fires (?)
  - Cattle-related impacts
  - Exotic plant invasions
  - Exotic and urban-related predators (*e.g.*, cats, Argentine ants)
  - Cowbird nest parasitism
  - Prolonged drought
  - Wet and cold weather

Under the HRMP, adaptive management actions in the Habitat Reserve to benefit the California gnatcatcher include: **(1)** fire management to help protect and maintain patches of occupied coastal sage scrub; **(2)** exotic species controls; and **(3)** cowbird trapping. Long-term fire management will significantly reduce the likelihood of type conversion of coastal sage scrub to annual grassland, in contrast to many areas in southern California lacking adaptive management (see discussion of the Wildland Fire Management Plan in regard to the cactus wren above and *Appendix N*). Comparative analyses of fire and grazing regimes with other areas, as appropriate, will be conducted to better understand the roles of fire and grazing in maintaining occupied coastal sage scrub (see discussion in *Chapter 7*). Exotic species controls (*e.g.*, artichoke thistle) will also help reduce the likelihood of type conversion to annual grassland.

The Reserve Manager and Science Panel will consider habitat restoration actions in the Habitat Reserve to benefit the California gnatcatcher, including discretionary implementation of a CSS/VGL restoration program to enhance habitat value and improve habitat connectivity. Areas identified for coastal sage scrub restoration that would benefit the gnatcatcher include Chiquita and Chiquadora ridges and Sulphur Canyon. In combination with other major elements of the HRMP discussed above, targeted habitat restoration would help maintain the *major population/key location* at current recovery levels over the long term.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the coastal California gnatcatcher is warranted in Subarea 1 because approximately 83 percent of locations and 86 percent of suitable habitat for the California gnatcatcher would be conserved in the Habitat Reserve and SOS, including 399 of 483 gnatcatcher locations (83 percent) in the *major* and *important populations* in Subarea 1. The *major* and *important populations* would be conserved in seven large, unfragmented habitat blocks. Key habitat linkages within Subarea 1 also would be conserved and managed. In addition to the wildlife corridors/habitat linkages provided within the Southern Subregion, important open space protection providing connectivity between the Southern Subregion and the Central Subarea portion of the Central/Coastal NCCP Subregion already is provided within

Subarea 2. Based on cooperative actions involving the County, landowners in Subarea 2 and the Wildlife Agencies, important open space in Saddleback Meadows, Live Oak Plaza and the County-owned parcel located north of the Oso Reservoir and adjacent to the western boundary of O'Neill Regional Park has been protected to supplement previously protected open space. The County and Wildlife Agencies have determined that, cumulatively, these new open space areas provide important connectivity between the habitat blocks and species populations located within the adjacent NCCP Subregions. The County and Wildlife Agencies also agree that this enhanced connectivity contributes significantly to the conservation of the species. In conjunction with conservation of *major* and *important populations* and important habitat linkages, restoration activities identified above also would provide significant benefits to the species. Conservation and management of the coastal California gnatcatcher in Subarea 1 would provide for recovery of the species in this area and substantially contribute to its recovery rangewide. Furthermore, the coastal California gnatcatcher and its habitat have already been substantially conserved in coastal southern California, having received regulatory coverage under the large programs such as the Central/Coastal NCCP/HCP, Western Riverside County MSHCP, and the San Diego MSCP and MHCP and smaller programs such as the Shell, East Coyote Hills, and Ocean Trails HCPs. In addition, substantial gnatcatcher populations occur on federal lands; 620 locations on MCB Camp Pendleton and 53 locations on MCAS Miramar.

***d. Cooper's Hawk (Accipiter cooperii)***

**Federal Status:** None  
**State Status:** California Species of Special Concern  
**Science Advisors:** Group 2  
**NCCP/MSAA/HCP Planning Species**

1. Rangewide and Planning Area Status

The Cooper's hawk is a wide-ranging species in North America that breeds from British Columbia eastward to Nova Scotia and southward to northern Mexico and Florida (AOU 1998). Its nesting range includes southern British Columbia, northwestern Montana, Wyoming, eastern North Dakota, southern Manitoba, western Ontario, northern Michigan, southern Ontario, Southern Quebec, Maine, and Nova Scotia, south to Baja California, south-central Texas, Louisiana, central Mississippi, central Alabama, and central Florida (Terres 1980; Reynolds 1975). Although Cooper's hawks are relatively common in California, a decline in the population was noted by Remsen (1978). The Cooper's hawk has a CNDDDB rank of G5S3, indicating that it is secure throughout its range, but has a restricted range or is rare in California. A major decline that occurred in the 1970s during the nesting season probably was due to eggshell thinning resulting from pesticide exposure (Terres 1980; Henny and Wight 1972). However, habitat destruction, mainly in lowland riparian areas, due to urbanization is probably

the main current threat, although direct or indirect human disturbance at nest sites may also be a factor (Remsen 1978; Boal and Mannan 1998).

Cooper's hawks primarily breed in riparian areas and oak woodlands, and apparently are most common in montane canyons (Garrett and Dunn 1981; Hamilton and Willick 1996). They hunt in broken woodland and habitat edges (Zeiner *et al.* 1990).

The Cooper's hawk is still a relatively common breeding resident in riparian and woodland habitats in the planning area. The database includes 44 historic nest sites, of which 41 are in Subarea 1, distributed throughout the planning area, including San Mateo Creek, the confluence of Talega and Cristianitos canyons, Talega Canyon, Cristianitos Canyon, Gabino Canyon, La Paz Canyon, San Juan Creek, Bell Canyon, Wagon Wheel Canyon, lower Cañada Gobernadora, and Arroyo Trabuco. There is no apparent clustering of nest sites and no *major* or *important* populations were identified in the planning area.

## 2. Conservation Analysis

The conservation analysis for the Cooper's hawk is based both on site-specific information including documented historic nest sites and identified important habitat areas (although no *major/important populations/key locations* were identified for this species) and the amount of total conserved suitable nesting and foraging habitat, defined as riparian and woodland habitats. The conservation analysis also considers potential indirect effects of existing and proposed development by analyzing buffers between nest sites and existing and proposed development, including roads.

### (a) Impacts

The proposed Covered Activities would result in direct, permanent impacts to 750 acres (12 percent) of riparian and woodland habitat and six historic nest sites (12 percent) (*Table 13-2* and *Figure 196-M*). Two of the impacted sites are mapped in Habitat Reserve, but, as discussed below, the proposed Covered Activities would result in potential indirect impacts to these two nest sites such that their long-term viability is questionable. The proposed Covered Activities also would result in temporary direct impacts to 85 acres of habitat, but no historic nest sites.

Potential indirect impacts resulting from urban development, including roads, near nesting areas is an important consideration for assessing impacts to Cooper's hawk. Thus, in addition to clear impacts to sites in proposed development areas, the impact analysis considers potential indirect effects by examining the buffers between historic nest sites and existing and proposed development and existing and proposed roads. Any site within 300 feet of existing or planned development or roads is considered to be potentially impacted, unless there is some mitigating

factor to indicate otherwise. The linear distance of each “conserved” historic nest site (*i.e.*, sites within the Habitat Reserve or SOS based on the GIS analysis) from the nearest existing and proposed development area (including the Cow Camp Road alignment and Cristianitos Road/”F” Street) was calculated. Based on the GIS analysis, the median distance from the nearest existing or proposed development or existing or new roads of 37 nest sites located in Habitat Reserve and SOS is 1,020 feet, with a minimum of 155 feet. Thirty-two of the 37 historic nest sites in the Habitat Reserve or SOS are at least 300 feet from existing or proposed development and roads. Nest site 22 in Verdugo Canyon is located within 155 feet of proposed development in PA 4 (see *Figure 196-M*). Although the footprint of PA 4 has not been determined, it is assumed for this impact analysis that this nest site could be indirectly impacted. Nest site 34 is within 237 feet of the proposed Cristianitos/”F” Street in middle Chiquita (*Figure 196-M*). This site also is considered be potentially impacted by the proposed road. Nest sites 9 and 43 are 250 feet and 281 feet from existing development, respectively, in Arroyo Trabuco (*Figure 196-M*). Because these sites are in the arroyo, which provides additional topographic buffering to the absolute linear distance from existing development, and no new development is proposed for this area, they are considered extant and not subject to impacts resulting from the proposed Covered Activities. Finally, nest site 14 is 280 feet from the western boundary of PA 8 (*Figure 196-M*). Because this site approaches the 300-foot distance criterion and will be topographically separated from future development in PA 8, this site is considered conserved. In summary, the buffer analysis indicates that two additional historic Cooper’s hawk nests sites could be indirectly impacted, in addition to the four located within the direct impact areas. Therefore, it is estimated that six Cooper’s hawk nest sites could be directly or indirectly impacted.

#### (b) Conservation

A total of 4,537 acres (73 percent) of suitable nesting and foraging habitat (riparian and woodland) would be conserved in the Habitat Reserve (*Table 13-2* and *Figure 196-M*). An additional 929 acres (15 percent) of habitat would be in SOS. Based on the impacts analysis described above, 30 historic nest sites (73 percent) would be conserved in the Habitat Reserve and five sites (12 percent) are in Subarea 1 SOS. Overall, 5,466 acres (88 percent) of habitat and 35 historic nests sites (85 percent) would be in the Habitat Reserve and SOS.

Although no *major/important populations* were identified for the Cooper’s hawk, breeding and foraging habitat within the major drainages in Subarea 1, including San Juan Creek, Bell Canyon, Wagon Wheel Canyon, lower Cañada Gobernadora, and Arroyo Trabuco, would be in the Habitat Reserve and SOS. In addition, habitat for the Cooper’s hawk is generally well-buffered in the large habitat blocks. A total of 4,321 acres of riparian and woodland is located in the Arroyo Trabuco, Northeastern and Southeastern habitat blocks, accounting for 79 percent of the conserved habitat (*Table 13-9*). An additional 388 acres are in the Chiquita Ridge, Upper Chiquita, Wagon Wheel and Radio Tower Road mesa blocks, accounting for an additional 7

percent of the conserved habitat. Overall, 86 percent of the conserved riparian and woodland is in the large habitat blocks.

### 3. Management

A variety of environmental stressors identified for the Cooper's hawk will be considered for management, including:

- Urbanization adjacent to Habitat Reserve
- Altered hydrology
- Altered geomorphology
- Prolonged drought
- Exotic plant invasions (*e.g.*, giant reed)
- Frequent and/or high intensity wildfires
- Cattle-related impacts
- Disease affecting oak woodlands
- Predation on acorns, seedlings, saplings
- Human harassment
- Disease affecting nestlings
- Collisions with vehicles and windows

Landscape-level habitat management of riparian and woodland vegetation communities that will benefit the Cooper's hawk is addressed in *Chapter 7*. These management activities will address stressors such as altered hydrology and morphology, exotic plant invasions, wildfires, and disease and predation impacts on woodlands.

Urbanization adjacent to nesting areas and related harassment appear to be key management issues for the Cooper's hawk. While Cooper's hawks exhibit some tolerance of human activity in fairly urbanized areas and nest in suitable habitat within about 100 feet of residences, their reproductive success is substantially higher in natural settings than in urban settings (Boal and Mannan 1999). Thus to maximize the likelihood of nesting success in the Habitat Reserve, control of human disturbances during the breeding season is important. The HRMP includes measures to minimize human disturbance in close proximity to active nest sites within the Habitat Reserve during the breeding season such as public education, signage and access restrictions where feasible. Potential indirect impacts to active nest sites during construction or maintenance/repair activities (*e.g.*, infrastructure construction and maintenance) will be

addressed by minimizing activities within 300 feet of nest sites if activities occur during the breeding season through implementation of MMs 4.9-26 and 4.9-30 of the Ranch Plan GPA/ZC EIR for raptor-related construction monitoring and preparation of a Biological Resources Construction Plan (BRCP).

Other management actions in the Habitat Reserve that would benefit the Cooper's hawk include protecting breeding and foraging habitat in GERA by maintaining hydrology. Restoration activities that would benefit the Cooper's hawk include implementing a restoration program in Gobernadora Creek (the Gobernadora Multi-purpose Basin) which addresses: **(1)** the historic creek meander above the knickpoint; and **(2)** upstream land use-induced channel incision and erosion through the Gobernadora Multi-purpose Basin, including potentially excessive surface and groundwater originating upstream. Restoration efforts also would address localized headcuts and channel incision within the Chiquita sub-basin. Exotic species control in Arroyo Trabuco and San Juan Creek also will benefit this species.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the Cooper's hawk is warranted because the Habitat Reserve would conserve 73 percent of the historic nest sites and suitable nesting and foraging habitat. An additional 12 percent of nest sites and 15 percent of habitat conserved in SOS would result in 85 percent conservation of nest sites and 88 percent of habitat. Four historic nest sites would be directly impacted and two would be indirectly impacted. In conjunction with the conservation measures and adaptive management measures, the restoration activities identified above also would provide significant benefits to the species. In addition, coverage is warranted because the Cooper's hawk is widely distributed beyond the Southern Subregion in California and throughout much of North America. Its global rank of G5 indicates that it is considered secure within the context of its broader range. The conservation and adaptive management measures would contribute to the viability of this species in California and within its global range. Finally, the Cooper's hawk and its habitat have already been substantially conserved in coastal southern California, having received regulatory coverage under the Western Riverside County MSHCP and the San Diego MSCP and MHCP.

##### *e. Grasshopper Sparrow (Ammodramus savannarum)*

**Federal Status:** None  
**State Status:** None  
**Science Advisors:** Group 2  
**NCCP/MSAA/HCP Planning Species**

## 1. Rangewide and Planning Area Status

The grasshopper sparrow breeds from eastern Washington south to southern California and northernmost Mexico, and eastward to Virginia. The species has a disjunct distribution through the western portion of the United States and is not present within the mountainous and desert regions. It occurs in the areas east of the Rocky Mountains from Canada to the southern states as a breeding resident. In southern California, the species occurs locally in appropriate habitats west of the deserts and has nested at elevations up to about 4,900 feet in the San Jacinto Mountains in western Riverside County (Garrett and Dunn 1981). It is an uncommon and local summer resident and breeder in foothills and lowlands west of the Cascade-Sierra Nevada crest from Mendocino and Trinity counties south to San Diego County, as well as Lassen and Siskiyou counties (Zeiner *et al.* 1990).

During the breeding season in California, grasshopper sparrows occur on mesas and slopes in dense, dry or well-drained grasslands, especially native grassland with a mix of grasses and forbs for foraging and nesting (Grinnell and Miller 1944; Garrett and Dunn 1981). Apparently, thick cover of grasses and forbs is essential for concealment. They require fairly continuous native grassland areas with occasional taller stems for breeding areas (Garrett and Dunn 1981). They especially occur in grasslands composed of a variety of grasses and tall forbs with scattered shrubs for singing perches (Zeiner *et al.* 1990). Grasshopper sparrows use a variety of forb species for perches and choose them predominantly on the basis of their height rather than the specific plant species (Payne *et al.* 1998). Although shrub and forb species are used for perching, they tend to avoid grassland areas with extensive shrub cover and the presence of native grasses is less important than the absence of trees (Smith 1963; Vickery 1996). Grasshopper sparrows typically forage on the ground and in low foliage for insects (especially Orthoptera), other invertebrates, and grass and forbs seeds, with grass seeds a large percentage of winter diet. Because the species is a visual predator, bare ground is important for foraging.

Although the grasshopper sparrow has no official state or federal sensitivity status, it has been treated as a sensitive species characteristic of grasslands by the Wildlife Agencies and multi-species planning efforts in southern California. It does not have a CNDDDB rank, but is a U.S. Forest Service Species of Special Management Concern. This species is being proposed for regulatory coverage because it could be listed in the future because of the cumulative loss, degradation and fragmentation of grassland habitat and because most conservation programs in southern California to date conserve relatively low percentages of grasslands. Garrett and Dunn (1981) concluded that the grasshopper sparrow has declined as a breeder in recent decades due to the development of open hilly areas that make up the grasshopper sparrow's preferred habitat. Extensive and intensive grazing in western North America also has had a negative impact on this species (Vickery 1996). Brown-headed cowbird parasitism does occur but is generally considered a low threat (Vickery 1996).

The Southern Subregion planning area includes about 730 documented occurrences for the grasshopper sparrow, of which 658 locations are in Subarea 1, concentrated in grassland and agricultural areas (fallow barley fields). It should be noted that these observations are not documented nest sites and do not distinguish breeding pairs and single individuals, but they do reflect concentrations of habitat use in the planning area by the species. The planning area appears to support one *major population* and two *important populations* of the grasshopper sparrow that account for about 92 percent of the documented locations in the subregion.

## 2. Conservation Analysis

The conservation analysis for the grasshopper sparrow is based both on site-specific information (*i.e.*, documented occurrences and identified *major* and *important populations/key locations*) and landscape-level habitat factors including amount of habitat conserved and habitat patch size and within-patch contiguity. Connectivity between large habitat patches was not considered to be a crucial issue for this mobile migratory species.

### (a) Impacts

The proposed Covered Activities would result in permanent impacts to 4,199 acres (33 percent) of habitat comprised of grassland (2,669 acres including 3 acres of alkali meadow; 29 percent) and barley field agriculture (1,503 acres; 45 percent), and 267 grasshopper sparrow locations (41 percent) (*Table 13-2* and *Figures 194-M* and *174-M*). The proposed Covered Activities would also result in temporary impacts to 212 acres of habitat and 15 locations (*Table 13-6*).

The following impacts would occur within *major/important populations*:

- a total of 137 of 362 locations (38 percent) in the Chiquita Ridge/Chiquadora Ridge/Gobernadora *major population/key location*, including 123 locations in PA 2 and 14 locations impacted by infrastructure construction, operation, and maintenance/repair;
- 63 of 141 locations (45 percent) in the Cristianitos, Lower Gabino/Blind Canyons *important population/key location*, including 25 locations in PA 8, 34 locations in proposed orchard in PAs 6 and 7 (of which ultimately the number impacted would be substantially less), and four locations impacted by infrastructure construction, operation, and maintenance/repair; and
- 52 of 118 locations (44 percent) in the Radio Tower Road/Prima Deshecha *important population/key location*, of which 28 are in the conceptual Avenida La Pata Improvement Project footprint, which ultimately should be much smaller.

Overall, of 621 locations in *major/important populations*, a total of 252 locations (40 percent) would be potentially impacted by the proposed Covered Activities. However, ultimately this impact level will be reduced with more refined impact footprints for PAs 6 and 7 and possibly for the Avenida La Pata Improvement Project.

(b) Conservation

A total of 7,568 acres (60 percent) of suitable grassland and agricultural habitat for the grasshopper sparrow and 382 locations (58 percent) would be conserved in the Habitat Reserve (*Table 13-2*). An additional 957 acres (8 percent) and eight locations (1 percent) are in Subarea 1 SOS, bringing the total conservation to 8,525 acres (68 percent) and 390 locations (59 percent). Notably, all of the Chiquita Canyon bottom north of the treatment plant and grasslands on the Radio Tower Road mesa south of San Juan Creek that support large grasshopper sparrow populations would be conserved. In addition, the vast majority of grasslands in Cristianitos Canyon would be conserved and managed because the proposed orchards in PAs 6 and 7, which under the conservation analysis encompasses 431 acres, would be limited to 50 acres, resulting in a minimum of 300 acres of additional grassland conservation. Thirty-four locations occur in the proposed orchards in PAs 6 and 7. With conservation of an additional 381 acres in this area a substantial portion of these 34 locations will also be conserved, resulting in ultimate conservation of grasshopper sparrows over 60 percent (*e.g.*, a conservative estimate of 20 additional locations would bring the total conservation to 62 percent).

Overall, 368 (94 percent) of the 390 conserved locations are in *major/important populations*, as follows:

- 222 of 362 locations (61 percent) of the *major population/key location* in Chiquita sub-basin/Chiquadora Ridge/Gobernadora;
- 59 of 118 locations (50 percent) of the *important population* on the Radio Tower Road mesa (assumes 28 locations impacted by the large, conceptual footprint for Avenida La Pata); and
- 87 of 141 locations (62 percent) of the Cristianitos, Lower Gabino/Blind Canyons *important population* (assumes impacts of 34 locations in PAs 6 and 7 targeted for orchards).

Habitat patch size and internal contiguity appears to be important for the grasshopper sparrow. For example, predation rates are highest in patch sizes less than about 37 acres and in one study nesting was avoided within about 165 feet of habitat edges (Delisle and Savidge 1996). Using the refined habitat block analysis (see *Table 13-9* and *Figure 193-M*), about 331 of the 390 conserved grasshopper sparrow locations (85 percent) are in large habitat blocks, including about

170 locations in the Chiquita Ridge block, 32 locations in the Wagon Wheel block, 73 locations in the Southeastern block (this number will be increased with conservation of 381 of 431 acres targeted for new orchards and refined development area in PA 8), and 56 locations in the Radio Tower Road mesa block. The refined habitat block analysis also shows that substantial grassland and agriculture habitat for the grasshopper sparrow is conserved in habitat blocks, ranging from 477 acres in the Wagon Wheel block to 2,722 acres in the Southeastern block, which includes Cristianitos Canyon. The Chiquita Ridge block contains 1,331 acres of suitable habitat.

### 3. Management

Management of the grasshopper sparrow and its habitat will consider a number of environmental stressors identified for the species, including:

- Habitat fragmentation, roads and trails
- Cattle-related impacts
- Exotic plants
- Too frequent fire
- Mowing
- Pesticides
- Urban-related predators (*e.g.*, cats)

Adaptive management for the grasshopper sparrow and its habitat will focus on maintaining habitat heterogeneity, characterized by a mix of grasses and forbs and open areas for foraging. Habitat heterogeneity appears to be important for supporting breeding populations of grasshopper sparrows. Management will also focus on stressors that may have direct impacts on sparrows and their reproductive success.

Management actions in the Habitat Reserve that would benefit the grasshopper sparrow by enhancing habitat heterogeneity include implementation of the Wildland Fire Management Plan (*Appendix N*) to promote native perennial grasses and forbs. Periodic fire (*e.g.*, every third or fourth year) can also have a beneficial effect on native grassland, especially in regard to reducing litter and thatch and alien species. In addition, periodic fire in coastal sage scrub and chaparral can help maintain openings in these shrublands to create a diverse mosaic of habitats and ecotones, increasing habitat value for the grasshopper sparrow and overall biodiversity. However, prescribed burning may have limited application in the Chiquita Canyon portion of the Habitat Reserve because of the relatively close proximity of urban development to important grasshopper sparrow areas. Small-scale experimental prescribed burning to enhance habitat value in Cristianitos Canyon likely is more feasible.

The coordinated program of grazing management (GMP; *Appendix G*) also will be important for maintaining and enhancing the habitat value of grasslands. Appropriately timed grazing can increase the vigor of native grasslands, and therefore its value as grasshopper sparrow habitat, by removal of thatch and litter, recycling of nutrients, stimulation of tillering (sprouting of new stalks), removal and control of alien species, and reduced transpiration (loss of water) by alien species, making more water available for native grasses.

Although brown-headed cowbird nest parasitism appears to be a lower level threat (Vickery 1996), cowbird trapping also will be conducted in the Habitat Reserve as needed as a general management tool to benefit native passerines such as the grasshopper sparrow, as well as the California gnatcatcher and least Bell's vireo.

Habitat restoration activities in the Habitat Reserve to benefit the grasshopper sparrow include discretionary implementation by the Reserve Manager and Science Panel of the CSS/VGL restoration program designed to enhance habitat value, carrying capacity and connectivity. Areas identified for restoration that would benefit the grasshopper sparrow include Chiquita Ridge, Chiquadora Ridge, Sulphur Canyon, Cristianitos Canyon and upper Gabino Canyon. In addition, the Reserve Manager and Science Panel may recommend case-by-case restoration of native grasslands, such as in areas of degraded or low quality grassland that are not naturally recovering through passive management, areas that are degraded or disturbed by future natural events, and it is determined that they are not likely to recover naturally (*e.g.*, an area that has burned too frequently), and areas that have been temporarily disturbed by either authorized (*e.g.*, infrastructure) or unauthorized (*e.g.*, illegal trails) activities.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the grasshopper sparrow is warranted because the Habitat Reserve would protect and manage approximately 58 percent of documented locations and 60 percent of suitable grassland and agricultural habitat. With additional conservation of locations and habitat in SOS, the total conservation for grasshopper sparrow would be 59 percent of locations and 68 percent of habitat. As noted above, at least an additional 300 acres of grassland in PAs 6 and 7 likely supporting additional grasshopper sparrow locations will be conserved upon final siting of the 50 acres of orchards. Conservation would be concentrated in the *major* and *important populations*, accounting for 368 of the 390 (94 percent) conserved locations. The large majority of the conserved locations are within large habitat blocks (331 of 390 locations; 85 percent), thus providing adequate unfragmented habitat to support nesting and foraging. In conjunction with the conservation and adaptive management measures, the restoration activities identified above also would provide significant benefits to the species. In addition, coverage is warranted because the grasshopper sparrow is widespread beyond the Southern Subregion. Finally, the grasshopper

sparrow and its habitat have been conserved in western Riverside County, having received regulatory coverage under the Western Riverside County MSHCP.

*f. Least Bell's Vireo (Vireo bellii pusillus)*

**Federal Status:**       **Endangered**  
**State Status:**       **Endangered**  
**Science Advisors:**   **Group 3**  
**NCCP/MSAA/HCP Planning Species**

1. Rangewide and Planning Area Status

The federally- and state-listed endangered least Bell's vireo formerly was a common and widespread summer resident below about 2,000 feet in the western Sierra Nevada, throughout the Sacramento and San Joaquin valleys, and in the coastal valleys and foothills from Santa Clara County south. Least Bell's vireo also was common in coastal southern California from Santa Barbara County south, east of the Sierra Nevada below about 4,000 feet, in the Owens and Benton valleys, along the Mojave River and other streams at the western edge of southeastern deserts, and along the entire length of the Colorado River (Grinnell and Miller 1944). Although the winter range of the full species Bell's vireo is not well known, generally it appears to winter from southern Baja and southern Sonora south along the west coast of Mexico and Central America to Honduras and casually to northern Nicaragua. It is also reported from the eastern coast of Central America from Veracruz south to Honduras (Brown 1993).

Although the least Bell's vireo population was greatly reduced by the 1980s, most of the current populations have undergone tremendous growth over the last decade. Census data collected over the past 16 years indicate that the population in southern California has increased from an estimated 300 pairs in 1986, to an estimated 1,346 pairs in 1996 (USFWS 1998b) and in 2001 to an estimated 2,443 confirmed territories (J. Terp, USFWS, pers. comm. 2002).

The least Bell's vireo is a neotropical migrant that primarily breeds in riverine riparian habitats that typically feature dense cover within three to seven feet of the ground and a dense, stratified canopy. It inhabits low, dense riparian growth along water or along dry parts of intermittent streams. Typically it is associated with southern willow scrub, cottonwood forest, mule fat scrub, sycamore alluvial woodland, coast live oak riparian forest, arroyo willow riparian forest, wild blackberry, or mesquite in desert localities. It uses habitat that is limited to the immediate vicinity of watercourses below about 1,500 feet elevation in the interior (USFWS 1986; Small 1994). In the coastal portions of southern California, the least Bell's vireo occurs in willows and other low, dense valley foothill riparian habitat and lower portions of canyons and along the western edge of the deserts in desert riparian habitat.

Sixty vireo nesting locations have been documented within the planning area (about 2 percent of the total in California). Fifty-three locations are documented in Subarea 1, including locations in Gobernadora Creek, middle San Juan Creek (between the Ortega Highway bridge and Caspers Wilderness Park), lower Arroyo Trabuco, Chiquita Creek, lower Cristianitos Creek, and in isolated patches of willow scrub in Prima Deshecha. Two *important populations* of the least Bell's vireo were identified in the planning area: lower Arroyo Trabuco and in GERA in lower Gobernadora Creek. These two areas combined support about 50 percent of the documented nesting locations in the planning area.

## 2. Conservation Analysis

The conservation analysis for the least Bell's vireo is based both on site-specific information (*i.e.*, documented nest occurrences and identified *important populations/key locations*) and amount of suitable nesting habitat conserved, defined as southern willow scrub, arroyo willow riparian forest and black willow riparian forest. Least Bell's vireos are not particularly impacted by habitat patch connectivity within the subregion as long as discrete habitat patches within riparian systems are large enough to support a breeding population.

### (a) Impacts

The proposed Covered Activities would result in direct, permanent impacts to 72 acres (10 percent) of willow riparian habitat (southern willow scrub, arroyo willow riparian forest and black willow riparian forest) and seven least Bell's vireo nest sites (13 percent) (*Table 13-2* and *Figure 172-M*). The proposed Covered Activities also would result in temporary direct impacts to 36 acres of habitat and two nest sites (*Table 13-6*). Of the seven direct nest impacts, six would occur as a result of the Prima Deshecha Landfill GDP and one would occur from construction of a pump station by RMV (*Table 13-5* and *Figure 172-M*).

### (b) Conservation

A total of 43 least Bell's vireo nest locations (81 percent) and 615 acres (88 percent) of suitable riparian habitat (southern willow scrub and arroyo willow riparian forest) would be conserved in the Habitat Reserve (*Table 13-2* and *Figure 172-M*). An additional three nest locations (6 percent) and 10 acres (1 percent) are in Subarea 1 SOS, bringing the total conservation to 46 nest locations (87 percent) and 625 acres (89 percent). Both *important populations* in the planning area – lower Arroyo Trabuco and GERA—would be in the Habitat Reserve.

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### 3. Management

Management of the least Bell's vireo and its habitat will consider a number of environmental stressors that have been identified for this species, including:

- Altered fire regime
- Too frequent flood regime
- Too infrequent flood regime
- Precipitation
- Urbanization adjacent to Reserve
- Exotic plant invasion
- Exotic animals
- Cattle-related impacts
- Upstream diversion
- Groundwater extraction
- Roads and trails

Maintaining and enhancing habitat quality for the least Bell's vireo is paramount for conservation of this species in the Habitat Reserve, particularly for the important *populations/key locations* in GERA and lower Arroyo Trabuco. Although both *key locations* are conserved in the Habitat Reserve, both are currently subject to significant stressors and will require management to sustain habitat quality. The Arroyo Trabuco population is affected by giant reed and pampas grass proliferation and the GERA population by erosion/sediment impacts resulting from excessive surface and subsurface flows from upstream development. The smaller population in San Juan Creek also is being affected by giant reed infestation. Management actions designed to address these stressors and enhance net habitat value for the least Bell's vireo include: (1) subject to the discretion by the Reserve Manager and Science Panel, revegetation in Sulphur Canyon to reduce the generation of fine sediments currently affecting downstream areas within Gobernadora Creek; (2) management of excessive surface and subsurface flows from Coto de Caza through the Gobernadora Multi-purpose Basin to protect existing riparian habitat downstream of the knickpoint in GERA and potential new habitat upstream of the knickpoint; (3) potential restoration of the historic meander and associated habitat above the knickpoint and potential restoration in the "fertile crescent" area near the mouth of Gobernadora Creek to provide additional vireo habitat; (4) addressing upstream land use-induced channel incision and erosion through the Gobernadora Multi-purpose Basin; (5) invasive plant species control, including giant reed in San Juan Creek and Arroyo Trabuco and pampas grass in Arroyo Trabuco, to provide for additional native riparian vegetation and increased water supplies; (6) conservation of upstream sources of coarse sediments and maintenance/repair of episodic flood

events to help maintain natural succession of southern willow scrub habitat; (7) implementation of the Water Quality Management Plan (WQMP; *Appendix K*) to address hydrologic conditions of concern and pollutants of concern; (8) control of Argentine ants; and (9) brown-headed cowbird trapping where needed. Habitat restoration also would address erosion and localized headcuts in Chiquita Creek, which supports a small vireo population.

A significant component of the management program will be giant reed control in San Juan Creek in Caspers Wilderness Park by the County as mitigation to offset impacts to the six vireo impacts resulting from the Prima Deshecha Landfill GDP and any future impacts to vireos associated with the construction of Avenida La Pata. This control program in Caspers, in conjunction with cooperative efforts in the Cleveland National Forest (CNF), will be essential to a successful control program downstream on RMV, not only for the vireo but for other riparian/aquatic species such as the arroyo toad, southwestern pond turtle, western spadefoot toad and yellow-breasted chat.

Cattle normally are excluded from GERA. However, grazing would occur in GERA once every three years for fuel modification outside the vireo breeding season (February 15-July 15). This periodic grazing in GERA will not affect the vireo.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the least Bell's vireo is warranted because 81 percent of the nest locations and 88 percent of suitable habitat for the species would be conserved in the Habitat Reserve (*Table 13-2* and *Figure 172-M*). An additional 6 percent of locations and 1 percent of habitat would be conserved in SOS, bringing the conservation total to 87 percent of nest locations and 89 percent of habitat. Both *important populations/key locations* would be conserved and adaptively managed in the Habitat Reserve. In addition, coverage is warranted because this species' primary breeding areas in southern California are outside the Southern Subregion (the subregion accounts for only about 2 percent of the nesting sites). In conjunction with conservation of the two *key locations* and adaptive management measures, the restoration activities identified above also would provide significant benefits to the species. Conservation of the least Bell's vireo in Subarea 1 would provide for recovery of the species in this area and contribute to its recovery rangewide. Finally, the least Bell's vireo and its habitat have already been substantially conserved in coastal southern California, having received regulatory coverage under the Central/Coastal NCCP/HCP, Western Riverside County MSHCP and the San Diego MSCP and MHCP. A major population of the vireo in the Santa Margarita River also is conserved on MCB Camp Pendleton (Biological Opinion 1-6-95-F-02).

***g. Long-eared Owl (Asio otus)***

**Federal Status:** None  
**State Status:** California Species of Special Concern  
**Science Advisors:** Group 3

1. Rangewide and Planning Area Status

The long-eared owl breeds from British Columbia, east across Canada, and south to southern California, southern Arizona and northern Mexico. It winters from the northern U.S. and south to Baja California. Within California, the long-eared owl is an uncommon resident or winter visitor throughout most of the northern part of the state, with the exception of the humid North Coast Range, Cascade Range, and higher elevations of the Sierra Nevada. It is a winter visitor in the Mojave Desert, and a very rare winter migrant along the southern coastline.

The long-eared owl typically occurs in dense riparian and live oak thickets near meadow edges, and nearby woodland and forest habitats, and occasionally in dense conifer stands at higher elevations. Riparian and other thickets with small, densely canopied trees appear to be a requirement for roosting and nesting. It usually hunts in open grassland areas, and occasionally in adjacent woodland and riparian habitats.

The long-eared owl is an uncommon breeding resident in southern California and there has been a marked decline of this species in southern California since the 1940's attributed to habitat destruction and fragmentation, and possibly inadvertent disturbance of nest sites due to urban development in close proximity to historic nesting areas (Grinnell and Miller 1944; Remsen 1978; Bloom 1994). The long-eared owl is a CDFG CSC and has a CNDDB rank of G5S3, indicating that it is secure throughout its range, but has a restricted range or is rare in California.

The NCCP raptor database includes nine historic nest sites for long-eared owl, of which eight are in the NCCP planning area (*Figure 197-M*). The ninth site is located in upper Talega Canyon mapped on Camp Pendleton just south of the RMV boundary. The eight historic nest sites in the NCCP planning area are located in the following locations: lower Talega Canyon near the confluence with Cristianitos Creek; lower La Paz Canyon; middle Gabino Canyon; Bell Canyon (two locations in NAS Starr Ranch); Fox Canyon (east of upper Bell in NAS Starr Ranch); Sulphur Canyon; and Arroyo Trabuco north of Santa Margarita Parkway. The long-eared owl also has been observed foraging in Chiquita Canyon approximately one mile north of San Juan Creek and farther north in the canyon (MBA 1996). Four long-eared owl breeding territories were observed along the CP alignment of the FTC; one located north of Ortega Highway in Cañada Gobernadora and three located in Cristianitos Canyon. These breeding territories are not included in the NCCP raptor database because they do not have documented nest site locations

as do the database sites. All four territories were active in 1992 but were inactive in 1994 and 1995.

## 2. Conservation Analysis

The conservation analysis for the long-eared owl focuses on documented historic nest sites rather than a landscape habitat-based analysis because of its relative rarity in the planning area compared to other raptors (only eight historic nest sites are located in Subarea 1 and only nine are in the NCCP raptor database) and because it is highly sensitive to urban development (Bloom 1994).<sup>4</sup> A habitat-based analysis likely would grossly overestimate the potential suitable habitat for this species in the planning area. The Science Advisors designated the long-eared owl as a “Group 3” species that is “Best conserved at a species-specific level” because it has an extremely low population and, as Bloom (1994) demonstrated, it is highly sensitive to small changes in landscape or habitat.

In order to assess potential direct and indirect impacts to historic nest sites, in addition to the GIS analysis of the nest locations directly impacted by the proposed Covered Activities, a buffer analysis was conducted to analyze the distance of historic nest sites to proposed development, including new roads. Using Bloom’s observation that long-eared owls appeared to be sensitive to residential development and roads within 3,280 feet (1 km) of nest sites as a guideline, the distance between each “conserved” nest site and proposed development and new roads was determined and evaluated.

### (a) Impacts

Of the eight historic nest sites in Subarea 1, five would be in the Habitat Reserve and three are in Subarea 1 SOS on NAS Starr Ranch (*Figure 197-M*). A ninth location in Talega Canyon is on MCB Camp Pendleton. However, two locations—Nos. 1 and 4 on *Figure 197-M*—are in close proximity to proposed development. Site 1 is located only 97 feet from existing development in Talega and 304 feet from proposed development in PA 8. If this site is not already extirpated due to its proximity to Talega, it would be considered impacted by PA 8, even under a circumstance where development in PA 8 was shifted to the east to provide additional buffer to Cristianitos Creek. Likewise Site 4 is located only 97 feet from the proposed alignment of Cristianitos Road/”F” Street and only 655 feet from PA 2 development. This site is considered to be impacted (although it may already be impacted by existing development in Coto de Caza about 2,000 feet to the north). In summary, at least two of the historic nest sites, if not already extirpated due to close proximity to existing development, likely would be impacted by the proposed Covered Activities.

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<sup>4</sup> Bloom (1994) found that in coastal southern California no active long-eared owl nest sites occurred within 1 kilometer (3,280 feet) of a residential street and concluded that the owl is extremely sensitive to urban development.

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(b) Conservation

The remaining three sites in the Habitat Reserve and three sites in SOS are considered conserved. Site 2 in La Paz Canyon, while only 1,730 feet from the eastern edge of PA 8 likely will remain viable because it is physically isolated from PA 8 by extremely rugged terrain. Conserved grasslands in Cristianitos and upper Gabino Canyon would provide substantial foraging habitat for this location. Site 3 is located in middle Gabino Canyon and is 4,650 feet from the nearest development in PA 4. Conserved grasslands in Cristianitos and upper Gabino Canyon also would provide substantial foraging habitat for this location. Sites 5, 6 and 7 are located on NAS Starr Ranch and are 2,640, 1,800 and 5,900 feet from existing development in Coto de Caza and Dove Canyon. These sites are considered conserved because of the rugged topography separating Bell and Fox canyons and Starr Ranch from development to the west. Site 8 is located in O'Neill Regional Park in Arroyo Trabuco. Although only 270 feet from existing development above the arroyo this site is considered conserved for this analyses because no additional indirect impacts to this site would occur from the proposed Covered Activities and it is afforded some additional physical buffer from development by the arroyo.

3. Management

Management for the long-eared owl will focus on maintaining the habitat quality of riparian and woodland habitats in the Habitat Reserve and minimizing human disturbance of the two historic nesting sites in La Paz and Gabino canyons. The management of riparian and woodland habitats is addressed by the HRMP, as described in *Chapter 7*.

It is acknowledged that new long-eared owl nest sites may be established in the Habitat Reserve in the future. As noted above, four long-eared owl breeding territories were observed along the CP alignment of the FTC; one located north of Ortega Highway in Cañada Gobernadora and three located in Cristianitos Canyon. All four territories were active in 1992 but were inactive in 1994 and 1995. Nest sites for these four territories were not documented, but it is possible that owls could nest in GERA in the future; although based on Bloom's (1994) observations that active nest sites do not occur within about 1 km (3,280 feet) of a residential street, future nesting in GERA seems unlikely. If new long-eared owl nest sites are documented in the future, however, measures to minimize human disturbance to active nest sites include minimizing human activities in proximity to any future active nest sites during the breeding season, including through public education, signage and restricted access where feasible. To control for potential indirect effects during construction and maintenance/repair activities within the Habitat Reserve (*e.g.*, infrastructure construction and maintenance), activities within 300 feet of active nest sites during the breeding season will be minimized per MMs 4.9-26 and 4.9-30 of the Ranch Plan GPA/ZC EIR for raptor-related construction monitoring and preparation of a BRCP.

Assuming that GERA is a potential future nesting location, restoration activities in the Habitat Reserve that potentially would benefit the long-eared owl include implementing a restoration program in Gobernadora Creek which addresses: (1) the historic creek meander above the knickpoint; and (2) upstream land use-induced channel incision and erosion through the Gobernadora Multi-purpose Basin, including potentially excessive surface and groundwater originating upstream.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the long-eared owl is warranted because six of eight historic nest locations would be conserved in the Habitat Reserve (three sites) and SOS (three sites on NAS Starr Ranch) (*Figure 197-M*). Five of these six nest sites appear to be relatively secure from human disturbance, and public access to the nest sites in middle Gabino and La Paz canyons would be highly restricted. The three nest sites on Starr Ranch are subject to the ongoing management and protections afforded by the Sanctuary. In addition, coverage is warranted because this species is widely distributed and relatively secure within its global range, as indicated by its G5 global ranking. The proposed Covered Activities would not significantly impact the long-eared owl within the context of its global distribution.

#### *h. Southwestern Willow Flycatcher (*Empidonax traillii extimus*)*

**Federal Status:**        **Endangered**  
**State Status:**        **Endangered**  
**Science Advisors:**   **Group 3**  
**NCCP/MSAA/HCP Planning Species**

#### 1. Rangewide and Planning Area Status

The full species willow flycatcher breeds throughout much of North America, absent only from the Central Plains and southeastern U.S. The breeding range of the state- and federally-listed endangered subspecies southwestern willow flycatcher (*E. t. extimus*) includes southern California, Arizona, New Mexico, extreme southern portions of Nevada and Utah, far western Texas, southwestern Colorado, and extreme northwestern Mexico (USFWS 1993b). Within California, the specific breeding range for this subspecies includes the Owens Valley; the south fork of the Kern River; the Los Angeles Basin (Unitt 1987; Zeiner *et al.* 1990); the Santa Ynez River near Buellton; the Prado Basin riparian forest in Riverside County; the Santa Margarita and San Luis Rey rivers in San Diego County; Middle Peak in the Cuyamaca Mountains; near Imperial Beach (Small 1974); lower Cristianitos and San Mateo Creeks; and most recently lower Gobernadora Creek in southern Orange County. This subspecies overwinters in Mexico

(USFWS 1995). Areas along the Rio Grande provide important refueling sites for flycatchers as they migrate between their breeding and wintering grounds (Yong and Finch 1997).

Based on survey data collected between 1993 and 1996, a total of 549 territories was estimated for the entire breeding range of the southwestern willow flycatcher. By 2000 at least 386 of these territories had been documented as confirmed probable breeding pairs (Finch and Stoleson 2000). Within California, there was an estimated 121 breeding territories (Finch and Stoleson 2000) which appeared to be scattered around southern California. Most recent published data for 2004 indicate 1,256 territories in 265 sites scattered throughout southern California, southern Nevada, southern Utah, southern Colorado, Arizona and New Mexico (Durst *et al.* 2005).

The southwestern willow flycatcher is restricted to riparian woodlands along streams and rivers with mature, dense stands of willows (*Salix* spp.), cottonwoods (*Populus* spp.) or smaller spring fed or boggy areas with willows or alders (*Alnus* spp.) (Sedgwick and Knopf 1992). It is an insectivore that forages within and above dense riparian vegetation, taking insects on the wing or gleaning them from foliage (USFWS 1993b). This species also forages in areas adjacent to nest sites which may be more open (USFWS 1995). Southwestern willow flycatchers breed in relatively dense riparian habitats in all or parts of seven southwestern states from near sea level in California to over 8,500 feet in Arizona and Colorado (USFWS 2001b).

The southwestern willow flycatcher is known to nest in two locations in the planning area: in GERA consistently over the last few years and in an isolated patch of riparian habitat in Talega development open space in the year 2000. The GERA location is the only *important population* of willow flycatcher in the planning area and also is considered a *key location* for the species because the willow flycatcher has consistently nested there in recent years.

## 2. Conservation Analysis

The conservation analysis for the southwestern willow flycatcher is based both on site-specific information (*i.e.*, documented occurrences and the single identified *important population/key location*) and amount of suitable nesting habitat conserved, defined as southern willow scrub, arroyo willow riparian forest and black willow riparian forest. Similar to the vireo, habitat connectivity within the Subregion is not crucial for the willow flycatcher as long as discrete habitat patches within riparian systems support the necessary habitat features.

### (a) Impacts

The proposed Covered Activities would result in direct, permanent impacts to 72 acres (10 percent) of willow riparian habitat (southern willow scrub, arroyo willow riparian forest and black willow riparian forest) but no direct impacts to documented southwestern willow

flycatcher nest locations (*Table 13-2* and *Figure 172-M*). The proposed Covered Activities also would result in temporary direct impacts to 36 acres of habitat, but no nest sites (*Table 13-6*).

### (b) Conservation

All six southwestern willow flycatcher nest locations and 615 acres (88 percent) of suitable riparian habitat (southern willow scrub and arroyo willow riparian forest) would be conserved in the Habitat Reserve (*Table 13-2* and *Figure 172-M*). An additional 10 acres (1 percent) of habitat are in Subarea 1 SOS, bringing the total conservation to all six nest locations and 625 acres (89 percent). The single *important population/key location* in GERA would be in the Habitat Reserve.

### 3. Management

Management of the southwestern willow flycatcher and its habitat will consider a number of environmental stressors that have been identified for this species, including:

- Altered fire regime
- Too frequent flood regime
- Too infrequent flood regime
- Precipitation
- Urbanization adjacent to Reserve
- Exotic plant invasion
- Exotic animals
- Cattle-related impacts
- Upstream diversion
- Groundwater extraction
- Roads and trails

As with the vireo, maintaining habitat quality for the willow flycatcher in the Habitat Reserve will be essential for this species. The *important population/key location* in GERA is currently subject to significant stressors that will require management: erosion/sediment impacts resulting from excessive surface and subsurface flows from upstream development. Management actions that would result in net benefits to the southwestern willow flycatcher include: (1) subject to Reserve Manager and Science Panel discretion, revegetation in Sulphur Canyon to reduce the generation of fine sediments currently affecting downstream areas within Gobernadora Creek; (2) management of excessive surface and subsurface flows from Coto de Caza through the Gobernadora Multi-purpose Basin to protect existing riparian habitat downstream of the

knickpoint in GERA and potential new habitat upstream of the knickpoint; (3) potential restoration of the historic meander and associated habitat above the knickpoint and potential restoration in the “fertile crescent” area near the mouth of Gobernadora Creek to provide additional willow flycatcher habitat; (4) addressing upstream land use-induced channel incision and erosion through the Gobernadora Multi-purpose Basin; (5) implementation of the WQMP to address hydrologic conditions of concern and pollutants of concern; (6) control of Argentine ants; and (7) brown-headed cowbird trapping where needed.

Cattle normally are excluded from GERA. However, grazing would occur in GERA once every three years for fuel modification outside the flycatcher breeding season (February 15-July 15). This periodic grazing in GERA will not affect the flycatcher.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the southwestern willow flycatcher is warranted because the single *important population/key location* in GERA and 88 percent of suitable habitat for the species would be conserved in the Habitat Reserve (*Figure 172-M*). In conjunction with the conservation of the *key location* in GERA and adaptive management, the restoration activities identified above also would provide significant benefits to the species. Conservation of the southwestern willow flycatcher in the Southern Subregion would provide for recovery of the species in the subregion and contribute to its recovery rangewide. In addition, coverage is warranted because this species’ primary breeding areas in southern California are beyond the subregion (the subregion accounts for only about 4 percent of the nesting sites). Finally, the southwestern willow flycatcher and its habitat have already been substantially conserved in coastal southern California, having received regulatory coverage under the Central/Coastal NCCP/HCP, Western Riverside County MSHCP and the San Diego MSCP and MHCP. A major population of the willow flycatcher in the Santa Margarita River also is conserved on MCB Camp Pendleton (Biological Opinion 1-6-95-F-02).

##### *i. Tricolored Blackbird (Agelaius tricolor)*

**Federal Status:** Federal Species of Concern, USFWS Bird of Conservation Concern  
**State Status:** California Species of Special Concern  
**Science Advisors:** Group 3  
**NCCP/MSAA/HCP Planning Species**

##### 1. Rangewide and Planning Area Status

The tricolored blackbird has a relatively restricted breeding range that extends from southern Oregon and the Modoc Plateau of northeastern California, south through the lowlands of

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California west of the Sierra Nevada to northwestern Baja California (Grinnell and Miller 1944). It is estimated that 95 percent of tricolored blackbirds are in California. The species generally is not migratory, but is nomadic and highly colonial, although the pattern of nomadism is poorly known (Orians 1961). Although the tricolored blackbird is not migratory over most of its range, it leaves Oregon, northeastern California, Santa Barbara County and eastern San Diego County in fall and winter, presumably migrating south (Zeiner *et al.* 1990; Beedy and Hamilton 1999). Flocks of the species become nomadic in fall, seeking food (Zeiner *et al.* 1990). In winter, flocks become more widespread from Marin to Santa Cruz counties and in the Sacramento River Delta (Zeiner *et al.* 1990).

While the tricolored blackbird is frequently an itinerant and opportunistic breeder, it generally is associated with wetland habitat and prefers emergent vegetation and conserved habitats near wetlands for nesting. Its preferred, or primary, habitat includes freshwater marsh and cismontane alkali marsh. It may use a wide variety of habitats, including flooded agriculture lands, pastures, and grasslands in a very nomadic and unpredictable manner for foraging (Garrett and Dunn 1981). The tricolored blackbird also has been documented to use riparian forest habitats occasionally for nesting.

The 2001 Point Reyes Bird Observatory (PRBO) survey documented a total of 142,000 birds at colony sites in California (Humple and Churchwell 2002). This compared to 162,000 in 2000, 240,000 in 1997 and 370,000 in 1994, indicating a continued decline in the species. The ten largest colonies are located in the Central Valley in Merced, Tulare, Fresno, Colusa, and Kern counties and range in size from 5,000 to 30,000 birds and account for 118,000 (83 percent) of the birds observed in 2001 (Humple and Churchwell 2002). Of the 10 largest colonies, seven were on private lands and three were on public lands (Humple and Churchwell 2002). It is important to note that prior to 1992 at least two breeding colonies numbered 120,000 (Laguna Seca) and 150,000 (Grey Hill Duck Club). The tricolored blackbird is a CDFG CSC and has a CNDDDB rank of G2G3S3. Per the CNDDDB ranking, it is considered endangered and restricted in its range. The global and state ranks are essentially the same because about 95 percent of the tricolored blackbird's global range is in California.

An important finding for the management of this species is that it appears to respond very well to habitat manipulation. Humple and Churchwell (2002) report that a man-made bulrush wetland at the San Jacinto sewage treatment ponds in Riverside County immediately attracted a breeding colony of tricolored blackbirds in 1993 and was the largest colony (35,000 birds) in southern California in 1994. It also is important to note that these ponds were bordered by large alfalfa fields and pasture that provided substantial foraging habitat.

Sporadic nesting by the tricolored blackbird has been observed in the planning area in the recent past. In 1989, Bontrager (1989), for example, observed approximately 1,510 birds in the "upper

Chiquita” colony (about 3,000 feet north of the Narrows and south of Oso Parkway and now considered Middle Chiquita) in about 1 acre of wetland, approximately 260 birds in the “Narrows” colony in a 0.7-acre wetland, approximately 420 birds in the CalMat settling basin in San Juan Creek, approximately 830 birds in the Trampas Canyon settling ponds, and approximately 380 birds in the Riverside Cement leaseholds in lower Gabino Canyon. Therefore, at least in 1989, about 3,400 tricolored blackbirds were documented nesting on RMV in five separate areas. More recent information suggests that the tricolored blackbird population declined in the 1990s, with the most consistently observed nesting location supporting several thousand birds in lower Coto de Caza from 1993 to 1996 (Ortega, pers. comm. 1996). Elsewhere breeding in the planning area has been sporadic over the last decade. Recent nesting has been observed in the stock pond south of a Ranch residence in the Radio Tower Road area. During FTC-S surveys in 1994 a small colony was presumed to have nested in Chiquita Canyon above the “Narrows.” This nesting colony was not observed in 1995, although a small flock was observed foraging near the nest site in 1995 (MBA 1996). Recent breeding has not been observed in San Juan Creek or in lower Gabino Canyon. The CNDDDB includes a 1992 record of a small breeding colony at the mouth of Verdugo Canyon under the Ortega Highway bridge. However, because of the itinerant behavior of this species, breeding sites and activity are difficult to predict.

Because of the nomadic behavior of this species, it is difficult to define *important populations* or *key locations*. However, at least one area currently seems to fit this definition. Breeding colonies of several thousand birds consistently were observed in the Gobernadora sub-basin ponds in south Coto de Caza from 1993 to 1996 (Ortega, pers. comm. 1996). This area thus should be considered to support an *important population* in a *key location*. Other locations listed above have only shown sporadic occupation by the tricolored blackbird.

## 2. Conservation Analysis

Conservation of the tricolored blackbird in the Habitat Reserve and SOS, in terms of conservation of viable nesting colonies and surrounding foraging habitat (grassland and agriculture), was analyzed by determining which historic and recent nest sites would be conserved and how much suitable foraging habitat would be conserved and developed within a four-mile radius of each of these sites, including SOS beyond Subarea 1 and foraging habitat on Camp Pendleton. Five recent nest sites were selected for the analysis: Middle Chiquita (formerly called the Upper Chiquita colony); Coto de Caza; Radio Tower Road; Verdugo; and Lower Gabino (aka Riverside Cement colony). As noted above, it is difficult to predict where tricolored blackbirds will nest from year-to-year, so the conservation analysis presented here is somewhat limited in predicting the conservation of future nest sites. Also, restoration has been shown to be quite successful in attracting nesting colonies (*e.g.*, the San Jacinto ponds), so new nesting areas conceivably could be created. However, the analysis of conserved foraging habitat

in the area is more straightforward and indicates whether adequate foraging habitat will be available to support nesting colonies. The four-mile radius for foraging habitat is based on Orian's (1961) finding that tricolored blackbirds tend to forage within about four miles of nesting sites. There is no available information on the minimum amount of foraging habitat needed to sustain a colony of tricolored blackbirds, and in southern Orange County, at least, the limit on nesting colonies in the planning area in the past probably has been available nesting areas, considering the 18,000+ acres of existing grassland and agriculture in the Subregion. For the purposes of this analysis it was assumed that at least 1,000 acres of foraging habitat within four miles of a nest site would be more than adequate to sustain the relatively small nesting colonies that occur in the study area (e.g., at most a few thousand birds in southern Coto de Caza compared to colonies of 100,000+ birds in the Central Valley).<sup>5</sup>

The conservation analysis also incorporates the Ranch Plan GPA/ZC EIR MM 4.9-31 that requires avoidance of wetland/riparian habitat for the tricolored blackbird at the mouth or Verdugo Canyon.

#### (a) Impacts

Under the proposed Covered Activities, the only relatively recent documented nesting site that would be directly impacted by the proposed Covered Activities is the Trampas Canyon colony in PA 5. Documented recent and historic nesting areas would be conserved within the Narrows area of Chiquita Canyon, San Juan Creek (including at the mouth of Verdugo Canyon), and south of the Ranch residence south of Ortega Highway and the lower Gabino site. The Coto de Caza *important population/key location* is located in Subarea 3 and would not be affected by the proposed Covered Activities. For the purpose of this analysis, it is assumed that the Coto de Caza nesting area will remain viable.

*Table 13-10* presents the analysis of foraging habitat within four miles of historic and recent nesting sites. *Figure 198-M* illustrates the potential foraging zones for each of the nest sites. The key columns in *Table 13-10* are those for Subarea 1 for each of the nesting sites. Impacts to suitable foraging habitat in Subarea 1 within four miles of nesting sites ranges from 1,382 acres (23 percent of suitable habitat within four miles in Subarea 1) for the Middle Chiquita site to 3,168 acres (39 percent) for the Radio Tower site. Impacts to additional foraging habitat in Subarea 1 are relatively small, within 16 acres (8 percent) for the Middle Chiquita site and 145

<sup>5</sup> Another way of considering "carrying capacity" of foraging habitat for the tricolored blackbird is to calculate the ratio of colony size to available habitat acres. For example, if colonies forage within a four-mile radius of the nesting site, a 32,000-acre foraging area should be adequate to sustain a colony of 100,000 birds (assuming that all 32,000 acres are suitable foraging habitat), yielding a ratio of birds to habitat of 3 birds/1 acre of foraging habitat. Assuming similar prey productivity as the Central Valley, a 3:1 ratio indicates that 333 acres would be adequate to support a colony of 1,000 birds in the study area. Thus the assumption that 1,000 acres of foraging habitat is adequate for colonies in the study area is conservative.

acres (9 percent) for the Radio Tower site. No impacts occur outside Subarea 1 in potential foraging zones for the other nesting sites.

(b) Conservation

The proposed Covered Activities would result in conservation of foraging habitat in the Habitat Reserve within four miles of nesting sites ranging from a low of 2,084 acres for the Lower Gabino Canyon site (43 percent of total existing foraging habitat in the four-mile radius within Subarea) to a high of 4,702 acres (66 percent) for the Coto de Caza (*Table 13-10*). All sites except the Lower Gabino site have at least 4,000 acres of potential foraging habitat in the Habitat Reserve within the four-mile zone; the Lower Gabino site has about 2,084 acres within the four-mile zone. Each of the sites also has several hundred acres of potential foraging habitat in Subarea 1 SOS in Prima Deshecha and/or NAS Starr Ranch within the four-mile zone, ranging from 203 acres for the Verdugo Canyon site to 428 acres for the Radio Tower site. Additional SOS outside of Subarea 1 is variable, ranging from 106 acres for Verdugo Canyon to 1,571 acres for Radio Tower.

Under the assumption that at least 1,000 acres of suitable foraging habitat within four miles of a nesting site is needed to sustain the site, and based on this conservation analysis, it can be concluded that the availability of the suitable foraging habitat will not be a limit on the viability of historic and recent tricolored blackbird nest sites in the Habitat Reserve.

3. Management

Management of the tricolored blackbird and its nesting and foraging habitat will consider a number of environmental stressors identified for this species, including:

- Water diversions and land conversion
- Changed agricultural practices (different crops or timing of harvesting)
- Predation by native and non-native species
- Severe or extreme weather conditions (storms, cold)
- Non-native invasive species
- Pollutants and biocides
- Human disturbances and pets

**TABLE 13-10  
CONSERVATION AND IMPACTS FOR TRICOLORED BLACKBIRD  
FORAGING HABITAT WITHIN A FOUR-MILE RADIUS OF NESTING AREAS**

<b>Habitat Reserve and SOS Acres</b>																				
	<b>Middle Chiquita</b>				<b>Coto de Caza</b>				<b>Radio Tower</b>				<b>Verdugo Canyon</b>				<b>Lower Gabino Canyon</b>			
<b>Subareas</b>	<b>1</b>		<b>3</b>		<b>1</b>		<b>3</b>		<b>1</b>		<b>3</b>		<b>1</b>		<b>3</b>		<b>1</b>		<b>3</b>	
	<b>Habitat Reserve</b>	<b>SOS</b>	<b>SOS</b>	<b>SOS</b>	<b>Habitat Reserve</b>	<b>SOS</b>	<b>SOS</b>	<b>SOS</b>	<b>Habitat Reserve</b>	<b>SOS</b>	<b>SOS</b>	<b>SOS</b>	<b>Habitat Reserve</b>	<b>SOS</b>	<b>SOS</b>	<b>SOS</b>	<b>Habitat Reserve</b>	<b>SOS</b>	<b>SOS</b>	<b>SOS</b>
Grassland	2,593	279	43	163	2,870	327	39	38	3,252	428	2	1,537	3,545	203	2	70	2,062	359	0	878
Agriculture	1,873	0	46	19	1,832	0	46	14	1,198	0	24	8	813	0	34	0	22	0	0	0
<b>Total</b>	<b>4,466</b>	<b>279</b>	<b>89</b>	<b>182</b>	<b>4,702</b>	<b>327</b>	<b>85</b>	<b>52</b>	<b>4,450</b>	<b>428</b>	<b>26</b>	<b>1,545</b>	<b>4,358</b>	<b>203</b>	<b>36</b>	<b>70</b>	<b>2,084</b>	<b>359</b>	<b>0</b>	<b>878</b>
<b>% of Total</b>	<b>73%</b>	<b>5%</b>	<b>100%</b>	<b>92%</b>	<b>66%</b>	<b>5%</b>	<b>100%</b>	<b>100%</b>	<b>55%</b>	<b>5%</b>	<b>100%</b>	<b>91%</b>	<b>62%</b>	<b>3%</b>	<b>100%</b>	<b>100%</b>	<b>43%</b>	<b>7%</b>	<b>100%</b>	<b>100%</b>
<b>Development Acres</b>																				
	<b>Middle Chiquita</b>		<b>Coto de Caza</b>		<b>Radio Tower</b>		<b>Verdugo Canyon</b>		<b>Lower Gabino Canyon</b>											
<b>Subareas</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>1</b>													
Grassland	323	16	649	1,746	92	1,272	2,010													
Agriculture	1,059	0	1,415	1,422	53	1,246	450													
<b>Total</b>	<b>1,382</b>	<b>16</b>	<b>2,064</b>	<b>3,168</b>	<b>145</b>	<b>2,518</b>	<b>2,460</b>													
<b>% of Total</b>	<b>23%</b>	<b>8%</b>	<b>29%</b>	<b>39%</b>	<b>9%</b>	<b>36%</b>	<b>50%</b>													

The proposed Covered Activities relating to long-term management do not include water diversions, and land conversions, beyond what was discussed in the impacts section above. Changed agricultural practices also should not be a future management issue for the tricolored blackbird. Current Ranch agricultural practices, such as cattle grazing and barley cultivation, will not change significantly in the future. The GMP (*Appendix G*) addresses grazing management, which will be conducted much as it has been historically, including regular planting of barley fields. About 50 acres of new orchard will be planted in the PA 6 and 7 areas, but this will not have a significant impact on tricolored blackbirds.

The main focus of the management program will be on pollutants and predation by urban-related predators (*e.g.*, cats) that appear to have significantly contributed to the decline of this species. Poisoning, either deliberate (to control crop depredation) or indirect, and increased disturbance by humans from agriculture operations such as harvesting, have been cited as contributing to the continued population decreases (Beedy *et al.* 1991). Contamination by trace elements (selenium) and pesticides are a potential cause of nesting failures (Beedy and Hayworth 1987). Contaminants can have direct effects on individuals, but perhaps more importantly, may indirectly affect the food supply. Based on these potential stressors, management actions to benefit the tricolored blackbird include: **(1)** maintaining hydrology and water quality and minimizing additional loadings of nutrients or pollutants at potential breeding sites pursuant to the WQMP (*Appendix K*); **(2)** protecting grassland foraging habitats in proximity to breeding areas by implementing Integrated Pest Management Practices (*e.g.*, minimizing the use of any pesticides on golf courses that could be toxic to tricolored blackbirds either directly or indirectly through prey); **(3)** controlling of non-native urban-related predators (*e.g.*, feral cats); and **(4)** managing and minimizing human disturbance of breeding areas.

Activities that would benefit the tricolored blackbird include creation of suitable breeding habitat to be undertaken in association with the creation of the Gobernadora Multi-purpose Basin. As noted above, this species appears to be amenable to nesting habitat restoration. Case-by-case restoration of native grassland, at the discretion of the Reserve Manager and Science Panel, also will be undertaken during the course of long-term adaptive management of the Habitat Reserve and will focus on: **(1)** existing areas of degraded or low quality native grasslands that are not naturally recovering through passive management; **(2)** areas that are degraded or disturbed by future natural events and it is determined that they will not, or are unlikely to, recover naturally; **(3)** areas that have been temporarily disturbed either by authorized uses (*e.g.*, approved infrastructure) or unauthorized uses (*e.g.*, illegal trails); and **(4)** specific adaptive management research involving restoration treatments. The general adaptive management activities for existing grasslands focus on the enhancement of habitat value of grasslands through various management actions such as prescribed burning, and artichoke thistle control to contribute to maintaining and enhancing long-term net habitat value. Timed grazing through implementation of the coordinated GMP also will benefit the tricolored blackbird by retaining enough residual

dry matter (25 percent) to provide habitat for potential prey such as grasshoppers (see GMP, Appendix G).

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the tricolored blackbird is warranted because four sites known to support breeding populations would be conserved in the Habitat Reserve: Middle Chiquita Canyon, Verdugo Canyon, Radio Tower Road and Lower Gabino Canyon. Adequate foraging habitat within a four-mile radius of these sites also would be conserved in the Habitat Reserve. Adequate foraging habitat also would be conserved for the *important population* in a *key location* in Coto de Caza. Only one known breeding site in Subarea 1 in PA 5 (Trampas Canyon) would be directly impacted by the proposed Covered Activities. In conjunction with the conservation and adaptive management, potential restoration activities identified above also would provide significant benefits to the species. In addition, coverage is warranted because this species has a wide distribution beyond the Southern Subregion and the vast majority of the tricolored blackbird population occurs outside the subregion. Even under the assumption of 3,400 birds in the planning area based in the 1989 data and the 2001 estimate of 142,000 birds in California (Humple and Churchwell 2002), the local population accounts for at most about 2 percent of the statewide population. Finally, the tricolored blackbird and its habitat have already been substantially conserved in coastal southern California, having received regulatory coverage under the Western Riverside County MSHCP and the San Diego MSCP.

#### *j. White-Tailed Kite (Elanus leucurus)*

**Federal Status:** Federal Species of Concern, USFWS Migratory Nongame Birds of Management Concern  
**State Status:** Fully Protected  
**Science Advisors:** Group 3  
**NCCP/MSAA/HCP Planning Species**

##### 1. Rangewide and Planning Area Status

The current range of the white-tailed kite in North America includes California, Oregon, southern Washington, southern Texas and Florida. The main breeding area of the kite in North America remains in California, with nearly all areas up to the western Sierra Nevada foothills and southeast deserts occupied by the species (Small 1994; Dunk 1995). It is common in the Central Valley of California and along the entire length of the coast. Breeding also has been documented regularly in the western counties of Oregon, as well as recently in southern Washington. It is a common breeder in southern Texas and a small breeding population has established in southern Florida since at least 1986, with scattered reports elsewhere in the

peninsula and in the eastern panhandle (Dunk 1995). Its breeding range continues south along the coast in Mexico, into Central America and in South America from Colombia south to Buenos Aires, Argentina (Dunk 1995).

White-tailed kite foraging habitat includes grasslands, open shrub, agricultural areas, wetlands dominated by grasses, fence rows and irrigation ditches (with residual vegetation) adjacent to grazed lands, riparian, oak woodlands, coastal sage scrub, and saltmarsh. They forage in almost any habitat with a dense population of voles (*Microtus* spp.); its main prey in coastal Southern California is the California vole (*M. californicus*). It also preys on other small, diurnal mammals, and occasionally on birds, insects, reptiles, and amphibians. It takes small mammal prey approximately 95 percent of the time and can be considered a small mammal specialist (Dunk 1995). Kites forage from a central perch to an area as large as 1,200 acres. However, they seldom forage farther than 0.5 mile from the nest during the breeding season (Hawbecker 1942). Based on observations in coastal northwestern California, kites were observed to consume on average 3.1 prey/day, including California voles and harvest mice (*Reithrodontomys megalotis*), resulting in the assimilation of 113.1 kcal/day (Koplin *et al.* 1980). This caloric intake is within the range predicted by an energy expenditure model applied to the kite (Koplin *et al.* 1980). Assuming an average intake of 3.1 prey/day (Koplin *et al.* 1980), a pair of kites would require at least 2,260 prey per year. California vole densities vary cyclically and dramatically, with maximum peak densities of about 400 voles/acre, but with typical peaks of about 180 voles/acre. During low density periods, voles may be almost absent or restricted to only a few high quality habitat patches (Wilson and Ruff 1999). Thus, during typical peak periods of about 180 voles/acre, a kite pair's annual energy needs could be met with an area as small as 12 acres of foraging habitat, but during low population density periods much more habitat would be needed to support a pair; *e.g.*, at just 10 voles/acre at least 220 acres would be needed to meet minimal annual energy requirements. Tall grasslands have the highest suitability because they provide good vole habitat (Faanes and Howard 1987).

The California population of the white-tailed kite originally was reduced by habitat loss, shooting and possibly egg collecting (Pickwell 1930). Although the population rebounded, more recent breeding bird surveys indicated that the population numbers were again declining in some areas (Dunk 1995). This apparent decline may be due to the conversion of natural or agricultural lands to urban or commercial property; clean farming techniques that leave few residual vegetation areas for the prey; increased competition for nest-sites with other raptors and corvids; a relatively long-term drought throughout California during much of the time from 1982 to 1991; and increased disturbances at nest sites (Dunk 1995). A significant threat to the species is the degradation of habitat, especially the loss of nest trees and foraging habitat (Dunk 1995). The white-tailed kite is a CDFG Fully Protected Species and has a CNDDDB rank of G5S3; it is secure in its global range but has a restricted range in California.

There are 36 historic nest sites for the white-tailed kite scattered throughout the planning area, of which 31 are in Subarea 1. Because the nest sites are widely distributed, no single area appears to support an *important population*. However, several drainages appear to be important for this species in the planning area, including lower Gobernadora Creek (GERA), central San Juan Creek, Arroyo Trabuco (between Live Oak Canyon Road in the north and Avery Parkway in the south), Bell Canyon, middle Gabino Canyon, lower La Paz Canyon, Talega Canyon (including two sites south of the RMV property), and Cristianitos Canyon. It is important to note that at any given time the number of breeding pairs in the planning area probably is only a small percentage of the historic nesting sites. For example, Bloom estimated that only three pairs of kites nested on RMV in 2001 (P. Bloom, pers. comm. 2002).

## 2. Conservation Analysis

With regard to the impact analysis, proposed regulatory coverage for the white-tailed kite does not permit impacts to individuals or active nests. As a CDFG “Fully Protected” species, regulatory coverage for the white-tailed kite only extends to impacts to suitable nesting and foraging habitat.

Conservation of the white-tailed kite in the Habitat Reserve, in terms of conservation of potentially viable nest sites (based on the presence of an historic nest site), was analyzed by determining how much suitable nesting and foraging habitat would be conserved and developed within a 0.5-mile radius of historic nest sites (an approximately 500-acre circular area around the nest site) in the Habitat Reserve based on the GIS analysis. Combined nesting and foraging habitat is defined as agriculture, coastal sage scrub, grassland, alkali meadow, riparian, woodland and forest, marsh and stream courses. The 0.5-mile radius used for the analysis is based on the finding by Erichsen *et al.* (1996) that successful nest sites are surrounded by more natural vegetation and non-urban development (*e.g.*, agriculture) within a 0.5-mile radius of the nest site than failed nest sites. Furthermore, although foraging ranges can be quite large for this mobile species, kites seldom forage farther than 0.5 mile from the nest during the breeding season (Hawbecker 1942) and thus adequate foraging habitat within the 500 acres immediately surrounding the nest site is important for maintaining nesting territory viability. Distance of the nest site from existing and proposed development also was determined, under the assumption that nest sites with a buffer of at least 300 feet from development and sources of human disturbance will have a higher chance of remaining viable.<sup>6</sup> Finally, based on the recommendation of Faanes and Howard (1987), the minimum habitat area around a nest should be at least 50 acres; *i.e.*, within the 0.5-mile radius there should be at least 50 acres of foraging habitat to support a breeding pair of kites. However, kite territory size appears to ultimately be

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<sup>6</sup> Erichsen (1995) found that successful kite nests were all more than 100 m (328 feet) from a road and were surrounded by natural vegetation and non-urban human development (MS Thesis cited by J. Moore in species account for white-tailed kite, [www.prbo.org/calpif/html/docs/species/grassland/wkiacct.html](http://www.prbo.org/calpif/html/docs/species/grassland/wkiacct.html)).

regulated by prey abundance (Dunk and Cooper 1994), so prey abundance, which will vary widely (see above discussion), would need to be estimated to precisely estimate the minimum habitat area around any given nest site. It should be noted that the nest sites in the database are historic sites documented since about 1990 and all are not used in all years; typically only a few kites nest on RMV in any given year. Therefore, it was assumed that kites would not be directly competing for foraging habitat with other kites in areas where there are several nest sites in close proximity to one another, such as in GERA or along San Juan Creek.

(a) Impacts

The proposed Covered Activities would result in direct, permanent impacts to two historic nest sites and 750 acres (12 percent) of suitable riparian and woodland nesting habitat (*Table 13-2* and *Figure 199-M*). The proposed Covered Activities also would result in temporary impacts to 85 acres of riparian and woodland habitat but no nest sites. For nest sites within the Habitat Reserve and SOS (sites 28, 32 and 33 shown in *Figure 199-M*), *Table 13-11* shows the amount of potential nesting and foraging habitat that would be impacted within 0.5 mile of each “conserved” nest site.<sup>77</sup> Impacts range from no impact to 251 acres (60 percent) of habitat. All but four nest sites would have less than 200 acres of impacts, and 20 of the sites would have no impacts to nesting and foraging habitat. The remaining sites have between 10 acres and 141 acres of impacts.

*Table 13-11* also shows the distances between “conserved” nest sites and existing and proposed development and roads. Five of the historic nest sites in the Habitat Reserve are within 300 feet of existing or proposed development and/or roads (*Table 13-11*). Site 5 located in GERA is 279 feet from proposed PA 3 development. Because of the substantial riparian habitat available in GERA it is likely that the kite will continue to nest in this area and this site is considered conserved. Site 11 located in the Arroyo Trabuco is 289 feet from existing development in Mission Viejo. Because the arroyo provides additional topographic buffer from existing development, and because the proposed Covered Activities would not introduce any new potential indirect impacts on this site, it is considered conserved. Site 21 is located in San Juan Creek 216 feet from the planned Cow Camp Road alignment. This site is considered conserved because of the topographic buffer between San Juan Creek and Cow Camp Road and the availability of substantial riparian habitat in San Juan Creek. Site 30 is also located in Arroyo Trabuco 119 feet from existing development in Rancho Santa Margarita. Like site 11, the arroyo provides additional topographic buffer from existing development, and because the proposed Covered Activities would not introduce any new potential indirect impacts on this site, it is considered conserved. Site 54 is located in riparian habitat within 49 feet of the Arroyo Trabuco Golf Course. Because the golf course has a low level of indirect impact, this site is considered

<sup>77</sup> For this analysis, infrastructure impacts within the 0.5 mile radius were not included because of the added complexity of the analysis and because the overlap of proposed infrastructure and the 0.5 mile zones would result in only minor additional impacts that would not change the overall conclusions of the analysis.

conserved. Based on this analysis, all historic nest sites within the Habitat Reserve are unlikely to be significantly indirectly impacted and thus are considered conserved.

**TABLE 13-11  
WHITE-TAILED KITE CONSERVATION ANALYSIS**

Historic Nest Site in Habitat Reserve or SOS	Distance (ft) From Nearest New/Existing Development/Road	Total Habitat Acres Within 0.5 Mile of Nest Site	Conserved Habitat Acres Within 0.5 Mile of Nest Site		Impacted Habitat Acres Within 0.5 Mile of Nest Site	% Conserved Habitat Acres Within 0.5 Mile of Nest Site	Nest Site Considered Conserved
			Habitat Reserve	SOS			
2	440	474	393	0	80	83%	Yes
3	612	422	185	0	237	44%	Yes
4	361	398	183	0	214	46%	Yes
5	279	414	164	0	251	40%	Yes
10	928	417	188	0	228	45%	Yes
11	289	174	174	0	0	100%	Yes
12	773	473	406	0	67	86%	Yes
13	2,466	448	448	0	0	100%	Yes
14	491	413	413	0	0	100%	Yes
18	3,898	348	348	0	0	100%	Yes
19	2,087	248	238	0	10	96%	Yes
20	3,371	192	192	0	0	100%	Yes
21	216	459	319	0	141	69%	Yes
22	1,042	398	334	0	65	84%	Yes
24	1,439	467	462	0	0	99%	Yes
25	2,757	421	421	0	0	100%	Yes
26	1,201	451	451	0	0	100%	Yes
27	846	347	347	0	0	100%	Yes
28 <sup>1</sup>	2,572	463	8	455	0	100%	Yes
29	3,461	486	486	0	0	100%	Yes
30	119	185	185	0	0	100%	Yes
31	434	264	264	0	0	100%	Yes
32 <sup>1</sup>	3,604	452	0	452	0	100%	Yes
33 <sup>1</sup>	2,413	480	6	474	0	100%	Yes
34	387	310	310	0	0	100%	Yes
36	899	218	0	218	0	100%	Yes
37	510	166	164	0	0	99%	Yes
53	326	155	155	0	0	100%	Yes
54	49	218	218	0	0	100%	Yes

<sup>1</sup> Nest site in SOS on NAS Starr Ranch

### (b) Conservation

A total of 26 historic nest sites (84 percent) and 4,537 acres (73 percent) of suitable nesting habitat (riparian and woodland) would be conserved in the Habitat Reserve (*Table 13-2* and *Figure 199-M*). An additional three nest sites (all in NAS Starr Ranch) and 929 acres (15 percent) of habitat are in Subarea 1 SOS, bringing the total conservation to 29 nest sites (94 percent) and 5,466 acres (88 percent) of habitat. The Habitat Reserve would meet the conservation recommendations of the Draft Southern Planning Guidelines, which include conservation of nesting and foraging habitat in GERA in lower Gobernadora Creek and in central San Juan Creek. In addition, nesting habitat in middle Chiquita would be conserved.

These conservation estimates are supported by the historic nest site-specific analysis for foraging and nesting habitat conservation and buffer distances from existing and proposed development and roads presented in *Table 13-11*. Conservation levels of habitat in the Habitat Reserve and SOS range from a low of 155 acres for site 53 (located in the Arroyo Trabuco Golf Course area) to a high of 486 acres for site 29 located in Bell Canyon in Caspers Wilderness Park. All conserved sites easily meet the 50-acre nesting and foraging habitat criterion for sustaining a nest site.

As described in detail above in the impact analysis, five of the 29 conserved sites are within 300 feet of existing or proposed development or roads. However, it was determined in this analysis that all five sites have good potential to remain active because the smaller buffers are mitigated by topographic barriers that effectively increase the buffer function.

### 3. Management

Management of the white-tailed kite will consider several environmental stressors generally identified for this species, including:

- Urbanization and altered agricultural practices (*i.e.*, “clean” farming)
- Altered hydrology
- Altered geomorphology
- Prolonged drought
- Exotic plant invasions (*e.g.*, giant reed)
- Frequent and/or high intensity wildfires
- Cattle-related impacts
- Disease affecting oak woodlands

- Predation on acorns, seedlings, saplings
- Human harassment/disturbance (*e.g.*, activity around nests, shooting, egg collecting)

The direct and potential indirect impacts of urbanization on the white-tailed kite have been addressed above in the conservation analysis. "Clean" farming, which generally refers to intensive agricultural practices typical of the large corporate farms in California's Central Valley where most, if not all, native vegetation is removed and little wildlife habitat remains, is not an issue in the Southern Subregion. RMV does not employ clean farming techniques.

Within the Habitat Reserve, the kite likely is most sensitive to environmental stressors that degrade nesting habitat quality (*e.g.*, exotics, altered hydrology) and stressors that potentially disturb nesting behavior such as recreational activities. In addition, because this species is likely limited by prey abundance, management of foraging habitat also will be important.

Overall management of habitat quality (*i.e.*, riparian and woodland nesting habitats and coastal sage scrub and grassland foraging habitat) is addressed in *Chapter 7* in the context of adaptive management of the major vegetation communities. More species- and site-specific management actions are described here.

Management actions that specifically would benefit the white-tailed kite include: **(1)** managing surface and subsurface flows from upstream development through the Gobernadora Multi-purpose Basin to protect existing riparian habitat downstream of the knickpoint in GERA; **(2)** minimizing human disturbance within close proximity of active nest sites in the Habitat Reserve during the breeding season through public education, signage and access restrictions where feasible; **(3)** implementing fire management techniques to help protect nesting and foraging habitat, including promoting perennial grasses to provide high quality vole habitat (the kite's preferred prey); and **(4)** minimizing rodent controls in the Habitat Reserve, including the use of rodenticides in accordance with an Integrated Pest Management Program. To control for potential indirect effects during construction and maintenance/repair activities within the Habitat Reserve (*e.g.*, infrastructure construction and maintenance), activities within approximately 300 feet of active nest sites during the breeding season will be minimized through MMs 4.9-26 and 4.9-30 of the Ranch Plan GPA/ZC EIR for raptor-related construction monitoring and preparation of a Biological Resources Construction Plan (BRCP).

Restoration activities to benefit the white-tailed kite include discretionary implementation by the Reserve Manager and Science Panel of the CSS/VGL restoration program that would help enhance habitat carrying capacity for prey such as voles. Restoration areas in Subarea 1 that could benefit the white-tailed kite include Chiquita Ridge, Sulphur Canyon, and Chiquadora Ridge.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the white-tailed kite is warranted because the Habitat Reserve would protect and manage 84 percent of the historic nest sites and 73 percent of suitable nesting habitat, as well as adequate foraging habitat within 0.5 mile of historic nest sites. Combined with the three kite nest sites on NAS Starr Ranch and additional conservation of 929 acres of riparian and woodland, total conservation would be 94 percent of historic nest sites and 88 percent of nesting habitat. In conjunction with conservation and adaptive measures, the restoration activities identified above also would provide significant benefits to the species. In addition, coverage is warranted because the species is widely distributed beyond the Southern Subregion and secure in its global range, as indicated by its G5S3 CNDDDB rank. Also, the white-tailed kite and its habitat have already been substantially conserved in coastal southern California, having received regulatory coverage under the Central/Coastal NCCP/HCP and Western Riverside County MSHCP. As discussed above, as a CDFG Fully Protected species, proposed regulatory coverage for the white-tailed kite and its habitat only extends to impacts on suitable nesting and foraging habitat and does not cover actual disturbances of white-tailed kites and their active nests.

##### ***k. Yellow-breasted Chat (*Icteria virens*)***

**Federal Status:** None  
**State Status:** California Species of Special Concern  
**Science Advisors:** Group 3  
**NCCP/MSAA/HCP Planning Species**

##### 1. Rangewide and Planning Area Status

The yellow-breasted chat is a neotropical migrant that summers and nests from British Columbia eastward to New Hampshire, and southward to Baja California and northern, mainland Mexico. The species presumably migrates throughout much of North America and winters primarily from northern Mexico to Panama (AOU 1998). Within California the chat is an uncommon summer resident and migrant in coastal California and in the foothills of the Sierra Nevada (Zeiner *et al.* 1990), and is found up to about 4,800 feet in valley foothill riparian habitats, and up to 6,500 feet east of the Sierra Nevada in desert riparian habitats (Gaines 1977; DeSante and Ainley 1980; Garrett and Dunn 1981). The yellow-breasted chat is uncommon along the coast of northern California and occurs only locally south of Mendocino County (McCaskie *et al.* 1979). In southern California, the species breeds locally on the coast and very locally inland at lower elevations throughout most of the region (Garrett and Dunn 1981).

The chat has been characterized as a relative generalist in regard to nesting habitat selection within a riparian area (Brown and Trossett 1989). They nest in dense plant cover within streams,

swampy ground, and the borders of small ponds. Burhans and Thompson (1999) observed that chats preferred nesting in large habitat patches, which, despite increased risk of brood-parasitism, decreased the risk of nest predation and resulted in a higher nesting success.

The yellow-breasted chat is a CDFG CSC and has a CNDDDB rank of G5S3; it is secure in its global range but has a restricted range in California. Although once considered fairly common to common in California (Grinnell and Miller 1944), the yellow-breasted chat has been more recently considered to be uncommon and local in southern California (Garrett and Dunn 1981). Loss and fragmentation of riparian woodlands in the coastal lowland as a result of development, agriculture, and channeling rivers has led to the decline of the yellow-breasted chat as well as other neotropical migrants such as the least Bell's vireo. Garrett and Dunn (1981) concluded that the clearing of dense riparian thickets and brush tangles has caused a noticeable decline in the number of breeding pairs of the chat. Cowbird parasitism may have played an additional role in the decline of the yellow-breasted chat, affecting its distribution in addition to its density (Gaines 1974; Remsen 1978).

There are 130 documented nesting locations for the yellow-breasted chat in the planning area database, of which 116 locations are in Subarea 1. The yellow-breasted chat generally co-occurs with the least Bell's vireo, but is more widespread because it has somewhat broader habitat affinities; it occurs in both willow thickets and more open riparian forests and woodlands. Five *important populations* of the chat were identified for the subregion: lower Arroyo Trabuco, lower Gobernadora Creek (GERA), San Juan Creek near the confluence with Chiquita Creek, San Juan Creek just downstream of the confluence with Bell Creek, and lower Cristianitos Creek between the confluences with Gabino and Talega creeks (see *Figure 175-M*).

## 2. Conservation Analysis

The conservation analysis for the yellow-breasted chat is based both on site-specific information (*i.e.*, documented occurrences and identified *important populations/key locations*) and amount of suitable riparian nesting habitat conserved. Similar to the vireo, chats are not particularly impacted by habitat patch connectivity within the subregion as long as discrete habitat patches within riparian systems are large enough and have the necessary habitat characteristics to support a breeding population.

### (a) Impacts

The proposed Covered Activities would result in direct, permanent impacts to 186 acres (5 percent) of riparian habitat and 14 yellow-breasted chat historic nest sites (12 percent) (*Table 13-2* and *Figure 175-M*). The proposed Covered Activities also would result in temporary direct impacts to 66 acres of habitat and three nest sites (*Table 13-6*). Of the 14 direct nest impacts,

eight would occur from RMV project impacts, two as a result of the Prima Deshecha Landfill GDP, one from the Avenida La Pata Improvement Project and three from SMWD projects (*Table 13-5 and Figure 175-M*).

(b) Conservation

A total of 99 yellow-breasted chat nest locations (85 percent) and 3,119 acres (78 percent) of riparian habitat would be conserved in the Habitat Reserve (*Table 13-2 and Figure 175-M*). An additional 576 acres (14 percent) are in Subarea 1 SOS, bringing the total conservation to 99 nest locations (85 percent) and 3,695 acres (93 percent). All four of the identified *important populations* in Subarea 1 would be conserved in the Habitat Reserve. Furthermore, scattered locations in middle Chiquita, Bell Canyon, Verdugo Canyon and upper San Juan Creek would be conserved.

3. Management

Although it is assumed that loss and fragmentation of riparian vegetation communities in coastal lowlands to urban development and agriculture and flood control projects are primarily responsible for the decline of the yellow-breasted chat, relatively little is actually known about environmental stressors, such as brown-headed cowbird nest parasitism. Management of the yellow-breasted chat and its habitat thus will follow that described above for the least Bell's vireo, with which the most dense chat locations overlap, and will consider a number of environmental stressors with the potential to affect the chat, including:

- Altered fire regime
- Too frequent flood regime
- Too infrequent flood regime
- Precipitation
- Urbanization adjacent to Reserve
- Exotic plant invasion
- Exotic animals
- Cattle-related impacts
- Upstream diversion
- Groundwater extraction
- Roads and trails

Maintaining and enhancing habitat quality for the yellow-breasted chat will be the main focus in managing this species in the Habitat Reserve, particularly for the four *important populations* in Subarea 1. Although the four *important populations* are conserved in the Habitat Reserve, they are currently subject to significant stressors and will require management to sustain habitat quality. The Arroyo Trabuco population is affected by giant reed and pampas grass proliferation and the GERA population by erosion/sediment impacts resulting from excessive surface and subsurface flows from upstream development. The populations in San Juan Creek are being affected by giant reed infestation and the lower Cristianitos population is affected by tamarisk, giant reed and pampas grass. Management actions designed to address these stressors and enhance net habitat value for the yellow-breasted chat include: (1) subject to the discretion of the Reserve Manager and Science Panel, revegetation in Sulphur Canyon to reduce the generation of fine sediments currently affecting downstream areas within Gobernadora Creek; (2) management of excessive surface and subsurface flows from Coto de Caza through the Gobernadora Multi-purpose Basin to protect existing riparian habitat downstream of the knickpoint in GERA and potential new habitat upstream of the knickpoint; (3) potential restoration of the historic meander and associated habitat above the knickpoint and potential restoration in the “fertile crescent” area near the mouth of Gobernadora Creek to provide additional chat habitat; (4) addressing upstream land use-induced channel incision and erosion through the Gobernadora Multi-purpose Basin; (5) invasive plant species control, including giant reed in San Juan Creek and Arroyo Trabuco and pampas grass in Arroyo Trabuco, to provide for additional native riparian vegetation and increased water supplies; (6) conservation of upstream sources of coarse sediments and maintenance/repair of episodic flood events to help maintain natural succession of southern willow scrub habitat; (7) implementation of the WQMP (*Appendix K*) to address hydrologic conditions of concern and pollutants of concern; (8) control of Argentine ants; and (9) brown-headed cowbird trapping where needed. Habitat restoration also would address erosion and localized headcuts in Chiquita Creek, which supports a small chat population. Although lower Cristianitos Creek is not currently targeted as a high priority for invasive species controls, the Reserve Manager and Science Panel will monitor habitat conditions in lower Cristianitos and may implement invasive species controls in the future. Also, Northrop Grumman conducts invasive species eradication in Cristianitos Creek from the bridge to the Camp Pendleton property line for tamarisk, pampas grass, giant reed, artichoke thistle, and sweet fennel under USACE Permit #199915591-RLK, Special Conditions 1 and 2.

The County’s giant reed control program in San Juan Creek in Caspers Wilderness Park as mitigation for impacts to the least Bell’s vireo from the Prima Deshecha Landfill GDP and Avenida La Pata Improvement Project, and controls in the CNF, also will benefit the yellow-breasted chat throughout San Juan Creek.

Cattle normally are excluded from GERA. However, grazing would occur in GERA once every three years for fuel modification outside the chat breeding season (February 15-July 15). This periodic grazing in GERA will not affect the chat.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the yellow-breasted chat is warranted because 85 percent of nest sites and 78 percent of suitable habitat would be conserved in the Habitat Reserve (*Figure 175-M*), and with additional conservation of habitat in SOS, 93 percent of habitat would be conserved. All four of the identified *important populations* would be conserved and managed within the Habitat Reserve, as well as scattered locations in middle Chiquita, Bell Canyon, Verdugo Canyon and upper San Juan Creek. In conjunction with the conservation and adaptive management measures, the restoration activities identified above also would provide significant benefits to the species. In addition, coverage is warranted because the species has a wide-spread distribution beyond the Southern Subregion, albeit a restricted range in California, as indicated by its G5S3 CNDDDB rank. Finally, the yellow-breasted chat and its habitat have already been substantially conserved in coastal southern California, having received regulatory coverage under the Western Riverside County MSHCP and the San Diego MHCP. Under the protections for vireo and willow flycatcher (Biological Opinion 1-6-95-F-02), populations of chat in the Santa Margarita River and other riparian areas also would be conserved on MCB Camp Pendleton.

##### 1. *Yellow Warbler (Dendroica petechia)*

**Federal Status:** None  
**State Status:** California Species of Special Concern  
**Science Advisors:** Group 3  
**NCCP/MSAA/HCP Planning Species**

##### 1. Rangewide and Planning Area Status

The yellow warbler nests from northern Alaska eastward to Newfoundland, Canada and southward to northern Baja California and Georgia. This neotropical species migrates throughout much of North America and winters from southern California, Arizona and the Gulf Coast southward to central South America (AOU 1998). In California, the yellow warbler is an uncommon to common, summer resident in the north and locally common in the south (Zeiner *et al.* 1990). It breeds in riparian woodlands from northern and central California generally west of the Sierra Nevada to the coastal slopes of southern California. It also breeds in coastal and desert lowlands up to 8,000 feet in the Sierra Nevada and other montane chaparral and forest habitats (Grinnell and Miller 1944). The yellow warbler also occurs as a migrant throughout the state

and it is a common migrant on the Channel and Farallon islands in spring and fall (DeSante and Ainley 1980; Garrett and Dunn 1981).

Throughout its range the yellow warbler most commonly breeds in wet, deciduous thickets (especially those dominated by willows) and in disturbed and early successional habitats (Lowther *et al.* 1999). Yellow warblers in southern California breed in lowland and foothill riparian woodlands dominated by cottonwoods, alders, or willows and other small trees and shrubs typical of low, open-canopy riparian woodland (Garrett and Dunn 1981). The yellow warbler is found at elevations from about 300 to 8,860 feet within riparian habitat and at higher elevations along watercourses with riparian growth (Lowther *et al.* 1999). The yellow warbler also breeds in montane chaparral, open ponderosa pine and mixed conifer habitats with substantial amounts of brush (Zeiner *et al.* 1990). Breeding in montane shrubs and conifers is perhaps a recent phenomenon (Gaines 1977).

The subspecies *D. p. brewsteri*, which occurs in the NCCP planning area, is a CDFG CSC and has a CNDDDB rank of G5T3?S2. The full species *D. petechia* is secure in its global range. The “T3” rank attached to the global rank refers to the subspecies *D. p. brewsteri*, and indicates that the subspecies is restricted in its range. The “?” indicates some possible question regarding the status of the subspecies within its range. The S2 state rank indicates that the subspecies is considered endangered in California. Threats to the species include habitat destruction and fragmentation and brood-parasitism by brown-headed cowbirds (Garrett and Dunn 1981). The populations in the western United States are particularly affected by intense grazing, especially where willow growth along riparian habitats is reduced or removed. Brown-headed cowbird parasitism also is a threat to yellow warblers (Garrett and Dunn 1981). For example cowbird management is associated with a dramatic increase from five breeding territories in 1986 to over 250 in 1998 in the Prado Basin in Riverside County (Hays USFWS pers. obs, 1986; Pike 1998 USFWS, pers. comm. as cited in Western Riverside MSHCP, November 2002, Vol II-B, B-645).

There are 34 locations for the yellow warbler in the planning area database, of which 26 are in Subarea 1. The warbler distribution in the planning area generally overlaps with the least Bell’s vireo distribution, but, like the yellow-breasted chat, is somewhat broader because it also occurs in more open canopy riparian woodlands in the subregion. Four *important populations* of the yellow warbler were identified for the study area: lower Arroyo Trabuco, lower Gobernadora Creek (GERA), San Juan Creek at the confluence with Chiquita Creek, and San Juan Creek downstream of the confluence with Bell Creek (see *Figure 175-M*).

## 2. Conservation Analysis

The conservation analysis for the yellow warbler is based both on site-specific information (*i.e.*, documented occurrences and identified *important populations/key locations*) and amount of

suitable riparian nesting habitat conserved. As a migrant, and similar to the vireo and the chat, yellow warblers are not particularly impacted by habitat patch connectivity within the subregion as long as discrete habitat patches within riparian systems are large enough and have the necessary habitat characteristics to support a breeding population.

(a) Impacts

The proposed Covered Activities would result in direct, permanent impacts to 186 acres (5 percent) of riparian habitat, but no yellow warbler nest sites (*Table 13-2* and *Figure 175-M*). The proposed Covered Activities also would result in temporary direct impacts to 66 acres of habitat and one nest site (*Table 13-6*).

(b) Conservation

All 26 yellow warbler nest locations and 3,119 acres (78 percent) of riparian habitat would be conserved in the Habitat Reserve (*Table 13-2* and *Figure 175-M*). An additional 576 acres (14 percent) of riparian habitat are in Subarea 1 SOS, bringing the total conservation of riparian habitat to 3,695 acres (93 percent). All four of the identified *important populations* in Subarea 1 would be conserved in the Habitat Reserve. Furthermore, scattered locations in middle Chiquita, Bell Canyon, Lucas Canyon, upper San Juan Creek, middle Arroyo Trabuco, and lower Cristianitos Canyon would be conserved.

### 3. Management

It is assumed that loss and fragmentation of willow riparian vegetation communities in coastal lowlands to urban development and agriculture and flood control projects are primarily responsible for the decline of the yellow warbler. Cowbird parasitism is a major stressor on this species and has been the subject of a number of scientific studies (*e.g.*, Clark and Robertson 1981; Graham 1988; Sealy 1992; Weatherhead 1989). For example, Sealy (1992) documented 21 percent cowbird parasitism and Weatherhead (1989) documented 30 percent parasitism in Manitoba, Canada. The yellow warbler has increased dramatically in the Prado Basin during the course of cowbird management since 1986; between 1986 and 1998, the yellow number of breeding territories increased from five to 250 (Hays 1986, pers. obs.; Pike 1998; USFWS, pers. comm.).

The stressors for the yellow warbler are similar to those described above for least Bell's vireo. Management of the yellow warbler and its habitat thus will follow that described above for the least Bell's vireo and will consider a number of environmental stressors with the potential to affect the yellow warbler, including:

- Altered fire regime
- Too frequent flood regime
- Too infrequent flood regime
- Precipitation
- Urbanization adjacent to Reserve
- Exotic plant invasion
- Exotic animals
- Cattle-related impacts
- Upstream diversion
- Groundwater extraction
- Roads and trails

Maintaining and enhancing habitat quality for the yellow warbler will be the main focus in managing this species in the Habitat Reserve, particularly for the four *important populations* in Subarea 1. Although the four *important populations* are conserved in the Habitat Reserve, they are currently subject to significant stressors and will require management to sustain habitat quality. The Arroyo Trabuco population is affected by giant reed and pampas grass proliferation and the GERA population by erosion/sediment impacts resulting from excessive surface and subsurface flows from upstream development. The populations in San Juan Creek are being affected by giant reed infestation. Management actions designed to address these stressors and enhance net habitat value for the yellow warbler include: (1) subject to the discretion of the Reserve Manager and Science Panel, revegetation in Sulphur Canyon to reduce the generation of fine sediments currently affecting downstream areas within Gobernadora Creek; (2) management of excessive surface and subsurface flows from Coto de Caza through the Gobernadora Multi-purpose Basin to protect existing riparian habitat downstream of the knickpoint in GERA and potential new habitat upstream of the knickpoint; (3) potential restoration of the historic meander and associated habitat above the knickpoint and potential restoration in the “fertile crescent” area near the mouth of Gobernadora Creek to provide additional yellow warbler habitat; (4) addressing upstream land use-induced channel incision and erosion through the Gobernadora Multi-purpose Basin; (5) invasive plant species control, including giant reed in San Juan Creek and Arroyo Trabuco and pampas grass in Arroyo Trabuco, to provide for additional native riparian vegetation and increased water supplies; (6) conservation of upstream sources of coarse sediments and maintenance/repair of episodic flood events to help maintain natural succession of southern willow scrub habitat; (7) implementation of the WQMP (*Appendix K*) to address hydrologic conditions of concern and pollutants of concern; (8) control of Argentine ants; and (9) brown-headed cowbird trapping where needed. Habitat restoration also would address erosion and localized headcuts in Chiquita Creek, which supports a small warbler population.

The County's giant reed control program in San Juan Creek in Caspers Wilderness Park as mitigation for impacts to the least Bell's vireo from the Prima Deshecha Landfill GDP and Avenida La Pata Improvement Project and controls in the CNF also will benefit the yellow warbler in San Juan Creek.

Cattle normally are excluded from GERA. However, grazing would occur in GERA once every three years for fuel modification outside the warbler breeding season (February 15-July 15). This periodic grazing in GERA will not affect the warbler.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the yellow warbler is warranted because all 26 nest sites and 78 percent of suitable habitat would be conserved in the Habitat Reserve (see *Figure 175-M*). With additional habitat conservation in SOS, 93 percent of habitat would be conserved. All four of the identified *important populations* would be conserved and managed within the Habitat Reserve, as well as scattered locations in Chiquita Creek, Bell Canyon, Lucas Canyon, Gobernadora Creek, lower Cristianitos Creek, upper San Juan Creek and middle Arroyo Trabuco. In conjunction with conservation and adaptive management, the restoration activities identified above would also provide significant benefits to the species. Finally, the yellow warbler and its habitat have already been substantially conserved in coastal southern California, having received regulatory coverage under the Western Riverside County MSHCP. Under the protections for vireo and willow flycatcher (Biological Opinion 1-6-95-F-02), any populations of yellow warbler in the Santa Margarita River and other riparian areas also would be conserved on MCB Camp Pendleton

#### *m. Arroyo Toad (Bufo microscaphus)*

**Federal Status:**        **Endangered**  
**State Status:**        **California Species of Special Concern**  
**Science Advisors:**   **Group 3**  
**NCCP/MSAA/HCP Planning Species**

#### 1. Rangewide and Planning Area Status

The arroyo toad originally ranged from the upper Salinas River system in Monterey County, south through the Santa Ynez, Santa Clara and Los Angeles river basins and the coastal drainages of Orange, Riverside and San Diego counties in the U.S. and south to the Arroyo San Simeon system about 10 miles southeast of San Quintin, Baja California, Mexico (USFWS 1999c). Although the arroyo toad primarily occurs in coastal drainages, it also is known from

desert slopes of the Transverse and Peninsular ranges south of the Santa Clara River in Los Angeles County (USFWS 1999c). Population areas along the desert slope include the Mojave River in San Bernardino County and Little Rock Creek, Whitewater River, San Felipe Creek, Vallecito Creek, and Pinto Canyon in Riverside County (Jennings and Hayes 1994; Patten and Myers 1992; Stebbins 1985).

Arroyo toads are found in foothill canyons and inter-mountain valleys where rivers are bordered by low hills and the stream gradients are low (Miller and Miller 1936; Sweet 1992). The arroyo toad uses riparian environments for breeding and adjacent uplands for foraging and estivation. Arroyo toads are known to either breed, forage, and/or aestivate in aquatic habitats, riparian, coastal sage scrub, oak, and chaparral habitats (see *Geomorphic and Hydrologic Needs of Aquatic and Riparian Endangered Species*, PCR and Dudek 2002). The species is restricted to medium- to large-sized, slow-moving streams. The majority of arroyo toad populations studied occur within third and fourth order drainages that are characterized by decomposed granite bedrock. However, toad populations have been found in a wide range of stream orders, including lower, second order, and higher, fifth and sixth order coastal streams characterized by sedimentary rock (PCR and Dudek 2002). According to USFWS, streams supporting arroyo toads range from first to sixth order in the central part of the species' range (Orange, Riverside and San Diego counties) (USFWS 1999c). The reader is directed to the Species Accounts and Conservation Analyses (*Appendix E*) for a full review of arroyo toad habitat characteristics.

Arroyo toads use habitat adjacent to breeding areas for foraging and estivation. While there seems to be a general relationship between lateral movement and topography, the USFWS (2001a) concluded that there are not enough data “to characterize fully overwintering activities and habitat use in all of the systems that arroyo toads inhabit.” However, they did conclude that, “Individual toads have been observed as far as 2 km (1.2 mi) from streams where they breed, but are found most commonly within 0.5 km (0.3 mi) of those streams (USFWS 1999c; Griffin *et al.* 1999; Dan C. Holland, Camp Pendleton Amphibian and Reptile Survey, Fallbrook, California, unpublished data; Holland and Sisk 2000).” (66 Federal Register, 9415-9416, 2/7/01). For the purpose of modeling critical habitat in the 2001 critical habitat designation, which was incorporated by reference into the final critical habitat designation (70 Federal Register, 19562, 4/13/05) the USFWS used the 80-foot (24 m) contour above the streamcourse as the boundary below which the majority of arroyo toad activity occurs across various studies and below which the areas “most likely to contain primary constituent upland habitat elements that are essential to arroyo toads.” (66 Federal Register, 9420, 2/7/01). In the final critical habitat designation, the 80-foot contour was revised to 82 feet (70 Federal Register, 19576, 4/13/05).

The arroyo toad is federally-listed endangered and is a CDFG CSC with a CNDDDB rank of G2G3S2S3. Per the CNDDDB ranking, it is considered restricted in range/rare to endangered within its range (the toad is endemic to California, therefore the global and state ranks are

identical). As of 1994, only 22 discrete populations were thought to exist in California over an area representing about 25 percent of the historic range of the species. The decline of the arroyo toad has been attributed to the cumulative effects of a number of factors, including diversions and dams of streamcourses for flood control and reservoirs, conversion of riparian/wetland habitats for agricultural and urban uses, road construction, off-road vehicles, cattle grazing, campground development, and mining.

Within the Southern Subregion planning area the arroyo toad is associated with riparian, streamcourses with sandy benches along streams in both the San Juan Creek and San Mateo Creek watersheds (see PCR and Dudek 2002 and *Figure 173-M*). Surveys consistently have found toads in the San Juan Creek Watershed from about the mouth of Chiquita Canyon upstream to about Hot Springs Creek and in lower Bell Canyon in Caspers Wilderness Park. In the portion of the San Mateo Watershed within the planning area, the toad occurs in Talega, lower Gabino and lower Cristianitos creeks. Based on the comprehensive survey data for the arroyo toad, two *major populations* and two *important populations* were identified for the planning area. The two *major populations* are located in (1) San Juan Creek from near the confluence with Chiquita Canyon north to beyond the confluence with Hot Spring Creek and (2) in Talega Creek from the confluence with Cristianitos Creek to at least the eastern boundary of the planning area. The two *important populations* are located in (1) Bell Canyon from the confluence with San Juan Creek north to about 2.2 miles north of the confluence and (2) lower Cristianitos/lower Gabino Canyon extending from the confluence of Cristianitos and Talega creeks to about 3,000 feet upstream of the confluence of Gabino and La Paz creeks (*i.e.*, into middle Gabino) and in Cristianitos Creek extending about 2,500 feet upstream of Gabino Creek.

## 2. Conservation Analysis

The conservation analysis for the arroyo toad is based both on site-specific information (*i.e.*, identified *major/important populations/key locations*) and a consideration of impacts to suitable upland foraging and estivation habitat in the context of site-specific habitat use based on radio telemetry data collected for the San Juan Creek population on RMV by Ramirez (2003). As noted above, toads can move up to 1.2 miles in adjacent upland habitat foraging and estivation habitat, but that for the purposes of critical habitat modeling the USFWS (2001) set the 80-foot contour above the streamcourse as the area “most likely to contain primary constituent upland habitat elements that are essential to arroyo toads.” (66 Federal Register, 9420, 2/7/01).<sup>8</sup> An approximately 80-foot contour was used to define suitable upland habitat adjacent to San Juan,

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<sup>8</sup> The longer movements exhibited by toads may not be essential to the short-term life history requirements of a local population but probably serve to link separate local populations and provide for exchange of individuals and genetic material important for long-term viability of the metapopulation.

Talega, lower Gabino and lower Cristianitos creeks by the following method.<sup>9</sup> The centerlines of these creeks on RMV property were buffered on both sides by the approximate 80-ft contour line (see *Figure 200-M*) and then intersected with the digital SCS soils map for Orange County, the NCCP vegetation database, and the proposed development footprints for PAs 2, 3 and 4 for San Juan Creek and the PA 8 development envelope for Talega, Cristianitos and Gabino creeks. An analysis of PA 1 along San Juan Creek was omitted because toads have not been observed this far downstream and thus it was assumed that toads would not be using this area. Furthermore, the development footprints for PAs 3 and 4 do not exclude the setbacks along the San Juan Creek corridor separating the PAs that would ultimately provide a 1,320-foot (400 m) wide protected corridor (thus, the analysis assumes the maximum impact area) and the PA 8 footprint includes the entire 1,349-acre planning area within which a maximum of 500 acres will developed. Thus, the analysis provides an “overstated” estimate for impacts to upland habitat adjacent to the creeks. These intersections were then sorted by Habitat Reserve, proposed development in PAs, permanent and temporary infrastructure impacts, soil type and vegetation type. Soils considered to be suitable for upland foraging and estivation include all non-clayey sands and loams and include the following: Botella loam, Cieneba sandy loam, Myford sandy loam, Capistrano sandy loam, Riverwash, Corralitos loamy sand, Modjeska gravelly loam, San Andreas sandy loam, Soboba cobbly loamy sand, Soboba gravelly loamy sand, Yorba gravelly sandy loam, Soper loam, Soper gravelly loam, and Sorrento loam. Soils that were considered to be unsuitable for the toad include clays and rock outcrops, as follows: Alo clay, Bosanko clay, Bosanko-Balcom complex, Botella clay loam, Calleguas clay loam, Chino silty clay loam, Cropley clay, outcrop-Cieneba complex, Soper rock outcrop complex, and Sorrento clay loam. Vegetation communities considered to be suitable for the arroyo toad include chaparral, forest, grassland, riparian, coastal sage scrub and woodland. Vegetation and cover types considered unsuitable include open water, freshwater marsh, agriculture (the vast majority is nursery adjacent to San Juan Creek), developed and disturbed.

Based on the intersection of elevation, soil, and vegetation parameters, an estimated total of 1,074 acres of suitable habitat is present on RMV within the 80-foot contour adjacent to the San Juan Creek *major population*, 195 acres adjacent to the Talega Canyon *major population*, and 495 acres adjacent to the Lower Cristianitos Creek/Lower Gabino Canyon *important population* (*Table 13-12*).

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<sup>9</sup> The 80-foot contour criterion used in the 2001 critical habitat designation was subsequently revised to 82 feet in the 2005 final critical habitat designation (70 Federal Register 19576, 4/13/05). Because the 80-foot criterion was an approximation based on USGS topography, the 2-foot difference in the two criteria is not significant.

**TABLE 13-12  
CONSERVATION ANALYSIS FOR ARROYO TOAD HABITAT**

Population	Total Habitat Area on RMV	Habitat Reserve Acres	Total Impact Acres	PA Impact Acres	Infrastructure Impact Acres	Temporary Impacts
<b>San Juan Creek Major Population</b>						
Habitat Acres	1,074	672	402	345	57	29
Percent		63%	37%	32%	5%	
<b>Talega Canyon Major Population</b>						
Habitat Acres	195	169	26	0	0	0
Percent		87%	13%	0%	0%	
<b>Lower Cristianitos Creek/Lower Gabino Canyon Important Population</b>						
Habitat Acres	495	481	14	2	12	7
Percent		97%	3%	<1%	2%	

(a) Impacts

The proposed Covered Activities would not directly impact any arroyo toad breeding locations in San Juan, Talega, Cristianitos or Gabino creeks *major/important populations* (Figure 173-M), with the exception of some small impacts related to placement of piers to support bridge crossings of San Juan Creek and lower Cristianitos Creek, as described below.

Development adjacent to San Juan Creek in PAs 3 and 4 and associated infrastructure, would result in permanent direct impacts to 402 acres (37 percent) of suitable foraging and estivation habitat, as defined above, including 345 acres in the PAs and 57 acres from infrastructure construction, operation and maintenance/repair (Table 13-12). It should be noted, however, that existing Ortega Highway already substantially impacts uplands adjacent to PA 4 and thus these areas have reduced value for toad under existing conditions.

Permanent impacts to suitable breeding habitat in San Juan Creek for placement of bridge piers in the creek bottom would total about 0.06 acre. Impacts for bridge abutments, which would be constructed outside the active creek channel on adjacent historic terrace, are included in the road impact analysis, which totals about 23 acres. Based on conceptual designs, significant long-term shading impacts to San Juan Creek would not occur because both proposed bridges across San Juan Creek are at least 50 feet high. Sufficient light would reach below the bridge structures to promote growth of typical riparian species such as mule fat and willows.

The PA 8 development overlaps with 26 acres (13 percent) of the potential foraging and estivation habitat adjacent to the Talega Canyon *major population*. This estimate likely

overstates the impact because it does not reflect siting of development in PA 8 that will in part focus on avoiding impacts to the toad. As discussed in more detail below, a five-year radiotelemetry study of arroyo toad habitat use in the area will be conducted pursuant to SAMP USACE Permit Special Condition I.D.8 to help inform the appropriate siting of development in PA 8 and to minimize impacts to toads. No permanent or temporary infrastructure impacts to the *Talega major population* will occur.

The PA 8 development envelope also overlaps with two acres of suitable foraging and estivation habitat in the Lower Cristianitos Creek/Lower Gabino Canyon *important population*. Permanent infrastructure impacts on this population would be 12 acres, resulting in a total of 14 acres (3 percent) of impact to suitable foraging and estivation habitat. In addition, about 0.02 acre of impact to potential breeding habitat in Cristianitos Creek would occur for the placement of bridge piers.

A total of 29 acres would be subject to temporary impacts resulting from infrastructure.

Potential indirect impacts to the arroyo toad include hydrologic conditions of concern such as changes in rates of erosion or sedimentation and the generation of pollutants of concern such as metals. These potential indirect effects are addressed in the Management section below.

#### (b) Conservation

All arroyo toad breeding locations would be conserved in the Habitat Reserve (*Figure 173-M*), including the San Juan Creek *major population* and Bell Canyon *important population/key location* in the San Juan Creek Watershed and the Talega Canyon *major population/key location* and the Lower Cristianitos Creek/Lower Gabino Canyon *important population/key location* in the San Mateo Creek Watershed. In the San Juan Creek Watershed, all upland foraging and estivation habitat within Caspers Wilderness Park adjacent to the *major population/key location* in San Juan Creek and the *important population/key location* in Bell Canyon would be conserved. As shown in *Table 13-12*, 672 acres (63 percent) of the suitable foraging and estivation habitat adjacent to the San Juan Creek *major population/key location* would be conserved on RMV and 100 percent would be conserved in San Juan Creek and Bell Canyon within Caspers Wilderness Park. In the San Mateo Creek Watershed, 169 acres (87 percent) of the potential foraging and estivation habitat adjacent to the Talega Canyon *major population/key location* would be conserved, and 481 acres (97 percent) of the habitat adjacent to the Lower Cristianitos Creek/Lower Gabino Canyon *important population/key location* would be conserved.

Although the above habitat-based analysis estimates that 402 acres (37 percent) of suitable habitat within the 80-foot contour adjacent to San Juan Creek on RMV, which extends well

beyond the 100-year floodplain, would be impacted, it is reasonable to assume that the impact on actual arroyo toad use areas would be substantially less because the majority of toad activity is confined to flood prone areas of the creek. Ramirez (2003) conducted a radiotelemetry study in the RMV portion of San Juan Creek in 2001 to determine the activity patterns and spatial distribution of toads. Ramirez found that toads use all habitats within the flood prone area of San Juan Creek and that core activity areas also were concentrated in this area (see *Figure 201-M*). Ramirez states that:

*The majority of individuals tracked during the study were located immediately adjacent to the active channel or within the bench habitats located within the San Juan Creek flood prone area. A single arroyo toad was documented within the upland terrace north of San Juan Creek burrowed in loam substrate within annual grassland. (p. 2)*

In addition, existing Ortega Highway is a movement barrier to uplands in PA 4, likely limiting the extent to which toads currently use suitable habitat in the PA.

It should also be noted that any long-distance instream toad movements north and south in the San Mateo Creek Watershed would most likely occur along Chiquita, Gobernadora and Trampas creeks. These drainages are all within the Habitat Reserve and there would be no constraints on toad movements. The Trampas drainage also provides a relatively unconstrained dispersal route between populations in the San Juan and San Mateo watersheds that are separated by about three miles.

The conservation estimates for the Talega and Lower Cristianitos/Lower Gabino populations are conservative because they are based on the "over-stated" impacts in PA 8. Pursuant to SAMP USACE Permit Special Condition I.D.8, a five-year radiotelemetry study of the arroyo toad populations near PA 8 will be undertaken and the results will be submitted to the USACE prior to submittal of an application to USACE. The results will be used to design appropriate measures to minimize impacts to arroyo toads in PA 8.

Habitat connectivity within the riparian systems is critical for maintaining habitat connectivity to support dispersal and migration movements within the watersheds. Within the San Juan Creek Watershed, the *major population* in San Juan Creek and the *important population* in Bell Canyon are directly connected. As discussed below, invasive species controls in San Juan Creek will be implemented to improve habitat connectivity among the populations in the creek. Within the San Mateo Creek Watershed, the *major population* in Talega Canyon and the *important populations* in lower Cristianitos and lower Gabino creeks also are directly connected, allowing for movement by toads between the systems.

The Habitat Reserve would also conserve upland habitat between the San Juan and San Mateo watersheds that would allow for the likely rare dispersal events between the San Juan and San Mateo populations. The minimum distance between the San Juan Creek and lower Cristianitos Creek populations is about 3-3.5 miles. The Habitat Reserve would facilitate long distance overland movements by toads. A minimum 6,000-foot wide swath of natural vegetation between PAs 4 and 5 would be conserved, providing a robust connection between the San Juan and Cristianitos creek populations. The only potential obstacle to dispersing toads would be 50 acres of new orchard sited somewhere within PAs 6 and/or 7, which is highly unlikely to inhibit toad movement. Based on topography and vegetation characteristics, dispersal along the “path of least resistance” likely would generally be along the current alignment of Cristianitos Road that takes advantage of the most gentle terrain separating the two watersheds. A potential north-south dispersal route following Cristianitos Road gradually climbs from about 300 feet at San Juan Creek to about 500 feet maximum elevation before dropping down into Cristianitos Canyon where, at about 300 feet, the Cristianitos population is located. A tributary to Cristianitos Creek adjacent to the road that picks up about 1.1 miles south of San Juan Creek would seem the most likely dispersal corridor through Cristianitos Canyon. A second potential dispersal route is a tributary to San Juan Creek east of Cristianitos Road that would require toads to disperse through dense and rugged chaparral at elevations of at least 600 feet. Both potential dispersal routes would be conserved in the Habitat Reserve. Habitat connectivity and provisions for toad movements, both for instream and overland, are consistent with the USACE Permit Special Condition I.D.2 regarding San Juan, Cristianitos, Talega, and Gabino creeks.

### 3. Management

Management of the arroyo toad will consider a variety of environmental stressors that have been generally identified for the species:

- Altered fire regime/related erosion
- Too frequent flood regime
- Too infrequent flood regime
- Precipitation
- Upstream diversion
- Groundwater extraction
- Water quality
- Urbanization adjacent to Reserve
- Exotic plant invasion
- Exotic predators
- Cattle-related impacts

- Roads and trails
- Recreation and collection

With these potential stressors in mind, Similarly, natural hydrological conditions would be maintained in the San Mateo Watershed to protect the Talega and Lower Cristianitos/Lower Gabino populations.

As part of the HRMP, bullfrog and crayfish control programs to help protect arroyo toads would be implemented, with a special focus on permanent water bodies that provide source concentrations of bullfrogs and crayfish (also see SAMP USACE Permit Special Condition I.D.5 regarding eradication of bullfrogs in water quality treatment basins within 1,640 feet [0.5 km] of streams known to support arroyo toads). Habitat restoration and enhancement activities to benefit the toad include implementation of giant reed control programs within San Juan Creek in Caspers Wilderness Park by the County and on RMV property. Control of giant reed in San Juan Creek will result in more arroyo toad breeding habitat both by providing for more native riparian vegetation and increasing water supplies necessary to sustain breeding pools throughout the winter/spring breeding season. Movement along San Juan Creek will be enhanced through the USACE Permit Special Condition I.D.3 regarding retrofitting or relocation of the existing Cow Camp culvert to allow fish passage. Finally, construction of the new Cow Camp Road likely will reduce traffic on existing Ortega Highway, thereby reducing impacts to toad upland movements.

Within the San Mateo Creek Watershed, several restoration actions that would benefit the toad have been identified, including: (1) subject to the discretion of the Reserve Manager and Science Panel, CSS/VGL restoration and soils stabilization programs to control erosion and generation of fine sediments in Cristianitos and upper Gabino canyons potentially resulting in long-term, chronic degradation of downstream toad breeding habitat, and (2) control of exotic species, such as pampas grass, giant reed and tamarisk in lower Cristianitos Creek, and bullfrogs and crayfish in water bodies in the watershed. Currently an annual monitoring of populations and some plant exotics controls (pampas grass, tamarisk, giant reed, sweet fennel, and artichoke thistle) to benefit the arroyo toad is conducted by Northrop Grumman in lower Cristianitos Creek from the Camp Pendleton boundary to the Cristianitos Bridge (per Special Conditions 1 & 2 of USACE Permit #199915591-RLK).

The coordinated GMP (*Appendix G*) will help protect arroyo toad habitat by excluding cattle from breeding habitat during the breeding season once such areas are dedicated.

With regard to recreation and the potential for collection of toads (particularly by children), especially along San Juan Creek where trails are close the creek, impacts will be managed by public education and signage prohibiting the disturbance and collection of all amphibians,

including tadpoles. In some instances, where necessary and feasible, access to breeding pools may be restricted by signage and fencing.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the arroyo toad is warranted because all breeding populations in the Subarea would be conserved in the Habitat Reserve. Including the “over-stated” impacts for PA 4, at least 63 percent of potential upland foraging and estivation habitats adjacent to the portion of the San Juan Creek *major population* on RMV would be conserved. Post-construction, the available habitat within the 1,320-foot (400 m) wide San Juan Creek corridor separating PAs 3 and 4 will be protected because permanent impacts in these areas will be limited to trails and infrastructure; no residential/commercial development is allowed in this protected area. All of the potential upland foraging and estivation habitat adjacent to the San Juan *major population/key location* and the *important population/key location* in lower Bell Canyon in Caspers Wilderness Park would be conserved. In the San Mateo Watershed, 87 percent of the potential upland habitat adjacent to the Talega Canyon *major population/key location* and 97 percent of the upland habitat adjacent to the Lower Cristianitos Creek/Lower Gabino Canyon *important population/location* would be conserved. All areas providing “in-stream” connectivity between these populations would be conserved. Habitat to mediate potential overland dispersal events between the San Juan and San Mateo watersheds would be conserved. Conservation of the arroyo toad in Subarea 1, including the management and restoration activities reviewed above, would provide for recovery of the species in this area and substantially contribute to its recovery rangewide. Finally, the arroyo toad and its habitat have already been conserved in substantial areas of coastal southern California, having received regulatory coverage under the Western Riverside County MSHCP and the Central/Coastal NCCP/HCP (one recently discovered extant population occurs in Silverado Canyon, GLA 2005). The arroyo toad also is conserved on MCB Camp Pendleton (Biological Opinion 1-6-95-F-02).

#### *n. California Glossy Snake (Arizona elegans occidentalis)*

**Federal Status:**       None  
**State Status:**         None  
**Science Advisors:**   Group 3

##### 1. Rangewide and Planning Area Status

The full species of glossy snake occurs in the southwest United States and Mexico. Its range extends from southwest Nebraska to eastern Texas to central California, and from southern Utah to southern Baja, Mexico and southern Sinaloa, Mexico (Stebbins 1985). The subspecies California glossy snake (*A. e. occidentalis*) occurs in the Central Valley from about Mt. Diablo in

Contra Costa County south to the northern portion of western Baja California and occupies all of Kings, Kern, Orange, San Bernardino, Riverside, San Diego, and Imperial counties (Zeiner *et al.* 1990) and most of Stanislaus, Merced, Inyo, and Los Angeles counties in cismontane habitats (Holland and Goodman 1998). It usually inhabits open areas with sandy or loamy soils, typically riparian areas and wash habitats, and also occurs in coastal sage scrub, chaparral, grassland and sparse oak woodlands, typically in areas with sparse vegetation and loose soils (Holland and Goodman 1998).

Despite its widespread distribution in California, there are few documented records for the glossy snake in southern California. Glossy snakes are primarily nocturnal and are rarely found under rocks and other surface objects typical of many other snakes (Stebbins 1985). Also, the CNDDDB does not contain records for the species because it is not a California special status species; *i.e.*, it is not a CSC and has no CNDDDB global or state rank. The Western Riverside MSHCP database which covers 1.26 million acres, for example, only has three documented occurrences since 1984. The NCCP Science Advisors report indicates that the planning area is one of only three locations in southern California where the species recently has been recorded. Bloom's data include four records of this species for the planning area: two records in coastal sage scrub along San Juan Creek at the entrance to Caspers Park; at the Caspers Park visitor center; and San Juan Creek at Cow Camp. However, based on this species' habitat associations, it potentially could occur in suitable habitat throughout the planning area landscape, and thus no *important populations* or *key locations* for the species have been identified. California glossy snake was identified for coverage because there is increasing concern for this species by biologists (P. Bloom, pers. comm. 2003) and there is a reasonable likelihood of listing of the species over the duration of the project.

## 2. Conservation Analysis

A landscape-level, habitat-based analysis primarily is applied to the California glossy snake because of its relatively broad habitat requirements and relative lack of site-specific occurrence data. Amount of habitat conserved and habitat patch size, contiguity and connectivity are considered for this species. Although the habitat analysis is at a landscape level, this species typically uses loose soils (sandy and loamy soils), but also rocky areas. For the purpose of estimating suitable habitat for the impact and conservation analysis, the following soils were considered potentially suitable for the glossy snake: Anaheim loam, Blasingame loam and stony loam, Botella loam, Capistrano sandy loam, Cieneba sandy loam, Cieneba-Blasingame-rock outcrop complex, Corralitos loamy sand, Exchequer-rock outcrop complex, Hanford sandy loam, Marina sandy loam, Mocho loam, Myford sandy loam, Modjeska gravelly loam, Ramona fine sandy loam, Riverwash, rock outcrop-Cieneba complex, San Andreas sandy loam, Soboba cobbly loamy sand, Soboba gravelly loamy sand, Soper loam, Soper gravelly loam, Soper-rock outcrop complex, Sorrento loam, Yorba gravelly sandy loam and Yorba cobbly sandy loam.

Vegetation communities/land covers used by the glossy snake include coastal sage scrub, chaparral, grassland, riparian, stream courses and woodlands and forest. Using GIS the suitable soils and vegetation communities/land covers were intersected with the proposed B-12 Alternative impact areas, Habitat Reserve and SOS.

(a) Impacts

The proposed Covered Activities would result in direct, permanent impacts to 5,115 acres (18 percent) of suitable habitat, as defined above and shown in *Table 13-2*. None of the four documented locations in Subarea 1 would be impacted (*Figure 202-M*). The proposed Covered Activities also would result in temporary direct impacts to 288 acres of habitat, but no sites (*Table 13-6*).

(b) Conservation

All four documented locations in Subarea 1 and 20,989 acres (74 percent) of habitat would be conserved in the Habitat Reserve (*Table 13-2* and *Figure 202-M*). An additional 2,300 acres (8 percent) of habitat are in Subarea 1 SOS, bringing the total conservation of habitat to 23,289 acres (82 percent).

There are no data on dispersal or other spatial behavior of the glossy snake. However, it seems reasonable to assume that glossy snakes are unlikely to disperse between highly isolated habitat patches through unsuitable habitat and that roads are significant risks for the species due to vehicle collisions. Thus habitat patch size, contiguity and connectivity likely are key reserve design considerations for this species.

The results of the refined habitat block delineation used to analyze patch size are presented in *Table 13-9* and depicted in *Figure 193-M*. The seven habitat blocks combined include about 28,489 acres (including habitat in SOS in Coto de Caza in Subarea 3) of suitable vegetation types.<sup>10</sup> Habitat within the blocks ranges from 809 acres in the Radio Tower Road mesa block to 13,694 acres in the Southeastern block.

- Habitat linkages likely to be important for the glossy snake also would be conserved, including: the north-south connection along Chiquita Ridge spanning the area from Ladera Open Space to Chiquita Creek (linkage C); the east-west connection from Arroyo Trabuco to Gobernadora and Caspers Wilderness Park via Chiquita Canyon (linkages B, D, H, I); the north-south connection along Chiquadora Ridge (linkage G); the floodplain along San Juan Creek and into Bell Canyon (linkage J); the linkage along and perpendicular to Verdugo Canyon (linkages L and M); the north-south linkages through

<sup>10</sup> Note that the soils analysis was not applied to the habitat blocks. For the block analysis, it seemed reasonable to base the estimate on the conservation of suitable vegetation communities alone because intact, contiguous habitat areas in a block within which both suitable (sands, loams and rock outcrops) and unsuitable soils (clays and silts) occur function as an integrated habitat area.

the central and western portions of Trampas Canyon and Cristianitos Canyon (linkages J, K and N); and linkages O, P and Q in Gabino, La Paz and Talega canyons, respectively (see *Figure 193-M*). Where roads cross linkage areas wildlife movement and dispersal will need to be addressed. For example, bridges will be constructed across San Juan, Chiquita and Gobernadora creeks for Cow Camp Road, and San Juan Creek and Chiquadora Ridge for Cristianitos/"F" Street. For the extension of Cristianitos Road/"F" Street through Chiquita Canyon to Oso Parkway, a wildlife culvert at Chiquita Narrows within the design of Cristianitos Road shall be included with the following dimensions: The culvert shall have a minimum dimension of 15 by 15 feet, the bottom of the culvert shall be of a natural substrate, light shall be visible from one end of the culvert to the other, vegetation installed at either end shall be native low growing to prevent predator-prey stalking, and if required for public health and safety, all lighting on the road above the culvert shall be shielded to prevent spill-over effects (*NCCP Minimization Measure 8-1*).

### 3. Management

The California glossy snake has not been studied adequately to directly evaluate environmental stressors on the species. However, it can be assumed that general impacts to its habitat and prey base have an adverse effect on the species. In addition, direct impacts common to many snakes such as vehicle collisions and human harassment can be assumed. Thus the following land uses and activities that can be stressors on suitable habitat and/or individual snakes will be considered for management:

- Habitat loss and fragmentation
- Urbanization adjacent to Habitat Reserve
- Exotic plant invasions (especially those that choke sandy washes and streamcourses such as giant reed)
- Rodent controls (glossy snakes may use small mammal burrows as refugia, for foraging and for laying eggs)
- Urban-related predators such as dogs
- Roads and trails
- Argentine ants (through effects on native lizards that are important prey items for glossy snakes)
- Collection

Management actions to benefit the glossy snake would be implemented primarily at a landscape level and include fire management and invasive species controls, including artichoke thistle controls in uplands and giant reed controls along washes that may be used for movement. Rodent controls will be prohibited within the Habitat Reserve, and the use of chemical pesticides in areas adjacent to the Habitat Reserve (e.g., golf courses) will be minimized to the extent feasible and will be used in accordance with an approved Integrated Pest Management Program designed to avoid and minimize effects on native species and habitats. Control of urban-related predators such as dogs will be controlled in the Habitat Reserve through public education and direct controls such as trapping to the extent necessary and feasible. Collecting of the glossy snake by the public would be prohibited within the Habitat Reserve. Argentine ant controls will be implemented to reduce impacts on native lizards that are prey for the glossy snake. Habitat restoration activities implemented at the discretion of the Reserve Manager and Science Panel to benefit this species include CSS/VGL restoration on Chiquita Ridge, in Sulphur Canyon, and on Chiquadora Ridge.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the California glossy snake is warranted because all four known locations, 82 percent of suitable habitat, all major drainages supporting sandy deposits and other potentially important habitat linkages in Subarea 1 would be conserved the Habitat Reserve and SOS. The seven large habitat blocks comprise 28,489 acres of conserved habitat for the glossy snake, thus the large majority of conserved habitat is relatively unfragmented. In addition, coverage is warranted because the species is widely distributed beyond the Southern Subregion. The restoration activities identified above also would provide additional benefits to the species.

##### *o. Coast Patch-nosed Snake (Salvadora hexalepis virgultea)*

**Federal Status:**       None  
**State Status:**       California Species of Special Concern  
**Science Advisors:**   Group 2

#### 1. Rangewide and Planning Area Status

The full species western patch-nosed snake is widely distributed throughout desert regions of the southwestern U.S., and northern mainland Mexico and all of Baja California (Stebbins 1985). The subspecies coast patch-nosed snake (*S. h. virgultea*) is widely distributed in the lowlands of southern California from sea level to 7,000 feet from about Santa Barbara south into the northern third of Baja California. The coast patch-nosed snake is found in coastal chaparral, desert scrub, washes, sandy flats, and rocky areas. As an active, diurnal snake, it will occasionally take refuge

in rock crevices, in small mammal burrows, and under vegetation. Its habitat and dietary requirements appear to be broad and opportunistic.

The subspecies coast patch-nosed snake is a CDFG CSC and has a CNDDDB rank of G5T3S2S3; the full species is secure in its global range but the subspecies, as indicated in the T and S ranks, is considered restricted/rare to endangered in California. It is being proposed for coverage because biologists are becoming increasingly concerned about its status in southern California. Recent pitfall trapping programs in southern California, for example, have resulted in few captures of the patch-nosed snake, indicating that it is becoming rare (P. Bloom, pers. comm. 2003).

There are three records of this species in the subregion, all of which are in Subarea 1 (*Figure 202-M*): in uppermost Cristianitos Canyon along Cristianitos Road just south of Ortega Highway; in Caspers Park on the ridge between Cañada Gobernadora and Bell Canyon; and from Starr Ranch just south of Fox Canyon and north of Crow Canyon. Based on this species' habitat associations, it potentially could occur in suitable habitat throughout the planning area landscape, and no *important populations* or *key locations* for the species have been identified.

## 2. Conservation Analysis

A landscape habitat-based analysis primarily is applied to the coast patch-nosed snake due to its broad habitat associations, defined as coastal sage scrub, chaparral and grassland, and relatively little site-specific information in the planning area.

### (a) Impacts

The proposed Covered Activities would result in direct, permanent impacts to 6,254 acres (19 percent) of suitable habitat and one of three documented locations in the planning area (the documented location is in the area identified for potential orchards where 381 acres of 431 acres ultimately would be conserved) (*Table 13-2* and *Figure 202-M*). The proposed Covered Activities also would result in temporary direct impacts to 205 acres of habitat, but no sites (*Table 13-6*).

### (b) Conservation

One of the three documented locations in Subarea 1 and 23,111 acres (71 percent) of habitat would be conserved in the Habitat Reserve (*Table 13-2* and *Figure 202-M*). An additional documented location and 3,461 acres (11 percent) are in Subarea 1 SOS, bringing the total conservation of habitat to 26,572 acres (81 percent) and two of three documented locations.

There are no data on dispersal or other spatial behavior of the coast patch-nosed snake. However, as with the other snakes proposed for regulatory coverage, it seems reasonable to assume that coast patch-nosed snakes are unlikely to disperse between highly isolated habitat patches through unsuitable habitat and that roads are significant risks for the species due to vehicle collisions. Thus habitat patch size, contiguity and connectivity likely are key reserve design considerations for this species.

The results of the refined habitat block delineation used to analyze patch size are presented in *Table 13-9* and depicted in *Figure 193-M*. The seven habitat blocks combined include about 24,280 acres (including habitat in SOS in Coto de Caza in Subarea 3) of the 26,572 acres (91 percent) of conserved habitat (coastal sage scrub, chaparral and grassland) for the patch-nosed snake. Habitat within the blocks ranges from 732 acres in the Radio Tower Road mesa block to 11,985 acres in the Southeastern block.

Habitat linkages likely to be important for the coast patch-nosed snake also would be conserved, including: the north-south connection along Chiquita Ridge spanning the area from Ladera Open Space to Chiquita Creek (linkage C); the east-west connection from Arroyo Trabuco to Gobernadora and Caspers Wilderness Park via Chiquita Canyon (linkages B, D, H, I); the north-south connection along Chiquadora Ridge (linkage G); the floodplain along San Juan Creek and into Bell Canyon (linkage J); the linkage along and perpendicular to Verdugo Canyon (linkages L and M); the north-south linkages through the central and western portions of Trampas Canyon and Cristianitos Canyon (linkages J, K and N); and linkages O, P and Q in Gabino, La Paz and Talega canyons, respectively (see *Figure 193-M*). Where roads cross linkage areas wildlife movement and dispersal will need to be addressed. For example, bridges will be constructed across San Juan, Chiquita and Gobernadora creeks for Cow Camp Road, and San Juan Creek and Chiquadora Ridge for Cristianitos/"F" Street. For the extension of Cristianitos Road/"F" Street through Chiquita Canyon to Oso Parkway, a wildlife culvert at Chiquita Narrows within the design of Cristianitos Road shall be included with the following dimensions: The culvert shall have a minimum dimension of 15 by 15 feet, the bottom of the culvert shall be of a natural substrate, light shall be visible from one end of the culvert to the other, vegetation installed at either end shall be native low growing to prevent predator-prey stalking, and if required for public health and safety, all lighting on the road above the culvert shall be shielded to prevent spill-over effects (*NCCP Minimization Measure 8-1*).

### 3. Management

The coast patch-nosed snake has not been studied adequately to directly evaluate environmental stressors on the species that inform management actions. However, it can be assumed that general impacts to its habitat and prey base have an adverse effect on the species. In addition, direct impacts common to many snakes such as vehicle collisions and human harassment can be

assumed. Thus the following land uses and activities that can disturb suitable habitat and/or individual snakes are identified as potential stressors and thus will be considered for management:

- Habitat loss and fragmentation
- Urbanization adjacent to Habitat Reserve
- Exotic plant invasions (especially those that choke sandy washes and streamcourses such as giant reed)
- Rodent controls (snakes may use small mammal burrows as refugia, for foraging and for laying eggs)
- Urban-related predators such as dogs
- Roads and trails
- Argentine ants (through effects on native lizards that are prey items for patch-nosed snakes)
- Collection

Management actions to benefit the coast patch-nosed snake would be implemented primarily at a landscape level and include fire management and invasive species controls, including artichoke thistle controls in uplands and giant reed controls along washes that may be used for movement. Rodent controls will be prohibited within the Habitat Reserve, and the use of chemical pesticides in areas adjacent to the Habitat Reserve (*e.g.*, golf courses) will be minimized to the extent feasible and will be used in accordance with an approved Integrated Pest Management Program designed to avoid and minimize effects on native species and habitats. Control of urban-related predators such as dogs will be controlled in the Habitat Reserve through public education and direct controls such as trapping to the extent necessary and feasible. Collecting of the coast patch-nosed snake by the public would be prohibited within the Habitat Reserve. Argentine ant controls will be implemented to reduce impacts on native lizards that are prey for the coast patch-nosed snake. Habitat restoration activities implemented at the discretion of the Reserve Manager and Science Panel to benefit this species include CSS/VGL restoration on Chiquita Ridge, in Sulphur Canyon, and on Chiquadora Ridge.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the coast patch-nosed snake is warranted within Subarea 1 because one of three occurrence locations, 71 percent of suitable habitat, and potentially important habitat linkages would be conserved and managed in the Habitat Reserve. A second documented location is conserved in SOS on NAS Starr Ranch. Additional habitat conservation in SOS

would bring the total habitat conservation to 81 percent. The seven large habitat blocks comprise about 91 percent of conserved suitable habitat for the coast patch-nosed snake; thus the large majority of conserved habitat is relatively unfragmented. In addition, coverage is warranted because, while the species is now considered rare to endangered in southern California, it is still widely distributed in southern California beyond the Southern Subregion and its range-wide viability is not dependent on conservation activities in the project area. The restoration activities identified above also would provide additional benefits to the species.

***p. Northern Red-diamond Rattlesnake (Crotalus ruber ruber)***

**Federal Status:** None  
**State Status:** California Species of Special Concern  
**Science Advisors:** Group 3

1. Rangewide and Planning Area Status

The full species red-diamond rattlesnake ranges throughout Southern California from San Bernardino County south to Cabo San Lucas, Baja California (Stebbins 1985). In its northern reaches, the rattlesnake occupies coastal habitats to the desert slopes of the mountains, but is absent from the lower desert flats and mountain elevations above 5,000 feet. The subspecies northern red-diamond rattlesnake (*C. r. ruber*) ranges from about Pioneertown and Morongo Valley in San Bernardino County south on both the coastal and desert sides of the Peninsular Ranges and the Santa Ana Mountains to about Loreto in Baja California. The red-diamond rattlesnake occurs in desert habitats, dense chaparral, inland mesas and valleys, and the coastal regions and it most commonly associated with heavy brush, large rocks, and boulders (Klauber 1972).

The northern red-diamond rattlesnake is a CDFG CSC and has CNDDDB rank of G4T3T4S2?; although the full species appears to be globally secure there are some factors to cause concern about its status. Within its range, including much of Baja California, the subspecies northern red-diamond rattlesnake is considered to have a restricted range, but is apparently secure. In California the S2? rank indicates that the subspecies may be considered endangered, but that there is still some question as to its status. In recent years there has been growing concern for the northern red-diamond rattlesnake by biologists, the Wildlife Agencies and environmental groups. Concern for this subspecies primarily stems from habitat loss and fragmentation, particularly from the clearing of steep, rocky and brushy slopes for drip agriculture such as avocado orchards. Collisions with vehicles and harassment in populated areas also are increasing problems as former habitat areas become urbanized and interactions with humans increase.

The northern red-diamond rattlesnake is widely distributed in the planning area. There are 18 locations for the subspecies in the NCCP data base, of which 16 are in Subarea 1. Rattlesnake locations include Arroyo Trabuco, Tijeras Creek at Chiquita Ridge, an area south of General Thomas F. Riley Wilderness Park, Chiquadora Ridge, east of Avenida La Pata at Ortega Highway, San Juan Creek just west of Chiquita Canyon, upper Cristianitos Canyon, and the Talega sub-basin (Dudek 1995; MBA 1996; Bloom database; Behrends, pers. obs.). This subspecies probably occurs wherever there is suitable habitat (coastal sage scrub, chaparral and grassland), but the Science Advisors considered the western portion of the planning area as particularly important.

## 2. Conservation Analysis

The conservation analysis for the northern red-diamond rattlesnake is based on both site-specific information and landscape-level habitat, defined as coastal sage scrub, chaparral and grassland, due to its fairly broad habitat associations. Amount of habitat conserved and habitat patch size, contiguity and connectivity are considered for this species.

### (a) Impacts

The proposed Covered Activities would result in direct, permanent impacts to 6,254 acres (19 percent) of suitable habitat (coastal sage scrub, chaparral and grassland) and six of 16 (37 percent) documented locations in Subarea 1 (*Table 13-2* and *Figure 202-M*). The proposed Covered Activities also would result in temporary direct impacts to 205 acres of habitat and three locations (*Table 13-6*).

### (b) Conservation

Nine of the 16 (56 percent) documented locations in Subarea 1 and 23,111 acres (71 percent) of habitat would be conserved in the Habitat Reserve (*Table 13-2* and *Figure 202-M*). An additional location and 3,461 acres (11 percent) are in Subarea 1 SOS, bringing the total conservation of red-diamond rattlesnakes to 10 locations (63 percent) and habitat to 26,572 acres (81 percent).

Rattlesnakes in general are capable of moving long distances, including by swimming, as evidenced by their colonization of islands (Klauber 1971). However, they are a slow-moving snake and can often be seen basking on warm paved roads in the morning or evening and thus are particularly vulnerable to vehicle collisions when crossing or basking on roads. Some data are available on movement patterns and spatiotemporal behavior by rattlesnakes in southern California that help inform an evaluation of the Habitat Reserve. A four-year radiotelemetry study by Brown *et al.* (2004) of red-diamond rattlesnakes in the MSCP in San Diego County

documented highly variable home ranges between years and sexes, with male home ranges nearly three times that of females. “Resident” snake home ranges varied between 0.7 and 15.3 acres and “relocated” snake ranges varied between 3.9 and 44.5 acres; “relocated” snakes were those moved away from animal enclosures and pedestrian paths at the San Diego Wild Animal Park for safety purposes and thus were likely placed in unfamiliar territory. Fitch and Shirer (1971) observed average daily movements of about 150 feet by radio-telemetered snakes, but no movement at all on about half the days. About 10 percent of movements were greater than about 500 feet.

Based on the capacity of red-diamond rattlesnakes to move long distances, but also their vulnerability to vehicle collisions, habitat patch size, contiguity and connectivity likely are key reserve design considerations for this species. The results of the refined habitat block delineation used to analyze patch size are presented in *Table 13-9* and depicted in *Figure 193-M*. The seven habitat blocks combined include about 24,280 acres (including habitat in SOS in Coto de Caza in Subarea 3) of the 26,572 acres (91 percent) of conserved habitat (coastal sage scrub, chaparral and grassland) for the red-diamond rattlesnake. Habitat within the blocks ranges from 732 acres in the Radio Tower Road mesa block to 11,985 acres in the Southeastern block.

There are relatively few occurrences of red-diamond rattlesnake in Subarea 1, but of the 10 conserved locations, eight occur in large habitat blocks, with one in the Arroyo Trabuco block, one in the Chiquita Ridge block, one in the Wagon Wheel block, four in the Southeastern block, and one in the Northeastern block.

Habitat linkages likely to be important for the red-diamond rattlesnake also would be conserved, including: the north-south connection along Chiquita Ridge spanning the area from Ladera Open Space to Chiquita Creek (linkage C); the east-west connection from Arroyo Trabuco to Gobernadora and Caspers Wilderness Park via Chiquita Canyon (linkages B, D, H, I); the north-south connection along Chiquadora Ridge (linkage G); the floodplain along San Juan Creek and into Bell Canyon (linkage J); the linkage along and perpendicular to Verdugo Canyon (linkages L and M); the north-south linkages through the central and western portions of Trampas Canyon and Cristianitos Canyon (linkages J, K and N); and linkages O, P and Q in Gabino, La Paz and Talega canyons, respectively (see *Figure 193-M*). Where roads cross linkage areas wildlife movement and dispersal will need to be addressed. For example, bridges will be constructed across San Juan, Chiquita and Gobernadora creeks for Cow Camp Road, and San Juan Creek and Chiquadora Ridge for Cristianitos/“F” Street. For the extension of Cristianitos Road/“F” Street through Chiquita Canyon to Oso Parkway, a wildlife culvert at Chiquita Narrows within the design of Cristianitos Road shall be included with the following dimensions: The culvert shall have a minimum dimension of 15 by 15 feet, the bottom of the culvert shall be of a natural substrate, light shall be visible from one end of the culvert to the other, vegetation installed at either end shall be native low growing to prevent predator-prey stalking, and if required for

public health and safety, all lighting on the road above the culvert shall be shielded to prevent spill-over effects (*NCCP Minimization Measure 8-1*).

### 3. Management

Management for the red-diamond rattlesnake will focus on stressors identified for this species that are primarily related to habitat loss and fragmentation. This loss and fragmentation of habitat and construction of roads has exposed the slow-moving and relatively docile red-diamond rattlesnake to a variety of chronic stressors beyond the immediate effect loss of habitat, including increased vehicle collisions, trampling by livestock such as horses, sheep, goats and cattle, and harassment by humans and pets (cats and dogs). Thus the following land uses and activities that can disturb suitable habitat and individual snakes are identified as potential stressors and will be considered for management:

- Habitat loss and fragmentation
- Urbanization adjacent to Habitat Reserve
- Urban-related predators (*e.g.*, cats and dogs)
- Livestock
- Roads and trails
- Human harassment

Two specific management issues that stem from habitat loss, fragmentation and urbanization adjacent to the Habitat Reserve are important for this species: vehicle collisions and harassment by humans. As part of the HRMP, “roadkill” data for the species will be collected to determine if there are specific areas within the Habitat Reserve with unusually high mortality rates. Establishing a reliable pattern of mortality likely would take several years of monitoring, and such areas would then need to be evaluated for ways to prevent or reduce mortality (*e.g.*, permanent drift fences to direct snakes away from the area). Urban-related predators such as cats and dogs will be controlled through public education and direct controls such as trapping where necessary and to the extent feasible. Harassment by humans will be managed through public education and signage in areas where the public are likely to encounter rattlesnakes (including the more common western rattlesnake [*Crotalus viridis*]). Personnel involved in cattle and other agricultural operations and other facilities within the Habitat Reserve also will be trained to recognize and avoid harming all rattlesnakes to the extent possible. Whenever possible, animal control personnel will be contacted to remove rattlesnakes (without harming them) from areas located outside the Habitat Reserve or from non-reserve facilities located within the Habitat Reserve. All rattlesnakes removed by animal control personnel will be placed back into the wild in the nearest suitable habitat.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the northern red-diamond rattlesnake is warranted because 56 percent of locations and 71 percent of suitable habitat would be conserved in the Habitat Reserve. In combination with the additional location and 11 percent of habitat in SOS, 63 percent of locations and 81 percent of suitable habitat would be conserved. The seven large habitat blocks comprise 91 percent of conserved suitable habitat for the red-diamond rattlesnake, thus the large majority of conserved habitat is relatively unfragmented. In addition, coverage is warranted because, although it appears to be becoming increasingly rare, the subspecies is still widely distributed in southern California and Baja California, the latter of which is the major part of the subspecies' range beyond the Southern Subregion (*i.e.*, T4 rank), and its rangewide viability does not depend on the proposed Covered Activities. The Habitat Reserve also would include areas within the western portion of the planning area (*e.g.*, Arroyo Trabuco, Chiquita Ridge, Radio Tower Road mesa) that were considered by the Science Advisors to be important for the species. Finally, the northern red-diamond rattlesnake and its habitat have already been substantially conserved in southern California, having received regulatory coverage under the Central/Coastal NCCP/HCP and Western Riverside County MSHCP.

#### ***q. Orange-throated Whiptail (*Aspidoscelis hyperythra beldingi*)***

**Federal Status:** None  
**State Status:** California Species of Special Concern  
**Science Advisors:** Group 2  
**NCCP/MSAA/HCP Planning Species**

##### 1. Rangewide and Planning Area Status

The current range of the full species orange-throated whiptail includes southwestern California and virtually all of Baja California. The subspecies Belding's orange-throated whiptail (*A. h. beldingi*) ranges from southwestern California to southern Baja, Mexico with the other subspecies, Cape orange-throated whiptail (*A. h. hyperythra*), restricted to the extreme southern portion of Baja. In California, the orange-throated whiptail reportedly ranges from the southern edges of Orange County (Corona del Mar) and San Bernardino County (near Colton) southward to the Mexican border (Jennings and Hayes 1994). However, the CNDDDB includes a single record from Tujunga Wash in Los Angeles County south of Interstate 210 near Sunland. This disjunct record suggests that the species is more widespread than described in the literature. They are located on the coastal slope of the Peninsular Ranges and extend from near sea level to about 3,400 feet northeast of Aguanga in Riverside County (Jennings and Hayes 1994).

The orange-throated whiptail inhabits coastal sage scrub, chaparral, non-native grassland, oak woodland, alluvial fan sage scrub and riparian areas. This species is presumably tied to perennial vegetation because its major food source, termites, requires perennial plants as a food base (Bostic 1966a). Termites comprise 72-92 percent of the orange-throated whiptail's diet (Bostic 1966a). In late summer, however, when termites migrate deep into the soil to avoid high surface temperatures, alternate prey items dominate the whiptail's diet.

The orange-throated whiptail is still relatively common in coastal sage scrub, chaparral and woodland habitats, but it is a CDFG CSC and has a CNDDDB rank of G5T2S2; the full species is secure in its global range, but the subspecies Belding's orange-throated whiptail is considered endangered both in its entire range including Baja California and within California. The orange-throated whiptail was designated as one of the three target species for the NCCP coastal sage scrub pilot program in 1993, along with the California gnatcatcher and cactus wren. The main threat to the orange-throated whiptail has been habitat loss and fragmentation to development in recent decades. The CDFG estimated in 1990 that the orange-throated whiptail had been extirpated from 75 percent of its historic range (Jennings and Hayes 1994). The lower coastal floodplains have been developed, leaving the smaller, higher elevation and relatively isolated drainages and terraces as habitat for the whiptail. Because these areas are smaller and isolated, thus limiting dispersal opportunities, local populations have a greater risk of local extinction. The CDFG (2003) also suggests that the drought of 1986-1990 may have depleted the orange-throated whiptail's prey base, which poses a particular problem to a dietary specialist than cannot easily shift to another prey. As with the horned lizard, Argentine ants, that displace many native insects, also may influence the prey base of orange-throated whiptail (Jennings and Hayes 1994). Finally, McGurty (1981) suggested the frequent fires resulting in type conversion from scrub to grassland habitat reduces woody shrubs and food sources for termites. Lack of cover caused by fires may also affect the whiptail's ability to thermoregulate.

The NCCP database includes 174 locations for the orange-throated whiptail, of which 169 locations are in Subarea 1 (*Figure 177-M*). Whiptails are broadly distributed throughout the planning area, ranging from the Saddleback Meadows area in the northwest to the Talega sub-basin in the southeast. While the orange-throated whiptail occurrences are widely scattered, based on the database there appears to be three distinct clusters of occurrences that may be considered *important populations in key locations*: (1) a cluster of 59 occurrences in coastal sage scrub along the ridge between Chiquita Canyon and Wagon Wheel Canyon south of Oso Parkway; (2) a cluster of 18 occurrences along Chiquadora Ridge; and (3) a cluster of 47 occurrences in the Gobernadora/Central San Juan Creek sub-basins north and east of the Colorspot Nursery. However, identifying these three areas as *important populations in key locations* must be qualified. These clusters occur within survey areas for the FTC-S (SOCTIIP) surveys and thus probably reflect, at least in part, the greater survey effort in this portion of the planning area. Given the wide distribution of this species in the planning area, and its fairly

general habitat requirements, it is likely to occur in substantial numbers in many other locations within the planning area.

## 2. Conservation Analysis

The conservation analysis for the orange-throated whiptail is based on both site-specific information (*i.e.*, documented occurrences and identified *important populations/key locations*) and on a landscape-level habitat basis, including amount of habitat conserved, defined as coastal sage scrub, chaparral and woodland and forest, and habitat patch size, contiguity and connectivity.

### (a) Impacts

The proposed Covered Activities would result in direct, permanent impacts to 4,149 acres (16 percent) of suitable habitat and 48 of 169 (28 percent) documented locations in Subarea 1 (*Table 13-2* and *Figure 177-M*). The proposed Covered Activities also would result in temporary direct impacts to 101 acres of habitat and eight locations (*Table 13-6*).

A total of 37 of 47 (79 percent) of the whiptail locations in the Gobernadora/Central San Juan Creek *important population/key location* would be impacted in PA 3. Five individuals (9 percent) of the Chiquita Canyon/Wagon Wheel Ridgeline *important population/key location* would be impacted; one by development in PA 2 and four within the alignment for Cristianitos Road/"F" Street. The road also would bisect this population, resulting in potential fragmentation of the population (*Figure 177-M*). None of the 18 locations in the Chiquadora Ridge *important population/key location* would be directly impacted, but the population also would be bisected by Cristianitos Road/"F" Street.

### (b) Conservation

A total of 115 (68 percent) documented locations in Subarea 1 and 18,803 acres (73 percent) of habitat would be conserved in the Habitat Reserve (*Table 13-2* and *Figure 177-M*). An additional six locations (4 percent) and 2,860 acres (11 percent) are in Subarea 1 SOS, bringing the total conservation of the orange-throated whiptail to 121 locations (72 percent) and habitat to 21,663 acres (84 percent).

All 18 locations in the Chiquadora Ridge *important population/key location* would be conserved; however, the population would be bisected by Cristianitos Road/"F" Street. A portion of the ridge will be bridged and continuous habitat along Chiquadora Ridge will be conserved and maintain the functional connection within this population. Fifty-three of 58 locations (91 percent) in the Chiquita Canyon/Wagon Wheel Ridgeline *important population/key location*

would be conserved, but the population would be bisected by Cristianitos Road/"F" Street. For the extension of Cristianitos Road/"F" Street through Chiquita Canyon to Oso Parkway, a wildlife culvert at Chiquita Narrows within the design of Cristianitos Road shall be included with the following dimensions: The culvert shall have a minimum dimension of 15 by 15 feet, the bottom of the culvert shall be of a natural substrate, light shall be visible from one end of the culvert to the other, vegetation installed at either end shall be native low growing to prevent predator-prey stalking, and if required for public health and safety, all lighting on the road above the culvert shall be shielded to prevent spill-over effects (*NCCP Minimization Measure 8-1*).

There are no specific data on dispersal by the orange-throated whiptail, but whiptails (Teiids) in general can move hundreds of meters from one location to another (Fitch 1958; Jorgensen and Tanner 1963; McCoy 1965; Knopf 1966; Lewis and Saliva 1987; Anderson 1993; Eifler and Eifler 1998; cited on [www.natureserve.org](http://www.natureserve.org)). Thus it should be assumed that orange-throated whiptails are at least capable of dispersing distances of at least several hundred meters to a few kilometers and that roads separating habitat patches are significant risks for the species. Thus habitat patch size, contiguity and connectivity likely are key reserve design considerations for this species.

The results of the refined habitat block delineation used to analyze patch size are presented in *Table 13-9* and depicted in *Figure 193-M*. The seven habitat blocks combined include about 20,223 acres (including habitat in SOS in Coto de Caza in Subarea 3) of the 21,663 acres (93 percent) of conserved habitat (coastal sage scrub, chaparral and woodland and forest) for the orange-throated whiptail. Habitat within the blocks ranges from 228 acres in the Radio Tower Road mesa block to 9,853 acres in the Southeastern block. Of the 121 conserved whiptail locations, 102 (84 percent) are in large habitat blocks: 53 in the Wagon Wheel block; 20 in the Southeastern block; 13 in the Chiquita Ridge block; seven in the Northeastern block; four in the Radio Tower Road mesa block; three in the Upper Chiquita block; and two in the Arroyo Trabuco block.

Important habitat linkages for the orange-throated whiptail also would be conserved, including: the north-south connection along Chiquita Ridge spanning the area from Ladera Open Space to Chiquita Creek (linkage C); the east-west connection from Arroyo Trabuco to Gobernadora and Caspers Wilderness Park via Chiquita Canyon (linkages B, D, H, I); the north-south connection along Chiquadora Ridge (linkage G); the floodplain along San Juan Creek and into Bell Canyon (linkage J); the linkages along and perpendicular to Verdugo Canyon (linkages L and M); the north-south linkages through the central and western portions of Trampas Canyon and Cristianitos Canyon (linkages J, K and N); and linkages O, P and Q in Gabino, La Paz and Talega canyons, respectively (see *Figure 193-M*). Where roads cross linkage areas wildlife movement and dispersal will need to be addressed. As discussed above, the two whiptail *important populations/key locations* on the Chiquita Canyon/Wagon Wheel Ridgeline and on

Chiquadora Ridge will be affected by the construction of Cristianitos Road/"F" Street. A wildlife culvert under Cristianitos Road/"F" Street per *NCCP Minimization Measure 8-1* will be constructed to maintain the functional connection of the Chiquita Canyon population. A bridge spanning a portion of Chiquadora Ridge will maintain the functional connection within the Chiquadora population. For other linkages bridges will be constructed across San Juan, Chiquita and Gobernadora creeks for Cow Camp Road, and San Juan Creek.

### 3. Management

Management of the orange-throated whiptail will consider several stressors that have been identified for the species, including:

- Habitat loss and fragmentation
- Precipitation (specifically extended drought)
- Argentine ants (through effects on native lizards that are prey items for whiptails)
- Frequent fire
- Exotic plant invasions
- Urban-related predators such as cats and dogs
- Paved roads

Fire appears to be significant stressor on orange-throated whiptails in several respects. McGurty (1981) suggested that frequent fires, resulting in type conversion from shrublands to grasslands, reduces woody perennial shrubs that are food sources for termites. The lack of shrub cover resulting from frequent fires also may affect the whiptail's ability to thermoregulate because it uses shade from bushes and possibly engages in arboreal behavior to dissipate heat. Also, the proliferation of dense, annual grasses and other exotic species may reduce available foraging area because substantial bare ground is required for foraging (McGurty 1981). Invasive Argentine ants, which displace native invertebrates, may affect the prey of whiptails. Orange-throated whiptails may be vulnerable to predation by pets (cats and dogs) along urban/wildland edges. Orange-throated whiptail movements have been found to be inhibited by heavily trafficked roads (Brehme 2003).

Management actions to address these stressors include: **(1)** implementation of the Wildland Fire Management Plan (*Appendix N*); **(2)** control of Argentine ants, and urban runoff and irrigation adjacent to the Habitat Reserve that attracts ants; and **(3)** control of urban-related predators such as cats and dogs in the Habitat Reserve through public education and direct controls such as trapping where necessary and to the extent feasible.

At the discretion of the Reserve Manager and Science Panel, habitat restoration activities that would benefit the whiptail include CSS/VGL restoration on Chiquita Ridge, in Sulphur Canyon, and on Chiquadora Ridge.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the orange-throated whiptail is warranted because 68 percent of locations and 73 percent of suitable habitat would be conserved in the Habitat Reserve. An additional 4 percent of locations and 11 percent of habitat is in SOS, bringing the total conservation of the orange-throated whiptail to 72 percent of locations and 84 percent of habitat. Two of the three *important locations* in *key locations* would be conserved and managed, although the extension of Cristianitos Road/"F" Street will result in potential fragmentation of the Chiquita Canyon/Wagon Wheel Ridgeline and Chiquadora Ridge *important populations/key locations*. A wildlife culvert under Cristianitos Road/"F" Street to maintain the Chiquita Canyon/Wagon Wheel population per *NCCP Minimization Measure 8-1* will be constructed. A bridge spanning a portion of Chiquadora Ridge to maintain connection of the Chiquadora Ridge population will be constructed. The seven large habitat blocks comprise 93 percent of conserved suitable habitat for the orange-throated whiptail and 84 percent of the conserved whiptail locations are in the large habitat blocks, indicating that most of the conserved whiptail habitat is relatively unfragmented. Furthermore, although the orange-throated whiptail is considered endangered based on its CNDDDB rank, coverage is warranted because the species is still relatively common throughout its geographic distribution in southern California and its viability rangewide does not depend on the proposed Covered Activities. The restoration activities identified above also would provide additional benefits to the species. Finally, the orange-throated whiptail and its habitat have already been substantially conserved in coastal southern California, having received regulatory coverage under the Western Riverside County MSHCP, the Central/Coastal NCCP/HCP, and the San Diego MSCP and MHCP.

#### *r. Red Coachwhip (Mastiscophis flagellum piceus)*

**Federal Status:** None

**State Status:** None

#### 1. Rangewide and Planning Area Status

The full species coachwhip is a wide-ranging species found throughout the southern U.S. from coast to coast and into northern Mexico (Stebbins 2003). They range in elevation from below sea level (in the desert) to about 7,700 feet. The subspecies red coachwhip (*M. f. piceus*) occurs throughout the arid desert regions of the southwest, including the Great Basin, Mojave, Colorado and Sonora deserts, as well as coastal southern California from the Central Valley south to the

border with Baja California. Coachwhips in the southwestern U.S. typically occur in open, dry, vegetative associations with very few or no trees. They appear to be most abundant in grass, desert, scrub, chaparral, and pasture habitats (Zeiner *et al.* 1990).

The subspecies red coachwhip is not a California Special Status species and thus has no CDFG designation or CNDDDB rank. However, similar to the other snakes proposed for regulatory coverage, biologists are becoming increasingly concerned about this subspecies in coastal southern California due to loss and fragmentation of habitat (P. Bloom, pers. comm. 2003) and it has a reasonable likelihood of listing over the duration of the project.

There are three documented locations for the red coachwhip in the planning area, all of which are in Subarea 1 (*Figure 202-M*). Two locations are in Arroyo Trabuco and one is at the confluence of Chiquita and San Juan creeks. Because of its broad habitat associations – coastal sage scrub, chaparral and grassland – this species could occur throughout suitable habitat in the planning area.

## 2. Conservation Analysis

The conservation analysis for the red coachwhip focuses primarily on landscape level habitat conservation because of its broad habitat associations and relative lack of site-specific occurrence information. Conservation is assessed in terms of overall habitat conservation, habitat blocks, and habitat contiguity and connectivity.

### (a) Impacts

The proposed Covered Activities would result in direct, permanent impacts to 6,254 acres (19 percent) of suitable habitat (coastal sage scrub, chaparral and grassland) and one of three (33 percent) documented locations in Subarea 1 (*Table 13-2* and *Figure 202-M*). The proposed Covered Activities also would result in temporary direct impacts to 205 acres of habitat, but no locations (*Table 13-6*).

### (b) Conservation

Two of the three (67 percent) documented locations in Subarea 1 and 23,111 acres (71 percent) of habitat would be conserved in the Habitat Reserve (*Table 13-2* and *Figure 202-M*). An additional 3,461 acres (11 percent) are in Subarea 1 SOS, bringing the total conservation of habitat to 26,572 acres (81 percent).

There are some data on the spatial behavior of the coachwhip indicating that they are quite wide ranging and active for a colubrid snake. In the eastern Mojave Desert, Secor (1995; cited at

www.natureserve.org) documented average “activity ranges” of 131 acres, movements on 76 percent of days monitored, and average daily movements of more than 600 feet. Based on available movement information for other colubrid snakes, NatureServe sets the “Separation Distance” through unsuitable habitat at 1 km (3,280 feet) and through suitable habitat at 5 km (3.1 miles); other colubrids exhibit home ranges between about 7 and 62 acres, although large colubrids have larger home ranges. Based on other colubrid species, it is reasonable to assume that coachwhips are unlikely to disperse between highly isolated habitat patches through unsuitable habitat and that paved, heavily used roads are significant risks for the species. Thus habitat patch size, contiguity and connectivity likely are key reserve design considerations for this species.

The results of the refined habitat block delineation used to analyze patch size are presented in *Table 13-9* and depicted in *Figure 193-M*. The seven habitat blocks combined include about 24,280 acres (including habitat in SOS in Coto de Caza in Subarea 3) of the 26,572 acres (91 percent) of conserved habitat (coastal sage scrub, chaparral and grassland) for the red coachwhip. Habitat within the blocks ranges from 732 acres in the Radio Tower Road mesa block to 11,985 acres in the Southeastern block.

Habitat linkages likely to be important for the red coachwhip also would be conserved, including: the north-south connection along Chiquita Ridge spanning the area from Ladera Open Space to Chiquita Creek (linkage C); the east-west connection from Arroyo Trabuco to Gobernadora and Caspers Wilderness Park via Chiquita Canyon (linkages B, D, H, I); the north-south connection along Chiquadora Ridge (linkage G); the floodplain along San Juan Creek and into Bell Canyon (linkage J); the linkage along and perpendicular to Verdugo Canyon (linkages L and M); the north-south linkages through the central and western portions of Trampas Canyon and Cristianitos Canyon (linkages J, K and N); and linkages O, P and Q in Gabino, La Paz and Talega canyons, respectively (see *Figure 193-M*). Where roads cross linkage areas wildlife movement and dispersal will need to be addressed. For example, bridges will be constructed across San Juan, Chiquita and Gobernadora creeks for Cow Camp Road, and San Juan Creek and Chiquadora Ridge for Cristianitos/“F” Street. For the extension of Cristianitos Road/“F” Street through Chiquita Canyon to Oso Parkway, a wildlife culvert at Chiquita Narrows within the design of Cristianitos Road shall be included with the following dimensions: The culvert shall have a minimum dimension of 15 by 15 feet, the bottom of the culvert shall be of a natural substrate, light shall be visible from one end of the culvert to the other, vegetation installed at either end shall be native low growing to prevent predator-prey stalking, and if required for public health and safety, all lighting on the road above the culvert shall be shielded to prevent spill-over effects (*NCCP Minimization Measure 8-1*).

### 3. Management

The red coachwhip has not been studied adequately to directly evaluate environmental stressors on the species that would provide the basis for management actions. However, it can be assumed that general impacts to its habitat and prey base have an adverse effect on the species. In addition, direct impacts common to many snakes such as vehicle collisions and human harassment can be assumed. Thus the following land uses and activities that can disturb suitable habitat and/or individual snakes are identified as potential stressors and will be considered for management:

- Habitat loss and fragmentation
- Urbanization adjacent to Habitat Reserve
- Exotic plant invasions (especially those that choke sandy washes and streamcourses such as giant reed)
- Rodent controls (coachwhips may use small mammal burrows as refugia, for foraging and for laying eggs)
- Urban-related predators such as cats and dogs
- Roads and trails
- Argentine ants (through effects on native lizards that are prey items for coachwhips)

Management actions to benefit the red coachwhip would be implemented primarily at a landscape level and include fire management and invasive species controls, including artichoke thistle controls in uplands and giant reed controls along washes that may be used for movement. Rodent controls will be prohibited within the Habitat Reserve, and the use of chemical pesticides in areas adjacent to the Habitat Reserve (*e.g.*, golf courses) will be minimized to the extent feasible and will be used in accordance with an approved Integrated Pest Management Program designed to avoid and minimize effects on native species and habitats. Urban-related predators such as cats and dogs will be controlled in the Habitat Reserve through public education and direct controls such as trapping where necessary and to the extent feasible. Collecting of the red coachwhip snake by the public would be prohibited within the Habitat Reserve, although this issue is not as great for the coachwhip as some other more docile snakes because it is difficult to catch and very aggressive when handled. Argentine ant controls will be implemented to reduce impacts on native lizards that are prey for the red coachwhip. Habitat restoration activities implemented at the discretion of the Reserve Manager and Science Panel to benefit this species include CSS/VGL restoration on Chiquita Ridge, in Sulphur Canyon, and on Chiquadora Ridge.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the red coachwhip snake is warranted because two of three occurrence locations, 71 percent of suitable habitat, and potentially important habitat linkages would be conserved and managed in the Habitat Reserve. Additional habitat conservation in SOS would bring the total habitat conservation to 81 percent. The seven large habitat blocks comprise about 91 percent of conserved suitable habitat for the red coachwhip, thus the large majority of conserved habitat is relatively unfragmented. In addition, coverage is warranted because the species is still relatively common in its range in the southwest U.S. beyond the Southern Subregion, it is not currently a federal or state Special Status species, and its viability rangewide does not depend on the proposed Covered Activities. The restoration activities identified above also would provide additional benefits to the species.

##### *s. “San Diego” Coast Horned Lizard (Phrynosoma coronatum; blainvillei population)*

**Federal Status:** Federal Species of Concern  
**State Status:** California Species of Special Concern  
**Science Advisors:** Group 2  
**NCCP/MSAA/HCP Planning Species**

#### 1. Rangewide and Planning Area Status

The full species coast horned lizard ranges throughout central and southern California west of the desert and Cascade/Sierra highlands throughout all of Baja California, except for the northeastern portion (Stebbins 1985). Until recently the subspecies San Diego horned lizard (*P. c. blainvillei*) was treated as a valid taxon. The 2005 CDFG Special Animals list now treats the former “San Diego” horned lizard as the coast horned lizard (*blainvillei* population); *i.e.*, *P. c. blainvillei* is no longer treated as a separate subspecies by CDFG. For consistency with the commonly used terminology for the “*blainvillei*” population in the literature, however, the common name “San Diego horned lizard” is retained in this discussion. The geographic range of the San Diego horned lizard includes the Transverse Ranges in Kern, Los Angeles, Santa Barbara, and Ventura counties southward through the Peninsular Ranges of southern California to Baja California (Jennings 1988).

The San Diego horned lizard is found in a wide variety of vegetation types, including coastal sage scrub, annual grassland, chaparral, oak woodland, riparian woodland and coniferous forest (Klauber 1939; Stebbins 1985). Although range wide, the species uses a variety of vegetation types, in the planning area the primary vegetation used by the horned lizard appears to be coastal sage scrub and chaparral. In inland areas, this species is restricted to areas with open

microhabitats, often created by natural or anthropogenic disturbances (e.g., floods, fire, roads, grazed areas, fire breaks) (Jennings and Hayes 1994). Horned lizards in general (*i.e.*, the genus *Phrynosoma*) primarily are ant-eating reptiles with relatively well-known dietary habits (Montanucci 1989; Pianka and Parker 1975; Powell and Russell 1984; Rissing 1981; Turner and Medica 1982). Up to 90 percent of the diet of San Diego horned lizard consists of native harvester ants (*Pogonomyrmex* spp.) (Pianka and Parker 1975). However, the San Diego horned lizard does not appear to eat non-native Argentine ants (*Linepithema humile*) (Jennings and Hayes 1994), which displace native ants wherever they are introduced (Suarez *et al.* 2001).

The San Diego horned lizard was once common on coastal plains and in riparian and coastal sage scrub habitats on the old alluvial fans in southern California (Hayes and Guyer 1981; Bryant 1911; Van Denburgh 1922), but appears to have been extirpated from about 45 percent of its former range in southern California (Jennings 1988). The “San Diego” horned lizard (*i.e.*, blainvillei population) is a CDFG CSC and has a CNDDDB rank of G4T3T4S2S3. The full species coast horned lizard is apparently secure but some factors such as loss of habitat rangewide are a cause for some concern. The San Diego horned lizard is considered restricted/rare to apparently secure throughout its range, including Baja California, but within California, per the CNDDDB ranking, it is considered restricted/rare to endangered. As noted above, non-native Argentine ants displace native harvester ants and thus are considered a threat to horned lizards (Suarez *et al.* 2001). Because Argentine ants tend to invade the urban-wildland interface, habitat fragmentation is an important issue for the horned lizard. In addition to habitat loss and Argentine ants, Jennings and Hayes (1994) identified several other threats to the San Diego horned lizard, including collection by humans, off-road vehicles, livestock grazing, conversion of habitat to agriculture, firebreaks and prescribed burning (although the latter two may actually create open microhabitats used by horned lizards).

The NCCP database for the San Diego horned lizard includes 50 occurrence records in the planning area, with virtually all in coastal sage scrub, and of which 48 of the locations are in Subarea 1 (*Figure 177-M*). Although there is a wide scattering of horned lizard occurrences in the subregion, based on the database there appears to be two clusters of occurrences that may be considered *important populations in key locations*: (1) a cluster of 15 occurrences in coastal sage scrub along the ridge between Chiquita Canyon and Wagon Wheel Canyon south of Oso Parkway; and (2) a cluster of 14 occurrences in the upper Cristianitos and southern Trampas Canyon sub-basins located between Cristianitos Road and Cristianitos Creek. As with the orange-throated whiptail, identifying these two areas as *important populations in key locations* must be qualified because they occur within survey areas for the FTC-S (SOCTIIP) surveys and thus probably reflect, at least in part, the greater survey effort in that portion of the planning area. On the other hand, even within the FTC-S survey area, these two locations stand out as having exceptionally high concentrations of horned lizards. Given the wide distribution of this species in the planning area, and its fairly general habitat requirements, it is likely that substantial

numbers of horned lizards occur in many other locations within the planning area, but perhaps not in the concentrations found in these two areas.

## 2. Conservation Analysis

The conservation analysis for the San Diego horned lizard is based both on site-specific information (*i.e.*, documented occurrences and identified *important populations/key locations*) and landscape-level habitat factors including amount of habitat conserved (defined as coastal sage scrub and chaparral), and habitat patch size, contiguity and connectivity.

### (a) Impacts

The proposed Covered Activities would result in direct, permanent impacts to 3,585 acres (15 percent) of suitable habitat (coastal sage scrub and chaparral) and 12 of 48 (25 percent) documented locations in Subarea 1 (*Table 13-2* and *Figure 177-M*). The proposed Covered Activities also would result in temporary direct impacts to 81 acres of habitat, but no locations (*Table 13-6*).

Five of the 14 individuals in the Cristianitos Canyon *important population/key location* are in PA 6 in the area targeted for potential future orchards. In addition, within the Chiquita Canyon/Wagon Wheel Ridgeline *important population/key location*, the alignment of Cristianitos Road/"F" Street extending to Oso Parkway isolates two horned lizard locations within this population from the rest of the population east of the alignment, effectively reducing the size of the population in the absence of measures to maintain the functional connection within this population.

### (b) Conservation

Thirty-six of the 48 (75 percent) documented locations in Subarea 1 and 17,385 acres (74 percent) of habitat would be conserved in the Habitat Reserve (*Table 13-2* and *Figure 177-M*). An additional 2,507 acres (11 percent) of habitat are in Subarea 1 SOS, bringing the total habitat conservation to 19,892 acres (85 percent).

All 15 locations in the Chiquita Canyon/Wagon Wheel Ridgeline *important population/key location* would be the Habitat Reserve. However, as noted above, the construction of Cristianitos Road/"F" Street would isolate two of the 15 locations on the west side of the road, so the ultimate conserved population is located to the east of the road (but see discussion of wildlife undercrossing below). Nine of the 14 locations in the Cristianitos Canyon *important population/key location* are in the Habitat Reserve. Reflecting the somewhat scattered

distribution of the horned lizard in the Habitat Reserve, 12 of the 36 conserved locations were not mapped within *important populations*.

There are no dispersal data for the San Diego horned lizard, but horned lizards as a group show limited home ranges, usually less than 5 acres (*e.g.*, Munger 1984), and daily movements of the closely related *P. cornutum* averaged about 150 feet per day (Whitford and Bryant 1979). Radiotelemetry of several dozen coast horned lizards in southern California locations over a 5-year period documented annual home range sizes of about 3 to 3.5 acres, with the likelihood that, across years, home range areas could be larger (unpublished data, Suarez, pers. comm. 2005). Because of their limited movements and relatively small home ranges, horned lizards are considered to be relatively sedentary animals and roads separating habitat patches likely are a significant barrier to dispersal. Large, unfragmented habitat blocks thus are considered important for this species.

The results of the refined habitat block delineation used to analyze patch size are presented in *Table 13-9* and depicted in *Figure 193-M*. The seven habitat blocks combined include about 18,684 acres (including habitat in SOS in Coto de Caza in Subarea 3) of the 19,892 acres (94 percent) of conserved habitat (coastal sage scrub and chaparral) for the horned lizard. Habitat within the blocks ranges from 211 acres in the Radio Tower Road mesa block to 9,307 acres in the Southeastern block. The Wagon Wheel habitat block that includes the Chiquita Canyon/Wagon Wheel Ridgeline *important population/key location* contains 610 acres of habitat.

Of the 36 conserved horned lizard locations, 34 (94 percent) are in large habitat blocks: 14 in the Wagon Wheel block, of which 13 comprise an *important population/key location*; 14 in the Southeastern block, of which nine are part of the Cristianitos *important population/key location*; and six in the Chiquita Ridge block, of which two are in the Chiquita Canyon/Wagon Wheel Ridgeline *important population/key location*. As discussed below, a wildlife undercrossing to maintain the connection of this population will be important.

Important habitat linkages for the San Diego horned lizard also would be conserved, including: the north-south connection along Chiquita Ridge spanning the area from Ladera Open Space to Chiquita Creek (linkage C); the east-west connection from Arroyo Trabuco to Gobernadora and Caspers Wilderness Park via Chiquita Canyon (linkages B, D, H, I); the north-south connection along Chiquadora Ridge (linkage G); the floodplain along San Juan Creek and into Bell Canyon (linkage J); the linkages along and perpendicular to Verdugo Canyon (linkage L and M); the north-south linkages through the central and western portions of Trampas Canyon and Cristianitos Canyon (linkages J and K); and linkages O, P and Q in Gabino, La Paz and Talega canyons, respectively (see *Figure 193-M*). As noted above, the construction of Cristianitos Road/"F" Street will affect the Chiquita Canyon/Wagon Wheel Canyon Ridgeline *important*

*population/key location* and thus, a wildlife undercrossing to maintain the connection of this population may be necessary, as discussed in the *Chapter 8* consistency analysis. (This connection will also be important for the orange-throated whiptail *important population/key location* discussed above.)

### 3. Management

Management for the San Diego horned lizard will consider a variety of environmental stressors identified for the species, including:

- Habitat loss and fragmentation due to urban and agricultural development
- Precipitation (extended drought, but also wet periods promoting spread of Argentine ants resulting from higher moisture content along urban/wildland interfaces)
- Argentine ants (through effects on native lizards that are prey items for horned lizards)
- Frequent fire
- Exotic plant invasions
- Cattle-related impacts
- Off-road vehicles
- Urban-related predators (primarily cats)
- Paved roads
- Human harassment and collection

The primary stressor on the coast horned lizard is habitat loss and fragmentation, with approximately 45 percent of habitat extirpated as of 1988 (Jennings 1988). In addition to habitat loss, Jennings and Hayes (1994) identified several other threats to the horned lizard, including collection by humans (including for commercial uses), off-road vehicles, livestock grazing, conversion of habitat to agriculture, invasion by Argentine ants, firebreaks and prescribed burning (although the latter two may actually create open microhabitats used by horned lizards). The stationary defensive behavior of horned lizards makes them particularly vulnerable to collection by people and crushing by vehicles and cattle. The invasion of habitat by Argentine ants in California recently has become a high profile threat, not only to the horned lizard, but also to other native species. While Argentine ants have been in California for at least 93 years (Holway 1995), studies of the species date back only to the 1970s. It is now clear that Argentine ants disrupt natural communities by displacing native ants and other arthropods and disrupting ant-plant and ant-aphid mutualisms (evolved interdependent associations) (Holway 1995). Fisher *et al.* (2002), for example, found in a pitfall-trapping study conducted throughout southern

California that the presence of horned lizards was positively correlated with the absence of Argentine ants and presence of native harvester ants.

Management actions to benefit the San Diego horned lizard will focus on fire management, control of Argentine ants, including control of urban runoff and irrigation adjacent to the Habitat Reserve that attracts Argentine ants, and control of collecting by the public. Urban-related predators (primarily cats) will be controlled in the Habitat Reserve through public education and direct controls such as trapping where necessary and to the extent feasible. Habitat restoration activities, subject to discretionary implementation by the Reserve Manager and Science Panel, to benefit this species include CSS/VGL restoration on Chiquita Ridge, in Sulphur Canyon, on Chiquadora Ridge and in upper Cristianitos Canyon. The coordinated GMP (*Appendix G*) will also benefit the San Diego horned lizard by preventing over-grazing. Artichoke thistle control will help maintain habitat quality for the horned lizard.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the San Diego horned lizard is warranted because 75 percent of locations and 74 percent of suitable habitat would be conserved in the Habitat Reserve. An additional 11 percent of habitat is in SOS, bringing total conservation to 75 percent of locations and 85 percent of habitat. Furthermore, 13 of 15 locations in the Chiquita/Wagon Wheel Ridgeline *important population/key location* would be conserved. Nine of 14 locations in the Cristianitos *important population/key location* would be conserved; the other five locations are in PA 6 targeted for potential orchards. The seven large habitat blocks comprise 18,684 acres (94 percent) of the 19,892 of conserved suitable habitat for the horned lizard. Furthermore, although it is considered restricted/rare to endangered in California according to its CNDDDB state rank, coverage is warranted because the species is widely distributed in southern California beyond the Southern Subregion and its viability rangewide does not depend on the proposed Covered Activities. The restoration activities identified above also would provide additional benefits to the species. Finally, substantial conservation of the horned lizard and its habitat has occurred in southern California, having regulatory coverage under the Coastal/Central NCCP/HCP, the Western Riverside County MSHCP and the San Diego MSCP.

##### *t. Southwestern Pond Turtle (Emys marmorata pallida)*

**Federal Status:** Federal Species of Concern  
**State Status:** California Species of Special Concern  
**Science Advisors:** Group 3  
**NCCP/MSAA/HCP Planning Species**

## 1. Rangewide and Planning Area Status

The full species western pond turtle historically extended along most of the west coast of North America, primarily west of the Cascade-Sierra crest from western British Columbia to northern Baja California (Ernst *et al.* 1994). The subspecies southwestern pond turtle (*E. m. pallida*) ranges from south of San Francisco Bay to northern Baja California, Mexico, and intergrades with the northwestern pond turtle (*E. m. marmorata*) over a large area in central California (Bury 1970; Stebbins 1985). Isolated populations of the southwestern pond turtle are known to exist as far into the Mojave Desert as Afton Canyon and in the Amargosa River (Lovich 1999). The elevational range of the western pond turtle is from brackish estuarine waters at sea level to over 6,560 feet, but it is uncommon over about 5,000 feet (Stebbins 1954; Bury 1963; Holland 1994). Pond turtles inhabit slow-moving or permanent or intermittent streams, small ponds, small lakes, reservoirs, abandoned gravel pits, permanent and ephemeral shallow wetlands, stockponds, and treatment sewage ponds (Rathbun *et al.* 1992; Holland 1994).

A number of threats have been identified for the southwestern pond turtle, with the greatest threat the loss and alteration of aquatic habitat, but also predation of young by introduced aquatic predators, collection for pets, competition with non-native turtles, contaminant spills, grazing, off-road activity, and vehicle collisions on roads. The southwestern pond turtle is a CDFG CSC and has a CNDDDB rank of G3G4T2T3S2. Globally the full species is considered restricted/rare to apparently secure, but with some concerns such as narrow habitat associations or continuing threats. The subspecies southwestern pond turtle is considered restricted/rare to endangered in its range, which extends south into northern Baja California, and within California, per the CNDDDB ranking, it is considered endangered.

There are currently 12 individual pond turtle occurrences from about eight discrete locations in the NCCP database, all of which are in Subarea 1 (*Figure 176-M*). The largest population is in the stock pond and adjacent grassland habitat in upper Cristianitos Canyon; several pond turtles have been observed in this area since the early 1990s, with the most recent observation during FTC-S (SOCTIIP) surveys of two individuals basking in the stockpond in 2001. There are four observations of single pond turtles within and adjacent to San Juan Creek, two of which were observed in CalMat Lake, one in uplands just north of the lake in a tributary drainage to San Juan Creek adjacent to Colorspot Nursery and one in uplands along the north edge of Colorspot Nursery. There is an observation of a single individual in grassland just west of Jerome's Lake in upper Gabino Canyon. Determinations of pond turtle locations are based on visual surveys (*i.e.*, as opposed to trapping), which tend to underestimate actual population sizes, so these data should be considered locational only. Additional survey work would be required to establish the population sizes at each of the occupied sites. However, given the few numbers visually observed at the sites, it is assumed that the populations are relatively small. Because the pond turtle is relatively rare in the planning area, all occupied sites except the location along the

northern edge of Colorspot Nursery are considered *important populations in key locations*. The Colorspot Nursery site is not considered an *important population in a key location* because the area does not support suitable breeding habitat and the current high level of human activity in the area poses a risk to turtles (e.g., potential collisions with vehicles and equipment). It seems unlikely that a population could persist in this area under existing conditions.

## 2. Conservation Analysis

The conservation analysis for the southwestern pond turtle focuses on specific documented locations, including *important populations/key locations*, uplands adjacent to breeding sites and habitat linkages to support both within stream dispersal by turtles and overland long-distance movements between the San Juan Creek and San Mateo Creek watersheds. Because conservation of breeding sites is site-specific, a landscape-level habitat analysis was not conducted, except for the purpose of assessing overland dispersal and migration opportunities.

### (a) Impacts

The proposed Covered Activities would result in impacts to the two pond turtle locations next to the Colorspot Nursery; the site in the tributary to San Juan Creek, which is part of the *important population/key location* and the site along the northern edge of the nursery which is not considered an *important population* (Figure 176-M). The stock pond and adjacent grassland habitat in upper Cristianitos Canyon is within the footprint for potential orchards in PA 6. This site will be avoided.

### (b) Conservation

Six of the eight known locations of the southwestern pond turtle would be conserved in the Habitat Reserve, including the site in Cristianitos Canyon that is within the PA 6 potential orchard area (Figure 176-M). All conserved sites are considered *important populations/key locations*. In addition, all conserved sites would have adequate buffers of at least a 300-foot radius (about 7-8 acres in area) from adjacent development and southern exposures to provide for nesting and overwintering sites. The undisturbed San Juan Creek floodplain would provide within stream dispersal habitat between pond turtle sites located along the creek (Figure 176-M).

Habitat connections between the San Juan Creek and San Mateo Creek watersheds would be maintained to allow for possible, but likely infrequent, long-distance dispersal movements between populations in San Juan Creek and upper Cristianitos Creek. The Southeastern habitat block south of San Juan Creek between PA 4 (East Ortega) and PA 5 (Trampas Canyon) is about 6,000 feet wide (Figure 176-M). The most likely dispersal route, considering terrain and vegetation, is along the riparian corridor east of Trampas Canyon connecting to the alkali

wetland/drainage and stockpond supporting turtles in upper Cristianitos Canyon. Although Ortega Highway would remain in service, the construction of Cow Camp Road north of Ortega Highway likely would reduce traffic volumes on Ortega Highway and the risk of vehicle collisions with turtles attempting to cross the highway.

### 3. Management

Management for the pond turtle will consider a variety of environmental stressors identified for the species, including:

- Exotic predators (introduced and urban-related; corvids?)
- Altered fire regime
- Too frequent flood regime
- Too infrequent flood regime
- Precipitation
- Upstream diversion
- Groundwater extraction
- Water quality
- Urbanization adjacent to Reserve
- Exotic plant invasion
- Cattle-related impacts
- Roads and trails
- Recreation
- Disease

Rangewide the main stress factors to the southwestern pond turtle have been habitat loss and fragmentation and commercial exploitation. Over 90 percent of wetland habitat within the historic range of the pond turtle in California has been eliminated by agricultural and urban development and water diversion projects (USFWS 1992, 1993d). Introduced predators such as bullfrogs, bass and catfish (bullheads) and urban-related predators (*e.g.*, dogs), competition with non-native turtles (Holland 1991), contaminant spills, grazing, off-road vehicle use and roadkill (Holland 1994) also are identified as stressors. Other stressors that specifically could affect breeding/nesting habitat quality include excessive groundwater extraction, water quality degradation and invasive plant species such as giant reed and tamarisk that alter hydrology and

channel morphology. Collecting by children also would be a logical threat in areas with recreation and close to urban areas.

Management and restoration actions addressing hydrology and water quality to benefit the pond turtle include maintaining hydrology, water quality and sediment delivery to San Juan Creek and minimizing additional loadings of nutrients or pollutants through the Gobernadora Multi-purpose Basin in Gobernadora Creek above GERA. (See the WQMP, *Appendix K*, as a “Coordinated Management Plan” and the draft Watershed Planning Principles consistency analysis in *Chapter 8*.) This involves a restoration program which addresses: (1) potential restoration of the historic creek meander above the knickpoint; (2) upstream land use-induced channel incision and erosion through the Gobernadora Multi-purpose Basin, including potentially excessive surface and groundwater originating upstream; and (3) identification of likely causes of erosion in Gobernadora Creek and potential measures to rectify causes of headcutting in the lower portion of the creek. Management will also address maintenance and/or repair of flow characteristics comparable to existing conditions from Trampas Canyon into San Juan Creek to preserve breeding habitat in San Juan Creek. Invasive species control/habitat restoration activities to benefit the pond turtle will include implementation of a giant reed control program for San Juan Creek within RMV boundaries in coordination with upstream County and CNF control efforts to protect and enhance breeding habitat and provide more water downstream to support breeding areas. The CSS/VGL restoration program in upper Cristianitos and Gabino canyons and soils stabilization programs to control erosion, implemented at the discretion of the Reserve Manager and Science Panel, also would benefit the pond turtle.

Other management actions include: (1) the Wildland Fire Management Plan (*Appendix N*) to help prevent erosion and siltation impacts on breeding habitats; (2) a bullfrog and non-native turtle control program in potential breeding areas where necessary; (3) protection of occupied nesting locations of the pond turtle from human disturbance and collection; (4) control of urban-related predators such as dogs through public education and direct controls such as trapping where necessary and to the extent feasible; and (5) signage along trails and bike paths in the Habitat Reserve to inform the public of the risk to native species such as pond turtles, and other reptiles and amphibians from recreational activities. In addition to these management actions, any pond turtles that are found in development areas will be salvaged and translocated to the nearest suitable conserved habitat.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the southwestern pond turtle is warranted because six *important population/key location* breeding sites and the adjacent upland nesting and over-wintering areas would be conserved in the Habitat Reserve (see *Figure 176-M*). An upland habitat linkage connecting the San Juan Creek and San Mateo Creek watersheds would be conserved to allow

for long-distance dispersal movements between breeding locales. In conjunction with conservation and management of breeding locations and associated upland nesting habitat, the restoration activities identified above would provide significant additional benefits to the species. In addition, although the southwestern pond turtle is considered endangered according to its CNDDDB rank, coverage is warranted because it is widely distributed in central and southern California beyond the Southern Subregion and the viability of the pond turtle does not depend on conservation in the planning area. Finally, substantial conservation of this species has already occurred in southern California, having regulatory coverage under the Western Riverside County MSHCP and the San Diego MSCP and MHCP.

***u. Western Spadefoot Toad (*Spea hammondi*)***

**Federal Status: Federal Species of Concern**  
**State Status: California Species of Special Concern**  
**Science Advisors: Group 3**  
**NCCP/MSAA/HCP Planning Species**

1. Rangewide and Planning Area Status

The western spadefoot toad is a California near endemic ranging from Shasta County southward into Baja California (Stebbins 1985). Its known elevation range extends from near sea level to about 4,900 feet (Zeiner *et al.* 1990; Ervin *et al.* 2001). The known range of western spadefoot toad is restricted to west of the Sierran-desert range axis (Myers 1944). Western spadefoot toads inhabit coastal sage scrub, chaparral, and grasslands habitats, but are most common in grasslands with vernal pools or mixed grassland/coastal sage scrub areas (Holland and Goodman 1998). For reproduction and successful metamorphosis, western spadefoot toads require rain-filled pools ranging between 48 and 86 degrees Fahrenheit (Brown 1966, 1967) that hold standing water for more than three weeks (Feaver 1971). Riparian habitats with suitable water resources also may be used for reproduction (Holland and Goodman 1998). Breeding pools must lack fish, bullfrogs, and crayfish in order for western spadefoot toad to successfully reproduce and metamorphose (Jennings and Hayes 1994).

The western spadefoot toad is a CDFG CSC and has a CNDDDB rank of G3S3; per the CNDDDB ranking, it is considered restricted/rare throughout its range in California (which is also essentially its global range). About 80 percent of the habitat once occupied by western spadefoot toad in southern California has been developed or converted to uses incompatible with successful reproduction or recruitment (Jennings and Hayes 1994). In addition, planting of mosquito fish for mosquito abatement programs in rain pools threatens some populations (Jennings and Hayes 1994) and bullfrogs emigrating into rain pool breeding sites also may pose a threat to this species as a predator (Hayes and Warner 1985; Morey and Guinn 1992). Finally, cattle grazing may

have an impact on this species if cattle trample eggs masses and tadpoles and lower water levels when they drink at pools.

The NCCP database includes 24 discrete locations for the western spadefoot toad, all of which are in Subarea 1 (*Figure 176-M*). Based on the database five *important populations* were identified: (1) vernal pools on Chiquita Ridge in Ladera Open Space; (2) vernal pools on Radio Tower Road; (3) San Juan Creek from the RMV Headquarters to the confluence with Verdugo Creek; (4) the stock pond in upper Cristianitos Canyon; and (5) lower Gabino Canyon. Because all of these scattered locations appear to support small populations and none appear to be crucial for maintaining the species in the planning area, no *key locations* were identified. The spadefoot toad likely is more widespread in the planning area than indicated by the database, but based on the focused survey efforts conducted for the species, it seems unlikely that a *major population* or a *key location* would have been missed.

## 2. Conservation Analysis

The conservation analysis for the western spadefoot toad is based on documented breeding locations and surrounding habitat because of its dependence on aquatic habitat for reproduction. Western spadefoot toads apparently do not move far from their breeding pool during the year, with movements within a few hundred meters of breeding pools (Zeiner *et al.* 1990), and it is likely that their entire post-metamorphic home range is situated around a few pools. Because conservation of the spadefoot toad depends on site-specific protection, a landscape-level habitat analysis was not conducted for this species, except for the purpose of assessing overland dispersal and migration opportunities.

### (a) Impacts

The proposed Covered Activities would result in impacts to four (17 percent) of the 24 breeding locations. These impacts assume that through project site design the three vernal pools supporting spadefoot toads and their hydrological sources in PA 5 would be protected (*e.g.*, by limiting the grading to below the grade of the pools) (see the Ranch Plan GPA/ZC EIR MM 4.9-35). Two of the impacted locations would be associated with proposed RMV development within PA 1 and two would occur in association with the Prima Deshecha Landfill Expansion GDP. Both impacted locations in PA 1 are within the San Juan Creek *important population*. One of the two impacted locations on the Prima Deshecha Landfill would be directly impacted by proposed expansion activities in Zone 4 of the Landfill and the other, although located in SOS, is only 150 feet from the edge of the Zone 4 impact area, likely resulting in inadequate upland habitat adjacent to the breeding site to support the life history requirements of the species. One temporary impact resulting from trail construction also was identified.

## (b) Conservation

A total of 19 locations (79 percent) would be conserved in the Habitat Reserve and one location (4 percent) in Subarea 1 SOS, including the Chiquita Ridge *important population*; three of the five locations in the San Juan Creek *important population*; all five locations in the Radio Tower Road *important population* (per MM 4.9-35); the Upper Cristianitos *important population*; the Lower Gabino Creek *important population*; a location in upper Chiquita, two locations along Chiquita Ridge (north and south of the Chiquita Ridge *important population*); a location at the confluence of Bell and San Juan creeks; and a location in SOS in NAS Starr Ranch (*Figure 176-M*). All conserved breeding locations except one location in San Juan Creek would have at least a 650-foot upland habitat buffer zone (about a 30-acre area) from proposed development that would be adequate to support all life stages of the spadefoot toad. The location next to PA 4 would be subject to at least temporary impacts, but because the PA 4 area adjacent to San Juan Creek will have long-term impacts limited to trails and infrastructure, and because the creek itself will be undisturbed, this site is considered conserved.

There is relatively little information bearing on the question of spadefoot toad movement between separate breeding locations or their capability of moving long distances (in contrast to the arroyo toad, for example) (see Morey 1998). They appear to carry out all their life-history requirements within a few hundred feet of breeding pools. The Habitat Reserve would, however, link all the *important populations* by natural vegetation communities and, thus would facilitate potential dispersal between populations. Direct linkages between the *important populations* include the following:

- A continuous linkage along Chiquita Ridge of approximately 6,860 feet from the Chiquita Ridge/Ladera Open Space population to the San Juan Creek population that includes grassland, coastal sage scrub, barley fields and riparian along Chiquita Creek.
- A linkage between the San Juan Creek and Radio Tower Road populations over a distance of approximately 4,750 feet composed mostly of grassland. Ortega Highway is an existing obstacle to movement between the two populations and could function as a sink. However, there are drainage culverts under Ortega Highway that could be used by toads. For example, there is an existing corrugated steel pipe culvert measuring 13 feet x 54 feet that crosses under Ortega Highway at Radio Tower Road that could be used by dispersing toads (Dudek 1995).
- A linkage of approximately 8,975 feet between the Upper Cristianitos and Lower Gabino populations along Cristianitos Creek and the canyon composed primarily of grassland and riparian habitats east of and within the creek and chaparral and coastal sage scrub west of the creek in the Donna O'Neill Land Conservancy.

The potential habitat linkages between the San Juan Creek and Radio Tower Road populations to the Upper Cristianitos populations though are more circuitous. Movement between the San Juan Creek and Upper Cristianitos populations, for example, could occur in a manner similar to that described for the arroyo toad and southwestern pond turtle. That is, based on topography and vegetation characteristics, dispersal along the “path of least resistance” between these two populations likely would generally be along the current alignment of Cristianitos Road that takes advantage of the most gentle terrain separating the two watersheds. A potential north-south dispersal route following Cristianitos Road gradually climbs from about 300 feet at San Juan Creek to about 500 feet maximum elevation before dropping down into Cristianitos Canyon where, at about 300 feet, the Cristianitos population is located. A tributary to Cristianitos Creek adjacent to the road that picks up about 1.1 miles south of San Juan Creek would seem the most likely dispersal corridor to the Cristianitos population. A second potential dispersal route is a tributary to San Juan Creek east of Cristianitos Road that would require toads to disperse through dense and rugged chaparral at elevations of at least 600 feet. For toads potentially moving between San Juan Creek and Upper Cristianitos generally a 5,000 to 6,000 foot wide swath of natural vegetation between PAs 4 and 5 would be conserved, providing a robust connection between the two populations.

The connection between the Radio Tower Road and Cristianitos populations would be less direct. Currently the only physical obstacle between the two populations is the Oglebay Norton Industrial Sands operation in Trampas Canyon. Intact natural vegetation currently directly links the two populations north and south of the mine. Upon development of PA 5 this existing potential link would be disrupted and toads would have to move either north or south of PA 5 development. Movements to the north possibly could occur along the face of the hill south of Ortega Highway or more indirectly via San Juan Creek. Movements to the south could occur along the constrained habitat linkage K between PA 5, the Prima Deshecha Landfill and the Talega development. Either route would substantially increase the required movement distance over the existing condition.

### 3. Management

Management of the western spadefoot toad will consider several environmental stressors identified for the species, including:

- Exotic predators
- Altered fire regime
- Too frequent flood regime
- Too infrequent flood regime
- Precipitation

- Groundwater extraction
- Water quality
- Urbanization adjacent to Reserve
- Exotic plant invasion
- Cattle-related impacts
- Roads and trails
- Recreation

Beyond loss and conversion of habitat, one of the primary factors in the decline of amphibians in California appears to be the introduction of exotic species such as bullfrogs and fishes (Fisher and Shaffer 1996). The planting of mosquito fish for mosquito abatement programs in rain pools threatens some populations (Jennings and Hayes 1994) and predatory bullfrogs emigrating into rain pool breeding sites also pose a threat to western spadefoots (Hayes and Warner 1985; Morey and Guinn 1992). Fisher and Shaffer (1996) documented a general significant inverse relationship between declines in amphibians, including western spadefoot, and introduced exotics (bullfrogs and fish) in the Central Valley. They also found that most ponds with native amphibians lacked exotic species.

In principle, other stressors listed above that potentially alter breeding and non-breeding upland habitat such as fire (both destruction of vegetation and soil impacts such as erosion of uplands and sedimentation of creeks and pools), altered flood regimes, surface and subsurface water sources, and roads and trails can have profound effects on spadefoot populations. For example, breeding pool duration is extremely important for successful reproduction. Morey (1998) found that successful metamorphosis in the Central Valley occurred in pools that were filled for at least 36 days, although successful metamorphosis may occur in as few as three weeks (Jennings and Hayes 1994). Also, metamorphosis occurs at a larger size in longer duration pools, which has important implications for terrestrial survival and fitness (*e.g.*, fatter toads are more resistant to starvation than leaner toads) (Morey 1998).

Cattle may have an impact on this species if cattle trample eggs masses and tadpoles and lower water levels when they drink at pools. However, a recent study of Central California vernal pools suggests a more complex relationship between cattle and vernal pool hydrology, where in some cases cattle grazing may enhance pool duration and the likelihood of vernal pool species completing their reproductive cycles (Pyke and Marty 2005; Marty 2005; see *Appendix E* for a more detailed discussion).

Collecting of toads at pools accessible by the public also is a potential threat to this species.

Management actions to address these stressors and that would benefit the western spadefoot toad include: **(1)** conservation of downstream habitat in San Juan Creek by maintaining hydrology, water quality and sediment delivery and minimizing additional loadings of nutrients or toxics; **(2)** implementation of a bullfrog and crayfish control program within permanent and semi-permanent water bodies in San Juan Creek, identification of other bullfrog and crayfish breeding areas that may pose a risk to the spadefoot, and implementation of control programs where necessary; **(3)** maintenance/repair of stormwater flow characteristics comparable to existing conditions from Trampas Canyon into San Juan Creek to preserve breeding habitat; and **(4)** implementation of a management program for vernal pools and other ephemeral breeding sites for the spadefoot, including control of non-native species and minimization of human access. The coordinated GMP (*Appendix G*) also would benefit this species by protecting vernal pools during the breeding season.

Habitat restoration activities that would benefit the western spadefoot toad include implementation of an invasive species control program for San Juan Creek on RMV between San Juan Capistrano and Bell Canyon to control giant reed and pampas grass in coordination with upstream control efforts by the County and the CNF.

Other management actions subject to discretionary implementation by the Reserve Manager and Science Panel that potentially could enhance breeding and upland estivation habitat value for the western spadefoot toad include implementation of an invasive species control program for lower Cristianitos Creek from the confluence with Gabino Creek and the RMV boundary to control tamarisk, pampas grass, bullfrogs and crayfish and implementation of a native grasslands restoration program in the upper portion of the Cristianitos sub-basin.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the western spadefoot toad is warranted because 83 percent of the documented breeding locations would be conserved in the Habitat Reserve and SOS. Four of the five *important populations* (Chiquita Ridge, Radio Tower Road, Upper Cristianitos and Lower Gabino Creek) would be 100 percent conserved, and three of the five locations in the San Juan Creek *important population* would be conserved in the Habitat Reserve. Adequate upland habitat around all these breeding sites would be conserved and managed. Conservation of these locations and associated upland habitat, in conjunction with the aforementioned management measures, would provide for the conservation of the species. Although the western spadefoot toad is considered restricted/rare in California based on its CNDDDB rank, coverage is warranted because it is widespread in southern California beyond the Southern Subregion and its viability range wide does not depend on conservation actions in the planning area. Finally, substantial conservation of this species has already occurred in southern California, having regulatory

received coverage under the Central/Coastal NCCP/HCP, Western Riverside County MSHCP and the San Diego MHCP.

***v. Partially-armored Threespine Stickleback (Gasterosteus aculeatus ssp. microcephalus)***

**Federal Status:** None  
**State Status:** None  
**Science Advisors:** Group 3

1. Rangewide and Planning Area Status

The partially-armored threespine stickleback historically occurred in the creeks and rivers between San Juan and Trabuco creeks in Orange County and the Tijuana River in San Diego County (Swift *et al.* 1993). This subspecies prefers clean, clear pools or flowing streams with sand and cobble along the bottom, and vegetation along the sides. It also prefers submergent plants for refugia and to make its elaborate nest. It appears to be subject to predation from other fish and typically occurs only with arroyo chub in the suitable areas of the creek. When creeks flood in the winter and spring, sticklebacks are able to utilize the temporary habitat areas, persisting until these areas dry-out in summer or fall. Although the partially-armored threespine stickleback may retreat to a few refugia areas within a creek, there may be annual or at least intermittent geneflow between these sub-populations and the maintenance of the intermediate creek stretches may be important for their long-term persistence.

The partially-armored threespine stickleback is listed as in decline by the CDFG (Moyle *et al.* 1995). It has widely disappeared throughout this region due to a variety of factors including channelization and introduction of exotic species (Moyle *et al.* 1995). Currently, only San Juan and Trabuco creeks within their native range are considered to support stable populations. In addition to habitat loss, the taxonomy and natural history of this species has contributed to its rarity. Specifically, stickleback populations in California (as throughout their range) include two basic forms: robust anadromous forms and smaller non-migratory freshwater forms. Because each non-migratory population is independently derived from anadromous sticklebacks, each drainage course with a non-migratory population could be considered an endemic taxon (species or subspecies); however, this is not reflected in the current taxonomic treatments. According to Swift (2005) the current range of what is taxonomically classified as *G. a. microcephalus* includes San Juan Creek extending into the Cleveland National Forest, Bell Canyon in Caspers Wilderness Park, upper portions of Trabuco Creek and two or three locations in northern Baja, California.

As noted above, the partially-armored threespine stickleback is known from San Juan and Arroyo Trabuco creeks, the latter documented by Johnston (1998) in surveys for the Arroyo Trabuco Golf Course Project.

## 2. Conservation Analysis

The conservation analysis for the partially-armored threespine stickleback includes an analysis of some minor permanent direct and temporary indirect impacts resulting from bridge placements across San Juan and Gobernadora creeks, but mostly focuses on potential future long-term impacts on habitat quality such as hydrologic and geomorphic processes and water quality.

### (a) Impacts

The proposed Covered Activities would result in minor direct impacts to habitat of the partially-armored threespine stickleback. The proposed crossings of San Juan Creek by the bridges for Cristianitos and Cow Camp roads would require piers that would impact a total of 0.06 acre in the streambed. However, the piers would not adversely affect natural streambed processes such as base flows and sediment transport and deposition and would not be a barrier to fish movement. San Juan and Gobernadora creeks would be subject to temporary alteration or diversion to accommodate grading and construction for the circulation system of the B-12 Alternative resulting in short-term direct and indirect impacts associated with implementation of the proposed Covered Activities. Suitable habitat for the stickleback in Gobernadora Creek extends approximately 3,000 feet upstream of the potential impact areas and would not be affected by construction activities. Construction along or across San Juan Creek could potentially impact the quality of the natural habitats supporting the stickleback. Factors that could potentially impact these areas in the short-term include: **(1)** the temporary blockage or diversion of water flow in San Juan Creek; **(2)** increased siltation from grading or movement of construction equipment; and **(3)** the degradation of water quality by the disturbance of anaerobic (low oxygen) sediments. Because most of the high quality habitat areas in San Juan Creek are upstream of RMV in Caspers Wilderness Park (including Bell Canyon) and extending into the Cleveland National Forest, the potential impacts would not be considered substantial. Potential long-term impacts include hydrologic conditions of concern such as changes in rates of erosion or sedimentation and the generation of pollutants of concern such as metals. These potential indirect effects are addressed in the Management section below.

### (b) Conservation

All occupied aquatic habitat for the partially-armored threespine stickleback would be in the Habitat Reserve. As described above, the proposed Covered Activities would result in some minor direct impacts to habitat of the partially-armored threespine stickleback where the

proposed crossings of San Juan Creek by the bridges for Cristianitos and Cow Camp roads would require piers. The piers would not adversely affect natural streambed processes such as base flows and sediment transport and deposition and would not be a barrier to fish movement. Also, based on conceptual designs, significant shading impacts to San Juan Creek would not occur because both proposed bridges are 50 feet or higher. Thus sufficient light would reach below the bridge structures to promote growth of typical riparian species such as mule fat and willows. These project design features also are referenced in the SAMP USACE Permit Special Condition I.D.1.a regarding bridge crossings. In addition, the existing Cow Camp culvert crossing of San Juan Creek is addressed by Special Condition I.D.3 which addresses the retrofit or relocation of the existing crossing to allow for fish passage. Finally, Special Condition II.9 requires stickleback surveys within 1,000 feet downstream of each PA prior to construction to address construction-related turbidity.

Conservation of this species in the Habitat Reserve thus primarily will rely on short-term protection during construction activities and long-term management of hydrologic and geomorphic processes and water quality, as described below.

### 3. Management

Management for the partially-armored threespine stickleback will focus on potential long-term indirect impacts to San Juan, Gobernadora and Arroyo Trabuco creeks that could affect stickleback habitat quality. These potential impacts include hydrologic conditions of concern such as changes in rates of erosion or sedimentation and the generation of pollutants of concern such as metals. Several management and restoration actions could benefit the stickleback and enhance recovery of the species in the Habitat Reserve. First, Verdugo Canyon hydrology would be maintained to protect sources of sediment that would be important for maintaining suitable stickleback breeding habitat in downstream areas of San Juan Creek (see Draft Watershed Planning Principles analysis in *Chapter 9*). Second, potential spawning sites in San Juan Creek would be conserved by maintaining hydrology and water quality, including flow characteristics of episodic events, and minimizing additional loadings of nutrients or pollutants (*e.g.*, metals) through implementation of the WQMP (*Appendix K*). Stormwater flow characteristics would be maintained to preserve the natural succession of riparian habitat and the overall natural hydrologic/geomorphic conditions. Third, as part of the HRMP, bullfrog and crayfish control programs to help protect stickleback eggs, fry and juveniles would be implemented, with a special focus on permanent and semi-permanent water bodies that provide source concentrations of bullfrogs and crayfish. Fourth, habitat restoration and enhancement activities to benefit the threespine stickleback would include a giant reed control program on RMV property within San Juan Creek in coordination with upstream control efforts by the County and CNF and giant reed and pampas grass control in Arroyo Trabuco. Control of giant reed and pampas grass in these two drainages will result in more potential spawning habitat both by providing for more native

riparian vegetation and increasing water supplies necessary to sustain water throughout the spawning season. Fifth, implementation of a restoration program in Gobernadora Creek which addresses (1) the historic creek meander above the knickpoint, and (2) existing upstream land use-induced channel incision and erosion through the Gobernadora Multi-purpose Basin, including potentially excessive surface and groundwater originating upstream.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the partially-armored threespine stickleback is warranted because all occupied areas in the Subarea would be conserved in the Habitat Reserve and managed to avoid and minimize potential direct and indirect effects to hydrologic and geomorphic processes and water quality. Invasive species controls and habitat restoration in San Juan, Gobernadora and Arroyo Trabuco creeks would benefit this species by increasing the available suitable habitat and water to support spawning.

##### *w. Arroyo Chub (*Gila orcutti*)*

**Federal Status:** Federal Species of Concern  
**State Status:** California Species of Special Concern  
**Science Advisors:** Group 3

#### 1. Rangewide and Planning Area Status

The native range of the arroyo chub includes major coastal drainages from Malibu Creek and the Los Angeles and San Gabriel rivers in the north to the Santa Margarita and San Luis Rey rivers in the south. Areas where the chub appears to be fairly common include: the upper Santa Margarita River and its tributary De Luz Creek; Trabuco Creek below O'Neill Regional Park; San Juan Creek; and Malibu Creek. Populations of arroyo chub considered to be introduced (or at least it is suspected to be introduced) are known from the Santa Maria-St. Inez, Mojave, Santa Clara, and Cuyama river drainages, and a portion of San Felipe Creek.

The chub prefers clean, clear pools or flowing streams with cobble and riffles. It appears to be vulnerable to predation from other fish and often occurs in stream segments with the partially-armored threespine stickleback. When creeks flood in the winter and spring, the chub is able to invade the newly created flowing habitats and persist until these reaches dry in the summer and fall. In general, they prefer slow moving stream segments or backwater pools of warm to cool streams with substrates of sand or mud (Moyle 1976). The depth of the stream is typically greater than 10 inches. Although arroyo chub may have a few refugia populations within a creek, there may be annual, or at least periodic, geneflow between these populations and the maintenance of the intermediate creek stretches may be important for long-term persistence.

The arroyo chub is a CDFG CSC and has a CNDDDB rank of G2S2; it is considered endangered throughout its range. The chub is vulnerable to a number of threats that are habitat-, biologically- and water quality-based, most significantly introduced fish species and continued degradation of the urbanized streams that constitute much of its habitat. Because existing habitat is degraded and fragmented the arroyo chub likely is highly vulnerable to random events, environmental factors, and genetic isolation and demographic instability. Floods, fires, variations of annual weather patterns, predation, and associated demographic uncertainty can result in local extirpations, that, because of isolation and physical barriers, cannot be recolonized. Other impacts on the arroyo chub and their habitat include: (1) human recreational use of rivers and streams that can disturb spawning and feeding behavior; (2) cattle urine and feces that increase ammonia and nitrate levels that result in increased oxygen consumption by nitrifying bacteria and a concomitant decrease in oxygen available for fish; and (3) toxins that can be deleterious in chronic amounts (*e.g.*, Thurston *et al.* 1986). In Orange County, mosquito fish and minnows have been introduced into Trabuco and San Juan creeks and the interaction between these fish species is not known.

Currently, only a few creeks within their native range support stable populations. One of the largest remaining natural populations occurs in Orange County in San Juan and Trabuco creeks. Surveys conducted in San Juan Creek in 2004 detected arroyo chub downstream of the RMV boundary near the La Novia Bridge and it is expected that they continue to occupy areas within RMV and Caspers Wilderness Park, extending well into the Cleveland National Forest, which exhibits the largest areas of suitable habitat. Surveys conducted by MBA in 1995 also report the arroyo chub in Gobernadora Creek, upstream of San Juan Creek; however, this population is isolated from San Juan Creek due to impassable areas in Gobernadora Creek immediately upstream of the confluence with San Juan Creek that allow only movement from Cañada Gobernadora to San Juan Creek but not from San Juan Creek to Gobernadora. Surveys by Johnston (1998) for the Arroyo Trabuco Golf Course project documented the chub in lower Arroyo Trabuco.

## 2. Conservation Analysis

The conservation analysis for the arroyo chub is similar to that described above for the partially-armored threespine stickleback because of the similar distribution and overlap of the two species and because they are likely to be subject to the same stressors. Likewise, management actions carried out for these two species essentially will be the same because there are no obvious differences in their known ecologies that would suggest substantially different management approaches, or situations where management of one of the species would be contrary or detrimental to the other. It is possible in the future that more species-specific management measures may be required, at which time the potential impact of the measure on the other species

would need to be determined. For the sake of completeness, the complete conservation analysis for the arroyo chub is provided below.

(a) Impacts

The proposed Covered Activities would result in minor direct impacts to habitat of the arroyo chub. The proposed crossings of San Juan Creek by the bridges for Cristianitos and Cow Camp roads would require piers that would impact 0.06 acre in the streambed. However, the piers would not adversely affect natural streambed processes such as base flows and sediment transport and deposition and would not be a barrier to movement. San Juan and Gobernadora creeks would be subject to temporary alteration or diversion to accommodate grading and construction for the circulation system of the B-12 Alternative resulting in indirect impacts associated with implementation of the proposed Covered Activities. Suitable habitat for the chub in Gobernadora Creek extends approximately 3,000 feet upstream of the potential impact areas and would not be affected by construction activities. Construction along or across San Juan Creek could potentially impact the quality of the natural habitats supporting the chub. Factors that could potentially impact these areas include: **(1)** the temporary blockage or diversion of water flow in San Juan Creek; **(2)** increased siltation from grading or movement of construction equipment; and **(3)** the degradation of water quality by the disturbance of anaerobic (low oxygen) sediments. Because most of the high quality habitat areas in San Juan Creek are upstream of RMV in Caspers Wilderness Park (including Bell Canyon) and extending into the Cleveland National Forest, the potential impacts would not be considered substantial. Potential long-term impacts include hydrologic conditions of concern such as changes in rates of erosion or sedimentation and the generation of pollutants of concern such as metals. These potential indirect effects are addressed in the Management section below.

(b) Conservation

All occupied habitat for the arroyo chub would be in the Habitat Reserve. As described above, the proposed Covered Activities would result in some minor direct impacts to habitat of the chub where the proposed crossings of San Juan Creek by the bridges for Cristianitos and Cow Camp roads would require piers. The piers would not adversely affect natural streambed processes such as base flows and sediment transport and deposition and would not be a barrier to movement. Also, based on conceptual designs, significant shading impacts to San Juan Creek would not occur because both proposed bridges are 50 feet or higher. Thus sufficient light would reach below the bridge structures to promote growth of typical riparian species such as mule fat and willows. These project design features also are referenced in the SAMP USACE Permit Special Condition I.D.1.a regarding bridge crossings. In addition, the existing Cow Camp culvert crossing of San Juan Creek is addressed by Special Condition I.D.3 which addresses the retrofit or relocation of the existing crossing to allow for fish passage. Finally, Special Condition

II.9 requires arroyo chub surveys within 1,000 feet downstream of each PA prior to construction to address construction-related turbidity.

Conservation of this species in the Habitat Reserve thus primarily will rely on short-term protection during construction activities and long-term management of hydrologic and geomorphic processes and water quality, as described below.

### 3. Management

Management for the arroyo chub will focus on potential long-term indirect impacts to San Juan, Gobernadora and Arroyo Trabuco creeks that could affect chub habitat quality. These potential impacts include hydrologic conditions of concern such as changes in rates of erosion or sedimentation and the generation of pollutants of concern such as metals. Several management and restoration actions could benefit the chub and enhance recovery of the species in the Habitat Reserve. First, Verdugo Canyon hydrology would be maintained to protect sources of sediment that would be important for maintaining suitable chub breeding habitat in downstream areas of San Juan Creek (see Draft Watershed Planning Principles analysis in *Chapter 9*). Second, potential spawning sites in San Juan Creek would be conserved by maintaining hydrology and water quality, including flow characteristics of episodic events, and minimizing additional loadings of nutrients or toxics (*e.g.*, metals) through implementation of the WQMP (*Appendix K*). Stormwater flow characteristics would be maintained to preserve the natural succession of riparian habitat and the overall natural hydrologic/geomorphic conditions. Third, as part of the HRMP, bullfrog and crayfish control programs to help protect chub eggs, fry and juveniles would be implemented, with a special focus on permanent and semi-permanent water bodies that provide source concentrations of bullfrogs and crayfish. Fourth, habitat restoration and enhancement activities to benefit the arroyo chub would include a giant reed control program on RMV property within San Juan Creek in coordination with upstream control efforts by the County and CNF and giant reed and pampas grass control in Arroyo Trabuco. Control of giant reed and pampas grass in these two drainages will result in more potential spawning habitat both by providing for more native riparian vegetation and increasing water supplies necessary to sustain water throughout the spawning season. Fifth, implementation of a restoration program in Gobemadora Creek which addresses (1) the historic creek meander above the knickpoint, and (2) existing upstream land use-induced channel incision and erosion through the Gobernadora Multi-purpose Basin, including potentially excessive surface and groundwater originating upstream.

### 4. Rationale for Regulatory Coverage

Regulatory coverage for the arroyo chub is warranted because all occupied areas in the Subarea would be conserved in the Habitat Reserve and managed to avoid and minimize potential direct and indirect effects to hydrologic and geomorphic processes and water quality. Invasive species

controls and habitat restoration in San Juan, Gobernadora and Arroyo Trabuco creeks would benefit this species by increasing the available suitable habitat and water to support spawning.

Also, the arroyo chub has received substantial conservation in southern California, having regulatory coverage under the Western Riverside County MSHCP and San Diego MSCP.

***x. Riverside Fairy Shrimp (*Streptocephalus woottoni*)***

**Federal Status:       Endangered**  
**State Status:         None**  
**Science Advisors:   Group 3**  
**NCCP/MSAA/HCP Planning Species**

1. Rangewide and Planning Area Status

The Riverside fairy shrimp is restricted to southwestern California and northwestern Baja California. It occurs from southern Ventura County south and east through Orange and western Riverside counties to coastal San Diego County (primarily Camp Pendleton and Otay Mesa) and the vicinity of Baja Mar north of Ensenada in Baja California, Mexico. With the exception of the Riverside populations, all populations are within about nine miles of the coast (Eriksen and Belk 1999).

The Riverside fairy shrimp is restricted to deep seasonal vernal pools, vernal pool-like ephemeral ponds, and stock ponds and other human modified depressions (Eng *et al.* 1990; USFWS 1993c; USFWS 2001d). Riverside fairy shrimp prefer warm-water pools that have low to moderate dissolved solids, are less predictable, and remained filled for extended periods of time (Eriksen and Belk 1999). Basins that support Riverside fairy shrimp are typically dry a portion of the year, but usually are filled by late fall, winter or spring rains, and may persist through May (USFWS 2001d). All known vernal pool habitat lies within annual grasslands, which may be interspersed through chaparral or coastal sage scrub vegetation.

The Riverside fairy shrimp is federally-listed as endangered. Its CNDDDB rank is G1S1; it is considered extremely endangered throughout its range in both California and Baja California. The Riverside fairy shrimp has suffered substantial loss of vernal pool habitat in southern California due to conversion to agriculture and urbanization and existing pools are often degraded by habitat fragmentation, cattle grazing, contaminants, off-road vehicles and exotic species (USFWS 1998c).

The Riverside fairy shrimp is known from vernal pools on Saddleback Meadows in Subarea 2 in the northwest portion of the planning area, two pools near the intersection of Antonio Parkway

and the FTC-North segment, a very large population in a large pool on Chiquita Ridge (Pool 4) and in two pools located on the Radio Tower Road mesa (Pools 2 and 7). Because this species is rare in the subregion, all vernal pools supporting the Riverside fairy shrimp are considered *important populations in key locations*.

## 2. Conservation Analysis

The conservation analysis for the Riverside fairy shrimp focuses on the protection and management of vernal pools supporting the species in the Habitat Reserve.

### (a) Impacts

The only potential direct impact to the Riverside fairy shrimp is to Pool 7 on the Radio Tower Road mesa (*Figure 173-M*). Through project site design Pool 7 and its hydrological sources would be protected (*e.g.*, by limiting the grading to below the grade of the pools) (see the Ranch Plan GPA/ZC EIR MM 4.9-35). Potential direct and indirect impacts that could adversely affect pools supporting the Riverside fairy shrimp over the long term include impacts on hydrology, water quality, invasive exotic species and human disturbance. Cattle-related impacts (*e.g.*, trampling pools, impacts on water quality, etc.) are an issue for Pools 2 and 7 on Radio Tower Road mesa. These potential impacts are addressed in the management section below.

### (b) Conservation

All three vernal pools supporting the Riverside fairy shrimp and their contributing hydrological resources on Chiquita Ridge (Pool 4) and the Radio Tower Road mesa (Pools 2 and 7) would be conserved and managed in the Habitat Reserve (see *Figure 173-M*), assuming avoidance of Pool 7 through project site design per the Ranch Plan GPA/ZC EIR MM 4.9-35.

## 3. Management

Given 100 percent conservation of occupied vernal pools, management and monitoring of the pools through implementation of the HRMP is the key issue for conservation of the Riverside fairy shrimp in the Habitat Reserve. Management of hydrology of the vernal pools and controlling invasive species are the primary management concerns. Because the contributing hydrological resources will be unaltered, direct disturbances to the hydrology of the vernal pools are not expected. The effects of cattle and exotic species on hydrology are considered to be the two important management issues. Exotic species can have a clear negative impact on vernal pool hydrology such as decreasing the pool's hydroperiod, possibly because of increased evapotranspiration rates associated with abundant vegetation in and around pools (Marty 2005). The relationship between cattle grazing and vernal pool hydrology is more complex. Marty

(2005) found that removing cattle from some vernal pool areas in California's Central Valley decreased pool inundation periods by 50 to 80 percent, making it difficult for some vernal pool species to complete their life cycle. Marty attributes this to the reduction of vegetation in and around the vernal pools by cattle and the fact that vernal pool species are adapted to some level of grazing that has occurred in California grasslands back to the Pleistocene. However, Marty cautions that any beneficial effects of cattle likely will interact with seasonal and site-specific variations in rainfall; *e.g.*, where rainfall levels are higher, the positive effect of grazing may be less prominent. Whether this beneficial effect of cattle on vernal pools in the Central Valley holds for the pools in the Subregion would require further study.

Management of two occupied Radio Tower Road mesa vernal pools primarily will be implemented through timed grazing per the coordinated GMP (*Appendix G*) for exotic species control during the vernal pool dry season and seasonal exclusion of grazing during the wet season to allow the fairy shrimp to complete their life cycle. Experimental prescribed burns may also be used as an exotics control technique. Because cattle grazing has already been excluded from the occupied Chiquita Ridge vernal pool within existing Ladera Open Space and because prescribed burns probably are not feasible due to the close proximity to existing development in Ladera Ranch, management primarily will be implemented through exotics controls by means of mowing and/or selective weeding.

The HRMP also will include monitoring of the Radio Tower Road mesa and Chiquita Ridge vernal pools and Riverside fairy shrimp populations (including the two small pools on Chiquita Ridge and the one pool on Radio Tower Road mesa lacking documented Riverside fairy shrimp), managing hydrological regimes by maintaining the existing local contributing hydrological sources, managing water quality to emulate baseline conditions, and controlling public access, especially during the wet season.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the Riverside fairy shrimp is warranted because all three vernal pools (2, 4 and 7) supporting the shrimp would be conserved and managed in the Habitat Reserve. In addition, substantial conservation of the Riverside fairy shrimp in southern California has already occurred. It is provided regulatory coverage by the Central/Coastal NCCP/HCP, the Western Riverside County MSHCP, and the San Diego County MSCP and MHCP, and, furthermore, one of the largest vernal pool complexes supporting Riverside fairy shrimp is located on MCB Camp Pendleton. Conservation of the Riverside fairy shrimp in Subarea 1 would provide for recovery of the species in the permit area and contribute to its recovery rangewide.

*y. San Diego Fairy Shrimp (Branchinecta sandiegonensis)*

**Federal Status:**        **Endangered**  
**State Status:**         **None**  
**Science Advisors:**   **Group 3**  
**NCCP/MSAA/HCP Planning Species**

1. Rangewide and Planning Area Status

The San Diego fairy shrimp is restricted to vernal pools in coastal southern California and Baja California, Mexico. Its current range in coastal southern California includes western San Diego County and southern and central Orange County. All known localities of the species are below 2,300 feet and are within 40 miles of the Pacific Ocean (USFWS 2000c). The largest concentration of vernal pools supporting the San Diego fairy shrimp is in San Diego County, with an estimated 202 acres of occupied vernal pool basins in the County at the time of the species' listing in 1997. Of this occupied habitat, approximately 70 percent is on military lands, including the Miramar MCAS and Camp Pendleton (USFWS 2000c).

The San Diego fairy shrimp is federally-listed as endangered. Its CNDDDB rank is G1S1; it is considered extremely endangered throughout its range in both California and Baja California. The San Diego fairy shrimp has suffered substantial loss of vernal pool habitat in southern California due to conversion to agriculture and urbanization and existing pools are often degraded by habitat fragmentation, cattle grazing, contaminants, off-road vehicles and exotic species (USFWS 1998c).

The San Diego fairy shrimp occurs in two locations in the planning area: in the large and small vernal pools on Chiquita Ridge (pools 4 and 6) and in three pools located on the Radio Tower Road mesa (pools 1, 2 and 7) (*Figure 173-M*). Because this species is rare in the region, all locations are *important populations in key locations*.

2. Conservation Analysis

The conservation analysis for the San Diego fairy shrimp focuses on the protection and management of vernal pools supporting the species in the Habitat Reserve. The conservation analysis presented here is similar to that presented above for the Riverside fairy shrimp because the issues are the same.

### (a) Impacts

The only potential direct impact to the San Diego fairy shrimp is to Pool 7 on the Radio Tower Road mesa. Through project site design Pool 7 and its hydrological sources would be protected (*e.g.*, by limiting the grading to below the grade of the pools) (see the Ranch Plan GPA/ZC EIR MM 4.9-35). Potential direct and indirect impacts that could adversely affect the pools supporting the San Diego fairy shrimp over the long term include impacts on hydrology, water quality, invasive exotic species and human disturbance. Cattle-related impacts (*e.g.*, trampling pools, impacts on water quality, etc.) are an issue for Pools 1, 2 and 7 on Radio Tower Road mesa. These potential impacts are addressed in the management section below.

### (b) Conservation

All five vernal pools supporting the San Diego fairy shrimp and their contributing hydrological resources on Chiquita Ridge (Pools 4 and 6) and the Radio Tower Road mesa (Pools 1, 2 and 7) would be conserved and managed in the Habitat Reserve (see *Figure 173-M*), assuming avoidance of Pool 7 through project site design per the Ranch Plan GPA/ZC EIR MM 4.9-35.

## 3. Management

Given 100 percent conservation of occupied vernal pools, management and monitoring of the pools through implementation of the HRMP is the key issue for conservation of the San Diego fairy shrimp in the Habitat Reserve. Management of hydrology of the vernal pools and controlling invasive species are the primary management concerns. Because the contributing hydrological resources will be unaltered, direct disturbances to the hydrology of the vernal pools are not expected. The effects of cattle and exotic species on hydrology are considered to be the two important management issues. Exotic species can have a clear negative impact on vernal pool hydrology such as decreasing the pool's hydroperiod, possibly because of increased evapotranspiration rates associated with abundant vegetation in and around pools (Marty 2005). The relationship between cattle grazing and vernal pool hydrology is more complex. Marty (2005) found that removing cattle from some vernal pool areas in California's Central Valley decreased pool inundation periods by 50 to 80 percent, making it difficult for some vernal pool species to complete their life cycle. Marty attributes this to the reduction of vegetation in and around the vernal pools by cattle and the fact that vernal pool species are adapted to some level of grazing that has occurred in California grasslands back to the Pleistocene. However, Marty cautions that any beneficial effects of cattle likely will interact with seasonal and site-specific variations in rainfall; *e.g.*, where rainfall levels are higher the positive effect of grazing may be less prominent. Whether this beneficial effect of cattle on vernal pools in the Central Valley holds for the pools in the Subregion would require further study.

Management of three occupied Radio Tower Road mesa vernal pools primarily will be implemented through timed grazing per the coordinated GMP (*Appendix G*) for exotic species control during the vernal pool dry season and seasonal exclusion of grazing during the wet season to allow the fairy shrimp to complete their life cycle. Experimental prescribed burns may also be used as an exotics control technique. Because cattle grazing has already been excluded from the occupied Chiquita Ridge vernal pools within existing Ladera Open Space and because prescribed burns probably are not feasible due to the close proximity to existing development in Ladera Ranch, management primarily will be implemented through exotics controls through mowing and/or selective weeding.

The HRMP also will include monitoring of the Radio Tower Road mesa and Chiquita Ridge vernal pools and San Diego fairy shrimp populations, managing hydrological regimes by maintaining the existing local contributing hydrological sources, managing water quality to emulate baseline conditions, and controlling public access, especially during the wet season.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for the San Diego fairy shrimp is warranted because all five vernal pools (1, 2, 4, 6 and 7) supporting the shrimp would be conserved and managed in the Habitat Reserve. In addition, substantial conservation of the San Diego fairy shrimp in southern California has already occurred. It is provided regulatory coverage by the Central/Coastal NCCP/HCP and the San Diego County and substantial habitat occurs on MCB Camp Pendleton MSCP. (San Diego fairy shrimp is not located in the Western Riverside County MSHCP area.) Conservation of the San Diego fairy shrimp in Subarea 1 would provide for recovery of the species in the permit area and contribute to its recovery rangewide.

##### ***z. Chaparral Beargrass (*Nolina cismontana*)***

**Federal Status:** None  
**State Status:** None  
**CNPS:** List 1B.2  
**Science Advisors:** Group 3  
**NCCP/MSAA/HCP Planning Species**

#### 1. Rangewide and Planning Area Status

Chaparral beargrass, also called chaparral nolina and cismontane nolina, is a shrub species of the Liliaceae family that is endemic to cismontane southern California. It is a yucca-like perennial succulent with a 1-1.5 m (3.3-4.9 ft) flower stalk that blooms from April to June. No published literature on the life history of this species is available. It occurs in the coastal foothills in xeric

coastal sage scrub and chaparral on sandstone and gabbro soils in San Diego, Orange, Riverside and Ventura counties. Some locations in San Diego and Orange counties occur on the boundary with Riverside County, and locations in Ventura County are close to the borders with Los Angeles and Santa Barbara counties, so it would not be surprising for this species to occur in additional areas in those counties as well. The known elevation range of chaparral beargrass is 460 to 4,180 feet.

*The Jepson Manual* (Hickman 1993) does not recognize *Nolina cismontana* as a distinct species and mentions it as “undescribed” in the description of *Nolina parryi*. However, based on an examination of “*N. parryi*” specimens from desert and coastal areas, Hess and Dice (1995) determined that the desert and coastal specimens differed in certain morphological traits such as leaf number and width, stem length, panicle length and diameter and bract size. Hess and Dice (1995) proposed the name *Nolina cismontana* for this “undescribed” species to reflect its occurrence west of the mountain ranges. The CNPS and CNDDDB have adopted this taxon and designated the species as sensitive.

Chaparral beargrass is a California Native Plant Society (CNPS) List 1B species with a Threat Code of “2.” List 1B indicates that chaparral beargrass is rare, threatened or endangered throughout its range. The Threat Code of “2” indicates that it is fairly endangered in California (20-80 percent of occurrences threatened). It is considered to be threatened by development, agriculture, road construction, and recreational activities (CNPS 2005). Reiser (1994), for example, states that chaparral beargrass is declining in the Pala region of north San Diego County from conversion of habitat to agriculture and residences, and in the Santa Ana Mountains from residential development. The USFS identified protection of the species from too-frequent fire as a management issue. Chaparral beargrass has no state or federal status.

The NCCP database for chaparral beargrass includes two general areas for the planning area. A single location is located in the Foothill-Trabuco Specific Plan (FTSP) area (Subarea 2) between Live Oak Canyon Road and Trabuco Oaks Drive. Two locations are in the Talega sub-basin, one individual just east the Northrop Grumman facility and a cluster of five individuals in the eastern portion of the sub-basin (*Figure 173-M*). The cluster of five individuals in the Talega sub-basin is an *important population* in a *key location* because of the rarity of this species. Survey data for the Foothill-Trabuco Specific Plan Area are incomplete and, based on general habitat conditions in the area, it is likely that chaparral beargrass is present in other areas of Subarea 2. If the species occurs in Subarea 2 in any substantial populations, they may be considered *major* or *important populations* in *key locations*.

## 2. Conservation Analysis

The conservation analysis for chaparral beargrass focuses on the known locations in the Subarea in the Talega sub-basin, which are the only known locations in Subarea 1.

### (a) Impacts

The proposed Covered Activities potentially would impact the single location of chaparral beargrass south of the Northrop Grumman facilities (*Figure 173-M*). This location is in the PA 8 development envelope and is assumed to be impacted because the final project site design for the PA has not been done.

### (b) Conservation

The cluster of five chaparral beargrass locations in the eastern portion of the Talega sub-basin comprising an *important population/key location* would be conserved in the Habitat Reserve (*Figure 173-M*).

## 3. Management

As described above, identified stressors on the chaparral beargrass include conversion of habitat to agriculture, residences, and frequent fire. Of these, the stressor relevant to management of chaparral beargrass in the Habitat Reserve is fire management. Implementation of the Wildland Fire Management Plan (*Appendix N*) and regular monitoring of the population will address this issue.

## 4. Rationale for Regulatory Coverage

Regulatory coverage for the chaparral beargrass is warranted because at least five of six of the locations in the Subarea would be conserved and managed in the Habitat Reserve.

### ***aa. Coast Live Oak (Quercus agrifolia)***

**Federal Status:** None  
**State Status:** Addressed by Public Resources Code Section 21083.4  
**CNPS Status:** None

## 1. Rangewide and Planning Area Status

Coast live oak is the most common oak in coastal California and is widespread in valleys and slopes below about 4,900 feet (Hickman 1993; Holland and Keil 1995). According to Hickman (1993), it is known from the following California Floristic Provinces: Northwest California; Outer North Coast Ranges that extend north from Sonoma County to the northern California boundary and are characterized by redwood, mixed evergreen, and mixed hardwood forests and very high rainfall; Central Western California which extends south from Sonoma County to Santa Barbara County; Southwestern California which extends south from Ventura County to Baja California, Mexico; and Baja California to about the San Pedro Martir (Barbour and Minnich 2000).

Coast live oaks are large trees at maturity, ranging from 30 to 80 feet in height. They may occur in four types of vegetation communities in the NCCP planning area, as defined by Gray and Bramlet (1992):

- oak savanna, which is annual or needlegrass grassland with widely scattered oaks (less than 10-20 percent canopy cover);
- oak woodland, which is a multi-layered vegetation community with 20-80 percent cover of oaks;
- oak forest, which is similar to oak woodlands, but with 80 percent or more canopy cover; and
- southern coast live oak riparian forest, which is a riparian community in drainages and streamcourses dominated by coast live oak, but mixed with other riparian species such as western sycamore and various willow species.

Generally the upland oak communities (savanna, woodland and forest) are open where moisture is limited in drier, more exposed aspects, and densest in moist areas (Holland and Keil 1995). North-facing slope occurrences of oak woodlands and forests are also denser than south-facing slope occurrences (Holland and Keil 1995).

Soils that commonly support coast live oak include sandstone and shale-derived soils (Sawyer and Keeler-Wolf 1995). Coast live oak typically occupies slopes with deep soils, alluvial terraces, and the recent alluvium of canyon bottoms (Griffin 1977; Brown 1982). Open woodlands form when soils are shallow (Holland and Keil 1995).

Oak woodlands and forest occur throughout the NCCP study area and comprise approximately 5,840 acres, of which 2,622 acres are in the planning area and 3,218 acres are in the CNF (*Figure 14-R*). The largest areas of coast live oak woodland are in the eastern portion of the study area in

Caspers Wilderness Park and the hills west of Bell Canyon and in the northern portion of the planning area in Live Oak Canyon and upper Arroyo Trabuco. Live oak forest primarily occurs on the Donna O'Neill Land Conservancy, at the head of Cristianitos Creek, on the northern slopes of Blind Canyon, and in small patches in lower Chiquita Canyon and east of Cañada Gobernadora. The vast majority of woodlands and forest in the planning area are located in Subarea 1 (86 percent), followed by Subarea 2 (9 percent), Subarea 4 (3 percent) and Subarea 3 (2 percent). Except for Subarea 4, woodlands and forest are similarly represented in the Subareas. Proportionally, woodlands and forest account for 4 percent of the natural habitats in Subarea 1, 5 percent in Subarea 2, 3 percent in Subarea 3, but less than 1 percent in Subarea 4.

Southern coast live oak riparian forest is the most common riparian community in the study area (*Figure 15-M*). It comprises approximately 3,258 acres, with 2,106 acres (65 percent) in the planning area and 1,152 acres in the CNF. This vegetation type occurs throughout the study area, including Arroyo Trabuco, San Juan Creek, Cañada Gobernadora, Chiquita Canyon, Cristianitos Creek and its tributaries, Gabino Canyon, Airplane Canyon, Verdugo Canyon, Bell Canyon, Crow Canyon, Trampas Canyon, Live Oak Canyon, Lion Canyon, Hot Spring Canyon, Hickey Canyon and Rose Canyon (*Figure 15-M*). Within the Subareas, the large majority of coast live oak riparian forest in the planning area is in Subarea 1 (65 percent) followed by Subarea 2 (19 percent), Subarea 4 (10 percent), and Subarea 3 (5 percent) (*Chapter 3, Table 3-2*). Coast live oak riparian forest is the predominant riparian habitat type in all of the Subareas, accounting for 41 percent of Subarea 1, 99 percent in Subarea 2, 47 percent in Subarea 3 and 39 percent in Subarea 4.

Oak savanna is relatively uncommon with only 14 acres mapped in the study area; 11 acres in Caspers Wilderness Park, about 1 acre on Starr Ranch, about 1 acre in O'Neill Regional Park, less than 1 acre in Subarea 2 in the FTSP area, and less than 1 acre in Subarea 4 in Rancho Santa Margarita. There is no oak savanna in Subarea 1 in areas proposed for development.

Threats to coast live oak woodlands (encompassing all four types in the Subregion) and coast live oak riparian forest primarily stem from habitat destruction, reproductive depression, and disease. Holland and Keil (1995) state that in the vast majority of California oak woodland sites, oak reproduction ceased around 1900. The loss of acorn viability can be attributed to cattle and sheep in rangelands and an overabundance of deer in many northern California areas (Holland and Keil 1995). The oak woodland habitat also has been altered by the replacement of native bunch grasses with exotic annual grasses that produce many more seeds. Man's reduction in the number of predators of seed-eating animals which predate oak acorns also has been found to be a threat (Holland and Keil 1995). Introduced annual grasses, due to their rapid growth and uptake of available surface water, also contribute to the loss of native grasses historically present in oak woodlands and savannas as well as diminishing water supplies for oak seedlings (Stephenson and Calcarone 1999). In some areas, it appears that California laurel is replacing coast live oak,

possibly due to grazing (Holland 1988). Wood-cutting, although not as prevalent in the southern portion of the State, has left areas of stumps because oaks were not able to reestablish (Holland 1988a). Root rot, caused by overwatering during the summer in urban oaks, also has been known to cause mortality (Holland and Keil 1995). Since about 1995, a dieoff of oaks in Santa Cruz and Marin counties, termed Sudden Oak Death (SOD), has occurred, apparently indirectly from a water mold of the genus *Phytophthora* (EBCNPS 2001). This water mold breaks down the tree's circulatory system and makes it vulnerable to invasion by bark beetles, which normally cannot invade healthy trees. This water mold is infecting at least three species of oak: coast live oak, tanoak (*Lithocarpus densiflorus*), and black oak (*Quercus kelloggii*).

## 2. Conservation Analysis

The conservation analysis for coast live oak is vegetation community-based because a detailed oak tree inventory has not been conducted in Subarea 1 or elsewhere in general in the NCCP planning area (exceptions would be project-level oak inventories, but these are not in the NCCP vegetation database). Oak woodland and forest are combined for the conservation analysis because the only difference between the two communities is percent canopy cover.

### (a) Impacts

The proposed Covered Activities would result in impacts to 629 acres (17 percent) of coast live oak woodland and forest and coast live oak riparian forest (*Table 13-3* and *Figure 203-M*). The breakout for impacts to the coast live oak communities is 65 acres (5 percent) of coast live oak riparian forest and 564 acres (24 percent) of coast live oak woodland and forest. (Coast live oak riparian forest, as a CDFG jurisdictional vegetation community, is also addressed in *Section 13.4*)

### (b) Conservation

A total of 2,572 acres (69 percent) of 3,712 acres of coast live oak woodland and forest and coast live oak riparian forest would be conserved in the Habitat Reserve and 517 acres (14 percent) are in Subarea 1 SOS, for a total conservation of 3,089 acres (83 percent) of the coast live oak vegetation communities (*Table 13-3* and *Figure 203-M*). For coast live oak woodland and forest, 1,418 acres (61 percent) would be in the Habitat Reserve and 353 acres (15 percent) are in Subarea 1 SOS. For coast live oak riparian forest, which is included in the riparian total, 1,155 acres (84 percent) would be conserved in the Habitat Reserve and 164 acres (12 percent) are in Subarea 1 SOS.

### 3. Management

As described in the HRMP (*Chapter 7*) the major vegetation communities, including oak woodland and forest, and coast live oak riparian forest, as a riparian type, will be managed and monitored. For oak woodland and forest, management issues are identified (*i.e.*, potential environmental stressors such as altered hydrology, fire, exotics and grazing)<sup>11</sup> and an extensive set of adaptive management goals and objectives are stated in *Section 7.11.2*, and, though too numerous to fully repeat here, generally include:

- maintaining diversity and quality of existing oak woodland communities;
- restoring and enhancing oak woodland communities;
- conducting monitoring of oak woodlands;
- managing stressors;
- maintaining acorn production; and
- maintaining structural diversity.

Similarly an extensive set of management and monitoring actions are stated in *Sections 7.11.3* through *7.11.5* that includes periodic monitoring of the oak communities, a “long list” of potential monitoring sites, standardized monitoring methods, identification of focal species for monitoring, and a description of a case-by-case restoration program implemented at the discretion of the Reserve Manager and Science Panel.

### 4. Rationale for Regulatory Coverage

Regulatory coverage for coast live oak is warranted because 69 percent of existing oak-dominated vegetation communities would be conserved in the Habitat Reserve and an additional 14 percent in Subarea 1 SOS, resulting in total conservation of 83 percent. The largest areas of contiguous coast live oak woodlands in the eastern portion of the study area in Caspers Wilderness Park and the hills west of Bell Canyon and in O’Neill Regional Park, as well as coast live oak riparian forest in O’Neill Park, Thomas F. Riley Wilderness Park, NAS Starr Ranch and Caspers Wilderness Park would be in the Habitat Reserve and SOS. In addition, the Habitat Reserve would create a large, biologically diverse and well-connected Habitat Reserve that will function effectively over the long term to maintain, and where feasible, enhance functions and values of both the upland and riparian oak communities. The HRMP will guide long-term management of oak communities and their supporting abiotic hydrologic and geomorphic processes within the Habitat Reserve, including, but not limited to, habitat restoration, invasive species control, grazing management and wildland fire management.

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<sup>11</sup> Although grazing is a potential stressor on oaks, it does not appear to be a significant impact on recruitment on RMV as evidenced by the abundant presence of seedlings and saplings observed on the Ranch (T. Bomkamp, pers. comm. 2005).

***bb. Coulter's Saltbush (Atriplex coulteri)***

**Federal Status:** None  
**State Status:** None  
**CNPS:** List 1B.2  
**Science Advisors:** Group 3  
**NCCP/MSAA/HCP Planning Species**

1. Rangewide and Planning Area Status

Coulter's saltbush occurs from Baja California, extending northward to Ventura County and also on the Channel Islands. Extant locations on California the mainland include: RMV (approximately 3,000 plants); San Clemente State Park; San Onofre State Park; Whispering Hills in San Juan Capistrano; Dana Point Headlands; Bommer Canyon (two small populations of about 20 plants each); San Joaquin Freshwater Marsh (less than 25 plants observed); Laguna Beach; MacArthur Boulevard and Pacific Coast Highway; behind Newport Beach Public Library (observed by Dave Bramlet in 1998); Pelican Hill; and the east slope above Los Trancos Canyon, where it is common along the dirt road passing through coastal sage scrub on a hill top in sandy clay soil. This species occurs on coastal bluffs and on alkali or saline flats in interior areas such as western Riverside County.

Coulter's saltbush is a CNPS List 1B species with a Threat Code of "2." List 1B indicates that Coulter's saltbush is rare, threatened or endangered throughout its range. The Threat Code of "2" indicates that it is fairly endangered in California (20-80 percent of occurrences threatened). It is considered to be threatened by development and feral herbivores (CNPS 2001). Coulter's saltbush has no state or federal status.

Coulter's saltbush is known from four general locations in the planning area: Chiquita Canyon, upper Cristianitos Canyon, and upper Gabino Canyon on RMV, and Whispering Hills to the west of RMV in Subarea 4 (*Figure 178-M*). Because this species is relatively rare within its range, all populations on RMV constitute *major or important populations*. The Chiquita Canyon group is further divided into one *major population* and two *important populations*. The Whispering Hills location has been dealt with as part of that development project and thus coverage is not being sought under the NCCP/MSAA/HCP. Thus, for the purposes of the conservation analysis, the planning area supports one *major population* and four *important populations*.

2. Conservation Analysis

The conservation analysis for Coulter's saltbush is based both on overall conservation of locations and individuals and on the conservation of *major and important populations* in key

*locations.* The impact and conservation analysis for plants in general is complicated by the fact that plant locations are mapped in the GIS as polygons and in many cases a polygon can be both “conserved” and “impacted” by a “blind” GIS analysis if the polygon is partially in development areas and partially in the Habitat Reserve. In these cases the proportion of the polygon conserved and impacted in terms of individuals needs to be analyzed in more detail to determine if the location should be considered permanently conserved or impacted. For example, the edge of a polygon of 100 individuals may be impacted such that 10 of the 100 individuals are impacted, resulting in 90 percent conservation of the location. In this case, even though 10 individuals are impacted, the location, as a whole, would be considered conserved. The conservation analyses for the Coulter’s saltbush, as well as the many-stemmed dudleya, southern tarplant, and thread-leaved brodiaea, were conducted according to the following decision rules:

- Locations with fewer than 100 individuals must have at least 75 percent of the individuals in the Habitat Reserve or SOS to be considered conserved;
- If more than 25 percent of the individuals are impacted in locations supporting less than 100 individuals, the **entire location** and **all individuals** at the location are considered impacted (*i.e.*, the entire location is considered non-viable over the long term);
- For locations with more than 100 individuals, any location with at least 75 individuals in the Habitat Reserve would be considered conserved; and
- For the purpose of reporting all impacts on proposed Covered Species, for locations that are considered conserved, but for which some proportion of the location is impacted, the number of impacted individuals is still reported even though overall the location is considered conserved.

Because the GIS database includes polygon size and directly counted or estimated numbers of individuals in the polygon, the number of individuals impacted or conserved is estimated as a proportion of the polygon impacted (*i.e.*, the population density within the location is assumed to be uniform). For example, if a polygon is 1 acre in size and has 100 individuals, an impact to 0.1 acre of the polygon would impact 10 individuals.

A location is considered to be “impacted” if the entire location would no longer be viable as a result of the impact, even if some small number of individuals at the location remained in the Habitat Reserve. Locations that are partly impacted, but would remain viable according to the criteria described above are not considered “impacted” for the purpose of reporting impact and conservation statistics even if some proportion of the population is lost. The impacted individuals in these locations, however, are included in total number of individuals impacted. Individuals that are in the Habitat Reserve but part of the location considered impacted are also included in the total number of individuals impacted because it is assumed that the population at the location as a whole would not be viable over the long-term.

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(a) Impacts

The proposed Covered Activities would permanently impact four of 33 locations (12 percent) and 277 of 2,752 individuals (10 percent) of Coulter's saltbush (*Table 13-3* and *Figure 178-M*). (Note that one location totaling 25 individuals wholly mapped in existing orchards and two others that are partially in orchards totaling 28 and 283 individuals, respectively, were omitted from the analysis.)

With regard to *major/important populations*, two of the three impacted locations of *major/important populations* are in the Upper Cristianitos Creek *important population* (not a *key location*), with populations of three and 12 individuals impacted. These locations are in the proposed orchards footprint in PA 6 and ultimately could be avoided. One location in the Middle Chiquita/Narrow Canyon *major population/key location* is considered impacted. The other impacted location totaling 10 individuals is located outside of mapped *major/important populations*. It is important to note that the Ranch Plan GPA/ZC EIR MM 4.9-3 states that "Prior to issuance of a grading permit for Planning Area 2, the Project Applicant shall demonstrate to the satisfaction of the County's Director of Planning Services Department or his/her designee that impacts to the key location and major population of Coulter's saltbush in the Chiquita sub-basin have been substantially avoided."

Of the 277 impacted individuals, 252 are in five locations in the Middle Chiquita/Narrow Canyon *major population/key location*. Based on the conservation criteria described above, four of the five locations with some impact to the population are considered conserved, as follows:

- 21 of 100 individuals impacted
- 3 of 21 individuals impacted
- 33 of 150 individuals impacted
- 185 of 600 individuals impacted

In the fifth location, 10 of 15 individuals are impacted and this location is considered permanently impacted.

The proposed Covered Activities also would result in temporary direct impacts to four locations and 111 individuals.

(b) Conservation

A total of 29 locations (88 percent) and 2,475 individuals (90 percent) would be conserved in the Habitat Reserve. With regard to *major/important populations* in *key locations*, 18 of 19 (95

percent) of the locations and 1,415 individuals (85 percent) in the Chiquita Canyon/Narrows *major population/key location* would be in the Habitat Reserve. All four locations and 350 individuals in the Middle Chiquita Canyon North of Treatment Plant *important population/key location*, both locations and 600 individuals in the Lower Chiquita Canyon *important population*, and all four locations and 100 individuals in the Upper Gabino *important population* would be conserved in the Habitat Reserve.

### 3. Management

Management of Coulter's saltbush is an important part of the conservation strategy. Little is known about Coulter's saltbush, but several potential stressors on the species have been identified, including:

- Non-native plants (wild radish, Italian ryegrass, Australian saltbush, and mustards)
- Alteration of soil/water relations
- Destruction of cryptogamic soils
- Cattle-related impacts

Because little is known about Coulter's saltbush in general and particularly its population variability and response to environmental stressors, fairly intense annual monitoring of known *major* and *important populations* for at least the first five years of the HRMP will be conducted. The reader is directed to *Section 7.12.2 of Chapter 7* and the Species Accounts and Conservation Analyses (*Appendix E*) for a description of management and monitoring for this species.

In addition to the adaptive management of Coulter's saltbush, if new populations in planned development areas are found, an experimental restoration program for the species would be undertaken, as described in the Translocation, Propagation and Management Plan for Special-status Plants (*Appendix I*). This plan describes the various methods for restoration, including seed collection, receptor site selection and preparation, greenhouse propagation, translocation of natural populations, introduction of cultivated plants, direct seeding at translocation sites, and long-term maintenance/repair and monitoring.

### 4. Rationale for Regulatory Coverage

Regulatory coverage for Coulter's saltbush is warranted because 88 percent of the locations and 90 percent of the individuals would be conserved and managed in the Habitat Reserve. All *major/important populations* in *key locations* would be conserved. This conservation of Coulter's saltbush would substantially contribute to and provide for the conservation of the species rangewide.

***cc. Many-stemmed Dudleya (Dudleya multicaulis)***

**Federal Status:** None  
**State Status:** None  
**CNPS:** List 1B.2  
**Science Advisors:** Group 3  
**NCCP/MSAA/HCP Planning Species**

1. Rangewide and Planning Area Status

Many-stemmed dudleya is endemic to southwestern California from western Los Angeles County, through extreme southwestern portions of San Bernardino and Orange Counties, and western Riverside County south to the northern edge of San Diego County. Roberts (1999, 2000) identified five major concentrations of many-stemmed dudleya: (1) the San Joaquin Hills; (2) the northern Lomas de Santiago including the Santiago Hills north to Gypsum and Blind Canyons (1 and 2 combined generally comprise the Orange County Central and Coastal Subregion); (3) Rancho Mission Viejo in the Southern Subregion NCCP; (4) the northern portion of San Diego County that comprises Camp Pendleton (Roberts 1999); and (5) the Gavilan Hills/Estelle Mountain area of western Riverside County. Orange County (excluding the relatively small occurrences in the CNF) supports approximately 65 percent of the total many-stemmed dudleya. Many-stemmed dudleya grows in open-habitat soils associated with coastal sage scrub and grassland plant communities in southern California. It usually grows in shallow weathered cobbly loam or clay soils, and open barrens associated with rock outcrops and ridgelines.

Many-stemmed dudleya is a CNPS List 1B species with a Threat Code of “2.” List 1B indicates that many-stemmed dudleya is rare, threatened or endangered throughout its range. The Threat Code of “2” indicates that it is fairly endangered in California (20-80 percent of occurrences threatened). It is considered to be threatened by development, road construction, grazing and recreation (CNPS 2001). Many-stemmed dudleya has no state or federal status.

Many-stemmed dudleya is known from five main areas in the planning area (see *Figure 179-M*): Chiquita Ridge; Chiquadora Ridge; Gobernadora/Central San Juan east of Gobernadora Creek and north of the Colorspot Nursery; Trampas Canyon/Cristianitos Canyon extending south to the Talega development in the San Clemente Watershed; and upper Gabino and La Paz canyons. A smaller cluster occurs east of the existing Northrop Grumman facilities on the mesa. Four *major populations in key locations*, two *important populations in key locations* and one *important population (not in a key location)* were identified in the planning area. The *major populations* are located in the following areas: (1) along Chiquadora Ridge; (2) in the Gobernadora and Central San Juan sub-basins; (3) in the Trampas Canyon/Cristianitos/lower Gabino/Blind

Canyon sub-basins; and (4) in the upper Gabino and La Paz canyons sub-basins. The *important populations* in *key locations* are located on Chiquita Ridge and in lower Chiquita Canyon, and the other *important population* is located in the eastern portion of the Talega sub-basin. The total many-stemmed dudleya numbers in the planning area is about 65,250 counted individuals in about 395 separate mapped locations. Subarea 1 supports about 63,666 individuals in about 386 locations.

## 2. Conservation Analysis

The conservation analysis for many-stemmed dudleya focuses on overall conservation of locations and populations and conservation of *major* and *important populations* in *key locations*. The same decision rules described above for Coulter's saltbush were applied to the conservation analysis of the many-stemmed dudleya.

MM 4.9-35 of the Ranch Plan GPA/ZC EIR also was incorporated into the conservation analysis: "Prior to issuance of a grading permit for Planning Area 8, the Project Applicant shall demonstrate to the satisfaction of the County's Director of Planning Services Department or his/her designee that eight known locations of many-stemmed dudleya in the Talega sub-basin are protected."

The conservation analysis also includes avoidance measures within PA 6 in siting the orchards to avoid seven locations and 4,216 individuals that are within the Cristianitos Canyon *major population/key location* (see *Figure 179-M*).

### (a) Impacts

As shown in *Table 13-13* and *Figure 179-M*, the proposed Covered Activities would result in direct permanent impacts to 149 of 386 locations (39 percent) and 19,642 of 63,666 individuals (31 percent) in Subarea 1. An additional impact to two locations totaling 395 individuals would occur in Subarea 4 SOS from road construction.

*Table 13-13* also shows impacts to *major* and *important populations*. One *major population/key location* would be almost entirely impacted. Development in PA 3 would impact 58 of 61 locations (95 percent) and 5,441 of 5,678 individuals (96 percent) in the Gobernadora *major population/key location*. One *important population/key location* also would be virtually entirely impacted. Development in PA 2 would impact 40 of 41 locations and 6,635 of the 6,637 individuals in the Lower Chiquita *important population*. Relatively fewer impacts would occur to other *major* and *important populations*, ranging from no impacts to the East Talega *important population* to 25 percent of locations and 21 percent of individuals in the Chiquadora Ridge *major population/key location*. Overall for *major populations/key locations*, 25 percent of locations and 21 percent of individuals would be impacted. Overall for *important populations*, 52 percent of locations and 69 percent of individuals would be impacted.

**TABLE 13-13  
CONSERVATION ANALYSIS FOR THE MANY-STEMMED DUDLEYA**

Population	Total		Habitat Reserve				Impacts			
	Locations	Individuals	Locations	%	Individuals	%	Locations	%	Individuals	%
Cristianitos Canyon Major Population/Key Location	151	32,653	134	89%	28,849	88%	17	11%	3,804	12%
Upper & Middle Gabino/La Paz Canyon Major Population/Key Location	13	4,170	11	85%	4,124	99%	2	15%	46	1%
Gobernadora Major Population/Key Location	61	5,678	3	5%	237	4%	58	95%	5,441	96%
Chiquadora Ridge Major Population/Key Location	48	8,623	36	75%	6,844	79%	12	25%	1,779	21%
<b>Subtotal for Major Populations/Key Locations</b>	<b>273</b>	<b>51,124</b>	<b>184</b>	<b>67%</b>	<b>40,054</b>	<b>78%</b>	<b>89</b>	<b>33%</b>	<b>11,070</b>	<b>22%</b>
Lower Chiquita Canyon Important Population/Key Location	41	6,637	1	2%	2	0%	40	98%	6,635	100%
Chiquita Ridge Important Population/Key Location	18	1,349	17	94%	1,324	98%	1	6%	25	2%
Upper Gobernadora Important Population/Key Location	14	1,622	10	71%	1,423	88%	4	29%	199	12%
East Talega Important Population	14	292	14	100%	292	100%	0	0%	0	0%
<b>Subtotal for Important Populations</b>	<b>87</b>	<b>9,900</b>	<b>42</b>	<b>48%</b>	<b>3,041</b>	<b>31%</b>	<b>45</b>	<b>52%</b>	<b>6,859</b>	<b>69%</b>
Outside Population	26	2,642	10	38%	929	35%	15	58%	1,713	65%
<b>Grand Total</b>	<b>386</b>	<b>63,666</b>	<b>236</b>	<b>61%</b>	<b>44,024</b>	<b>69%</b>	<b>149</b>	<b>39%</b>	<b>19,642</b>	<b>31%</b>

<sup>1</sup> Of the estimated impacts to the dudleya in the Cristianitos Canyon major population/key locations, nine locations and 3,221 individuals are located in the 431 acres PAs 6 and 7 targeted for new orchards. RMV will avoid seven other locations and 4,216 individuals in PA 6. Given that only 50 of the 431 acres will be converted to agriculture, some additional conservation can be expected, but because the siting of the orchards has not been determined the impact estimate is overstated as it is for other biological resources in PAs 6 and 7.

For many-stemmed individuals in scattered locations outside of mapped *major/important populations*, 58 percent of locations and 65 percent of individuals would be impacted.

The proposed Covered Activities would result in temporary impacts to 29 location and 360 individuals.

(b) Conservation

A total of 236 locations (61 percent) and 44,204 individuals (69 percent) would be conserved in the Habitat Reserve (*Table 13-13*). For *major populations/key locations*, 67 percent of locations and 78 percent of individuals would be in the Habitat Reserve. For *important populations*, 48 percent of locations and 52 percent of individuals would be in the Habitat Reserve. One small dudleya population located in SOS on NAS Starr Ranch also would be conserved.

3. Management

Management and monitoring of many-stemmed dudleya is an important part of the conservation strategy. All mapped and conserved many-stemmed dudleya locations in the Habitat Reserve are on proposed RMV Habitat Reserve Lands or the Donna O'Neill Land Conservancy and would be subject to adaptive management.

A variety of environmental stressors that will be subject to management were identified for the many-stemmed dudleya in *Chapter 7*:

- Non-native species (artichoke thistle, Italian ryegrass, bromes, wild oats, smooth cat's-ear, Crete hedyponois, mustards)
- Cattle-related impacts
- Human activities (hiking, mountain bikes, equestrian)

Management actions for many-stemmed dudleya would focus on controlling invasive species which compete with the dudleya for space, nutrients and water. The invasive effects of non-native species can be exacerbated by over-grazing and frequent fire. Artichoke thistle control is an ongoing program on RMV and will continue in the Habitat Reserve on RMV lands in the future. Various other methods to control invasive species may be implemented, including prescribed burning, mowing, manual removal (weed-whacking and hand-pulling) and focused herbicide treatment.

Cattle impacts on many-stemmed dudleya have not been observed on RMV (T. Bomkamp, pers. comm. 2005). Many-stemmed dudleya typically grows in areas where annual grasses are less

prevalent and thus less attractive to cattle. However, cattle have been identified as a potential stressor on the Cristianitos Canyon and Gabino Canyon populations because grazing in the southern pastures coincides with the dudleya growing season and monitoring for potential cattle impacts is thus warranted. However, generally the coordinated GMP (*Appendix G*) is expected to have a net benefit on the many-stemmed dudleya by controlling invasive, non-native grasses.

The reader is directed to *Section 7.12.2 of Chapter 7* for more information on the management and monitoring program for many-stemmed dudleya.

In addition to the management and monitoring of existing dudleya populations in the Habitat Reserve, translocation and propagation of many-stemmed dudleya would be conducted to the extent feasible and appropriate. Potential restoration and enhancement areas would be focused in areas targeted for CSS and CSS/VGL restoration, including Chiquita Ridge and Chiquadora Ridge. The Radio Tower Road area supports clay soils that also might be suitable for the translocation of dudleya, although there are no records for the species in this area. The Translocation, Propagation and Management Plan for Special-status Plants (*Appendix I*) describes the various methods for restoration of many-stemmed dudleya, including seed collection, receptor site selection and preparation, greenhouse propagation, translocation of natural populations, introduction of cultivated plants, direct seeding at translocation sites, and long-term maintenance/repair and monitoring.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for many-stemmed dudleya is warranted because even without substantial avoidance of the Cristianitos Canyon *major population/key location*, approximately 229 locations (59 percent) and almost 40,000 counted/estimated individuals (63 percent) would be conserved and managed in the Habitat Reserve, including 65 percent of locations and 70 percent of individuals in *major populations/key locations*. The by far largest *major population/key location* in the planning area in Cristianitos Canyon would be substantially conserved, with 127 locations (84 percent) and 24,633 individuals (75 percent) in the Habitat Reserve (without assuming additional conservation in the 431 acres in PAs 6 and 7 targeted for 50 acres of orchard). This conservation of many-stemmed dudleya would substantially contribute to and provide for the conservation of the species rangewide. In addition, many-stemmed dudleya has been substantially conserved in western Riverside County, having received regulatory coverage under the MSHCP, and the Central/Coastal NCCP/HCP.

***dd. California Scrub Oak (Quercus berberidifolia)***

**Federal Status:** None  
**State Status:** Addressed by Public Resources Code Section 21083.4  
**CNPS Status:** None

1. Rangewide and Planning Area Status

California scrub oak is a fairly common component of chaparral communities in much of western California and south into Baja California, Mexico, and has been referred to as the “default” scrub oak in California (Nixon 2002). It occurs in the following floristic provinces (Hickman 1993): North Coast Ranges from Tehama County south; Sierra Nevada Foothills; Tehachapi Mountains; Central Western California; Southwestern California; and Baja California. California scrub oak is found mostly below 5,000 feet and through much of its range in occurs along the outer coast and in the Transverse and Peninsular ranges of southern California. In Orange and San Diego counties it is absent from the immediate coast, where it is replaced by, or hybridizes with, the rare Nuttall’s scrub oak (*Q. dumosa*).

California scrub oak is commonly found in chaparral and woodland vegetation on dry slopes, hillsides, foothills, canyons, and mountains on a variety of soils. California scrub oak can establish dense thickets that exclude other understory plants. It also occurs in discrete patches that are interspersed with trees, grasses, and other shrubs. It typically takes a shrub form typically 6 to 15 feet tall, but occasionally is arborescent (tree-like) with multiple trunks.

The taxonomy of scrub oaks is complex because different species appear to hybridize wherever they come into contact (Nixon 2002). Nixon informally classifies California scrub oak as member of the “California scrub white oaks,” an apparently closely related set of species that have a similar small lobed leaf form that as a group may have derived from lobe-leaf ancestors (Nixon 2002). Identification of the different California scrub white oaks is based on both morphological differences and habitat. For example, diagnostic morphological features of California scrub oak include “the typical usually 7-8 rayed flat stellate trichomes of the lower leaf surface (in contrast to twisted, erect rayed flat trichomes of *Q. dumosa sensu stricto* and the much larger erect, straight trichomes with fewer rays, found in both varieties of *Q. durata*)...” (Nixon 2002, p. 14). The closely associated, but now very rare, *Q. dumosa* (Nuttall’s scrub oak), occurs “only in very restricted habitats in low hills near the coast, often on very loose sandstones or granitics, in association with species often referred to as “soft chaparral,” as opposed to the “hard chaparral” of *Q. berberidifolia* in higher and more interior localities.” (Nixon 2002, p. 13).

California scrub oak has been mapped in the study area, including the CNF, in the context of the general chaparral and coastal sage scrub vegetation communities, with the subassociations scrub

oak chaparral, scrub oak-sagebrush, and scrub oak-sage scrub where it occurs as a dominant or co-dominant species (Gray and Bramlet 1992). Scrub oak chaparral is dominated by California scrub oak with *Ceanothus* spp., toyon (*Heteromeles arbutifolia*), laurel sumac (*Malosma laurina*), *Rhamnus* spp., birch-leaf mountain mahogany (*Cercocarpus betuloides*), and flowering ash (*Fraxinus depetala*). Scrub oak-sage scrub is a mix of scrub oak and coastal sagebrush (*Artemisia californica*) and scrub oak-sage scrub is a mix of scrub oak and coastal sage scrub species other than coastal sagebrush (Gray and Bramlet 1992). The planning area supports 2,834 acres of scrub oak chaparral and 177 acres of scrub oak-sagebrush. The CNF supports 2,602 acres of scrub oak chaparral, 42 acres of scrub oak-sagebrush and 13 acres of scrub oak-sage scrub.

The majority of scrub oak chaparral in the planning area is located in Subarea 1, with 2,612 acres (92 percent). Most occurs on RMV (1,284 acres), followed by Caspers Wilderness Park (982 acres), NAS Starr Ranch (254 acres), Donna O'Neill Land Conservancy (46 acres), O'Neill Regional Park (45 acres), and the Upper Chiquita Conservancy (2 acres) (*Figure 204-M*). The largest patches of scrub oak chaparral in Subarea 1 are located in the Verdugo Canyon and Lucas Canyon sub-basins, just north of the Lucas Canyon sub-basin, and in upper Bell Canyon (*Figure 204-M*).

The 177 acres of scrub oak-sagebrush occurs mostly in Subarea 1 (170 acres); 80 acres in Caspers Wilderness Park, 77 acres in O'Neill Regional Park, 12 acres on NAS Starr Ranch and less than 1 acre on RMV (*Figure 204-M*).

## 2. Conservation Analysis

The conservation analysis for California scrub oak focuses on conservation at the landscape, vegetation community level.

### (a) Impacts

The proposed Covered Activities would result in impacts to 284 acres (10 percent) of California scrub oak vegetation communities (*Table 13-3* and *Figure 204-M*), all of which are scrub oak chaparral. Of these impacts, 281 acres are in the PAs and three acres in the Habitat Reserve are impacted as a result of infrastructure construction, operation, and maintenance/repair.

Temporary impacts would occur to about 2 acres of scrub oak chaparral (*Table 13-7*).

### (b) Conservation

A total of 2,233 acres (80 percent) of combined California scrub oak chaparral and scrub oak-sagebrush would be conserved in the Habitat Reserve (*Table 13-3* and *Figure 204-M*). An additional 265 acres are in Subarea 1 SOS on NAS Starr Ranch, for a combined conservation of 2,498 acres (90 percent).

The largest areas of contiguous scrub oak chaparral in the eastern portion of Subarea 1 in Caspers Wilderness Park and on RMV lands would be in the Habitat Reserve (*Figure 204-M*).

### 3. Management

Management and monitoring of California scrub oak also will occur at the vegetation community level. As described in the HRMP (*Chapter 7*) the major vegetation communities, including chaparral and coastal sage scrub will be managed and monitored. The main environmental stressor identified for chaparral, for example, is fire, although over-grazing, exotic species and drought are also identified, but considered less significant stressors. *Chapter 7* identifies several adaptive management goals and objectives for chaparral, as briefly summarized here:

- maintain the physiographic diversity of chaparral in the Habitat Reserve;
- restore and enhance degraded chaparral in the Habitat Reserve to maintain net habitat value;
- conduct monitoring of chaparral to track long-term habitat value;
- manage fire regimes such that a natural diversity of age stands and resprouters/obligate seeders is maintained throughout the Habitat Reserve and prevent type conversion to annual grassland; and
- control exotic invasions of chaparral, especially along the urban-Habitat Reserve interface, and along roads and utility corridors.

The reader is directed to *Section 7.8* of *Chapter 7* for a full discussion of the management and monitoring program for chaparral and coastal sage scrub.

### 4. Rationale for Regulatory Coverage

Regulatory coverage for California scrub oak is warranted because 90 percent of existing scrub oak chaparral and scrub oak-sagebrush would be conserved and managed in the Habitat Reserve. The largest areas of contiguous scrub oak chaparral in the eastern portion of Subarea 1 in Caspers Wilderness Park and RMV lands would be in the Habitat Reserve. Also, the CNF

supports about 48 percent of the scrub oak chaparral and sagebrush in the NCCP study area. The Habitat Reserve, in conjunction with scrub oak in SOS and the CNF would create a large, biologically diverse and well-connected Habitat Reserve and open space system that will function effectively over the long term to maintain scrub oak vegetation communities. The HRMP will guide long-term management of the scrub oak communities within the Habitat Reserve, including, but not limited to, wildland fire management, habitat restoration, and invasive species control.

*ee. Southern Tarplant (Centromadia parryi var. australis)*

**Federal Status:** None  
**State Status:** None  
**CNPS:** List 1B.1  
**Science Advisors:** Group 3  
**NCCP/MSAA/HCP Planning Species**

1. Rangewide and Planning Area Status

Southern tarplant is an annual member of the sunflower family (Asteraceae) that occurs in vernal pools, alkali playas, alkali grasslands, and disturbed areas. Historically southern tarplant was known from about 47 locations in San Diego, Orange, Los Angeles, Ventura and Santa Barbara counties, with four populations reported from Mexico. Of the approximately 47 populations in the U.S., 35 to 40 percent have been extirpated. Currently, Orange County contains the majority of the remaining populations. In his status report, Roberts divided the populations into: “major” – over 8,000; “moderate” – between 1,000 and 5,000; and “small” – fewer than 1,000. Nine populations are reported by Roberts as moderate (over 1,000) and two populations, Talbert Marsh and Canada Chiquita, are reported as major. Of the extant populations, many are on conserved lands, including: populations at Newport Ecological Reserve (estimated at 160,000 individuals by DuBois in 2002, pers. comm. 2002); Hellman Ranch (now in permanent conservation) (3,307 individuals recorded in 1996); Bolsa Chica Mesa (estimated 2,000 individuals in conservation/preservation areas based on surveys by LSA in 2001); Talbert Park (8,000+); Madrona Marsh; and Banning Ranch (2,000+ individuals in 1999 recorded by GLA). Also, not included by Roberts are 11,000+ individuals in the Chiquita Tesoro Mitigation Site and an estimated 10,000+ individuals in the Ladera portion of the GERA mitigation area, both of which would be considered as “major” populations based upon the Roberts’ convention.

Southern tarplant is a CNPS List 1B species with a Threat Code of “1.” List 1B indicates that southern tarplant is rare, threatened or endangered throughout its range. The Threat Code of “1” indicates that it is seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat). It is considered to be threatened by habitat

fragmentation, urbanization, vehicles and foot traffic (CNPS 2001). Southern tarplant has no state or federal status.

Southern tarplant is limited to two sub-basins in the planning area (*Figure 180-M*). The largest population is in Chiquita Canyon and, including the Tesoro mitigation site, has been estimated in recent years to number more than 130,000 individuals (there is substantial year-to-year variation in population sizes of this opportunistic species). A large population numbering 10,000+ individuals occurs on the GERA site in Gobernadora. The Chiquita locations comprise two *major populations* located in “The Narrows” area and the Tesoro site southwest of the wastewater treatment plant, respectively, and one *important population* located just north of the treatment plant. The GERA population also is a *major population*. All the populations are *key locations*.

## 2. Conservation Analysis

The conservation analysis for the southern tarplant focuses on overall conservation of locations and individuals and of *major* and *important populations* in *key locations* using the same decision rules described above for Coulter’s saltbush. (Note that three locations totaling 3,105 individuals are mapped in existing orchard in Chiquita Canyon and are not a part of this analysis.)

### (a) Impacts

The proposed Covered Activities would result in permanent direct impacts to seven locations (19 percent) and 12,587 individuals (9 percent) (*Table 13-14* and *Figure 180-M*). With regard to impacts to *major/important populations*, four locations (14 percent) and 11,405 individuals (10 percent) of the Middle Chiquita *major population/key location* would be impacted. Two individuals in the Middle Chiquita Canyon North of the Treatment Plant *important population* would be impacted by maintenance of the existing RMV water line. Because only two of 635 individuals in this population would be impacted the location is not considered “impacted” although the two individuals are included in the impact totals. The remaining impacts to three locations and 1,180 individuals would occur outside mapped *major/important populations*. It is important to note that the Ranch Plan GPA/ZC EIR MM 4.9-2 states that “Prior to issuance of a grading permit for Planning Area 2, the Project Applicant shall demonstrate to the satisfaction of the County’s Director of Planning Services Department or his/her designee that impacts to the key location and major population of southern tarplant in the Chiquita sub-basin have been substantially avoided.”

**TABLE 13-14  
SOUTHERN TARPLANT CONSERVATION ANALYSIS**

Population	Total		Habitat Reserve				Impacts			
	Locations	Individuals	Locations	%	Individuals	%	Locations <sup>1</sup>	%	Individuals	%
Middle Chiquita Canyon/Narrows Major Population/Key Location	29	119,006	25	86%	107,601	90%	4	14%	11,405	10%
Gobernadora Creek Major Population/Key Location	1	10,000	1	100%	10,000	100%	0	0%	0	0%
Tesoro Mitigation Site Major Population/Key Location	1	11,000	1	100%	11,000	100%	0	0%	0	0%
Middle Chiquita Canyon North of Treatment Plant Important Population/Key Location	2	635	2	100%	633	100%	0	0%	2	0%
Outside Population	4	1,930	1	25%	750	39%	3	75%	1,180	61%
<b>Grand Total</b>	<b>37</b>	<b>142,571</b>	<b>30</b>	<b>81%</b>	<b>129,984</b>	<b>91%</b>	<b>7</b>	<b>19%</b>	<b>12,587</b>	<b>9%</b>

<sup>1</sup> Impacted locations refers to the number of locations that would be considered impacted and not viable over the long-term.

### (b) Conservation

A total of 30 locations (81 percent) and 129,984 individuals (91 percent) would be conserved in the Habitat Reserve (*Table 13-13* and *Figure 180-M*). Within regard to conservation of *major/important populations*, 25 locations (86 percent) and 107,601 individuals (90 percent) in the Middle Chiquita/Narrows *major population/key location* would be conserved. All locations and individuals in the Gobernadora Creek and Tesoro Mitigation Site *major populations/key locations* would be conserved in the Habitat Reserve. Virtually 100 percent of the locations and individuals in the Middle Chiquita Canyon North of the Treatment Plant *important population* would be conserved in the Habitat Reserve.

### 3. Management

Management of southern tarplant is an important part of the conservation strategy. Although southern tarplant typically does well in disturbed areas, several potential stressors have been identified, including:

- Non-native plants (wild radish, Italian ryegrass, and mustards)
- Alteration of soil/water relations
- Population fragmentation

Because southern tarplant populations can fluctuate spatially and temporally in relation to disturbance events, fairly intense annual monitoring of known *major* and *important populations* for at least the first five years of the HRMP will be conducted. The reader is directed to *Section 7.12.2 of Chapter 7* and the Species Accounts and Conservation Analyses (*Appendix E*) for a description of management and monitoring for this species.

In addition to the adaptive management of southern tarplant, if new populations in planned development areas are found, salvaged plants would be translocated to suitable receiver sites in the same sub-basin where the impact occurs, as described in the Translocation, Propagation and Management Plan for Special-status Plants (*Appendix I*). This plan describes the various methods for restoration, including seed collection, receptor site selection and preparation, greenhouse propagation, translocation of natural populations, introduction of cultivated plants, direct seeding at translocation sites, and long-term maintenance/repair and monitoring.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for southern tarplant is warranted because 81 percent of the locations and 91 percent of the individuals would be conserved and managed in the Habitat Reserve. All *major/important populations* in *key locations* would be conserved. This conservation of southern tarplant would substantially contribute to and provide for the conservation of the species rangewide.

#### ***ff. Thread-leaved Brodiaea (Brodiaea filifolia)***

**Federal Status:**        **Threatened**  
**State Status:**        **Endangered**  
**CNPS:**                **List 1B.1**  
**Science Advisors:**   **Group 3**  
**NCCP/MSAA/HCP Planning Species**

#### 1. Rangewide and Planning Area Status

Thread-leaved brodiaea is a perennial geophyte that is usually associated with clay soils in chaparral openings, cismontane woodland, coastal sage scrub, playas, valley and foothill

grassland, and vernal pools. Thread-leaved brodiaea has a fairly wide range in coastal southern California at elevations of 100 to 2,500 feet (USFWS 2004d). In the Transverse Ranges, it is known from the foothills of the San Gabriel Mountains and east to Arrowhead Hot Springs in the San Bernardino Mountains. Populations are also found in southern Orange, western Riverside, and northwestern San Diego counties. At the time of the brodiaea's federal listing in 1998 the USFWS (1998d) estimated that 50 extant populations occurred in southern California, with the majority consisting of sites supporting less than 2,000 plants. In 2004, in the proposed critical habitat designation, the USFWS (2004d) estimated 84 extant populations.

The largest known single population locality of thread-leaved brodiaea is in San Marcos in northern San Diego County, with an estimated range of 201,200 to 342,000 flowering stalks. In western Riverside County this species is known to occur on the Santa Rosa Ecological Reserve (over 30,000 estimated flowering stalks); Upper Salt Creek, west of Hemet; the San Jacinto Wildlife Area (two localities); Perris, east of the Perris Valley Airport (approximately 5,000 flowering stalks); south of San Jacinto Road (<500 flowering stalks); and in Railroad Canyon where approximately 3,000 plants are associated with *Sporobolus*-dominated alkali grassland. In Orange County, populations are known from Aliso-Woods Canyon Regional Park (several thousand flowering stalks), Rancho Mission Viejo (more than 9,300 flowering stalks), Forster Ranch (approximately 5,000 flowering stalks associated with a restoration/relocation program), Prima Deshecha Landfill (three locations with three individuals), and the Talega development area where one small population would be preserved in open space and a second population is slated for translocation.

Thread-leaved brodiaea is state-listed endangered, federally-listed threatened and is a CNPS List 1B species with a Threat Code of "1." List 1B indicates that thread-leaved brodiaea is rare, threatened or endangered throughout its range. The Threat Code of "1" indicates that it is seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat). It is considered to be seriously threatened by residential development, agriculture, mowing and discing for weed suppression and fire control, grazing, off-road vehicles, other recreational activities, military training and competition from non-native species (CNPS 2001; USFWS 2004d).

Thread-leaved brodiaea is found naturally in several general locations in the planning area and at a translocated population at Forster Ranch. On RMV lands thread-leaved brodiaea is known from Chiquadora Ridge; southern Trampas canyon subunit; Cristianitos Canyon; lower Gabino Canyon; middle Gabino Canyon; Talega ridgeline east of Northrop Grumman; and just east of Trabuco Creek in the Arroyo Trabuco Golf Course area (see *Figure 173-M*). These locations comprise two *major populations/key locations* on Chiquadora Ridge (one large location totaling 2,000 flowering stalks and four small locations totaling 85 flowering stalks) and lower Cristianitos Canyon (six locations totaling 6,100 flowering stalks), and five *important*

*populations* in middle and upper Cristianitos Canyon (13 locations totaling 400 flowering stalks), the Trampas Canyon subunit (one location with 250 flowering stalks), the middle Gabino subunit (one location with 183 flowering stalks), Talega east of Northrop Grumman (four locations totaling about 288 flowering stalks), and Arroyo Trabuco (one location totaling 80 flowering stalks). Overall, about 9,536 flowering stalks have been counted in about 37 discrete locations in the Subregion planning area, with about 9,395 individuals in 33 locations in Subarea 1. About 8,100 of the 9,500+ flowering stalks occur in only two general locations: 2,000 individuals in a location on Chiquadora Ridge, and the six contiguous sites totaling 6,100 flowering stalks in lower Cristianitos/Gabino canyons. Outside of RMV lands, thread-leaved brodiaea is known from three small populations with three flowering stalks in the Prima Deshecha Landfill GDP area (BonTerra 2005). There is also a CNDDDB record for a small to moderate size population in Caspers Wilderness Park (not shown in *Figure 173-M*) that has ranged in documented size of 24 flowering stalks in 1989 to 850 stalks in 1995. This record is not in the NCCP database and is not included in the conservation analysis.

## 2. Conservation Analysis

The conservation analysis for the thread-leaved brodiaea focuses on both the overall conservation of locations and individuals and the conservation of *major* and *important* populations in *key locations*. Habitat fragmentation and connectivity and the role of pollinators also are considered in the conservation analysis.

The conservation analysis also accounts for the following avoidance/mitigation measure required by the Ranch Plan GPA/ZC EIR and the SAMP USACE Permit Special Conditions for avoidance of thread-leaved brodiaea:

- **MM 4.9-20.** Prior to issuance of a grading permit for Planning Area 8, the Project Applicant shall demonstrate to the satisfaction of the County's Director of Planning Services Department or his/her designee that the four known locations of thread-leaved brodiaea that constitute an important population in the Talega sub-basin are protected.
- **SAMP USACE Permit Special Condition I.A.3.** The permittee shall avoid all impacts to the thread-leaved brodiaea (a threatened facultative wetland plant) in a major population in a key location (as described in the Southern Planning Guidelines) on Chiquadora Ridge as part of construction for Planning Area 2.

### (a) Impacts

The proposed Covered Activities would result in impacts to 13 locations (39 percent) and 147 individuals (2 percent), of the thread-leaved brodiaea (see *Figure 173-M*).

With regard to *major population/important populations*, the following impacts would occur:

- four locations and 85 individuals in the Chiquadora Ridge *major population/key location*; and
- six locations and 59 individuals in the Cristianitos Canyon *important population* in potential orchards in PA 6.

Impacts to brodiaea mapped outside of the *major/important populations* include three locations supporting three individuals on the Prima Deshecha Landfill GDP site.

As noted above, the impact estimate provided above assumes avoidance of the large Chiquadora Ridge population of 2,000 individuals through project site design pursuant SAMP USACE Permit Special Condition I.A.3. Potential impacts in PA 8 are addressed by the GPA/ZC EIR MM 4.9-20 stated above. Some additional avoidance of impacts to the Cristianitos Canyon *important population* may occur in PAs 6 in siting of the orchards.

#### (b) Conservation

A total of 20 locations (61 percent) and 9,248 individuals (98 percent) of thread-leaved brodiaea would be conserved in the Habitat Reserve (*Figure 173-M*). Conservation of *major/important populations* would include:

- all six locations and all 6,105 individuals in the Cristianitos Canyon/Lower Gabino Canyon *major population*;
- seven locations (54 percent) and 341 individuals (85 percent) in the Cristianitos Canyon *important population*;
- all four locations and all 288 individuals in the East Talega *important population*;
- one location (100 percent) and 80 individuals (100 percent) in the Lower Arroyo Trabuco *important population*;
- one location (100 percent) and 183 individuals (100 percent) in the Middle Gabino *important population*; and
- one location (100 percent) and 250 individuals (100 percent) in the Trampas Canyon *important population*.

Protection of the vast majority of the brodiaea is important for conservation of the species, but maintaining adequate adjacent habitat to support pollinators of this species also is important. The Habitat Reserve would conserve adequate habitat in the vicinity of the conserved brodiaea

populations and provide for habitat connectivity between populations (see *Figure 173-M*). Pollinator studies of the Arroyo Trabuco and Cristianitos Canyon brodiaea populations conducted by GLA have determined that burrowing bees (family Anthrophoridae), sweat bees (family Halictidae) and flower-loving flies (family Syrphidae) are the most common pollinators of thread-leaved brodiaea in these two areas (GLA, unpublished data). Their data also show that grading for the Arroyo Trabuco Golf Course, for example, has not had an adverse effect on pollination of brodiaea because adequate habitat to support the pollinators was conserved as part of the project open space. Sweat bees do not travel more than about 328 feet (100 m) from nest sites to forage (Roubik 1989) and burrowing bees are expected to have similar size home ranges. Therefore, as long as natural open space is maintained within about 328 feet of brodiaea populations, effects on pollinators should be minimal.<sup>12</sup> All three conserved populations in the Habitat Reserve easily achieve this threshold.

Habitat connectivity and contiguity allowing for potential genetic exchange between populations via pollinators in the Habitat Reserve and other localities will be maintained through intact habitat blocks and robust habitat linkages, including the Arroyo Trabuco and Chiquadora Ridge populations via habitat linkages B, D, and G and between the Chiquadora Ridge and Trampas Canyon populations via linkages G and J. However, the existing distances between populations are substantially larger than the apparent dispersal capability of the documented likely pollinators; movements of more than 1,000 feet by sweat bees or burrowing bees likely are rare if they occur at all. The existing minimum distance between the Arroyo Trabuco and Chiquadora Ridge populations is about 17,000 feet and between the Chiquadora Ridge population and the Trampas Canyon population, the nearest population to the south, is about 14,000 feet; both well beyond the dispersal distance of the likely pollinators. Thus, although the Habitat Reserve would maintain dispersal habitat for potential pollinators, under existing conditions the Arroyo Trabuco and Chiquadora Ridge populations may be effectively isolated.

### 3. Management

Management of thread-leaved brodiaea is an important part of the conservation strategy. Several known or potential environmental stressors of brodiaea were identified in *Chapter 7*:

- Non-native plants (artichoke thistle, Italian ryegrass, bromes, wild oats and mustards);
- Cattle-related impacts
- Human activities (hiking, mountain bikes, equestrian)

<sup>12</sup> The reader is referred to Cane, J.H. 2001. Habitat fragmentation and native bees: a premature verdict? *Conservation Ecology* [www.consecol.org/vol5/iss1/art3](http://www.consecol.org/vol5/iss1/art3) for a discussion of native bee persistence in habitat fragments of "modest size." Cane concludes that networks of even small reserves can provide for "considerable pollinator diversity and the ecological services pollinators provide."

The main stressor on thread-leaved brodiaea in the Subregion likely is invasive, non-native species such as artichoke thistle and non-native grasses. Management actions for thread-leaved brodiaea would thus focus on controlling invasive species which compete with the brodiaea for space, nutrients and water, including, but not limited to, artichoke thistle, ryegrass, bromes, wild oats, and mustards. The invasive effects of non-native species can be exacerbated by over-grazing and frequent fire. Artichoke thistle control is an ongoing program on RMV and will continue in the Habitat Reserve on RMV lands in the future. Various other methods to control invasive species may be implemented, including prescribed burning, mowing, manual removal (weed-whacking and hand-pulling) and focused herbicide treatment. The coordinated GMP (*Appendix G*) also is expected to have a net benefit on the brodiaea through controls on non-native species, but the effects of grazing, positive or negative, need to be assessed through monitoring of the brodiaea populations. The reader is directed to *Section 7.12.2 of Chapter 7* for a full discussion of the relationship between grazing and brodiaea management.

Translocation and propagation of thread-leaved brodiaea would be conducted to the extent feasible and appropriate, as determined by the Reserve Manager and Science Panel, to expand the existing conserved locations. Potential restoration and enhancement areas would be focused in areas targeted for CSS and CSS/VGL restoration in Subarea 1, including Chiquita Ridge, and Chiquadora Ridge. The Translocation, Propagation and Management Plan for Special-status Plants (*Appendix J*) describes the various methods for restoration of thread-leaved brodiaea, including pre-translocation monitoring, seed collection, receptor site selection and preparation, translocation of natural populations, direct seeding at translocation sites, and long-term maintenance/repair and monitoring. The methods ultimately selected would depend on the extent of the impact, conditions associated with the affected populations, habitat conditions associated with individuals determined suitable for translocation, and site conditions associated with the receptor sites. Conserved and translocated brodiaea populations will be regularly monitored, as described in *Chapter 7* and in the Translocation, Propagation and Management Plan.

*Section 13.2.3* of this Chapter and the HRMP described in *Chapter 7* also addresses edge effects, including potential effects from herbicides, pesticides and fertilizers. Application procedures for these substances in landscaped areas located adjacent to the Habitat Reserve will be managed using standard Integrated Pest Management (IPM) protocols such as those developed for the Arroyo Trabuco Golf Course. IPM is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural and mechanical practices, and use of resistant varieties. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and non-target organisms, and the environment. With regard to pesticides and herbicides, for example, in selection and use of a chemical substance IPM considers the **(1)** efficacy of the material; **(2)** risk to the environmental in terms of toxicity and

exposure; (3) factors influencing chemical fate and exposure, including solubility, soil affinity, soil type, evaporation loss, groundwater, depth to groundwater and distance to surface water, and degradation; (4) restriction on chemicals in sensitive areas; and (5) use of windfoils to eliminate chemical drift during application. It should be noted that potential indirect effects on the Arroyo Trabuco population has already been addressed under the Section 7 consultation for the Arroyo Trabuco Golf Course, including a monitoring program and the study of pollinators described above.

#### 4. Rationale for Regulatory Coverage

Regulatory coverage for thread-leaved brodiaea is warranted because, with avoidance of the Chiquadora Ridge *major population/key location* and conservation of the Cristianitos Canyon/Lower Gabino Canyon *major population/key location*, more than 8,100 individuals (86 percent) would be conserved in the Habitat Reserve. With conservation of the *important populations*, about 9,248 individuals (98 percent) and 20 locations (61 percent) would be conserved in the Habitat Reserve (*Figure 173-M*). Adequate habitat to support pollinators and dispersal also would be conserved and the conserved populations would be adaptively managed. Furthermore, substantial conservation of this species already has occurred in southern California. It is provided regulatory coverage by the western Riverside County MSHCP and San Diego MSCP. Conservation of the thread-leaved brodiaea in the permit area would provide for recovery of the species in the area and substantially contribute to its recovery rangewide.

### **SECTION 13.3 CONSERVATION AND IMPACT ANALYSES FOR CONSERVED VEGETATION COMMUNITIES**

#### **13.3.1 Overview of Conserved Vegetation Communities**

The NCCP database defines 10 general or aggregated categories of natural vegetation communities/land covers (hereafter termed “vegetation communities”) in the NCCP planning area that are designated as Conserved Vegetation Communities. These Conserved Vegetation Communities are shown in boldface in column one of *Table 13-15*. Column one also shows the subassociations of the 10 Conserved Vegetation Communities. Column two of *Table 13-15* shows the five “focus” Conserved Vegetation Communities that would be managed pursuant to the proposed HRMP described in *Chapter 7* and their relationship to the 10 Conserved Vegetation Communities (woodland and forest are mapped as distinct vegetation communities in the NCCP database, but are combined for the purpose of the conservation analysis and adaptive management). One other general vegetation community not included in *Table 13-7* and not proposed for coverage is “cliff & rock” because only 4.7 acres of 9.5 acres in Subarea 1 would be conserved, no management is proposed, and it does not provide significant habitat for any of the proposed Covered Species discussed in *Section 13.2*. The 10 Conserved Vegetation

Communities are analyzed in terms of the impacts resulting by Covered Activities because: (1) they would be conserved by the Habitat Reserve, as described in detail in *Section 13.3.2*; (2) managed under the HRMP described fully in *Chapter 7* and summarized below in *Section 13.3.2.c*; and (3) these vegetation communities provide habitat essential to the conservation of the proposed Covered Species. The conservation and management of these 10 Conserved Vegetation Communities meets the goal of the NCCP Act to promote “the conservation of broad based natural communities and species diversity” and therefore these natural vegetation communities would be considered “Conserved Vegetation Communities” under the NCCP/MSAA/HCP.

**TABLE 13-15  
PROPOSED CONSERVED VEGETATION COMMUNITIES  
AND THE FIVE FOCUS CONSERVED VEGETATION COMMUNITIES**

Proposed Conserved Vegetation Communities	Five Focus Conserved Vegetation Communities
<b>Coastal Sage Scrub</b> <b>Subassociations</b> Black Sage Scrub Box Springs Goldenbush-Grassland California Buckwheat Scrub California Buckwheat Scrub-Grassland Coyote Brush Scrub Mixed Sage Scrub-Grassland Mixed Scrub Sagebrush Scrub-Black Sage Sagebrush-Buckwheat Scrub Sagebrush-Coyote Brush Scrub Sagebrush-Grassland Sagebrush-Monkeyflower Scrub Sagebrush Sage Scrub Scalebroom Scrub Southern Cactus Scrub White Sage Scrub	Coastal Sage Scrub
<b>Chaparral</b> <b>Subassociations</b> Chamise Chaparral Mixed Mid-Elevation Chaparral Scrub-Chaparral Scrub Oak Chaparral Scrub Oak-Sagebrush Snowball Ceanothus Chaparral Toyon-Sumac Chaparral	Chaparral
<b>Grassland</b> <b>Subassociations</b> Annual Grassland Valley Needlegrass Grassland Oak Savanna Grassland Sumac Savanna Grassland	Native Grassland <sup>1</sup>
<b>Riparian</b> <b>Subassociations</b> Arroyo Willow Riparian Forest Coast Live Oak Riparian Forest Herbaceous Riparian Mule Fat Scrub Southern Willow Scrub Sycamore Riparian Woodland	Riparian/Wetlands

**TABLE 13-15  
PROPOSED CONSERVED VEGETATION COMMUNITIES  
AND THE FIVE FOCUS CONSERVED VEGETATION COMMUNITIES**

Proposed Conserved Vegetation Communities	Five Focus Conserved Vegetation Communities
<b>Marsh</b> Subassociations Coastal Freshwater Marsh Alkali Marsh <b>Alkali Meadow</b> <b>Open Water</b> <b>Streamcourses</b>	
<b>Coast Live Oak Woodland</b> <b>Coast Live Oak Forest</b>	<b>Woodland &amp; Forest</b>

<sup>1</sup> The focus of the HRMP for grasslands is the management, restoration and enhancement of native grasslands. Artichoke thistle control also will be conducted in annual grasslands, as will management and monitoring of grassland focal species.

### 13.3.2 Conservation and Impacts Analyses for Conserved Vegetation Communities

*Table 13-16* summarizes the cumulative total conservation and impacts for the 10 Conserved Vegetation Communities in the Subarea 1 and non-Conserved Vegetation Communities/land covers (cliff & rock, agriculture, disturbed cover and development). *Table 13-17* provides a breakdown summary of the conservation and impacts for vegetation communities/land covers by source, including:

- Proposed RMV conservation and impacts, including impacts in the PAs for residential and commercial development and potential orchards and permanent impacts associated with construction of infrastructure in the Habitat Reserve and SOS;
- Prior RMV dedicated open space in the Habitat Reserve that would be adaptively managed by the RMVLC, including the Upper Chiquita Canyon Conservation Area, Donna O'Neill Land Conservancy, Ladera Ranch, and Arroyo Trabuco dedicated open space;
- CDFG open space in the Habitat Reserve set aside as part of Arroyo Trabuco Golf Course open space and to be adaptively managed by the RMVLC;
- County parklands that would be managed under the OMPs, including Caspers Wilderness Park, General Thomas F. Riley Wilderness Park and O'Neill Regional Park;
- NAS Starr Ranch designated as SOS;
- Prima Deshecha Landfill designated for impacts and SOS;
- Ladera Ranch areas designated as SOS;
- Ortega Rock Quarry Expansion Project impacts;

**TABLE 13-16  
OVERALL CONSERVATION AND IMPACT ANALYSIS FOR  
VEGETATION COMMUNITIES/LAND COVERS IN SUBAREA 1**

Vegetation Community	Subarea 1 Total <sup>1</sup>	Net Conserved Acres in Habitat Reserve <sup>2</sup>	Conserved %	Net Conserved Acres in SOS <sup>2</sup>	SOS %	Net Conserved Acres in Habitat Reserve and SOS	Habitat Reserve and SOS %	Net Permanent Impact Acres <sup>3</sup>	Impact %
<b>Conserved Vegetation Communities</b>									
Coastal Sage Scrub	16,811	12,191	73%	2,196	13%	14,387	86%	2,423	15%
Chaparral	6,668	5,194	78%	311	5%	5,505	83%	1,162	17%
Grassland	9,212	5,690	62%	954	10%	6,644	72%	2,666	29%
Riparian	3,895	3,120	80%	577	15%	3,697	95%	190	5%
Marsh	20	16	80%	0	0%	16	80%	2	10%
Alkali Meadow	38	36	92%	0	0%	36	92%	3	8%
Open Water	113	50	44%	0	0%	50	44%	63	56%
Streamcourses	25	24	96%	0	0%	24	96%	0	0%
Woodland & Forest	2,334	1,417	61%	353	15%	1,770	76%	565	24%
<b>Subtotal</b>	<b>39,116</b>	<b>27,738</b>	<b>71%</b>	<b>4,391</b>	<b>11%</b>	<b>32,129</b>	<b>82%</b>	<b>7,074</b>	<b>18%</b>
<b>Non-Conserved Vegetation Communities/Land Covers</b>									
Cliff & Rock	10	5	50%	0	0%	5	50%	5	50%
Agriculture	3,485	1,844	53%	3	<1%	1,847	53%	1,529	44%
Disturbed	1,050	374	36%	20	2%	394	39%	651	62%
Developed	970	465	48%	42	4%	507	53%	430	44%
<b>Subtotal</b>	<b>5,515</b>	<b>2,688</b>	<b>48%</b>	<b>65</b>	<b>2%</b>	<b>2,753</b>	<b>50%</b>	<b>2,615</b>	<b>47%</b>
<b>Total</b>	<b>44,631</b>	<b>30,426</b>	<b>68%</b>	<b>4,456</b>	<b>10%</b>	<b>34,888</b>	<b>78%</b>	<b>9,689</b>	<b>22%</b>

<sup>1</sup> Subarea 1 Total - Southern Subregion minus the Cleveland National Forest and other areas that are Not a Part of the Subarea 1 Plan Area, including Subareas 2, 3 and 4, the Chiquita Water Reclamation Plant, Ladera Ranch, Las Flores, Nichols Institute, Tesoro High School, the cities of Dana Point and Lake Forest and the Girl Scout Camp. The sum of Net Habitat Reserve, Net SOS and Net Impact may not equal Subarea 1 Total because not all lands in Subarea 1 fall into these categories. For the same reason the sum of the percentages may not be 100%

<sup>2</sup> The acreages represent "net" conservation because impacts due to construction, operation and maintenance/repair of infrastructure in the Habitat Reserve and SOS have been subtracted from the gross total.

<sup>3</sup> The impact acreage is an overstated impact scenario that assumes 100 percent disturbance in PAs 4 and 8 and potential orchards in PAs 6 and 7 because the specific impact areas have not been determined. Ultimately impacts will be reduced by 1,632 acres and the Habitat Reserve will be increased by the same amount.

**TABLE 13-17  
BREAKDOWN OF CONSERVATION AND IMPACTS FOR VEGETATION COMMUNITIES/LAND COVERS**

Vegetation Community	Gross Conserved Acres in Habitat Reserve				Gross Conserved Acres in SOS			Permanent Impact Acres <sup>1</sup>					Net Habitat Reserve	Net SOS
	Proposed RMV	Prior RMV	County Parks	DFG	Starr Ranch	Prima Deshecha	Ladera Ranch	RMV <sup>2</sup>	Ortega Rock	Prima Deshecha	La Pata	SMWD		
<b>Conserved Vegetation Communities</b>														
Sage Scrub	5,571	1,276	5,556	10	2,061	133	0	2,163	63	122	52	23	12,191	2,196
Chaparral	2,754	401	2,053	0	288	28	0	1,118	0	43	0	0	5,194	311
Grassland	3,129	1,237	1,538	29	622	331	2	1,918	0	484	250	14	5,690	954
Riparian	1,281	325	1,546	7	563	14	0	156	1	21	9	3	3,120	577
Freshwater Marsh	17	0	0	0	0	0	0	2	0	0	0	0	16	0
Alkali Meadow	36	0	0	0	0	0	0	3	0	0	0	0	36	0
Open Water	43	4	5	0	0	0	0	64	0	0	0	0	50	0
Streamcourses	8	0	17	0	0	0	0	0	0	0	0	0	24	0
Woodland & Forest	645	117	672	0	352	1	0	561	0	1	0	0	1,417	353
<b>Subtotal</b>	<b>13,484</b>	<b>3,360</b>	<b>11,387</b>	<b>46</b>	<b>3,886</b>	<b>507</b>	<b>2</b>	<b>5,985</b>	<b>64</b>	<b>671</b>	<b>311</b>	<b>40</b>	<b>27,738</b>	<b>4,391</b>
<b>Non-Conserved Vegetation Communities/Non-Natural Land Covers</b>														
Cliff & Rock	2	3	0	0	0	0	0	5	0	0	0	0	5	0
Agriculture	1,089	696	156	0	2	0	0	1,497	0	0	0	32	1,844	3
Disturbed	220	79	167	2	0	20	0	273	72	304	1	0	374	20
Developed	109	146	240	0	2	3	36	385	0	24	19	1	465	42
<b>Subtotal</b>	<b>1,420</b>	<b>924</b>	<b>563</b>	<b>2</b>	<b>4</b>	<b>23</b>	<b>36</b>	<b>2,160</b>	<b>72</b>	<b>328</b>	<b>20</b>	<b>33</b>	<b>2,688</b>	<b>65</b>
<b>Total</b>	<b>14,904</b>	<b>4,284</b>	<b>11,950</b>	<b>48</b>	<b>3,890</b>	<b>530</b>	<b>38</b>	<b>8,147</b>	<b>136</b>	<b>999</b>	<b>331</b>	<b>73</b>	<b>30,426</b>	<b>4,456</b>

<sup>1</sup> The impact acreage is an overstated impact scenario that assumes 100 percent disturbance in PAs 4 and 8 and potential orchards in PAs 6 and 7 because the specific impact areas have not been determined. Ultimately impacts will be reduced by 1,632 acres and the Habitat Reserve will be increased by the same amount.

<sup>2</sup> Permanent impacts for RMV include the construction new residential/commercial, and potential orchards in PAs and new infrastructure (roads, trails, sewer & water, etc.) and operation and maintenance/repair of existing infrastructure in the Habitat Reserve and SOS.

<sup>3</sup> Net Habitat Reserve and Net SOS reflect the subtraction of permanent infrastructure impacts from Gross Conserved Acres.

- Avenida La Pata conceptual alignment permanent impacts; and
- SMWD permanent impacts associated with the construction of the Upper Chiquita Reservoir and Gobernadora Multi-purpose Basin.

Please note that woodland and forest are combined in *Tables 13-15* and *13-16* because they are both dominated by coast live oak, only differ in the percent canopy cover, and provide similar wildlife habitat value. The tables also include conservation and impact estimates for non-conserved vegetation communities and non-natural land covers. The conservation and impact estimates account for impacts that would occur to proposed Conserved Vegetation Communities as a result of all Covered Activities.

As described in *Section 13.2*, the impact and conservation estimates presented in this section represent an “overstated” impact analysis of the ultimate project and an “understated” level of conservation. Although the proposed RMV component of the Habitat Reserve used for the conservation analysis is 14,904 gross acres (*i.e.*, not factoring in infrastructure impacts), the ultimate RMV portion of the Habitat Reserve will be about 16,536 acres. This is because the amount of impacts reported in this Chapter will ultimately be reduced by 1,632 acres when specific development/orchard conversion areas in PAs 4, and 6-8 are identified. Combined with the prior dedicated RMV, the CDFG open space associated with the Arroyo Trabuco Golf Course and County parklands components of the Habitat Reserve, which total 16,283 acres, the total ultimate Habitat Reserve would conserve approximately 32,819 acres of vegetation communities/landcovers.

The estimated conservation acreage of proposed Conserved Vegetation Communities in the Habitat Reserve and Subarea 1 SOS discussed in this section and estimated impacts to vegetation communities/land covers in development areas and from infrastructure, quarry and landfill impacts will vary over time as vegetation communities expand and contract in response to natural successional changes and stochastic events such as floods, fire and precipitation cycles. Coastal sage scrub, chaparral, and riparian acreage in particular is subject to variation. Thus, the coverage of vegetation communities, while based on current estimates, also includes any acreage changes over time. The Parties signatory to the NCCP/MSAA/HCP acknowledge that the acreage of proposed Conserved Vegetation Communities on lands both within the Habitat Reserve, SOS and the proposed development areas may fluctuate over time.

The conservation and impact estimates presented in *Tables 13-15* and *13-16* are limited to Subarea 1 of the B-12 Alternative for the NCCP/MSAA/HCP planning area, with the exception of some limited infrastructure impacts that occur in other subareas. They do not include a detailed analysis of conservation and impacts for vegetation communities in Subareas 2 and 4 as no impact authorization for vegetation communities is provided under the NCCP/MSAA/HCP for these areas, except for limited infrastructure impacts noted above. Any future impacts

proposed in these areas would require approval by USFWS and/or CDFG as part of an amendment to this NCCP/MCAA/HCP or separate NCCP/HCP or Section 7 consultation or 2081 or 4(d) permit authorization. Accordingly, future authorizations by USFWS and CDFG in such areas would require the Agencies to address the function and value of the vegetation communities in these areas in maintaining overall natural communities functions.

With regard to Subarea 3 (Coto de Caza), as an alternative to future 4(d) permits, HCP or Section 7 reviews, the following voluntary program is available for consideration by landowners within Subarea 3 as an optional means of complying with applicable FESA requirements. The required elements of this regulatory compliance option would include the following:

- Avoidance of Conserved Vegetation Communities to the maximum extent practicable;
- Mitigation of unavoidable impacts to Conserved Vegetation Communities occupied by Covered Species at a 2:1 ratio, with on-site avoidance habitat credited toward the mitigation ratio;
- Mitigation of unavoidable impacts to Conserved Vegetation Communities not occupied by Covered Species at a 1:1 ratio, with on-site avoidance habitat credited toward the mitigation ratio;
- To the extent that the project cannot accommodate the habitat mitigation requirement on-site, a mitigation fee of \$64,000 per acre of Conserved Vegetation Community (the fee subject to a CPI adjustment by the County), to reflect the costs of restoring/creating the subject Conserved Vegetation Communities, shall be paid to the County for adaptive management measures on County parklands;
- Funds generated for adaptive management measures on County parklands shall be placed in a non-wasting endowment to provide for long-term adaptive management implementation with the parklands;
- Any impacted cactus habitat shall, to the maximum extent practicable, be translocated to the fuel modification zone of the project;
- In addition to feasible translocation of impacted cactus plants, cactus shall be planted extensively within the fuel modification zone; and
- CC&Rs will be recorded requiring each landowner to eradicate invasive plant species on its property, including upon notice from any governmental agency.

## **a. Overall Conservation and Impacts**

### **1. Conservation of Proposed Conserved Vegetation Communities**

*Table 13-16* provides an overall summary of the acreage and percentages of the proposed Conserved Vegetation Communities in the Habitat Reserve and Subarea 1 SOS and other vegetation communities (*i.e.*, cliff & rock) and non-natural land covers not being proposed for coverage. *Table 13-17* shows the breakdown of these acreages and percentages in the Habitat Reserve proposed for the 22,815-acre RMV property and other already conserved open space proposed for the Habitat Reserve; *i.e.*, “Prior RMV” dedicated open space and CDFG open space that would be adaptively managed by the RMVLC and County parklands that would be managed under the OMPs. Overall, under the overstated impact scenario, the net Habitat Reserve would conserve a total of 30,426 acres (68 percent of Subarea 1), including 27,738 acres (71 percent) comprising the proposed Conserved Vegetation Communities and 2,688 acres (48 percent) comprising non-covered vegetation communities/land covers. As shown in *Table 13-16*, the overall conservation levels for the 10 Conserved Vegetation Communities in the Habitat Reserve generally are high, ranging from a low of 44 percent for open water to 96 percent for streamcourses. For the five major vegetation communities, the range is 61 percent conservation of woodland and forest to 80 percent of riparian. For the three major upland communities, 73 percent of coastal sage scrub, 78 percent of chaparral and 62 percent of grassland would be conserved in the Habitat Reserve.

Also as shown in *Table 13-16*, the Subarea 1 SOS contributes substantially to the overall conservation of vegetation communities in the Subarea, bringing the overall percentage for conservation of the proposed Covered Vegetation Communities to 82 percent, and notably 86 percent for coastal sage scrub, 83 percent for chaparral, 72 percent for grassland and 95 percent for riparian. Of note is that 3,890 acres (88 percent) of 4,442 acres of Subarea 1 SOS is in the NAS Starr Ranch Sanctuary (*Table 13-17*), which is managed for the purpose of habitat conservation, research and education. So, although the Subarea 1 SOS will not be adaptively managed under the HRMP, the large majority of SOS in Subarea 1 is protected for its ecosystem and wildlife habitat value.

### **2. Impacts on Proposed Conserved Vegetation Communities**

*Tables 13-15* and *13-16* provide summaries of the impacts on proposed Conserved Vegetation Communities assuming the overstated impact scenario for PAs 4 and 8 and potential orchards in PAs 6 and 7. As noted earlier, the ultimate impacts would be reduced by about 1,632 acres. *Table 13-16* shows cumulative net permanent impacts, including impacts on RMV within the PAs, all proposed infrastructure impacts proposed by RMV, County proposed impacts for the Prima Deshecha Landfill GDP and Avenida La Pata Improvement Project, SMWD impacts for

the Upper Chiquita Canyon Reservoir and Gobernadora Multi-purpose Basin, and Ortega Rock Quarry Expansion Project impacts (which are the responsibility of RMV). *Table 13-17* provides a breakout for the source of impact (*i.e.*, RMV, County, and SMWD).

The proposed Covered Activities would result in a grand total of 7,074 acres (18 percent) of impacts to the proposed Conserved Vegetation Communities. Impact percentages range from a low of 0 percent for streamcourses, to a high of 56 percent for open water. For the major vegetation communities, the range is 29 percent for grassland to 5 percent for riparian. An additional 2,615 acres of impacts non-covered cliff and rock, agriculture, disturbed and developed would occur under the proposed Covered Activities.

### 3. Native Grasslands

Subarea 1 supports approximately 1,023 acres of mapped native grasslands comprised of 1,018 acres of needlegrass grassland and 5 acres of *Elymus*-dominated native grassland (*Figure 206-M*). The Habitat Reserve would conserve 753 acres (74 percent) of native grassland. A total of 90 acres (9 percent) of permanent impacts to needlegrass grassland (89 acres) and *Elymus* grassland (1 acre) would occur, including 87 acres within the PAs and 3 acres from construction, operation and maintenance/repair of infrastructure. An additional 173 acres (17 percent) occur in the potential orchard footprints in PAs 6 and 7, of which the potential impacts are overstated because the orchard footprint would be limited to 50 acres. All permanent impacts are due to proposed RMV Covered Activities.

Construction, operation and maintenance/repair of infrastructure would result in 8 acres of temporary impacts to needlegrass grassland (also see discussion of temporary impacts below).

### 4. Oak-dominated Communities

Oak-dominated vegetation communities are analyzed separately in detail because coverage is proposed for the two oak species that occur in the planning area and would be subject to impacts under the proposed Covered Activities: coast live oak (*Quercus agrifolia*) and California scrub oak (*Quercus berberidifolia*) (see *Section 13.2*). Coast live oak occurs as a dominant species in coast live oak woodland, coast live oak forest, and coast live oak riparian forest, and is also a constituent of coast live oak savanna, which is mapped as a grassland community (Gray and Bramlet 1992). Scrub oak occurs as dominant or co-dominant species in scrub oak chaparral, scrub oak-sagebrush and scrub oak-sage scrub subassociations of chaparral. Engelmann oak (*Quercus engelmannii*) also occurs in the NCCP planning area in the Donna O'Neill Land Conservancy and was planted in GERA, but is not known from the proposed development areas and thus no impacts to this species are anticipated. It is important to understand that the number of oaks in the planning area has not been counted or estimated and that the analysis in this

section is based on the NCCP vegetation database which reports vegetation communities in terms of acreage. Scrub oaks, in particular, are not countable when they occur in dense chaparral communities in shrub-like forms.

As shown in *Table 13-16*, 1,417 acres (61 percent) of coast live oak woodland and forest would be conserved in the Habitat Reserve and 353 acres (15 percent) would be in Subarea 1 SOS (*Figure 203-M*). For coast live oak riparian forest, which is included in the riparian total, 1,155 acres (84 percent) would be conserved in the Habitat Reserve and 164 acres (12 percent) would be in Subarea 1 SOS. These three coast live oak-dominated vegetation communities combined would total 2,572 acres (69 percent) in the Habitat Reserve and 517 acres (14 percent) in Subarea 1 SOS of the 3,713 acres in Subarea 1.

Impacts to these coast live oak communities include 65 acres (5 percent) of coast live oak riparian forest and 564 acres (24 percent) of coast live oak woodland and forest.

For scrub-oak dominated communities, of the combined total 2,782 acres of scrub oak chaparral and scrub oak-sagebrush in Subarea 1, 2,233 acres (80 percent) would be in the Habitat Reserve, 265 acres (10 percent) would be in Subarea 1 SOS and 284 acres (10 percent) would be impacted (see *Table 13-3* and *Figure 204-M*). In addition, of 13 acres of oak savanna grassland, 12 acres would be in the Habitat Reserve and one acre in SOS; oak savanna grassland would not be impacted.

Individual conservation analyses for the two oak species are presented in more detail in *Section 13.2.5* under the Covered Species analysis and in the Species Accounts and Conservation Analyses (*Appendix E*).

## 5. Temporary Impacts

Temporary impacts to vegetation communities in the Habitat Reserve and SOS would occur in association with construction, operation and maintenance/repair of infrastructure. The assumptions for estimating temporary impacts and along with the responsible party in parentheses include:

- 34-foot temporary impact zone for construction of trails (*i.e.*, 17 feet from edge of trail) (RMV);
- Temporary impacts of 4 acres around new ground water storage tanks (RMV);
- Temporary impacts of existing small reservoirs that serve Ranch purposes (*e.g.*, stock ponds) (RMV);
- 2,500 square feet for temporary impacts to wells (RMV);

- 30-foot wide temporary impact area for existing and future domestic and non-domestic water/sewer pipeline operation and maintenance/repair (SMWD);
- 40-foot wide temporary impact area for maintenance/repair of the existing RMV water system (RMV);
- 50-foot wide temporary impact area for construction of drainage culverts (RMV); and
- Varying bridge widths and lengths ranging from 140 feet wide to 250 feet wide and 230 feet long to 1,400 feet long (see *Figure 187-R*).

*Table 13-18* summarizes the temporary impacts to vegetation communities that would occur during construction, operation and maintenance/repair of infrastructure facilities by RMV and SMWD. It is important to note that the temporary impacts would be cumulative over the life of the permit and they would be temporally distributed so that only a few acres at any given time would be impacted.

**TABLE 13-18  
TEMPORARY IMPACTS TO CONSERVED VEGETATION COMMUNITIES AND  
NON-CONSERVED VEGETATION COMMUNITIES AND LAND COVERS**

Vegetation Community	RMV Temporary Impacts		SMWD Temporary Impacts		Total Temporary Impacts <sup>1</sup>	
	Habitat Reserve	SOS	Habitat Reserve	SOS	Habitat Reserve	SOS
<b>Conserved Vegetation Communities</b>						
Coastal Sage Scrub	46	3	17	5	63	8
Chaparral	4	2	3	0	7	2
Grassland	70	11	36	5	106	16
Riparian	44	1	19	2	63	3
Freshwater Marsh	2	0	0	0	2	0
Alkali Meadow	2	0	0	0	2	0
Open Water	3	0	0	0	3	0
Streamcourses	0	0	0	0	0	0
Woodland & Forest	12	1	6	1	18	2
<b>Subtotal</b>	<b>183</b>	<b>18</b>	<b>81</b>	<b>13</b>	<b>264</b>	<b>1</b>
<b>Non-Conserved Vegetation Communities/Land Covers</b>						
Cliff & Rock	0	0	0	0	0	0
Agriculture	37	0	49	1	86	1
Disturbed	21	0	1	0	22	0
Developed	11	0	15	1	26	1
<b>Subtotal</b>	<b>69</b>	<b>0</b>	<b>65</b>	<b>2</b>	<b>134</b>	<b>2</b>
<b>Total</b>	<b>252</b>	<b>18</b>	<b>146</b>	<b>15</b>	<b>398</b>	<b>33</b>

<sup>1</sup> Totals will not sum precisely due to rounding error.

***b. Conservation and Impacts of Proposed Conserved Vegetation Communities for Participating Landowners/Permittees***

Participating Landowners/Permittees seeking regulatory coverage for impacts to the proposed Conserved Vegetation Communities include RMV, the County of Orange and SMWD. This

section describes the impacts and conservation of the proposed Conserved Vegetation Communities (as appropriate) for each of the participants.

### 1. Rancho Mission Viejo Conservation and Impacts

*Tables 13-19A and 13-19B* summarize the conservation and impact estimates for RMV alone, first for the overall property (*Table 13-19A*) and then by Planning Area (*Table 13-19B*). The summary includes a breakout for each PA and permanent and temporary impacts resulting from the construction, operation and maintenance/repair of infrastructure facilities. Note that some permanent and temporary impacts occur in SOS outside of the Ranch boundary as a result of new road and trails construction outside the Ranch property.

The total “net” Habitat Reserve (*i.e.*, with infrastructure impacts factored in), under the overstated impact scenario, would conserve 14,579 acres (64 percent) of the 22,815-acre RMV property (*Table 13-19*). The additional 1,632 acres for PAs 4, 6, 7 and 8 would bring the total conservation acreage to 16,211 acres, or 71 percent of RMV. An additional 122 acres of existing orchard and 50 acres of new orchard would be in open space but not included in the Habitat Reserve total. Even under the overstated impact scenario, the overall conservation percentages of the major proposed Conserved Vegetation Communities in the Habitat Reserve on RMV range from 61 percent for grassland to 89 percent for riparian, with coastal sage scrub at 72 percent and chaparral at 71 percent. It is anticipated that coastal sage scrub and chaparral percentages will be higher in the ultimate Habitat Reserve because both are dominant communities in PA 4. Likewise, the grassland conservation percentage will be significantly higher (by approximately 300 acres) because of additional conservation in PAs 6 and 7.

Woodland and forest is conserved at a moderate level of 53 percent, but this percentage likely will also increase with additional conservation in PAs 4 and 8. Overall, the conservation of proposed Conserved Vegetation Communities under the overstated scenario is 13,253 acres, or 69 percent of the total. An additional 1,326 acres (37 percent) of non-covered vegetation communities/land covers would be conserved in the Habitat Reserve, of which 1,024 acres (77 percent) are non-orchard agriculture, which provides valuable foraging habitat for raptors and tricolored blackbird and nesting habitat for grasshopper sparrow.

RMV also is responsible for impacts for the Ortega Rock Quarry Expansion Project (see *Appendix S*). This project would result in impacts to 136 acres, of which 64 acres are proposed Conserved Vegetation Communities (63 acres of coastal sage scrub and 1 acres of mule fat scrub) and 72 acres are non-Conserved Vegetation Communities/land covers (all disturbed habitat).

**TABLE 13-19A  
SUMMARY OF CONSERVATION AND IMPACTS TO VEGETATION COMMUNITIES/LAND COVERS FOR RMV**

Vegetation Community	Conservation and Impact Summary								
	Total Acres <sup>1</sup>	Conserved Vegetation Communities in Habitat Reserve on RMV	% Habitat Reserve on RMV	Total Permanent Impacts	Total Permanent Impacts in Planning Areas <sup>1</sup>	Total Permanent Infrastructure Impacts		Total Temporary Infrastructure Impacts	
						Habitat Reserve	SOS	Habitat Reserve	SOS
<b>Conserved Vegetation Communities</b>									
Coastal Sage Scrub	7,636	5,476	72%	2,163	2,063	95	5	46	3
Chaparral	3,854	2,740	71%	1,118	1,099	14	6	4	2
Grassland	4,967	3,054	61%	1,918	1,828	76	15	70	11
Riparian	1,405	1,255	89%	156	124	26	6	44	1
Freshwater Marsh	19	16	84%	2	2	1	0	2	0
Alkali Meadow	38	35	92%	3	2	1	0	2	0
Open Water	104	40	38%	64	61	3	0	3	0
Streamcourses	8	8	100%	0	0	0	0	0	0
Woodland & Forest	1,190	629	53	561	544	17	2	12	1
<b>Subtotal</b>	<b>19,221</b>	<b>13,253</b>	<b>69%</b>	<b>5,985</b>	<b>5,723</b>	<b>233</b>	<b>34</b>	<b>183</b>	<b>19</b>
<b>Non-Conserved Vegetation Communities/Land Covers</b>									
Cliff and Rock	7	2	29%	5	5	0	0	0	0
Development	486	99	20%	385	375	10	0	11	0
Disturbed	474	201	42%	273	254	19	0	21	0
Agriculture	2,628	1,024	39%	1,497	1,431	65	0	37	0
<b>Subtotal</b>	<b>3,595</b>	<b>1,326</b>	<b>37%</b>	<b>2,160</b>	<b>2,065</b>	<b>94</b>	<b>0</b>	<b>69</b>	<b>0</b>
<b>Total</b>	<b>22,816</b>	<b>14,579</b>	<b>64%</b>	<b>8,145</b>	<b>7,788</b>	<b>327</b>	<b>34</b>	<b>252</b>	<b>19</b>

<sup>1</sup> Assumes overstated scenario impacts for PAs 4, 6-8.

**TABLE 13-19B  
SUMMARY OF CONSERVATION AND IMPACTS TO  
VEGETATION COMMUNITIES/LAND COVERS FOR RMV BY DEVELOPMENT PLANNING AREA**

Conserved Vegetation Community	PA 1 <sup>2</sup>		PA 2		PA 3 <sup>3</sup>		PA 4 <sup>4</sup>		PA 5		PA 6 <sup>5,6</sup>	PA 7 <sup>5,6</sup>	PA 8 <sup>7</sup>	
	Impact	Habitat Reserve	Impact	Habitat Reserve	Impact	Habitat Reserve	Impact	Habitat Reserve	Impact	Habitat Reserve	Impact	Impact	Impact	Habitat Reserve
<b>Conserved Vegetation Communities</b>														
Coastal Sage Scrub	9	235	264	1,064	649	1,261	399	452	299	109	15	32	395	3,107
Chaparral	1	1	21	145	397	440	443	297	113	32	2	6	116	2,178
Grassland	222	611	39	321	196	206	61	81	325	297	225	140	620	2,613
Riparian	6	53	9	157	47	379	15	4	22	22	2	1	23	695
Freshwater Marsh	0	0	0	7	1	7	0	0	0	1	0	0	0	4
Alkali Meadow	0	0	0	15	0	19	0	0	0	0	0	0	1	3
Open Water	1	0	1	0	2	36	0	0	57	2	0	0	0	5
Streamcourses	0	0	0	1	0	0	0	0	0	0	0	0	0	7
Woodland & Forest	3	26	40	92	101	198	103	40	198	106	1	1	101	311
<b>Subtotal</b>	<b>242</b>	<b>926</b>	<b>374</b>	<b>1,802</b>	<b>1,393</b>	<b>2,546</b>	<b>1,021</b>	<b>874</b>	<b>1,014</b>	<b>569</b>	<b>245</b>	<b>180</b>	<b>1,256</b>	<b>8,923</b>
<b>Non-Conserved Vegetation Communities/Land Covers</b>														
Cliff and Rock	0	0	0	0	0	0	0	0	5	0	0	0	0	2
Development	102	31	0	30	102	21	107	22	20	18	0	3	93	105
Disturbed	2	2	0	6	83	81	0	0	152	5	2	14	0	142
Agriculture	239	21	523	999	607	134	1	9	0	0	0	9	0	45
<b>Subtotal</b>	<b>343</b>	<b>54</b>	<b>523</b>	<b>1,035</b>	<b>792</b>	<b>236</b>	<b>108</b>	<b>31</b>	<b>177</b>	<b>23</b>	<b>2</b>	<b>26</b>	<b>93</b>	<b>294</b>
<b>Total</b>	<b>585</b>	<b>980</b>	<b>897</b>	<b>2,837</b>	<b>2,185</b>	<b>2,782</b>	<b>1,129</b>	<b>905</b>	<b>1,191</b>	<b>592</b>	<b>247</b>	<b>206</b>	<b>1,349</b>	<b>9,217</b>

<sup>1</sup> Assumes overstated scenario impacts for PAs 4, 6-8.

<sup>2</sup> Includes 18 acres for the SOLAG Recycling Facility.

<sup>3</sup> Includes 14 acres for employee housing and 30 acres for setback along San Juan Creek.

<sup>4</sup> Development in PA 4 represents an overstated impact scenario. Ultimately a maximum of 550 acres would be developed in PA 4 for residential/commercial and 175 acres for reservoir.

<sup>5</sup> Potential orchards in PA 6 and/or 7 would be limited to 50 acres. In PA 7 25 acres are designated for the relocated Ranch Headquarters.

<sup>6</sup> Planting of orchards in PAs 6 and/or 7 is not associated with dedication of open space.

<sup>7</sup> Development in PA 8 represents an overstated impact scenario. Ultimately a maximum of 500 acres would be developed in PA 8.

## 2. County of Orange Impacts

The County of Orange would be responsible for impacts occurring in association with the Prima Deshecha Landfill GDP and Avenida La Pata Improvement Project (*Table 13-17* and *Figures 163-M* through *165-M*). It should be noted that the Prima Deshecha impact area is fairly well defined and provides an accurate estimate of future impacts. The Avenida La Pata conceptual impact area is very broad to provide the County with flexibility in siting the road alignment and estimating associated grading impacts, particularly remedial grading impacts; it is likely that ultimate impacts will be substantially less. The Prima Deshecha Landfill GDP would result in impacts to 671 acres of proposed Covered Vegetation Communities and an additional 328 acres of non-covered vegetation communities/land covers. The Avenida La Pata project would result in impacts to 311 acres of proposed Conserved Vegetation Communities and 20 acres of non-Conserved Vegetation Communities/land covers. Of the 331 total acres of impacts for La Pata, about 225 acres would be within the Habitat Reserve on RMV lands and 106 acres within SOS. A substantial portion of the La Pata impacts would be temporary due to the potential need to address geotechnical impacts that could be mitigated in a one-time basis with revegetation of impacted slope areas. It is also important to note that the impacts for Avenida La Pata for which regulatory coverage is sought extend into Subarea 4 in the City of San Clemente.

## 3. Santa Margarita Water District Impacts

The SMWD would be responsible for permanent impacts occurring in association with the construction of the Upper Chiquita Reservoir (38 acres total, including proposed pipelines) and the Gobernadora Multi-purpose Basin (35 acres) (see *Figure 160-M*). These impacts are summarized in *Table 13-17*, and combined include a total of 40 acres of proposed Conserved Vegetation Communities and 33 acres of non-covered vegetation communities/land covers. As summarized in *Table 13-18*, SMWD operations and maintenance/repair activities would result in 146 acres of temporary impacts in the Habitat Reserve, of which 81 acres would be to proposed Conserved Vegetation Communities and 65 acres would be to non-Conserved Vegetation Communities/land covers, and 15 acres in SOS, of which 13 acres would be to proposed Conserved Vegetation Communities. As noted above, temporary impacts are cumulative over the life of the project and will be distributed over time.

### ***c. Reserve Design Tenets***

Landscape-level reserve design considerations pertinent to the Habitat Reserve and conservation of the proposed Conserved Vegetation Communities were summarized in *Chapter 9* and presented in detail in *Appendix P* in the context of the SRP NCCP Conservation Guidelines, the Southern Orange County Science Advisors Reserve Design Tenets and the USACE SAMP Tenets. In addition to the conservation acreage and percentages discussed in the previous

section, the analysis for regulatory coverage of vegetation communities must take into consideration the landscape-level ecosystem features of the Habitat Reserve with regard to conservation of planning species, habitat block size, habitat contiguity (*i.e.*, lack of fragmentation) and connectivity, and biological diversity and physiographic representativeness (*e.g.*, spatial distribution and elevation).

### 1. Planning Species

*Chapter 8* provides a detailed quantitative and qualitative consistency analysis for the NCCP/MSAA/HCP planning species under the B-12 Alternative. *Section 13.2.5* also provides a detailed conservation analysis for the 32 proposed Covered Species, of which 22 are also planning species. This section provides a brief summary and examples of how the Habitat Reserve and SOS under the B-12 Alternative benefits the wildlife planning species that rely on the landscape-level major vegetation communities (*i.e.*, note that plant planning species and wildlife planning species such as western spadefoot and the fairy shrimp are excluded from this discussion because their conservation generally is site-specific rather than landscape-scale or vegetation community-specific).

As described in *Chapter 8*, the B-12 Alternative has very high consistency with the Draft Southern Planning Guidelines in large part due to high conservation levels of the proposed Covered Vegetation Communities that provide habitat for the planning species. For “obligate” coastal sage scrub species such as the California gnatcatcher and cactus wren, the Habitat Reserve conserves 12,191 acres of coastal sage scrub in Subarea 1, which is 73 percent of the total in the Subarea (*Table 13-16*). Combined with the 2,196 acres in Subarea 1 SOS, of which 2,061 acres are on the NAS Starr Ranch Sanctuary, 86 percent of the coastal sage scrub in Subarea 1 is conserved (*Table 13-17*). For planning species that use both coastal sage scrub and chaparral, such as the orange-throated whiptail lizard and San Diego horned lizard, the Habitat Reserve conserves 17,385 acres (74 percent) in Subarea 1. Combined with the 2,504 acres in Subarea 1 SOS, of which 2,349 acres are on Starr Ranch, 85 percent of coastal sage scrub and chaparral is conserved. For riparian/aquatic species such as the arroyo toad, yellow-breasted chat, yellow warbler and southwestern pond turtle, the Habitat Reserve conserves 3,120 acres of riparian vegetation, which is 80 percent of the total in Subarea 1.<sup>13</sup> Combined with the 577 acres of riparian in SOS, of which 563 acres are in Starr Ranch, 95 percent of the riparian vegetation is conserved. For raptor planning species that use riparian, woodland and forest as nesting habitat (Cooper’s hawk, white-tailed kite) the Habitat Reserve conserves 4,537 acres (73 percent) of nesting habitat. Combined with 930 acres of riparian, woodland and forest in SOS, of which 915 acres are in Starr Ranch, 88 percent of raptor nesting habitat is conserved. Finally for grassland

<sup>13</sup> Note that the least Bell's vireo and southwestern willow flycatcher are more restricted to southern willow scrub and riparian forest and thus are not discussed here for the generalized riparian vegetation community. The reader is directed to the conservation analyses for these species in *Section 13.2* and *Appendix E Species Accounts and Conservation Analyses*.

planning species such as the grasshopper sparrow, tricolored blackbird and foraging raptors (golden eagle, white-tailed kite and merlin) the Habitat Reserve conserves 5,690 acres (62 percent) of grassland and 1,844 acres (53 percent) of non-orchard agriculture. Combined with 944 acres of grassland in Subarea 1 SOS, of which 622 acres are on Starr Ranch and 331 acres are in Subarea 1 SOS in Prima Deshecha, 8,478 acres (67 percent) of grassland and agriculture are conserved in Subarea 1.

The high conservation levels of the proposed Conserved Vegetation Communities provide adequate habitat for the conservation of the wildlife planning species in Subarea 1.

## 2. Habitat Blocks and Contiguity

Reserve function is a function of both total area (as addressed above) and configuration. Large blocks of habitat containing large populations of species indicative of habitat quality are superior to small blocks of habitat containing small populations (Science Advisors 1998). A large, but fragmented reserve will function less effectively than a smaller, but intact reserve. In order to assess the degree of habitat contiguity, a “coarse” habitat block analysis was conducted by delineating intact habitat blocks, defined as contiguous areas at least 1,000 acres in size and at least 2,000 feet in width at their narrowest point and with little or no internal fragmentation by non-habit land covers such as disturbed land covers and hardscape development. The exception is the Arroyo Trabuco which narrows to less than 2,000 feet in several areas, but which is effectively separated from adjacent development by its steep bluffs. The habitat blocks include both Habitat Reserve and SOS in Subarea 1 and extend into other subareas where there is contiguous SOS that adds to the biological function of the block, such as Subarea 3 Coto de Caza open space adjacent to the Upper Chiquita Conservation Area. For this coarse analysis, existing and proposed infrastructure, including existing and proposed roads, were not factored into the habitat block analysis as they were for the “refined” habitat block delineations used for the species conservation analyses presented in *Section 13.2.5*. *Table 13-20* presents the results of the habitat block analysis and *Figure 159-M* shows the spatial distribution of the habitat blocks.

**TABLE 13-20  
CONSERVED VEGETATION COMMUNITIES AND  
OTHER LAND COVER WITHIN THE B-12 ALTERNATIVE HABITAT BLOCKS**

Conserved Vegetation Community	Habitat Block Acres <sup>1</sup>		
	Arroyo Trabuco	Western	Eastern
Coastal Sage Scrub	328	2,734	10,643
Chaparral	121	298	4,926
Grassland	552	1,678	3,666
Woodland & Forest	144	215	1,252

**TABLE 13-20  
CONSERVED VEGETATION COMMUNITIES AND  
OTHER LAND COVER WITHIN THE B-12 ALTERNATIVE HABITAT BLOCKS**

Conserved Vegetation Community	Habitat Block Acres <sup>1</sup>		
	Arroyo Trabuco	Western	Eastern
Riparian	616	509	2,351
Other Habitats/Land Covers	33	1,685	88
Subtotal Conserved Vegetation Communities	1,794	7,119	22,926
Developed/Disturbed (% of Total in Block)	109 (6%)	185 (2%)	286 (1%)
<b>Total Acres in Block</b>	<b>1,903</b>	<b>7,304</b>	<b>23,212</b>

<sup>1</sup> Acreages do not include infrastructure impacts.

As a whole, the B-12 Alternative would create three large blocks of habitat that are connected with each other in the planning area and with other large-scale conserved areas (*i.e.*, CNF, Camp Pendleton) (*Figure 159-M*):

- Western habitat block (7,304 acres);
- Arroyo Trabuco habitat block (1,903 acres); and
- Eastern habitat block (23,212 acres).

Within the context of the overall B-12 Alternative Habitat Reserve, these three blocks combined (32,419 acres) account for about 73 percent of the conserved lands in the planning area (including Habitat Reserve and SOS). For Subarea 1 alone, the three habitat blocks total 31,926 acres and account for about 89 percent of the conserved lands in Subarea 1.

The three habitat blocks are all interconnected by habitat linkages (*Figure 159-M*). The Arroyo Trabuco and Western habitat blocks are connected by existing linkage B between Ladera Ranch and Las Flores, which has a minimum width of about 1,500 feet. The Western and Eastern blocks are connected by linkages I and J. Linkage I is located between Coto de Caza and PA 3 in the Gobernadora sub-basin and would have a minimum width of 2,000 feet. Linkage J is located along San Juan Creek and would have a minimum width of about 1,320 feet with planned setbacks from the 100-year floodplain. These three habitat linkages would ensure connectivity among the proposed Conserved Vegetation Communities in the three large habitat blocks.

The three large habitat blocks have high habitat contiguity and exhibit relatively little internal fragmentation. Existing development and disturbed land uses within the habitat blocks comprise very small percentages of the blocks, ranging from about 6 percent of the Arroyo Trabuco block to 1 percent of the Eastern block (*Table 13-20*). The construction of roads and other infrastructure within the Habitat Reserve, however, would contribute to some additional internal fragmentation in the future. Cristianitos Road/"F" Street would cross San Juan Creek and would extend from PA 3 Gobernadora development to Oso Parkway. Cow Camp Road also would cross San Juan, Gobernadora and Chiquita creeks. These effects are reflected in the refined habitat block analysis shown in *Table 13-9* where the roads result in the delineation of seven discrete blocks compared to the three blocks in the coarse analysis. Each of these crossings would be designed to avoid and minimize impacts to vegetation communities and maximize the likelihood of long-term connectivity and contiguity (see Circulation Systems Consistency Analysis in *Section 8.3.4 of Chapter 8*). For example, bridge heights would be a minimum of 20 feet high to minimize shading effects on riparian vegetation. Other infrastructure, such as sewer and water lines, water tanks and reservoirs, pump stations, trails, drainage culverts, etc. would contribute to impacts within the Habitat Reserve, but would not significantly impact the function of the Habitat Reserve.

### 3. Diversity and Representativeness

The Science Advisors (1998) stated that blocks of habitats for reserves should contain a diverse representation of physical and environmental conditions. The overall diversity of the conserved vegetation communities in the Habitat Reserve and SOS is addressed in terms of overall habitat conservation and its proportional and spatial representation within the Habitat Reserve and SOS. The extent to which the Habitat Reserve and SOS in Subarea 1 (the 4,466 acres on Starr Ranch and Prima Deshecha) conserves the five major vegetation communities (coastal sage scrub, chaparral, grassland, woodland and forest, and riparian) and maintains the existing diversity is considered in several ways: **(1)** amount of vegetation conserved; **(2)** the proportional relationship between the amount of a vegetation community conserved and the amount of the community in Subarea 1 (*e.g.*, is a vegetation community over- or under-represented in the Habitat Reserve and SOS compared to other communities in relation to existing conditions?); and **(3)** the physiographic diversity of a conserved vegetation community compared to existing conditions in the Subarea, as measured by elevation gradient and distributions within watersheds. (Distance from coast also could be used as a measure of biological and physiographic diversity, but it is highly correlated with elevation in the planning area (Pearson Correlation = 0.91;  $p < 0.01$ ), and thus only elevation was used to evaluate diversity.)

*Table 13-21* shows the gross amount and percentage of the major vegetation communities conserved in the Habitat Reserve and SOS, both for the overall Subarea 1 and broken down by

watersheds.<sup>14</sup> Overall, the large majority of the major vegetation communities in Subarea 1 are conserved in the Habitat Reserve and SOS. Gross conservation ranges from a low of 75 percent for grassland to a high of 96 percent for riparian. Other than grassland, the lowest overall conservation percentage of the major vegetation communities is 77 percent for woodland and forest.

TABLE 13-21

## OVERALL CONSERVATION OF MAJOR VEGETATION COMMUNITIES AND WITHIN WATERSHEDS

Vegetation Community	Subarea 1 Gross Acres	% of Vegetation Community in Subarea 1	Gross Conserved Acres <sup>1</sup>	% of Total	% of Vegetation Community Conserved	% Deviation from Subarea 1 Existing Distribution
<b>Coastal Sage Scrub</b>	<b>16,811</b>		<b>14,610</b>	<b>87%</b>		
San Juan Creek	13,072	78%	11,433	87%	78%	0%
San Mateo Creek	3,483	21%	3,037	87%	21%	0%
Other Watersheds <sup>2</sup>	257	2%	140	54%	1%	-1%
<b>Chaparral</b>	<b>6,668</b>		<b>5,525</b>	<b>83%</b>		
San Juan Creek	4,094	61%	3,119	76%	56%	-5%
San Mateo Creek	2,502	38%	2,378	95%	43%	6%
Other Watersheds	72	1%	29	40%	1%	-1%
<b>Grassland</b>	<b>9,212</b>		<b>6,890</b>	<b>75%</b>		
San Juan Creek	5,533	60%	4,652	84%	68%	7%
San Mateo Creek	2,855	31%	1,879	66%	27%	-4%
Other Watersheds	824	9%	358	43%	5%	-4%
<b>Woodland &amp; Forest</b>	<b>2,334</b>		<b>1,788</b>	<b>77%</b>		
San Juan Creek	1,913	82%	1,469	77%	82%	0%
San Mateo Creek	415	18%	315	76%	18%	0%
Other Watersheds	5	0%	4	80%	0%	0%
<b>Riparian</b>	<b>3,895</b>		<b>3,735</b>	<b>96%</b>		
San Juan Creek	3,022	78%	2,910	96%	78%	0%
San Mateo Creek	839	22%	812	97%	22%	0%
Other Watersheds	35	1%	14	40%	0%	-1%

<sup>1</sup> Gross Conserved Acres does not include infrastructure impacts and Ortega Rock Quarry impacts.

<sup>2</sup> "Other Watershed" include the San Clemente and Aliso Hydrological Areas.

The Habitat Reserve and SOS also provide relatively balanced conservation of the major vegetation communities within the San Juan and San Mateo watersheds. As an example, in both the San Juan and San Mateo watersheds 87 percent of coastal sage scrub is conserved in Habitat Reserve and SOS. Similarly, woodland and forest and riparian are conserved at similar levels in the two watersheds. There is a larger difference in the relative conservation of chaparral and grassland in the two watersheds. For chaparral, 76 percent is conserved in the San Juan Watershed and 95 percent is conserved in the San Mateo Watershed. This disparity is partly due to the large chaparral component in PAs 3 and 4 (43 percent of the PA) compared to other PAs in

<sup>14</sup> Gross acreages were used for this analysis and the following analyses because of the greatly increased complexity of incorporating the various layers of infrastructure with relatively little gain in analytic precision.

the San Mateo Watershed (see *Table 13-19*). The percentage of conserved chaparral ultimately will be increased with the overall reduction of impacts in PA 4 by 402 acres compared to this overstated impact scenario. Likewise there is a relatively large difference in the percent conservation of grasslands between the two watersheds, with 84 percent conserved in the San Juan Watershed and 66 percent conserved in the San Mateo Watershed. This is a result of the relatively greater amounts of grassland in the San Mateo Watershed (*Table 13-19*). The percentage of conserved grassland in the San Mateo Watershed will be significantly increased because most of the area designated as potential orchard is grassland and only 50 acres of the designated 431 acres will be converted; approximately 300 additional acres of grassland will be conserved in the San Mateo Watershed upon final siting of the orchards in PAs 6 and 7. Similarly, in PA 8 development will be limited to only 500 acres within the 1,349-acre area.

Conservation percentages for vegetation communities in the “Other Watersheds” (San Clemente and Aliso Hydrological Areas) are consistently lower, ranging from a low of 40 percent for chaparral and riparian to a high of 54 percent for coastal sage scrub (woodland and forest only accounts for 5 acres in the Other Watersheds). Conservation is lower because the vast majority of the Other Watersheds in Subarea 1 is comprised of the Prima Deshecha Landfill in the San Clemente Hydrological Area where about 999 acres of the 1,530-acre landfill area will be impacted.

Another way of demonstrating the balance of conservation of the major vegetation communities in the watersheds in Habitat Reserve and SOS in Subarea 1 is expressed in *Table 13-21* as the “% of Vegetation Community in Subarea 1” and the “% of Vegetation Community Conserved.” This analysis compares the relative conservation within each vegetation community in relation to the watersheds. For example, within Subarea 1 78 percent of the coastal sage scrub is in the San Juan Watershed, 21 percent is in the San Mateo Watershed and 2 percent is in the Other Watersheds. In comparison, in the Habitat Reserve and SOS 78 percent of the conserved coastal sage scrub is in the San Juan Watershed, 21 percent in the San Mateo Watershed, and 1 percent in the other watersheds. This comparison is expressed in the column “% Deviation from Subarea 1 Existing Distribution.” Therefore, compared to the existing setting in Subarea 1, the Habitat Reserve and SOS conserve exactly the same percent distribution of coastal sage scrub in the San Juan and San Mateo watersheds, while 1 percent less is conserved in the other watersheds; *i.e.*, the Habitat Reserve and SOS provide unbiased spatial conservation of coastal sage scrub among the watersheds. Similarly, woodland and forest and riparian exhibit no spatial bias in conservation among the watersheds. Chaparral and grassland conservation show the largest biases among watersheds. Chaparral is under-represented in the San Juan Watershed by 5 percent and over-represented in the San Mateo Watershed by 6 percent. This discrepancy should be reduced somewhat with the reduction of impacts in PA 4. Grassland is over-represented by 7 percent in the San Juan Watershed and under-represented in the San Mateo and Other

Watersheds by 4 percent. The discrepancy in the San Mateo Watershed will be reduced with the reduction of grassland impacts in PAs 6, 7 and 8.

*Table 13-22* compares the conservation of the major vegetation communities in Subarea 1 with their existing representation in the Subarea as a whole. For example, coastal sage scrub accounts for 43 percent of the total acreage of the five major vegetation communities in Subarea 1 and 45 percent of the total acreage in the Habitat Reserve and SOS; *i.e.*, coastal sage scrub is “over-represented” by 2 percent in the Habitat Reserve and SOS in relation to its existing occurrence in Subarea 1. In contrast, grassland is “under-represented” in the Habitat Reserve and SOS by 3 percent compared to the Subarea as a whole. Although there is no established standard or threshold by which to compare the biological significance of a particular deviation from the existing conditions in Subarea 1, a maximum under-representation of 3 percent for grassland does not appear to be a significant deviation, especially in light of the dynamic nature of habitat successions between grassland, coastal sage scrub and chaparral and the general management goal of controlling the conversion of sage scrub and chaparral to annual grassland. Overall, the five major vegetation communities are adequately represented in the Habitat Reserve and SOS, with a minimum of 3 percent under-representation for grassland and maximum 2 percent over-representation for coastal sage scrub.

The same comparison was applied to watersheds, with similar results. The maximum deviations from existing conditions in Subarea 1 are grassland at 2 percent under-represented in the San Mateo Watershed and coastal sage scrub at 2 percent over-represented in the San Juan Watershed. Overall, the Habitat Reserve and SOS provide a balanced representation of the existing distribution of the major vegetation communities in the different watersheds.

*Table 13-23* compares the elevational distribution of the major vegetation communities in Subarea 1 with the distribution in the Habitat Reserve and SOS. The table includes two sets of analyses: (1) the total conservation percentages of each vegetation community in relation to elevation; and (2) the relative difference in conservation of a vegetation community at an elevation range in relation to its occurrence in the planning area. For example, 5 percent of the coastal sage scrub in Subarea 1 occurs at less than 400 feet, whereas 4 percent of the coastal sage scrub in the Habitat Reserve and SOS occurs at less than 400 feet; *i.e.*, a deviation and under-representation of 1 percent.

**TABLE 13-22  
COMPARATIVE CONSERVATION OF MAJOR VEGETATION COMMUNITIES**

Vegetation Community	Subarea 1 Gross Acres	% of Subarea 1	Gross Conserved Acres	% of Total	% Deviation from Subarea 1 Distribution
<b>Coastal Sage Scrub</b>	<b>16,811</b>	<b>43%</b>	<b>14,610</b>	<b>45%</b>	<b>2%</b>
San Juan Creek	13,072	34%	11,433	35%	2%
San Mateo Creek	3,483	9%	3,037	9%	0%
Other Watersheds	257	1%	140	0%	0%
<b>Chaparral</b>	<b>6,668</b>	<b>17%</b>	<b>5,525</b>	<b>17%</b>	<b>0%</b>
San Juan Creek	4,094	11%	3,119	10%	-1%
San Mateo Creek	2,502	6%	2,378	7%	1%
Other Watersheds	72	0%	29	0%	0%
<b>Grassland</b>	<b>9,212</b>	<b>24%</b>	<b>6,890</b>	<b>21%</b>	<b>-3%</b>
San Juan Creek	5,533	14%	4,652	14%	0%
San Mateo Creek	2,855	7%	1,879	6%	-2%
Other Watersheds	824	2%	358	1%	-1%
<b>Woodland &amp; Forest</b>	<b>2,334</b>	<b>6%</b>	<b>1,788</b>	<b>5%</b>	<b>-1%</b>
San Juan Creek	1,913	5%	1,469	5%	0%
San Mateo Creek	415	1%	315	1%	0%
Other Watersheds	5	0%	4	0%	0%
<b>Riparian</b>	<b>3,895</b>	<b>10%</b>	<b>3,735</b>	<b>11%</b>	<b>1%</b>
San Juan Creek	3,022	8%	2,910	9%	1%
San Mateo Creek	839	2%	812	2%	0%
Other Watersheds	35	0%	14	0%	0%

**TABLE 13-23  
ELEVATIONS OF CONSERVED VEGETATION  
COMMUNITIES COMPARED TO SUBAREA 1**

Vegetation Community Elevation Range	Subarea 1 Gross Acres	Existing % Within Vegetation Community	Gross Conserved Acres	Gross % Conserved	Conserved % Within Vegetation Community	% Deviation from Subarea 1 Existing Distribution
<b>Coastal Sage Scrub</b>						
0-400 ft	861	5%	607	70%	4%	-1%
401-800 ft	8,622	51%	6,814	79%	47%	-5%
801-1,200 ft	5,596	33%	5,457	97%	37%	4%
> 1,200 ft	1,732	10%	1,732	100%	12%	2%
Total	16,811		14,610	87%		
<b>Chaparral</b>						
0-400 ft	70	1%	37	53%	1%	0%
401-800 ft	4,212	63%	3,214	76%	58%	-5%
801-1,200 ft	1,947	29%	1,837	94%	33%	4%
> 1,200 ft	440	7%	440	100%	8%	1%
Total	6,669		5,528	83%		
<b>Grassland</b>						
0-400 ft	1,628	18%	1,140	70%	17%	-1%
401-800 ft	5,287	57%	3,872	73%	56%	-1%

**TABLE 13-23  
ELEVATIONS OF CONSERVED VEGETATION  
COMMUNITIES COMPARED TO SUBAREA 1<sup>1</sup>**

Vegetation Community Elevation Range	Subarea 1 Gross Acres	Existing % Within Vegetation Community	Gross Conserved Acres	Gross % Conserved	Conserved % Within Vegetation Community	% Deviation from Subarea 1 Existing Distribution
801-1,200 ft	2,041	22%	1,622	70%	24%	1%
> 1,200 ft	254	3%	254	100%	4%	1%
Total	9,210		6,888	75%		
<b>Woodland &amp; Forest</b>						
0-400 ft	314	13%	210	67%	12%	-2%
401-800 ft	1,359	58%	950	70%	53%	-5%
801-1,200 ft	523	22%	488	93%	27%	5%
> 1,200 ft	138	6%	138	100%	8%	2%
Total	2,334		1,786	77%		
<b>Riparian</b>						
0-400 ft	988	25%	928	94%	25%	-1%
401-800 ft	2,291	59%	2,193	96%	59%	0%
801-1,200 ft	532	14%	530	99%	14%	1%
> 1,200 ft	86	2%	86	100%	2%	0%
<b>Total</b>	<b>3,897</b>		<b>3,737</b>	<b>96%</b>		

The conservation percentages for the major vegetation communities tend to increase with elevation, with over 93 percent conservation of all major vegetation communities, except grassland, at elevations over 800 feet. Related to the relatively increasing conservation percentages at higher elevations, there is a pattern of slight under-representation at elevations under 800 feet and slight over-representations over 800 feet, as shown by the differences in the “Existing % Within Vegetation Community” and “Conserved % Within Vegetation Community” and expressed in the “% Deviation from Subarea 1 Existing Distribution.” For example, coastal sage scrub has a 1 percent under-representation under 400 feet, a 5 percent under-representation at 400 to 800 feet, a 4 percent over-representation at 800 to 1,200 feet and a 2 percent over-representation over 1,200 feet. Chaparral and woodland and forest show similar patterns to coastal sage scrub. Grassland and riparian show little elevational bias.

Overall the vegetation communities in the Habitat Reserve and SOS exhibit a diversity and representativeness in amount and spatial distribution similar to existing conditions; *i.e.*, the Habitat Reserve and SOS are not significantly biased toward a particular type of vegetation compared to existing conditions.

#### ***d. Habitat Reserve Management Program***

The 10 Conserved Vegetation Communities are subsumed under the five Major Conserved Vegetation Communities that will be managed under the HRMP (*Table 13-15*). The HRMP, as described in *Chapter 7*, is a stressor-based approach with three broad goals that establish the foundation of the program in regard to the proposed Conserved Vegetation Communities.

1. Maximize the likelihood of the persistence of a native-dominated vegetation mosaic in the planning area.
2. Restore or enhance the quality of degraded vegetation communities and other habitat types.
3. Maintain and restore biotic and abiotic natural processes, at all identified scales, for the planning area.

The HRMP is composed of three tiers as described in *Chapter 7*:

1. Existing County parklands where management is funded through the County's annual budget and planning process for the County HBP;
2. Existing County parklands within the Tier 1 parklands cited above where adaptive management activities would be implemented and funded by the optional Subarea 3 impact fees related to new development on remaining residential lots in Coto de Caza if the Opt-In Program reviewed in Section 13.5 is selected, or by the RMV AMP for adaptive management measures related to stressors on parklands identified through the AMP monitoring program and that affect Covered Species and conserved Vegetation Communities within RMV Habitat Reserve Lands; and
3. Previously protected RMV conservation easement area lands and future RMV dedication lands in response to regulatory coverage and that are committed to adaptive management funded by Participating Landowners as mitigation for impacts on Covered Species.

The HRMP identifies general environmental stressors on the five major vegetation communities to be managed, including habitat fragmentation, fire, cattle-related impacts, exotic species, altered hydrology and geomorphology, precipitation cycles, and human uses and recreation, and their known or hypothesized community-level responses, such as reduced nutrient recycling, community senescence, loss of community structure and diversity, community state-transitions (*e.g.*, type conversion of coastal sage scrub to annual grassland with frequent fire), and altered food web. Based on conceptual models for the effects of stressors on the five managed vegetation communities and the broad goals stated above, general stressor-based management objectives are identified. For example, altered hydrology is an important stressor on

riparian/wetland systems. Management objectives for surface and groundwater hydrology thus are:

- Emulate, to the extent feasible, the pre-disturbance runoff and infiltration patterns in consideration of specific terrains, soil types and ground cover.
- Address potential effects of future land use changes on hydrology.
- Minimize alterations of the timing of peak flows of each sub-basin relative to the mainstem creeks.
- Maintain and/or restore the inherent geomorphic structure of major tributaries and their floodplains.
- Utilize infiltration properties of sandy terrains for groundwater recharge and to offset potential increases in surface runoff and adverse effects to water quality.

It is important to note that managing hydrology and geomorphology not only pertains to managing riparian/wetland communities, but also to the Science Advisors' seventh Reserve Design Tenet that addresses abiotic processes:

- The reserve system should protect intact hydrologic and erosional processes, including both normal function and extreme events (flooding, earthflow). Reserve design should both protect to the maximum extent possible the hydrology and erosion regimes of riparian systems, especially in Cristianitos, San Juan and Trabuco drainages.

The HRMP also identifies specific management goals and objectives for each of the five major vegetation communities and describes appropriate management and monitoring measures designed to achieve the goals. As an example, for riparian/wetlands the monitoring program includes:

- Evaluation and update of the entire riparian/wetland vegetation database as part of the Habitat Reserve 5-year mapping.
- Annual on-the-ground monitoring of selected sample plots distributed across the Habitat Reserve in a spatial distribution that represents the diversity of the Reserve and in key areas where environmental stressors are most likely to operate (*e.g.*, downstream of development areas and along the Habitat Reserve-development edge). The monitoring program would include:
  - Establishment of a baseline vegetation map for the Habitat Reserve within two (2) years of executing the IA;
  - Evaluation and update of the vegetation map at 5-year intervals based on remote interpretation and spot field verification;

- Collection of regional climate, weather and air quality information to examine potential correlations between vegetation changes and these environmental variables;
- Annual field studies on selected permanent sample plots for at least the first five (5) years of the monitoring program;
- Monitoring of channel morphology; and
- Monitoring of stream and groundwater hydrology.

The AMP element of the HRMP also includes three subplans that address management and monitoring of the five major vegetation communities:

- Habitat Restoration Plan (*Appendix H*)
- Invasive Species Control Plan (*Appendix J*)
- Wildland Fire Management Plan (*Appendix N*)

The Habitat Restoration Plan, for example, includes both uplands and riparian components. The uplands component describes the restoration plan for coastal sage scrub and valley needlegrass grassland and includes:

- Habitat restoration goals
- Success criteria
- Preliminary designation of restoration areas
- Implementation plan
- Maintenance/repair plan
- Monitoring program

Two “Coordinated Management Plans” also will be implemented in coordination with the AMP element of the HRMP:

- A Grazing Management Plan (*Appendix G*) will be implemented on RMV lands and will include timed grazing at intensities that can help enhance and restore habitat (*e.g.*, controlling invasive exotic grasses) and identify sensitive resource areas where grazing may be excluded, typically on a seasonal basis.
- A Water Quality Management Plan (*Appendix K*) that will be “adaptively” implemented and will, in particular, address two main stressors: **(1)** “pollutants” generated by urban

development with the potential to adversely affect proposed Conserved Vegetation Communities and their value as wildlife habitat; and (2) “hydrologic conditions of concern” (addressing hydrologic/geomorphic processes), which likewise have the potential to affect Conserved Vegetation Communities and their value as wildlife habitat.

***e. Rationale for Considering Vegetation Communities Conserved***

The foregoing discussion demonstrates that the Habitat Reserve and accompanying HRMP, in combination with important Subarea 1 SOS areas on NAS Starr Ranch and Prima Deshecha, achieve two of the four components of the proposed Conservation Strategy presented in *Chapter 10*:

- Creation of a large, biologically diverse and well-connected Habitat Reserve that can function effectively over the long term to maintain, and where feasible, enhance functions and values of upland and riparian/wetland habitats and related natural processes.
- Implementation of an HRMP to guide long-term management of the biological resources and their supporting hydrologic and geomorphic processes within the Habitat Reserve, including habitat restoration, invasive species control, and wildland fire management.

The key features of the Habitat Reserve and SOS that justify the determination that the 10 Vegetation Communities are conserved include:

- An ultimate Habitat Reserve totaling more than 32,000 acres and at least 72 percent of vegetation communities/landcovers in Subarea 1;
- SOS totaling an additional 4,440 acres and 10 percent of vegetation communities/landcovers in Subarea 1;
- A combined Habitat Reserve and SOS system totaling more than 36,000 acres and at least 81 percent of vegetation communities/land covers in Subarea 1;
- A combined Habitat Reserve and SOS system of the 10 proposed Conserved Vegetation Communities totaling more than 32,000 acres and 82 percent of the existing acreage of the proposed Conserved Vegetation Communities;
- 74 percent conservation of native grasslands, assuming the overstated impact scenario in PAs 6 and 7;
- 69 percent conservation of coast live oak communities in the Habitat Reserve and 14 percent conservation in SOS, for a total of 83 percent conservation of coast live oak communities;

- Adequate conservation of proposed Conserved Vegetation Communities to support landscape-level NCCP/MSAA/HCP wildlife planning species, including California gnatcatcher, cactus wren, yellow warbler, yellow-breasted chat, tricolored blackbird, grasshopper sparrow, Cooper’s hawk, white-tailed kite, merlin, golden eagle, arroyo toad, orange-throated whiptail, San Diego horned lizard, mountain lion and mule deer;
- Conservation of 89 percent of the Habitat Reserve and SOS in Subarea 1 in three large, contiguous and functionally connected habitat blocks;
- Physiographic (watershed and elevation) conservation balance of the five major vegetation communities of coastal sage scrub, chaparral, grassland, riparian and woodland and forest such that the Habitat Reserve and SOS are representative of existing spatial diversity in Subarea 1;
- Implementation of the HRMP and the AMP and OMP elements, respectively; and
- Implementation of the complementary “Coordinated Management Plans;” the Grazing Management Plan (*Appendix G*) and the Water Quality Management Plan (*Appendix K*).

## **SECTION 13.4 CONSERVATION AND IMPACT ANALYSES FOR AREAS SUBJECT TO CDFG JURISDICTION PURSUANT TO SECTION 1600 PROPOSED TO RECEIVE REGULATORY COVERAGE**

### **13.4.1 Overview of CDFG Jurisdictional Areas to Receive Regulatory Coverage and Relationship to Proposed Conserved Vegetation Communities**

As noted in *Section 13.3* above, the NCCP database defines 10 general or aggregated categories of natural vegetation communities/land covers (hereafter termed “vegetation communities”) in the NCCP planning area that are considered conserved. A subset of these includes areas that are regulated under Section 1600 *et seq.* of the California Fish and Game Code. Specifically, areas subject to regulation of CDFG under the Section 1600 program are streambeds and lakes and areas of wetland and/or riparian habitat associated with the streambeds and lakes. Because CDFG jurisdiction focuses on streambeds, the vegetation communities addressed in this subsection include portions of five of the ten vegetation communities proposed as Conserved Vegetation Communities, namely: riparian communities, freshwater marsh, alkali meadow, and streamcourses.<sup>15</sup> This subsection reviews: (1) the methodology for determining CDFG jurisdictional areas; (2) habitat types/acreages determined to be within the overall riparian community subject to CDFG jurisdiction; (3) conservation and impacts; and (4) proposed mitigation involving both restoration, and long-term management.

<sup>15</sup> Open water is listed as an aquatic “land cover” within the reserve and although not specifically noted as one of the 10 covered vegetation communities, would be included as a covered “cover type,” as it could be associated with streambeds, areas of marsh, or other aquatic land cover types.

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**a. Definition of CDFG Jurisdiction**

*The term stream, which includes creeks and rivers, is defined in Title 14, California Code of Regulations (CCR), Section 1.72:*

*“A stream is a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation.”*

*However, this definition is not complete with respect to Sections 1601 or 1603 because it does not define the terms bed, channel, or bank and does not define other stream-related features such as aquatic life, riparian vegetation, etc. It is therefore incumbent on Department personnel to develop a sense of what constitutes a stream for purposes of implementing and enforcing sections 1600 – 1607 and Lake/Streambed Alteration Agreements.*

*The following concepts have therefore been developed to assist Department employees in this endeavor.*

- 1. The term stream can include intermittent and ephemeral streams, rivers, creeks, dry washes, sloughs, blue-line streams (United States Geological Survey Maps, USGS), and watercourses with subsurface flow. Canals, aqueducts, irrigation ditches, and other means of water conveyance can also be considered streams if they support aquatic life, riparian vegetation, or stream-dependent wildlife.*
- 2. Biologic components of a stream may include aquatic and riparian vegetation, all aquatic animals including fish, amphibians, reptiles, invertebrates, and terrestrial species, which derive benefits from the stream system.*
- 3. As a physical stream, a stream not only includes water (at least on an intermittent or ephemeral basis), but also a bed, bank, and/or levee, instream features such as logs or snags, and various flood plains depending on the return frequency of the flood event being considered (i.e., 10, 50, or 100 years, etc.).*
- 4. The lateral extent of a stream can be measured in ways depending on a particular situation and the type of fish or wildlife resources at risk. The following criteria are presented in order from the most inclusive to the least inclusive.*

- A. *The floodplain of a stream can be the broadest measurement of a stream's lateral extent depending on the return frequency of the flood event used. For most flood control purposes, the 100-year flood event is the standard measurement and maps of the 100-year flood plain exist for many streams. However, the 100-year flood plain may include significant amounts of upland or urban habitat and therefore may not be appropriate in many cases.*
- B. *The outer edge of riparian vegetation is generally used as the line of demarcation between riparian and upland habitats and is therefore a reasonable and identifiable boundary for the lateral extent of a stream. In most cases, the use of this criterion should result in protecting the fish and wildlife resources at risk.*
- C. *Most streams have a natural bank which confines flows to the bed or channel except during flooding. In some instances, particularly on smaller streams or dry washes with little or no riparian habitat, the bank should be used to mark the lateral extent of a stream.*
- D. *A levee or other artificial stream bank could be used to mark the lateral extent of a stream. However, in many instances, there can be extensive areas of valuable riparian habitat located behind a levee.*

*Any of the above criteria could be applicable in determining what constitutes a stream depending on the potential for the proposed activity to adversely affect fish and other stream-dependent wildlife resources.*

Thus, with respect to the Planning Areas (PAs) evaluated for this NCCP/MSAA/HCP, the outer limits of CDFG jurisdiction are defined as the outer limits of habitat functionally considered to be riparian as contrasted with "uplands" habitat.

### ***b. Project Level Delineation Overview***

Beginning in 2002, Wetland Specialists from Glenn Lukos Associates (GLA 2006, *Appendix R*) conducted a project level jurisdictional delineation for the areas proposed for development under the NCCP/MSAA/HCP, including areas outside of the individual RMV PAs impacted by infrastructure, to identify with a higher level of precision, the limits of CDFG jurisdiction pursuant to Section 1600, including areas of riparian habitat.<sup>16</sup>

During performance of the project level jurisdictional delineation, it became apparent that, as a result of the inherent generalization required to assemble the large-scale NCCP database

<sup>16</sup> Glenn Lukos Associates. 2006. Jurisdictional Delineation of Areas Subject to the Jurisdiction of the California Department of Fish and Game pursuant to Section 1600 of the Fish and Game Code. May 2006.

compared with a project-level delineation, areas identified as riparian habitat by the NCCP vegetation database overestimated the extent of riparian habitat in smaller drainages and in some instances mapped upland areas as riparian habitat. Following completion of the jurisdictional delineation, the vegetation mapping for the NCCP database within the PAs was refined to ensure consistency between the NCCP vegetation database and the project level delineation. Where these databases differed, the data collected during the jurisdictional delineation were utilized because, in most cases, jurisdictional measurements were accurate to within one foot.

### ***c. Functional Based Approach to Delineation***

Based on the regulatory framework and verified with CDFG personnel in the field, a number of factors were considered/evaluated in determining the limits of vegetation associations that would be regulated by CDFG as Riparian Habitat. The methodology provided for identification of the limits for riparian areas, associated with streambeds, within CDFG jurisdiction. Specific resources used to aid in the identification and delineation of vegetation defined as “riparian” include the following: *National List of Plant Species that Occur in Wetlands* (Reed 1988)<sup>17</sup> and *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1996).<sup>18</sup> Reed provides an indicator status for plants that occur in wetlands. Obligate Wetland species (OBL) are defined as species that occur in wetlands 99 percent of the time. Obligate Upland species (UPL) occur in uplands 99 percent of the time. Species between OBL and UPL include Facultative Wet (FACW), that are associated with wetlands 67 to 99 percent of the time with Facultative (FAC) species associated with wetlands 33 to 67 percent of the time. During the field-level delineation and review by CDFG, species considered to be “riparian” in all cases but one, coast live oak, exhibited an indicator status of FAC, FACW or OBL. Dominant species discussed below under descriptions of the identified riparian associations included black willow (*Salix gooddingii*, OBL), arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*, FACW), narrow-leaf willow (*Salix exigua*, OBL), white alder (*Alnus rhombifolia*, FACW), Fremont cottonwood (*Populus fremontii*, FACW), black cottonwood (*Populus trichocarpa balsamifera*, FACW), western sycamore (*Platanus racemosa*, FACW), and mule fat (*Baccharis salicifolia*, FACW).

Coast live oak (*Quercus agrifolia*, UPL), as noted, is the only upland species that is typically included as a dominant riparian species. Sawyer and Keeler-Wolf, which classifies each vegetation series as either “wetlands” or “uplands” within their description for each series provides the following description for Coast Live Oak Series:

<sup>17</sup> Reed, J.B. Jr. 1988. National List of Plant Species that Occur in Wetlands. U.S. Fish and Wildlife Service Biological Report 88(26.10).

<sup>18</sup> Sawyer, John, O. and Todd Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society, Sacramento.

***Uplands:*** slopes often very steep; raised, stream banks and terraces. Soils mostly sandstone or shale-derived. The national inventory of wetland plants (Reed 1988) does not list coast live oak. [Bold in original]

However, for the reasons stated in the delineation methodology summary presented below, coast live oak found within the parameters defined by the methodology are considered to be functionally part of the riparian habitat system and subject to state jurisdiction.

Use of the wetland indicator status provided in Reed (1988), as a useful tool for separating “riparian” from “upland” species is supported by an understanding of the origins of riparian systems in areas governed by a Mediterranean climatic regime. The dominant tree and shrub species that occur along perennial and intermittent streams are recognized remnants of the Arcto-Tertiary Geoflora of the Late Tertiary and Quaternary Periods that included wet climates, explaining their high demands for water (Holstein 1984).<sup>19</sup> In areas now dominated by the drier Mediterranean climate, these species persist in areas where there is a permanent or seasonal surface or subsurface water supply. The dominant genera in southern California include: willow (*Salix*, spp.), cottonwood (*Populus* spp.), alder (*Alnus rhombifolia*), sycamore (*Platanus racemosa*), maple (*Acer* spp.), ash (*Fraxinus* spp.), and in some settings, oak (*Quercus* spp.).<sup>20</sup> The hydrologic requirements for many of these genera differ and are generally well known. For example, well-aerated water that is close to the surface will favor alder whereas when the water table is relatively deep, sycamores will predominate as long as the intervening soil aeration is high. Direct measurements of water use by red willow documented water-use rates at 52.7 acre-inches per year with alder-dominated habitat using 47.0 acre-inches of water during the peak growing season July to October (California DPW 1942).<sup>21</sup>

The methods described here incorporated the wetland indicator status for each species as provided by Reed (1988), with the hydrologic requirements as noted above. The methods also follow Smith (2000) and are also consistent with the guidance provided by CDFG. The convention for application of these tools in the field for the project-level delineation was developed with direct input from CDFG biologists during the verification process. The methodology for defining the dimensions of riparian habitat in the field is summarized as follows:

- Designation of an area as “riparian habitat” was generally limited to stands of vegetation that included a predominance of species that exhibited an indicator status of FAC, FACW

<sup>19</sup> Holstein, Glen. 1984. California Riparian Forests: Deciduous Islands in an Evergreen Sea. In: Warner and Hendrix (Eds.). *California Riparian Systems: Ecology Conservation and Productive Management*. University of California Press, Berkeley.

<sup>20</sup> Holstein, Glen. 1984. California Riparian Forests: Deciduous Islands in an Evergreen Sea. In: Warner and Hendrix (Eds.). *California Riparian Systems: Ecology Conservation and Productive Management*. University of California Press, Berkeley.

<sup>21</sup> State of California Department of Public Works. 1942. *Bulletin No. 50: Use of Water by Native Vegetation*.

or OBL. (Coast live oaks were included as riparian habitat in specific instances as further described/discussed below.)

- Where all riparian habitat was included within the bank-full stream channel (*e.g.*, riparian herb), the outermost limits of either the bank or riparian habitat was mapped as the limits of CDFG riparian jurisdiction/habitat.
- Where riparian habitat extended beyond the bank-full channel to the active floodplain, and did not extend outside the active floodplain, the outermost limits of either the active floodplain or riparian habitat were mapped as the limits of CDFG riparian jurisdiction/habitat. By inclusion of the active flood plain and associated riparian habitat, the hydrologic, biogeochemical, and habitat functions not specifically associated with riparian vegetation, such as areas with localized ponding that support aquatic organisms (*e.g.*, invertebrates, amphibians, etc.), but providing such hydrologic, biogeochemical and habitat functions, were captured and included within the jurisdictional area(s).
- Where riparian habitat extended beyond the active flood plain to active terraces, the outermost limits of the riparian habitat on the terrace (*i.e.*, canopy edge or “drip line”) was mapped as the limits of CDFG riparian jurisdiction/habitat. Similar to inclusion of the flood plain described above, inclusion of the active terraces ensured that functions such as hydrologic exchange with the adjacent uplands, nutrient cycling, shading by overhanging vegetation, bank and channel stabilization by roots, as well as habitat functions, were included in the jurisdictional area(s).

This latter case (*i.e.*, channel stabilization by roots) was most typically applied to southern coast live oak riparian forest. In some cases, particularly in “U”-shaped canyons, the limits of the active terrace were not always discernible. In such cases, coast live oaks (and in a few instances California sycamores) were included as riparian where they either (1) exhibited roots that reached the banks of the drainage, thereby, benefiting from the drainage or by providing stabilization for the banks (*i.e.*, a benefit for the stream) or (2) where meaningful portions of the canopy overhung the stream, thereby providing for shading or litter (nutrient cycling) which would benefit the stream. In some instances, FACW species such as Mexican rush (*Juncus mexicanus*) or clustered field sedge (*Carex praegracilis*) were indicators of shallow subsurface water that was at least seasonally available to the stream environment. Coast live oaks (and western sycamores) located above active terraces or (where terraces were not distinct) beyond where either roots or shading provided direct benefits to the stream, or that supported a predominance of UPL vegetation were not included as CDFG-regulated riparian vegetation.

Vegetation communities and other aquatic features regulated under Section 1600 *et seq.* are listed in *Table 13-24*. The streambeds and associated riparian and wetland habitats are proposed for regulatory coverage because they would both be conserved by the Habitat Reserve, as described in detail in *Section 13.3.2*, and managed under the HRMP described fully in *Chapter 7*,

and, for these reasons, are included within five of the 10 proposed Conserved Vegetation Communities.

**TABLE 13-24  
PROPOSED COVERED AQUATIC FEATURES AND ASSOCIATED  
CONSERVED VEGETATION COMMUNITIES**

Proposed Covered Aquatic Features and Associated Vegetation Communities	Managed Riparian Vegetation Communities
<b>Wetland Riparian</b> Alkali Meadow Arroyo Willow Riparian Forest Southern Willow Scrub White Alder Riparian Forest Riparian Herb Freshwater Marsh Mule Fat Scrub Seasonal Pool Seasonal Wetland <b>Unvegetated Streams and Drainages</b> Ephemeral drainages Intermittent drainages Open Water <b>NON-WETLAND RIPARIAN WOODLANDS</b> Sycamore Riparian Woodland Coast Live Oak Riparian Canyon Live Oak Ravine Forest Scalebroom/Mule Fat Scrub Ecotone <sup>22</sup>	Riparian/Wetlands

***d. Planning Area 5 Tailings Pond***

Planning Area 5 (Trampas Canyon) includes an existing dam and associated mining tailings pond that was constructed in 1975 following preparation and certification of an EIR prepared pursuant to CEQA.<sup>23</sup> Construction of the dam and inundation of the tailings pond resulted in the loss of ephemeral drainages that also supported approximately 12 acres of southern coast live oak riparian forest prior to construction. While the EIR identified impacts to oak woodland, no distinction was made between southern coast live oak riparian forest and non-riparian oak woodlands or forest. The determination that approximately 12 acres of oak riparian habitat was affected by the dam and subsequent inundation was based on a review of historic aerial photographs in conjunction with an onsite field review of nearby canyons with similar oak riparian resources by GLA during the project level delineation. The tailings pond is still in active use by Oglebay Norton, the operator of the mining facility.

<sup>22</sup> Scalebroom/Mule Fat scrub ecotone is included with the mule fat community in the proposed Covered Vegetation Communities analysis presented in Section 13.3; however, it has been separated in this Section to distinguish between areas with mule fat that meet CDFG's wetland definition and areas that do not because they support a predominance of upland species and also lack wetland hydrology and hydric soils.

<sup>23</sup> Final Environmental Impact Report (EIR 74-7). 1974. Prepared for Owen-Illinois Waste Management and Water Reclamation System. Final EIR Certified on June, 1974.

### 13.4.2 Conservation and Impacts Analyses for Streambeds and Riparian Habitats Subject to Jurisdiction under Section 1602 Proposed to Receive Regulatory Coverage

Table 13-25 summarizes the cumulative conservation and impact totals in Subarea 1 for areas subject to regulation under Section 1600 *et seq.* proposed to receive regulatory coverage (herein referred to as “Covered CDFG Jurisdictional Areas”). Table 13-25 provides a breakdown summary of the conservation and impacts (impacts included both permanent impacts and temporary impacts) for wetland and riparian vegetation communities as well as unvegetated streambeds and includes:

**TABLE 13-25  
OVERALL CONSERVATION AND IMPACT ANALYSIS  
FOR CDFG JURISDICTIONAL AREAS<sup>24</sup>**

HABITAT TYPE	CDFG Jurisdiction In Subarea 1	Net Conserved in Subarea 1	Net Impacted in Subarea 1	Percent Impacted in NCCP
<b>Wetland Riparian Habitats</b>				
Alkali Meadow	37.41	36.09	1.32	3.5%
Arroyo Willow Riparian Forest	248.8	222.92	25.88	10.4%
Southern Willow Scrub	365.6	327.79	37.81	10.3%
White Alder Riparian Forest	0.0	0.0	0.00	0.0%
Riparian Herb	26.10	21.61	4.49	17.2%
Freshwater Marsh	32.11	31.29	0.82	2.6%
Mule Fat Scrub	160.80	139.85	20.95	13.0%
Seasonal Pool	0.64	0.00	0.64	100%
Seasonal Wetland	3.56	3.56	0.00	0.0%
General Riparian	0.0	0.0	0.00	0.0%
<b>Subtotal Wetland Riparian</b>	<b>875.02</b>	<b>783.11</b>	<b>91.91</b>	<b>10.5%</b>
<b>Unvegetated Streams and Drainages</b>				
Ephemeral Drainages	105.81	91.34	14.47	13.6%
Intermittent Streams	24.60	24.60	0.00	0.0%
Open Water	0.14	0.14	0.00	0.0%
<b>Subtotal Unvegetated Drainages</b>	<b>130.55</b>	<b>116.08</b>	<b>14.47</b>	<b>11.0</b>
<b>Non-Wetland Riparian Habitats</b>				
Scalebroom/Mule Fat Scrub Ecotone	3.66	3.30	0.36	10.0%
Sycamore Riparian Woodland	1165.4	1149.39	16.01	1.4%
Coast Live Oak Riparian	1155.5	1092.18	63.32	5.5%
Canyon Live Oak Ravine Forest	0.0	0.0	0.00	0.0%
<b>Subtotal Non-Wetland Riparian</b>	<b>2,244.87</b>	<b>2,324.56</b>	<b>79.69</b>	<b>3.4%</b>
<b>TOTAL</b>	<b>3,330.13</b>	<b>3,144.06</b>	<b>186.07</b>	<b>5.6%</b>

<sup>24</sup> The impact analysis provided in Tables 13-24 and 13-25 are overstated as they assume full impacts for Planning Areas 4 and 8; which, under the B-12 Alternative would be reduced substantially in these planning areas.

- Proposed RMV conservation and impacts, including impacts in the PAs for residential and commercial development and potential orchards and permanent impacts associated with construction of infrastructure in the Habitat Reserve and SOS;
- Proposed County conservation and impacts, including impacts associated with the Prima Deshecha Landfill GDP and the Avenida La Pata Improvement Project. County conservation includes County parklands that would be managed under the OMPs, including Caspers Wilderness Park, General Thomas F. Riley Wilderness Park and O’Neill Regional Park, and the Landfill SOS;
- Prior RMV dedicated open space in the Habitat Reserve that would be adaptively managed by the RMVLC, including the Upper Chiquita Canyon Conservation Area, Donna O’Neill Land Conservancy, Ladera Ranch, and Arroyo Trabuco dedicated open space;
- CDFG open space in the Habitat Reserve set aside as part of Arroyo Trabuco Golf Course open space and to be adaptively managed by the RMVLC;
- NAS Starr Ranch designated as SOS;
- Ladera Ranch SOS; and
- Ortega Rock Quarry Expansion Project impacts.

**a. Overall Conservation and Impacts**

1. Permanent Impacts and Conservation of Proposed Covered CDFG Jurisdictional Areas

*Table 13-25* provides an overall summary of the acreage and percentages of the proposed Covered CDFG Jurisdictional Areas in the Habitat Reserve. *Table 13-26* shows the breakdown of the impacts to CDFG jurisdictional areas for the proposed RMV development PAs, infrastructure for RMV outside of the PAs, County projects, and SMWD projects. The reader is directed to the CDFG jurisdictional delineation report attached as *Appendix R* for the delineation maps that accompany this analysis.

Overall, under the overstated impact scenario, a total of 186.07 acres of CDFG jurisdiction would be subject to permanent impacts, including 91.91 acres of wetland riparian habitats (*e.g.*, willow riparian and marsh habitats), 14.47 acres of unvegetated streambeds, and 79.69 acres of non-wetland riparian habitats (*e.g.*, southern coast live oak riparian). Conservation within the Subarea 1 would include 94.4 percent of all state jurisdictional areas (3,144.06 acres of 3,330.13 acres of jurisdiction), including:

**TABLE 13-26  
SUMMARY OF PERMANENT AND TEMPORARY IMPACTS TO CDFG JURISDICTION<sup>a</sup>**

Habitat Type	RMV PROJECT IMPACTS <sup>b</sup>												NON-RMV IMPACTS							
	Trails		Drainage Facilities <sup>c</sup>		Sewer-Water <sup>d</sup>		Roads/Bridges <sup>e</sup>		RMV Development Areas (PAs)		Existing RMV Maintenance		SMWD Maintenance		Ortega Rock		La Pata Road		Prima Deshecha	
	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp
<b>WETLAND RIPARIAN HABITATS</b>																				
Alkali Meadow (5.2)	0.0	0.0	0.0	0.0	0.03	0.00	0.0	0.16	1.29	0.0	0.0	2.28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arroyo Willow Forest (7.6)	1.65	3.75	1.17	0.15	0.34	0.00	1.02	7.58	21.70	0.0	0.0	2.71	0.0	3.28	0.0	0.0	0.0	0.0	0.0	0.0
Southern Willow Scrub (7.2)	2.28	4.77	2.19	0.24	0.40	0.00	0.84	1.16	13.25	0.0	0.0	5.47	0.0	7.03	0.0	0.0	12.85	0.0	6.0	0.0
Riparian Herb (7.1)	0.0	0.0	0.03	0.07	0.0	0.0	0.0	0.0	1.46	0.0	0.0	0.24	0.0	0.22	0.0	0.0	0.0	0.0	3.0	0.0
Coastal Freshwater Marsh (6.4)	0.05	0.19	0.02	0.05	0.10	0.00	0.11	0.30	0.54	0.0	0.0	1.87	0.0	0.29	0.0	0.0	0.0	0.0	0.0	0.0
Mule Fat Scrub (7.3)	0.86	1.63	0.19	0.17	0.80	0.00	1.47	2.97	15.87	0.0	0.0	1.35	0.0	0.96	0.0	0.0	0.0	0.0	1.76	0.0
Seasonal Pond (5.3)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.64	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Subtotal</b>	<b>4.84</b>	<b>10.34</b>	<b>3.60</b>	<b>0.68</b>	<b>1.67</b>	<b>0.00</b>	<b>3.44</b>	<b>12.17</b>	<b>54.75</b>	<b>0.0</b>	<b>0.0</b>	<b>13.92</b>	<b>0.0</b>	<b>11.78</b>	<b>0.0</b>	<b>0.0</b>	<b>12.85</b>	<b>0.0</b>	<b>10.76</b>	<b>0.0</b>
<b>UNVEGETATED STREAMS AND DRAINAGES</b>																				
Intermittent and Ephemeral Streams	0.02	14.25	0.05	0.85	0.04	0.00	0.26	12.37	14.07	0.0	0.0	25.28	0.0	3.31	0.00	0.0	0.03	0.0	0.0	0.0
<b>NON-WETLAND RIPARIAN HABITATS</b>																				
Scalebroom/Mule Fat Scrub	0.29	0.58	0.07	0.07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sycamore Riparian Woodland (7.4)	0.19	0.83	0.0	0.0	0.21	0.32	1.93	0.0	9.25	0.0	0.0	2.41	0.0	3.86	0.34	0.0	0.0	0.0	4.09	0.0
Oak Riparian Woodland (7.5)	1.17	2.48	0.06	0.09	1.72	0.00	8.41	0.20	51.96	0.0	0.0	7.07	0.0	6.11	0.0	0.0	0.0	0.0	0.0	0.0
<b>Subtotal</b>	<b>1.65</b>	<b>3.89</b>	<b>0.13</b>	<b>0.16</b>	<b>1.93</b>	<b>0.00</b>	<b>10.34</b>	<b>0.20</b>	<b>61.21</b>	<b>0.0</b>	<b>0.0</b>	<b>9.48</b>	<b>0.0</b>	<b>13.28</b>	<b>0.34</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>4.09</b>	<b>0.0</b>
<b>Total</b>	<b>6.51</b>	<b>28.48</b>	<b>3.78</b>	<b>1.69</b>	<b>3.64</b>	<b>0.00</b>	<b>14.04</b>	<b>24.74</b>	<b>130.03</b>	<b>0.00</b>	<b>0.00</b>	<b>48.68</b>	<b>0.00</b>	<b>25.06</b>	<b>0.34</b>	<b>0.00</b>	<b>12.88</b>	<b>0.00</b>	<b>14.85</b>	<b>0.00</b>

- a. Jurisdictional areas falling outside of the GLA study area boundary are estimated using NCCP data. The NCCP data generally overestimate jurisdiction.
- b. Note: as previously discussed this represents a worst case impact analysis and ultimate impacts will be less due to the limitations on development in Planning Areas 4 and 8, and orchards in Planning Areas 6 and 7
- c. Includes culvert outfalls and Gobernadora Water Quality Basin
- d. Includes nondomestic water, domestic water and sewer.
- e. Due to the lack of final design details on road and bridge construction, a contingency of up to 50-percent that is not reflected in the impact calculations set forth in this table is allowed and would be mitigated as set forth in this Section.

- 89.5 percent of the wetland/riparian habitats (*e.g.*, willow riparian and marsh habitats) or 783.11 acres;
- Varying widths and lengths of bridges ranging from 140 feet wide to 250 feet wide and 230 feet long to 1,400 feet long (see *Figure 187-R*) (RMV);
- 34-foot temporary impact zone for construction of trails (*i.e.*, 17 feet from edge of trail) (RMV);
- Temporary impacts of 4 acres around new ground water storage tanks (RMV);
- Temporary impacts of existing small reservoirs that serve Ranch purposes (*e.g.*, stock ponds) (RMV);
- 2,500 square feet for temporary impacts to wells (RMV);
- 30-foot wide temporary impact area for existing and future domestic and non-domestic water/sewer pipeline operation and maintenance/repair (SMWD)
- 40-foot wide temporary impact area for maintenance/repair of the existing RMV water system (RMV); and
- 50-foot wide temporary impact area for construction of drainage culverts (RMV).

*Table 13-26* includes a summary the temporary impacts to proposed Covered CDFG Jurisdictional Areas that would occur during construction, operation and maintenance/repair of infrastructure facilities by RMV and SMWD. It is important to note that although the temporary impacts are quantified as a cumulative total over the life of the permit, whereas the actual impacts would occur gradually over time so that only a few acres at any given time would be impacted. All areas subject to temporary impacts would be restored upon completion of activities associated with the temporary disturbance.

***b. Impacts of Proposed Covered CDFG Jurisdictional Areas for Participating Landowners and Jurisdictions***

Participating Landowners/Permittees seeking regulatory coverage for impacts to the proposed Covered CDFG Jurisdictional Areas include RMV, the County of Orange and SMWD. This section describes the impacts of the proposed Covered CDFG Jurisdictional Areas (as appropriate) for each of the participants.

1. Rancho Mission Viejo Conservation and Impacts

*Table 13-26* includes a summary of the impact estimates for RMV. The summary includes the impacts associated with the PAs and permanent and temporary impacts resulting from the

construction, operation and maintenance/repair of infrastructure facilities. Note that some permanent and temporary impacts occur in SOS outside of the Ranch boundary as a result of new road and trails construction outside the Ranch property.

## 2. County of Orange Impacts

The County of Orange would be responsible for impacts occurring in association with the Prima Deshecha Landfill GDP and Avenida La Pata Improvement Project (*Table 13-26*). It should be noted that the Prima Deshecha impact area is fairly well defined and provides an accurate estimate of future impacts. The Avenida La Pata conceptual impact area is very broad to provide the County with flexibility in siting the road alignment and estimating associated grading impacts, particularly remedial grading impacts; it is likely that ultimate impacts will be substantially less. The Prima Deshecha project would result in impacts to 14.85 acres of CDFG jurisdiction, all of which is riparian habitat. The Avenida La Pata project would result in impacts to 12.88 acres of CDFG jurisdiction of which 12.85 acres consist of riparian habitat.

## 3. Santa Margarita Water District Impacts

The SMWD does not propose any permanent impacts; rather all proposed impacts would be temporary and they are summarized in *Table 13-26*. SMWD operations and maintenance/repair activities would result in temporary impacts to 29.73 acres of CDFG jurisdiction. As noted above, temporary impacts are cumulative over the life of the project and will occur gradually over time.

### **13.4.3. Conservation Analysis**

Wetland and riparian habitats have been subject to substantial losses in coastal Southern California with estimates of loss as high as 90 percent since the beginning of the colonial period in southern California. Historically, losses have been associated with flood-control and channelization projects, agricultural conversions, and more recently due to urbanization across much of the Los Angeles Basin, including Orange County. In contrast with historic losses elsewhere, the proposed Habitat Reserve includes substantial areas of wetland riparian and non-wetland riparian habitats associated with sub-basins within the proposed Habitat Reserve. As summarized in *Table 13-25*, Subarea 1 includes 3,330.13 acres of streambeds and associated riparian habitat of which 783.11 acres consist of riparian habitats that would likely meet the State of California definition of wetlands in accordance with California Executive Order W-59-93, which established the California Wetlands Conservation Policy to ensure no overall net loss in the quantity and quality of California's wetlands. According to the Fish and Game Policies, published in the Fish and Game Addenda to the California Fish and Game Code, CDFG defines wetlands in accordance with the USFWS definition set forth in *Classification of Wetlands and*

*Deepwater Habitats of the United States*; FWS/OBS 79/31; December 1979. This definition requires the presence of at least one of the following attributes: (1) at least periodically, the land supports predominately hydrophytes; (2) the substrate is predominately undrained hydric soil; and (3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year. (This definition of wetlands is broader than the three-parameter test employed by the USACE.) Given the significance of the State wetlands policy, the following impacts and conservation summaries differentiate between “wetland riparian” vegetation communities and “non-wetland riparian” vegetation communities.

The conservation analysis for areas of CDFG jurisdiction focuses on the conservation and management at the landscape, vegetation community level.

#### **a. Impacts**

The proposed Covered Activities would result in permanent impacts to 186.07 acres (10.5 percent) of the wetland and non-wetland riparian vegetation communities (*Table 13-25*), which includes the habitats identified in *Tables 13-25* and *13-26* above. Of these impacts, 142.03 acres are in the PAs, 27.97 acres are associated with RMV infrastructure (trails, roads, bridges, etc.) and 42.81 acres are associated with County of Orange projects, which are divided between the Prima Deshecha Landfill GDP (14.85 acres) and Avenida La Pata Improvement Project (12.88 acres).

Temporary impacts, as summarized in *Table 13-26*, would be associated with construction of infrastructure and existing RMV and SMWD maintenance activities. Construction of RMV infrastructure would result in temporary impacts to 54.91 acres of CDFG jurisdiction, all of which would be restored upon completion of construction. Similarly, maintenance of existing facilities (such as culverts, stockponds, and other features, could impact up to 48.68 acres for RMV facilities and up to 25.06 acres associated with SMWD facilities. As noted above, temporary impacts are cumulative over the life of the project and will be distributed over time.

#### **b. Conservation**

A total of 3,144.06 acres (94.4 percent) of jurisdictional wetland riparian habitats, streambeds and open water, and non-wetland riparian habitats would be conserved in the Subarea 1. *Table 13-25* provides a summary according to type that will be subject to permanent protection.

#### **c. Habitat Reserve Management Program**

*Chapter 7* and the prior discussion in this Chapter of the wetland/riparian and woodlands vegetation communities proposed for regulatory coverage review extensively how the HRMP,

including the AMP element, contributes to maintaining and enhancing net habitat value of the vegetation communities containing CDFG jurisdictional areas within the subregion over the long term. The mitigation program for temporary and permanent impacts to wetland/riparian areas under CDFG jurisdiction is set forth in the Aquatic Restoration Plan component of the HRMP Habitat Restoration Plan (*Appendix H*). The goal of the Aquatic Restoration Plan is to ensure no-net-loss of wetlands in accordance with California Executive Order W-59-93, which established the California Wetlands Conservation Policy to ensure no overall net loss in the quantity and quality of California's wetlands. The aquatic/wetland/riparian component describes the restoration plan for restoring "wetland riparian" vegetation communities on a 1:1 acreage basis, and includes:

- Habitat restoration goals
- Success criteria
- Preliminary designation of restoration areas
- Implementation plan
- Maintenance/repair plan
- Monitoring Program

HRMP long-term management actions are intended to mitigate for impacts to non-wetland riparian vegetation communities within CDFG jurisdiction. In particular, HRMP stressor-based management and enhancement/restoration measures are intended, in conjunction with conservation provided through the Habitat Reserve, to address impacts to non-wetland riparian vegetation communities, including an Invasive Species Control Plan (*Appendix J*) that will be implemented on RMV lands and will involve controls of invasive plants and animals, such as giant reed, tamarisk, Spanish sunflower, bullfrogs, and crayfish.

Additionally, the coordinated WQMP (*Appendix K*) will be "adaptively" implemented and will, in particular, address two main stressors affecting vegetation communities within CDFG jurisdictional areas, namely: (1) "pollutants of concern" generated by urban development with the potential to adversely affect proposed Covered CDFG Jurisdictional Areas and their value as wildlife habitat; and (2) "hydrologic conditions of concern" (addressing hydrologic/geomorphic processes), which likewise have the potential to affect proposed Covered CDFG Jurisdictional Areas and their value as wildlife habitat.

#### ***d. Rationale for Regulatory Coverage through an MSAA***

The foregoing discussion demonstrates that the Habitat Reserve and accompanying HRMP, in combination with important SOS areas on NAS Starr Ranch and Prima Deshecha, are consistent

with the wetland/riparian Conservation Strategy presented in *Chapter 10*. Regulatory coverage under Section 1600 *et seq.*... is justified because the NCCP/MSAA/HCP results in:

- Creation of a large, biologically diverse and well-connected Habitat Reserve that can function effectively over the long term to maintain, and where feasible, enhance functions and values of upland and riparian/wetland habitats and related natural processes.
- Conservation of 3,144.06 acres (94.4 percent) of all CDFG jurisdictional areas.
- Conservation of 783.11 acres (89.5 percent) of wetland/riparian habitats within the Subarea 1 with replacement of areas subject to permanent impacts at a 1:1 replacement ratio to ensure no-net loss of wetlands in accordance with California Executive Order W-59-93.
- Conservation of 116.1 acres (89.9-percent) of unvegetated streambeds and open water with compensation for impacts to unvegetated streambed through implementation of the Invasive Species Control Plan (*e.g.*, species such as giant reed, tamarisk, Spanish sunflower, etc.).
- Implementation of a HRMP to guide long-term management of the proposed Covered CDFG Jurisdictional Areas and species, including aquatic species and their associated habitats, and the WQMP coordinated management program supporting hydrologic and geomorphic processes within the Habitat Reserve. The HRMP includes stressor-based management, habitat restoration, invasive species control (particularly control of giant reed in San Juan Creek and Arroyo Trabuco), and wildland fire management addressing non-wetland riparian habitats, including southern coast live oak riparian forest, southern sycamore riparian woodland and scalebroom/mule fat scrub ecotone as set forth in the AMP component of the HRMP.
- Physiographic (watershed and elevation) conservation balance of the five major vegetation communities of coastal sage scrub, chaparral, grassland, riparian and woodland and forest such that the Habitat Reserve and SOS are representative of existing spatial diversity in Subarea 1.
- Conservation of 2,244.87 acres (96.6 percent) of non-wetland riparian habitats within the Habitat Reserve.
- Implementation of the complementary WQMP addressing “hydrologic conditions of concern,” as noted above.

## **SECTION 13.5 SUBAREA 3 COTO DE CAZA POTENTIAL FUTURE IMPACTS**

*Chapter 2, Section 10.2.2* describes a voluntary program that landowners of the remaining undeveloped residential lots in Coto de Caza could participate in as an optional means of complying with applicable FESA and NCCP Act requirements. This approach would serve as an

alternative to requiring landowners in Subarea 3 to obtain future 4(d) permits, HCP or Section 7 reviews.

For the purpose of estimating the potential impacts on proposed Covered Species and proposed Conserved Vegetation Communities, the NCCP vegetation map and sensitive species data were overlain on the existing parcel map for Coto de Caza shown on a aerial based map. Undeveloped parcels selected for analysis included those that support coastal sage scrub, because these parcels have the potential to support the federally-listed California gnatcatcher, and thus have the potential for having to comply with the FESA. Undeveloped parcels only supporting grassland (mostly the interior undeveloped or partially developed parcels) and with no documented gnatcatcher locations were not included in this analysis because of the likely absence of a listed species. Because participation in the NCCP/HCP/MSAA is voluntary, and because these landowners would not be required to comply with either FESA or CESA in the absence of a listed species, they likely would not choose to participate in the program (*i.e.*, they would proceed under the CEQA process). As a conservative assumption, parcels with an existing dwelling unit, but which also contain coastal sage scrub not dedicated to open space, were also included in the analysis because of the chance that a landowner may subdivide the property or undertake additional development on the property in the future. In either case, additional development of the parcel could result. Finally, if a parcel was partly dedicated to open space, but still appeared to have some development potential based on review of the aerial photograph, it was included in the analysis.

Based on these criteria, 17 parcels were identified for an analysis of impacts to Conserved Vegetation Communities, California gnatcatchers and cactus wrens, as shown in *Figure 255-M*. *Table 13-27* presents the results of the analysis. Approximately 77 acres of Conserved Vegetation Communities, eight California gnatcatchers and seven cactus wrens are documented on the 17 parcels. Because some clearing has occurred on some parcels that is not reflected in the subregional NCCP vegetation map, the potential impacts reported here are overstated. The key parcels for maximizing the likelihood of habitat connectivity between existing SOS areas for gnatcatchers and cactus wrens through linkage F (see *Figures 41-M* and *255-M*) are numbers 1 through 13. These 13 parcels support approximately 55 acres of Conserved Vegetation Communities, including 40.4 acres of coastal sage scrub, seven gnatcatcher locations and three cactus wren locations.

**TABLE 13-27  
POTENTIAL IMPACTS ON CONSERVED VEGETATION COMMUNITIES  
AND COVERED SPECIES IN SUBAREA 3 COTO DE CAZA**

Conserved Vegetation Community <sup>2,3</sup>	Subarea 3 Coto de Caza Parcel No. <sup>1</sup>																	Total Acres
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Coastal Sage Scrub	8	8	2	1	1	2	0.4	2	2	3	3	3	5	4	2	5	6	57.4
Chaparral	0	0	0	0	0		0	0	0	0	0	0	0	0	0	2	0	2.0
Grassland	1	0	3	2	0	3	0	0	0	2	3	0	0	0	0	0	1	15.0
Riparian	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	3.0
<b>Total Acres</b>	<b>9</b>	<b>8</b>	<b>5</b>	<b>3</b>	<b>1</b>	<b>6</b>	<b>0.4</b>	<b>2</b>	<b>2</b>	<b>5</b>	<b>6</b>	<b>3</b>	<b>5</b>	<b>4</b>	<b>2</b>	<b>8</b>	<b>8</b>	<b>77.4</b>
Covered Species																		Total
California Gnatcatcher	2	1	0	0	0	0	0	0	0	0	0	4	0	0	0	0	1	8
Cactus Wren	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	3	1	7

<sup>1</sup> Parcel number was arbitrarily assigned and is not related to the legal assessor parcel number.

<sup>2</sup> It was assumed that even parcels with an existing dwelling could be subdivided and further developed.

<sup>3</sup> Impacts are based on subregional NCCP vegetation database, as revised by Dudek 2005 and does not reflect recent clearing on some parcels. Therefore the impacts are "overstated."