



OCTA M2 Natural Community Conservation Plan/ Habitat Conservation Plan

Final

November 2016

Prepared for
Orange County Transportation Authority
550 S. Main Street
Orange, CA 92863

Prepared by
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FINAL

**ORANGE COUNTY TRANSPORTATION
AUTHORITY M2 NATURAL COMMUNITY
CONSERVATION PLAN/HABITAT
CONSERVATION PLAN (NCCP/HCP)**

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Introduction

In 2006, Orange County voters approved the renewal of Measure M, effectively extending the half cent sales tax to provide funding for transportation projects and programs in the county. As part of the renewed Measure M (or Measure M2), a portion of the M2 freeway program revenues were set aside for the M2 Environmental Mitigation Program (EMP) to provide funding for programmatic mitigation to offset impacts from the freeway projects in the 13 freeway segments covered by Measure M2. The Orange County Transportation Authority (OCTA) has prepared this Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP or Plan) as a mechanism to offset potential project-related effects on threatened and endangered species and their habitats in a comprehensive manner. The Plan achieves higher-value conservation than what would be expected through project-by-project mitigation in exchange for a streamlined project review and permitting process for the Measure M2 freeway program as a whole.

This Plan fulfills the requirements for issuance of permits from the California Department of Fish and Wildlife (CDFW) and U.S. Fish and Wildlife Service (USFWS), collectively referred to as the Wildlife Agencies, which allows for the take of threatened and endangered species and their habitats. OCTA will be the sole Permittee receiving permits from the Wildlife Agencies with terms of 40 years from the date of issuance. The California Department of Transportation (Caltrans), as the owner and operator of the state highway system, will be included as a Participating Special Entity. Caltrans will usually be the Construction Lead and in those situations OCTA issue a project specific Certificate of Inclusion that will describe the authorized take and required avoidance and minimization measures as set forth in the Plan.

As part of an Early Action Plan (EAP), OCTA was able to bond against future M2 revenues to implement conservation actions (Preserve acquisitions and restoration projects) to provide advanced, comprehensive mitigation for effects on sensitive species and their habitats. The identification and selection of Preserve acquisitions and restoration projects was coordinated by the Environmental Oversight Committee (EOC). The EOC is made up of two OCTA Board members and representatives from Caltrans, the Wildlife Agencies, U.S. Army Corps of Engineers (USACE), environmental groups, and the public. The goal of the EOC was to identify conservation measures that protect and enhance habitats as mitigation for potential impacts associated with the M2 funded freeway improvement projects. To date, OCTA has acquired seven Preserves that include 1,232 acres of protected natural habitat, and has approved funding for 11 habitat restoration projects totaling approximately 357 acres. With remaining funds from the EAP and using additional M2 revenue funds as needed, OCTA is committed to funding additional restoration projects. The Plan establishes selection criteria for these future restoration projects to ensure that they will help to achieve the Plan's biological goals and objectives.

As part of this Plan, a conservation analysis was completed that compares the level of conservation achieved under the Plan with a set of quantifiable targets and broader biological goals and objectives. This will ensure that conservation actions occur within areas that complement regional conservation goals. The conservation analysis demonstrates that the OCTA Preserve acquisitions and restoration projects coupled with the existing conserved lands, and in conjunction with a set of approved avoidance and minimization measures, result in a level of conservation that meets the criteria for CDFW and USFWS to issue permits under the State Natural Community Conservation Planning Act (NCCPA) and federal Endangered Species Act (ESA), respectively.

Key elements of the Plan are summarized below.

Covered Species (Chapter 1, Section 1.2.3)

The Plan will protect and enhance native biological diversity, habitat for native species, natural communities, and local ecosystems throughout the Plan Area¹. This broad scope will conserve a wide range of natural resources, including native species that are common or rare. However, the permits issued by the Wildlife Agencies will address a defined set of Covered Species that are currently listed as threatened or endangered or that may become listed during the permit term, that may be impacted by Covered Activities, and that will benefit from Plan-related conservation and management. This Plan covers 13 listed and non-listed species including:

- Plants (3): intermediate mariposa lily, many-stemmed dudleya, southern tarplant
- Fish (1): arroyo chub
- Reptiles (3): coast horned lizard, orangethroat whiptail, western pond turtle
- Birds (4): cactus wren, coastal California gnatcatcher, least Bell's vireo, southwestern willow flycatcher
- Mammals (2): bobcat, mountain lion

Covered Activities (Chapter 3)

The primary goal of the Plan is to obtain authorization for take of Covered Species under the NCCPA and ESA for the implementation of covered freeway improvement projects and other management and monitoring activities on Preserves (Covered Activities). Freeway improvement projects covered by this Plan are defined to include all habitat or ground-disturbing impacts resulting from the M2 transportation planning and project implementation process. There are 13 discrete proposed freeway project areas in which freeway segments have been identified for coverage under the Plan. These proposed projects are designed to reduce congestion, increase capacity, and improve traffic flow of Orange County's important transportation infrastructure. The freeway improvement projects are, in all instances, along existing freeways and will include lane additions, interchange improvements, and associated facility upgrades. These freeway improvement projects do **not** include the construction of new freeways.

Covered Activities also include management of the Preserves, which could result in a small amount of take of Covered Species' habitats as a result of ongoing habitat restoration and monitoring by Preserve Managers. In addition, OCTA has made a commitment to allow some public access and passive recreation (e.g., trails for potential hiking, equestrian, and mountain biking use) on the Preserves such that these activities do not conflict and are compatible with the overall goals and objectives of wildlife and habitat protection established by the Plan. Improvements to and, where appropriate, creation of new trails will be covered under the Plan. In addition, public access and passive recreation that are consistent with the Plan will be compatible uses that do not require coverage under the permit because they are not anticipated to result in the take of Covered Species and/or their habitats.

¹ Plan Area includes the entirety of Orange County. It is a broad planning area in which impacts would be evaluated and conservation would occur.

Estimated Level of Take (Chapter 4)

The allowable amount of take associated with the freeway improvement projects was quantified by overlaying planning-level effect footprints (direct and indirect) on natural communities, predicted species habitat, species occurrences, and designated critical habitat. These footprints represent a worst-case scenario, and actual effects are expected to be less through implementation of avoidance and minimization measures. A total of **141.0 acres** of natural habitat is estimated to be directly affected; with grasslands the most heavily affected land cover type. Grasslands are especially common in previously disturbed areas, including areas along existing freeway infrastructure, which are often mowed and maintained by Caltrans. A total of **484.4 acres** of natural habitat occur within the indirect effects footprint (300 feet around the direct effect footprint). The types of indirect effects associated with freeway improvement projects include noise and light pollution, hydrology and water quality effects, introduction and spread of invasive species, degradation of habitat connectivity, risk of fire ignition, and vehicular mortality. Because these freeway projects are designed to improve existing freeway infrastructure, the indirect effects will represent a slight increase in the existing effects that are already occurring as a result of the original construction of these roadways. The additional effects associated with these freeway projects represent a negligible increase for the cumulative effects across the Plan Area. The freeway projects covered by the Plan are defined in the Long Range Transportation Plan Program EIR (OCTA 2006) as growth accommodating and therefore do not represent a growth inducing impact.

Some activities expected to occur as part of the Preserve management and monitoring may adversely affect some Covered Species and natural communities. These effects are expected to be of limited severity and generally temporary. Effects associated with trail or access road management, fire prevention/fuel modification, and management facilities construction may result in permanent impacts. For purposes of this Plan, a threshold of **13 acres** was determined to be the maximum amount of impacts resulting from these types of activities within the total of all Preserves to be acquired. The threshold of 13 acres represents approximately 1% of the overall natural habitat acreage acquired under this Plan (1,232 acres).

Biological Goals, Objectives, and Targets (Chapter 5, Sections 5.2 and 5.3)

To guide the development of the conservation strategy and serve as a benchmark for the Plan's conservation analysis, quantifiable biological targets were developed based on the type and level of take estimated to occur from the Covered Activities. Based on these estimates, the Plan will conserve a minimum target of **550.4 acres** of natural habitat, including specific targets for individual habitat types, as well as additional species-specific biological metrics. The targets represent an estimate of the amount of conservation to offset the direct and indirect effects from Covered Activities. The targets are listed in Table ES-1 at the end of this Executive Summary.

The Plan also contains a broader set of biological goals and objectives at the landscape, natural community, and species level that describe how the conservation actions occur within areas important for regional conservation purposes. Goals are broad and based on the conservation needs of the resources. Biological objectives describe in more detail the conservation or desired conditions to be achieved and have been designed to collectively attain the biological goals. The biological goals and objectives indicate how the additional conservation of large blocks of habitat will benefit the biodiversity, natural communities, and habitat connectivity throughout key portions of the Plan Area, and provide for the conservation and management of Covered Species. The Orange County Conservation Assessment prepared by the Conservation Biology Institute (CBI 2009) for the EOC

has identified priority conservation areas within Orange County and has been used as a tool to guide and evaluate the conservation actions. The biological goals and objectives are presented in Table ES-2 at the end of this Executive Summary.

Conservation Strategy (Chapter 5)

The Plan conservation strategy is designed to fulfill requirements of the California NCCPA and federal ESA, and to streamline compliance with the California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), and other applicable environmental regulations. OCTA is not a general land use agency with the jurisdictional authority to establish a “stand-alone” preserve system for the entire Plan Area, nor does OCTA affect development and conservation decisions subject to jurisdictions (various cities, County of Orange, etc.) having such land use authority. The Plan only authorizes habitat losses attributable to the Covered Activities. The Covered Activities extend across Orange County and across the plan areas for other conservation planning efforts in Orange County. Therefore, the Plan’s overarching conservation strategy is to make an important contribution to the existing network of conserved lands that occur throughout Orange County. The OCTA Plan will achieve this goal by increasing the size and habitat quality of core habitat areas, and by protecting/enhancing the connectivity of these core areas to other protected habitats throughout the Plan Area.

The primary elements of the Plan’s conservation strategy are:

- 1. Preserve Acquisitions (Chapter 5, Section 5.4).** OCTA has acquired seven properties, resulting in the protection of 1,232 acres of natural habitat (note that the total acreage of the seven properties is approximately 1,296 acres, but the amount of protected natural habitat credited to OCTA is less because portions of the properties are developed, include trails/maintenance roads, and the Saddle Creek South property was acquired, in part, with funding from the National Fish and Wildlife Foundation and credits were adjusted accordingly). Each property will be protected with a conservation easement, and sufficient funding will be set aside to ensure that the properties are properly monitored and managed in perpetuity. Public managed access will be provided on some of these properties, if that access is consistent with the Plan’s biological goals and objectives.
- 2. Restoration Projects (Chapter 5, Section 5.5).** OCTA has approved funding for 11 restoration projects to date, totaling approximately 357 acres of restored habitats. The restoration projects occur throughout the Plan Area in core habitat areas and within key habitat linkages and riparian corridors. The restoration projects are on lands currently protected and will enhance habitat for Covered Species. OCTA has committed to funding additional restoration projects with the remaining restoration funds (approximately \$400,000 remaining from the previous round of restoration project selection) and through future restoration project selections. The Plan identifies requirements for future restoration to ensure that the Plan provides conservation for all Covered Species.
- 3. Avoidance and Minimization (Chapter 5, Section 5.6).** The Plan includes measures to avoid and minimize take of Covered Species. These avoidance and minimization measures will be implemented through a process to verify compliance of project design and construction of Covered Activities. Covered Activities will comply through avoidance and minimization of sensitive biological areas, adherence to species-specific protection measures and policies, compliance with procedures for protection of nesting birds, stormwater and water quality best management practices (BMPs), and wildfire protection techniques. Any costs associated with implementing these measures for covered freeway improvement projects, as described in the Plan, will be funded through the individual project budgets and will not rely on funding under

the M2 Environmental Mitigation Program. OCTA will have a Project Manager overseeing the activities undertaken by the Construction Lead (either Caltrans or OCTA). The OCTA Project Manager will be responsible for ensuring all avoidance and minimization measures are completed and documented by the Construction Lead and its contractors following the requirements as set forth by the Plan.

4. **Streambed Program (Chapter 5, Section 5.7).** The Plan includes the Streambed Protection Mitigation Program (Streambed Program) which outlines the process for submittal of project-level Notification(s) of Lake or Streambed Alteration(s) (NLSA) and the issuance of individual Lake or Streambed Alteration Agreements (LSAAs) for the Covered Activities pursuant to California Fish and Game Code sections 1600–1616. The Streambed Program requires the evaluation of specific streambed avoidance and minimization measures prior to compensatory mitigation. The Streambed Program will ensure that adequate mitigation is completed and that this mitigation is based on habitat and type of aquatic resources necessary to address state regulatory obligations. For unavoidable permanent impacts on streambed and associated riparian habitat, OCTA will compensate at the pre-approved mitigation sites identified in Appendix E, “Streambed Program Guidelines,” which are sites within the acquired Preserves and the restoration projects approved for funding, to achieve no-net-loss standards. Additionally, for temporary impacts on streambeds and associated riparian habitat, OCTA will ensure the impact site will be restored to its pre-project condition, when appropriate, to achieve no-net-loss standards. Restoration plans, as approved by CDFW, USFWS, and if warranted the USACE and State Water Resources Control Board, will be implemented at the sites.
5. **Mitigation Approach (Chapter 5, Section 5.8).** The conservation actions taken as part of this Plan provide advanced mitigation only for the Covered Activities. Once the Covered Activities are completed, there will be no remaining credits that can be used by OCTA as mitigation for non-M2 projects. As the Plan is implemented, OCTA will be responsible for tracking impacts on natural resources resulting from Covered Activities to ensure impacts stay below the amount of impacts estimated as part of this Plan.

Conservation Analysis (Chapter 6)

The conservation analysis demonstrates how implementation of the conservation strategy (Preserve acquisitions, restoration projects, and avoidance and minimization measures) will result in either meeting or exceeding the Plan’s biological goals, objectives, and targets. A quantitative summary of how the Plan meets the targets is included as Table ES-1. A summary of the analysis of how the Plan also achieves the broader biological goals and objectives is included in Table ES-2. In some instances, the Plan identifies requirements for the future restoration projects to enhance and expand on the level of conservation needed to meet the Plan’s biological goals and objectives. The specific Covered Species highlighted for additional conservation include arroyo chub and many-stemmed dudleya.

Management and Monitoring (Chapter 7)

The Plan sets forth a Preserve Management and Monitoring Program that establishes practices to ensure the long-term health and viability of species and ecological values within the Preserves. Guidelines are provided as a framework for OCTA and its Preserve Managers to use when developing Preserve-specific resource management plans. General Preserve stewardship issues and actions addressed include species and habitat management, wildlife species management, property management, hydrology and erosion control, land uses within Preserves, land uses adjacent to

Preserves, recreation, enforcement of public access, fire management, and public outreach and education. The Plan also outlines the types of monitoring that will be done on the Preserves and explains how adaptive management will be used to revisit the management objectives and methods and revise them, if needed, to better achieve biological goals and objectives of the Plan. Furthermore, OCTA will conduct follow up monitoring of restoration projects approved for funding (approximately every 5 to 10 years over the duration of the permit term) to be able to evaluate the success of the restoration projects and apply “lessons-learned” to future restoration activities.

Plan Implementation (Chapter 8)

OCTA is responsible for implementation of the Plan. OCTA will act as the NCCP/HCP Administrator and will be responsible for filling the roles of Preserve Manager and the Monitoring Biologist, either directly with OCTA staff or by delegation to another entity (e.g., to public entities such as Orange County Parks or State Parks, or to a contracted private entity). Other entities/organizations participating in Plan implementation include: (1) the EOC, which will continue to serve as the interagency and public forum for decisions and oversight; (2) the OCTA Board of Directors, which will provide final decision making authority on substantial matters; (3) restoration project sponsors who implement the restoration projects; (4) restoration project land management entities who will provide long-term management of the restoration project locations for biological value; (5) Caltrans, which is primarily responsible for the construction of freeway improvement projects and will be required to follow all applicable avoidance and minimization measures; and (6) the Wildlife Agencies, which will have an active role in the oversight and administration of the Plan. OCTA will prepare annual reports summarizing activities over the previous year and present results at a public meeting(s).

Plan Funding (Chapter 8, Section 8.3)

Both the NCCPA and ESA require that a conservation plan assure that there is adequate funding to implement the plan’s conservation actions. The primary source of funding for the Plan will come from the M2 transportation sales tax designed to raise money to improve Orange County’s transportation system. As part of the M2 sales tax initiative, a minimum of 5% of the revenues from the freeway program will be set aside for M2 EMP revenues to be used for “programmatic mitigation.” OCTA has estimated (based on 2016 projections) that EMP revenues will total approximately \$285 million. The estimated expenditures for the development and implementation of the Plan (including Preserve acquisitions, recordation of conservation easements, Preserve management and monitoring, funding of restoration projects, program management, and interest of early action plan) totals approximately \$144 million. This estimate includes adequate funding to establish a permanent, non-wasting endowment to cover the long-term annual expenses of (1) Preserve management (general maintenance, access control, enforcement, public outreach, etc.), (2) adaptive management, (3) effectiveness biological monitoring, (4) ongoing program management, and (5) responding to changed circumstances. OCTA will ensure that a non-wasting endowment is established, per the review and approval of the Wildlife Agencies. The assumption for this Plan is that OCTA will be responsible for establishing the endowment, with a third party entity or entities managing the endowment in coordination with the Wildlife Agencies and EOC. OCTA will retain an option to manage the endowment itself, or a part, if there is an accompanying financial or administrative benefit for Plan implementation. An initial estimate of the endowment funding requirements has been developed using a real interest rate of 2.5%. The 2.5% real interest rate is an estimate that is consistent with rates used by third party entities that hold endowments for open space preserves. Within the 5 to 7 years of Plan approval, the OCTA Board of Directors, in

coordination with the Wildlife Agencies and the EOC, will make a determination of the appropriate endowment management entity and capitalization rate for the Plan, which will be used to determine the ultimate endowment needed to meet this Plan's commitments. Once OCTA has established an endowment to fund management and monitoring of Preserves and the endowment has been reviewed and approved by the Wildlife Agencies, the endowment is deemed to be adequate funding to carry out the obligations under the Plan and the Wildlife Agencies shall not require additional funding from OCTA.

Assurances (Chapter 8, Section 8.6)

Provisions of the NCCPA and ESA regulations provide for regulatory assurances to parties covered by approved NCCPs or HCPs. If unforeseen circumstances occur that adversely affect species covered by an NCCP or HCP, the Wildlife Agencies will not require additional land, water, or financial compensation or impose additional restrictions on the use of land, water, or other natural resources as mitigation for Covered Activities without the consent of OCTA.

Table ES-1. Summary of Conservation Analysis for Plan Targets

Biometrics	Total within Plan Area	Freeway Improvement Projects		Preserve Activities	Plan Targets ⁴	Conservation Actions		Conservation Above or Below Target
		Direct Effects ¹	Indirect Effects ²	Direct Effects ³		Preserve Acquisitions	Restoration Projects	
<i>Natural Communities (acres)</i>								
Chaparral	82,965	5.0	41.9	5.9	42.8	562.0	4.0	523.2
Coniferous Forest	1,930	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grasslands ⁵	41,635	108.1	280.9	0.8	358.3	74.2	78.4	-205.7
Riparian	4,457	5.0	57.0	0.2	38.9	18.3	110.4	89.8
Scrub	59,427	10.0	85.2	2.8	68.2	261.9	140.8	334.5
Water	2,696	0.4	0.1	0.0	0.9	0.0	1.0	0.1
Wet Meadows/ Marsh	2,235	2.5	0.0	0.0	5.0	0.0	5.0	0.0
Woodland	13,995	10.0	19.3	3.3	36.3	316.1	17.8	297.6
Totals	209,340	141.0	484.4	13.0	550.4	1,232.5	357.4	1,039.5
<i>Predicted Species Habitat Models (acres)</i>								
<i>Plants</i>								
Intermediate Mariposa Lily	55,623	3.9	28.1	3.3	28.5	315.7	0.0	287.2
Many-stemmed Dudleya	91,237	11.1	83.7	8.2	80.5	776.9	0.0	696.4
Southern Tarplant	5,963	9.2	35.3	0.1	36.2	9.3	31.2	4.3
<i>Fish</i>								
Arroyo Chub	69	0.1	1.9	0.0	1.1	0.1	13.0	12.0

Table ES-1. Summary of Conservation Analysis for Plan Targets (cont.)

Biometrics	Total within Plan Area	Freeway Improvement Projects		Preserve Activities	Plan Targets ⁴	Conservation Actions		Conservation Above or Below Target
		Direct Effects ¹	Indirect Effects ²	Direct Effects ³		Preserve Acquisitions	Restoration Projects	
<i>Reptiles</i>								
Coast Horned Lizard	96,100	63.4	184.2	5.6	230.2	529.8	140.8	440.4
Orangethroat Whiptail	23,469	45.1	110.7	0.5	146.7	52.1	140.8	46.2
Western Pond Turtle—Aquatic	5,963	3.1	16.5	0.1	14.7	9.9	22.1	17.3
Western Pond Turtle—Upland	90,120	45.8	283.8	5.9	245.3	561.2	88.3	404.2
<i>Birds</i>								
Cactus Wren	55,651	9.7	85.2	2.7	67.4	254.7	14.5	201.8
Coastal California Gnatcatcher	65,608	10.3	96.0	4.5	77.5	422.1	140.8	485.4
Least Bell's Vireo	4,466	4.9	55.2	0.1	37.5	8.7	110.4	81.6
Southwestern Willow Flycatcher	4,807	5.1	60.5	0.1	40.6	8.7	110.4	78.5
<i>Mammals</i>								
Bobcat	189,607	45.9	246.0	13.0	240.8	1,232.5	311.7	1,303.4
Mountain Lion	140,725	24.5	118.8	10.7	129.7	1,013.3	130.4	1,014.0
<i>Critical Habitat</i>								
Coastal California Gnatcatcher	18,752	53.9	182.7	6.4	212.0	608.5	5.5	402.0

¹ Estimated direct effects are based on a “planning-level” footprint. Actual effects are expected to be less through the implementation of avoidance and minimization measures. The amount of direct effects for individual habitat types and predicted species habitat models have been adjusted to address the low precision and accuracy of the regional habitat data and allowance for habitat types with small amount of impacts to serve as a reasonable cap to direct effects under the Plan.

² Indirect effects have been estimated using a 300-foot buffer around direct effect areas.

³ Direct effects associated with Preserve implementation activities (new trails, kiosks, maintenance facilities, etc.) have been estimated to be no more than 13 acres of natural habitat (approximately 1% of the Preserves). Because the location of the Preserve activity effects is not known at this time, a conservative estimate has been taken based on the proportion of the biometric within the Preserves. Actual effects on sensitive habitats are expected to be less through the implementation of avoidance and minimization measures.

⁴ Plan targets were calculated using the following formula: (direct effects * 2) + (indirect effects * 0.5).

⁵ Grasslands—All natural community types are substantially above their targets except for grasslands. The negative conservation balance for grasslands is, however, offset based on the following considerations: (a) direct and indirect effects on grasslands will generally occur for small patches of disturbed, predominantly nonnative grasslands along freeway edges that have low biological value; (b) conservation of grassland is occurring within large, intact areas of protected natural habitat that have a high biological value; (c) Preserve acquisitions include large patches of native grasslands; and (d) the Plan results in conservation of other sensitive habitats, including scrub, riparian, and woodlands, that exceed Plan targets.

Table ES-2. Biological Goals, Objectives, and Conservation Actions

Biological Goal or Objective	Conservation Actions ¹
Landscape Level Biological Goals and Objectives	
Landscape Goal 1: Protect, manage, and enhance natural landscapes that result in conservation of areas large enough to support ecological integrity and sustainable populations of Covered Species, and are linked to each other and/or other areas of protected habitat in or adjacent to the Plan Area.	
<u>Landscape Objective 1.1:</u> OCTA will conserve and manage natural landscape within core and linkage areas contiguous with existing protected lands.	Acquire. OCTA has acquired seven Preserves—Aliso Canyon, Ferber Ranch, Hafen, Hayashi, MacPherson, O’Neill Oaks, and Saddle Creek South—totaling 1,232.5 acres of natural habitat. In all instances, the seven Preserves are located within priority conservation areas (as defined by the CBI (CBI 2009) and immediately adjacent to other protected lands. These Preserves add to the protection of large blocks of natural open space in areas important for regional conservation.
<u>Landscape Objective 1.2:</u> OCTA will fund and successfully implement restoration projects within the Plan Area to restore or enhance habitat that supports populations of Covered Species and natural landscapes.	Restore. OCTA has approved for funding 11 restoration projects to date, totaling an estimated 357.4 acres of restored habitats. The restoration projects occur throughout the Plan Area in core habitat areas and within key habitat linkages and riparian corridors. The restoration projects are on lands that are either currently protected or are in the process of being protected through a conservation easement or an equivalent long-term protection mechanism approved by the Wildlife Agencies, and will enhance habitats that support Covered Species, including coastal sage scrub, cactus scrub, riparian, wetlands, and woodland habitats.
Landscape Goal 2: Protect and enhance natural and semi-natural landscapes important to maintain wildlife movement within the Plan Area.	
<u>Landscape Objective 2.1:</u> OCTA will acquire, protect, and manage natural landscapes that help to secure wildlife movement corridors and provide landscape connectivity.	Acquire. OCTA has acquired four Preserves—Ferber Ranch, Hafen, O’Neill Oaks, and Saddle Creek South—totaling 592.0 acres of natural habitat in the Trabuco Canyon area. The MacPherson Preserve (200.0 acres) was also acquired and is within the Silverado Canyon. These Preserves provide a significant addition to the protection of open space in a region of the Plan Area that provides connectivity between O’Neill Park, Cleveland National Forest, the Central-Coastal NCCP/HCP Central reserve system, and Orange County Southern Subregion HCP reserve system. In addition, OCTA has acquired the Hayashi Preserve in the Chino Hills area that provides 291.2 acres of natural habitat in a location that provides connectivity between the Puente Hills to the northwest and Santa Ana Mountains to the south..
<u>Landscape Objective 2.2:</u> OCTA will restore or enhance habitat through restoration projects that improve habitat connectivity and wildlife movement through existing protected lands.	Restore. Of the 11 restoration projects OCTA has approved for funding to date, five (totaling 179.7 acres of restored habitat) are located in areas highly important for habitat connectivity and wildlife movement and/or include specific design features (e.g., improve directional fencing to wildlife crossings) to promote wildlife movement. These restoration projects include North Coal Canyon (located in the Coal Canyon Linkage mapped by the CBI (CBI 2009)), West Loma (directional fencing to reduce roadkill on the 241 toll road), Big Bend (essential connection between Aliso and Wood Canyons Wilderness Park to the Laguna Coast Wilderness Park), Aliso Creek (riparian corridor linking several open space Preserves), and City Parcel (located in the Trabuco and San Juan Creeks Linkage mapped by CBI (CBI 2009)).

Table ES-2. Biological Goals, Objectives, and Conservation Actions (cont.)

Biological Goal or Objective	Conservation Actions ¹												
<p><u>Landscape Objective 2.3</u>: OCTA will set forth policies and procedures requiring the planning and execution of covered freeway improvement projects in a manner that maintains and, if feasible, enhances wildlife connectivity through existing structures. OCTA will provide monitoring, when and where appropriate, to demonstrate this objective has been met.</p>	<p>Policy. The Wildlife Crossing Policy (see Section 5.6.2.3) is an avoidance and minimization measure, and requires covered freeway improvement projects be evaluated during pre-project surveys to determine if existing structures function as wildlife movement corridors. OCTA will require that appropriate design features are implemented to ensure that the wildlife crossing continues to function after the freeway construction improvements are completed. OCTA will provide a technical report summarizing design recommendations for review and approval by the Wildlife Agencies prior to final design. This technical report will set forth appropriate monitoring requirements of the wildlife crossing using guidance outlined in the Caltrans <i>Wildlife Crossing Guidance Manual</i>.</p>												
<p>Landscape Goal 3: OCTA will protect, enhance, and/or restore natural landscapes within a range of environmental gradients and contiguous to other protected areas to allow for shifting species distributions in response to catastrophic events (e.g., fire, prolonged drought) or changed circumstances (e.g., climate change).</p>													
<p><u>Landscape Objective 3.1</u>: OCTA will acquire and/or restore natural landscapes within elevation ranges (0–500; 500–1,000; 1,000–1,500; 1,500–2,000 feet). The conservation and restoration of Covered Species habitat in or contiguous with existing Preserve lands will benefit potential shifting species distributions in response to catastrophic events and changed circumstances.</p>	<p>Acquire and Restore. OCTA has acquired Preserves and approved for funding restoration projects within different elevation ranges:</p> <table border="1" data-bbox="711 877 1365 1024"> <thead> <tr> <th><u>Elevation Range</u></th> <th><u>Combined Preserve and Restoration Acres</u></th> </tr> </thead> <tbody> <tr> <td>0–500 feet</td> <td>223.0</td> </tr> <tr> <td>500–1,000 feet</td> <td>328.2</td> </tr> <tr> <td>1,000–1,500 feet</td> <td>957.2</td> </tr> <tr> <td>1,500–2,000 feet</td> <td>81.5</td> </tr> </tbody> </table> <p>Areas of the Plan Area at higher elevations (over 2,000 feet) already have a high percent of protected lands (CBI 2009).</p>	<u>Elevation Range</u>	<u>Combined Preserve and Restoration Acres</u>	0–500 feet	223.0	500–1,000 feet	328.2	1,000–1,500 feet	957.2	1,500–2,000 feet	81.5		
<u>Elevation Range</u>	<u>Combined Preserve and Restoration Acres</u>												
0–500 feet	223.0												
500–1,000 feet	328.2												
1,000–1,500 feet	957.2												
1,500–2,000 feet	81.5												
<p>Landscape Goal 4: Protect and enhance habitat in geographically distinct areas across the Plan Area to conserve species by facilitating/promoting genetic exchange.</p>													
<p><u>Landscape Objective 4.1</u>: OCTA will acquire and/or restore natural landscapes within most of the major watersheds (HUC8) and a majority of the core and linkage areas that are contributing to genetic exchange within these areas.</p>	<p>Acquire and Restore. OCTA has acquired Preserves and approved funding for restoration projects within all of the major watersheds:</p> <table border="1" data-bbox="683 1318 1414 1486"> <thead> <tr> <th><u>Watersheds (HUC8)</u></th> <th><u>Combined Preserve and Restoration Acres</u></th> </tr> </thead> <tbody> <tr> <td>Aliso – San Onofre</td> <td>850.6</td> </tr> <tr> <td>Newport Bay</td> <td>15.7</td> </tr> <tr> <td>San Gabriel</td> <td>313.1</td> </tr> <tr> <td>Santa Ana</td> <td>402.3</td> </tr> <tr> <td>Seal Beach</td> <td>8.2</td> </tr> </tbody> </table> <p>In addition, OCTA has acquired Preserves and/or approved funding for restoration projects in 9 of the 12 core and linkage areas mapped by CBI (CBI 2009).</p>	<u>Watersheds (HUC8)</u>	<u>Combined Preserve and Restoration Acres</u>	Aliso – San Onofre	850.6	Newport Bay	15.7	San Gabriel	313.1	Santa Ana	402.3	Seal Beach	8.2
<u>Watersheds (HUC8)</u>	<u>Combined Preserve and Restoration Acres</u>												
Aliso – San Onofre	850.6												
Newport Bay	15.7												
San Gabriel	313.1												
Santa Ana	402.3												
Seal Beach	8.2												

Table ES-2. Biological Goals, Objectives, and Conservation Actions (cont.)

Biological Goal or Objective	Conservation Actions ¹
Natural Community Level Biological Goals and Objectives	
Natural Community Goal 1: Protect, manage, and enhance natural communities to promote native biodiversity.	
<p><u>Natural Community Objective 1.1 (Chaparral)</u>: OCTA will acquire and/or restore chaparral habitat to promote conservation of native biodiversity and connectivity that benefit Covered Species of the chaparral natural community.</p>	<p>Acquire and Restore. OCTA has acquired seven Preserves that include a total of 562.0 acres of chaparral habitat. A majority of the Aliso Canyon (84%), Hafen (66%), MacPherson (72%) and O'Neill Oaks (71%) Preserves include chaparral natural communities. In addition, the Agua Chinon/Bee Flat Canyon restoration project includes 4.0 acres of chaparral habitat restoration and/or enhancement. The conservation and restoration of chaparral habitat will benefit coast horned lizard, orangethroat whiptail, bobcat, and mountain lion (limited range).</p>
<p><u>Natural Community Objective 1.2 (Grassland)</u>: OCTA will acquire and/or restore grassland habitat to promote native biodiversity and connectivity that benefit Covered Species of the grassland natural community.</p>	<p>Acquire and Restore. OCTA has acquired the Aliso Canyon, Ferber Ranch, Hayashi, and MacPherson Preserves, which have a combined 74.2 acres of grassland habitat. Native grassland has been mapped on both the Ferber Ranch and Hayashi Preserves with large patches of high quality native grassland habitat (totaling 17.1 acres) occurring on the Ferber Ranch property. OCTA will ensure appropriate management actions to protect and enhance the native grassland patches in both Preserves will be completed in accordance with the requirements incorporated into the Ferber Ranch and Hayashi resource management plans (RMPs). In addition, OCTA has approved funding for four restoration projects that include restoration of grassland habitats totaling 78.4 acres. Together these efforts amount to 152.6 acres of grassland habitat acquired and/or restored.</p>
<p><u>Natural Community Objective 1.3 (Riparian)</u>: OCTA will acquire and/or restore riparian habitat in multiple locations across the Plan Area. These actions will enhance and expand riparian communities in key locations for wildlife movement, provide potentially suitable live-in and dispersal habitat for some of the Covered Species, and promote native biodiversity and connectivity to benefit many of the Covered Species.</p>	<p>Acquire and Restore. OCTA has acquired four Preserves—Ferber Ranch, Hafen, Hayashi, and MacPherson—that have a total of 18.3 acres of riparian habitat. On the Hayashi Preserve, OCTA has undertaken steps to remove grazing within the riparian zone (using fencing) to allow the riparian habitat to passively recover and expand. In addition, 9 of the 11 restoration projects OCTA has approved for funding to date include riparian habitat restoration totaling 110.4 acres. The riparian restoration projects occur within areas important for regional conservation, including large sized restoration projects along Aliso Creek and Lower Silverado Canyon. Conservation of riparian habitat will benefit Covered Species that rely on healthy streambed ecosystems (western pond turtle), riparian nesting birds (least Bell's vireo and southwestern willow flycatcher), and mammals using riparian habitat for movement cover (bobcat, mountain lion).</p>

Table ES-2. Biological Goals, Objectives, and Conservation Actions (cont.)

Biological Goal or Objective	Conservation Actions ¹
<p><u>Natural Community Objective 1.4 (Scrub)</u>: OCTA will acquire and/or restore scrub habitat. These actions will enhance and expand scrub habitat in key locations for wildlife movement, provide potentially suitable nesting habitat for Covered Species, and promote native biodiversity and connectivity that benefit Covered Species of the scrub natural community.</p>	<p>Acquire and Restore. OCTA has acquired six Preserves—Aliso Canyon, Ferber Ranch, Hafen, MacPherson, O’Neill Oaks, and Saddle Creek South—that have a total of 261.9 acres of scrub habitat. These Preserves support nesting populations of coastal California gnatcatcher and cactus wren and add to the protection of an important block of scrub habitat between the Orange County Southern Subregion HCP and Central-Coastal NCCP/HCP reserve systems. In addition, OCTA has approved for funding two restoration projects—UC Irvine Ecological Reserve and Chino Hills State Park—that include 14.5 acres of cactus scrub habitat in locations known to support cactus wren and seven restoration projects that included coastal sage scrub habitat (126.3 acres) that will enhance and expand habitat for the coastal California gnatcatcher. This amounts to a total of 402.6 acres of scrub habitat that has been acquired and/or will be restored.</p>
<p><u>Natural Community Objective 1.5 (Woodland)</u>: OCTA will acquire and/or restore woodland habitat. These actions will enhance and expand woodland habitat for foraging and cover by Covered Species, and will promote native biodiversity and connectivity that benefit Covered Species of the woodland natural community.</p>	<p>Acquire and Restore. OCTA has acquired six Preserves—Ferber Ranch, Hafen, Hayashi, MacPherson, O’Neill Oaks, and Saddle Creek South— that include a total of 316.1 acres of woodland habitat. A majority of the Hayashi (64%) Preserve includes woodland habitat, including 11.6 acres of coast live oak woodland and 174.4 acres of California walnut woodland. The California walnut woodland is a habitat type considered of special concern by the state and found to be under protected (CBI 2009). In addition, the Agua Chion/Bee Flat Canyon restoration project includes 17.8 acres of woodland habitat restoration and/or enhancement. A wide range of species use woodlands for reproduction, foraging, shelter, and dispersal, including bobcat and mountain lion.</p>
<p>Natural Community Goal 2: Maintain and enhance riparian and wetland function and values to benefit Covered Species and promote native biodiversity.</p>	
<p><u>Natural Community Objective 2.1</u>: OCTA will acquire, restore and/or enhance areas with aquatic resources (per CDFW jurisdiction). These conservation actions will protect riparian and wetlands functions and values by improving the condition and integrity of the physical streambed, aquatic and riparian habitat, and hydrology.</p>	<p>Acquire and Restore. For all of the Preserves that OCTA has acquired and 6 of the 11 restoration projects approved for funding by OCTA, detailed jurisdictional delineations have been completed to identify and map the extent of aquatic resources within the Preserve/project boundaries. A total of 86.0 acres of aquatic resources (per CDFW jurisdiction) occurs within the Preserves, and approximately 101.5 acres of aquatic resources will be restored, enhanced, and/or rehabilitated through the restoration projects. The conservation actions protect riparian and wetland functions and values, and will mitigate any unavoidable impacts on aquatic resources resulting from Covered Activities.</p>
<p><u>Natural Community Objective 2.2</u>: OCTA will set forth policies and procedures to ensure Covered Activities result in no net loss of wetland habitat values and acreage in the Plan Area.</p>	<p>Policy. The Plan sets forth the Streambed Program (Section 5.7 and Appendix E, “Streambed Program Guidelines”) designed to protect, and compensate for unavoidable impacts on streambed areas and riparian/wetland habitats under jurisdiction of CDFW. Table E-2 in Appendix E shows that impacts will be mitigated using mitigation ratios depending on the type and quality of resources affected and timing of mitigation. OCTA will track impacts and mitigation of aquatic resources by habitat type and acreage using a Mitigation Ledger and provide a summary in an annual report.</p>

Table ES-2. Biological Goals, Objectives, and Conservation Actions (cont.)

Biological Goal or Objective	Conservation Actions ¹
Species Level Biological Goals and Objectives	
Species Goal 1: Provide conservation of intermediate mariposa lily within the Plan Area and minimize and mitigate impacts associated with Covered Activities.	
<u>Species Objective 1.1:</u> OCTA will acquire Preserves with occurrences of intermediate mariposa lily. OCTA will ensure that appropriate management and monitoring actions are incorporated into the RMPs for each Preserve to support sustainable populations of intermediate mariposa lily.	Acquire. OCTA completed baseline biological surveys of the seven Preserves and during these surveys, six of the seven Preserves—Aliso Canyon, Ferber Ranch, Hafen, MacPherson, O’Neill Oaks, and Saddle Creek South—had a total of 93 identified locations, with a minimum population of 597 plants, of intermediate mariposa lily. OCTA will protect and monitor these locations and any future locations found, as part of the Preserve RMPs.
<u>Species Objective 1.2:</u> OCTA will establish policies and procedures that require OCTA to identify, track, mitigate, and report annually any unavoidable impacts on intermediate mariposa lily.	Policy. The Plan includes the Covered Plant Species Policy (see Section 5.6.2.2) which sets forth policies and procedures requiring OCTA to evaluate impacts based on project-specific field surveys of the Covered Activities and to mitigate any unavoidable impacts (at a 3:1 ratio) using credits determined through field surveys of Preserves and actions taken to enhance, restore, and create populations of covered plant species as part of restoration projects approved for funding by OCTA. OCTA will maintain a ledger-type accounting system to track credits and debits and report status as part of the Plan’s annual report.
Species Goal 2: Provide conservation of many-stemmed dudleya within the Plan Area and minimize and mitigate impacts associated with Covered Activities.	
<u>Species Objective 2.1:</u> OCTA will acquire a Preserve and/or implement a restoration project resulting in the protection, enhancement, and/or creation of a major population (i.e., 500 individuals) of many-stemmed dudleya.	Restore. To ensure that the Plan provides conservation and management for many-stemmed dudleya, OCTA will protect, enhance, and/or establish a major population (i.e., 500 individuals) of many-stemmed dudleya. During baseline biological surveys of the Aliso Canyon Preserve, four occurrences with a total of 60 individuals were detected. Ongoing Preserve management may improve habitat suitability (e.g., reduction of invasive species) that results in the expansion of the existing population on Aliso Canyon Preserve and/or establishment/detection of new populations on the other OCTA Preserves. Also, future non-drought conditions may result in the detection of new occurrences at Aliso Canyon. If a minimum of 500 individuals are eventually identified on the Preserves or within the approved restoration projects (see Species Objective 2.2) within the 10 years from Plan adoption, then this objective will be considered complete. If this objective cannot be met within the first 10 years as described, OCTA will select and oversee implementation of a restoration project designed to establish or expand a population of many-stemmed dudleya and will result in an increase of a current population or establishment of a new population such that a minimum of 500 individuals is achieved.
<u>Species Objective 2.2:</u> OCTA will implement restoration projects where there are known occurrences of many-stemmed dudleya in the project vicinity. The restoration actions will to improve and enhance potentially suitable habitat for many-stemmed dudleya.	Restore. OCTA has approved for funding two restoration projects, West Loma and Big Bend; many-stemmed dudleya has been mapped in the vicinity of both projects. This plant is capable of self-fertilization and remains dormant as an underground corm in the dry months (June–November). The restoration actions have the potential to improve habitat conditions for many-stemmed dudleya to establish.

Table ES-2. Biological Goals, Objectives, and Conservation Actions (cont.)

Biological Goal or Objective	Conservation Actions ¹
<p><u>Species Objective 2.3</u>: OCTA will establish policies and procedures that require OCTA to identify, track, mitigate, and report annually any unavoidable impacts on many-stemmed dudleya.</p>	<p>Policy. The Plan includes the Covered Plant Species Policy (see Section 5.6.2.2) which sets forth policies and procedures requiring OCTA to evaluate impacts based on project-specific field surveys of the Covered Activities and to mitigate any impacts (at a 3:1 ratio) using credits determined through field surveys of Preserves and actions taken to enhance, restore, and create populations of covered plant species as part of restoration projects approved for funding by OCTA. OCTA will maintain a ledger-type accounting system to track credits and debits and report status as part of the Plan’s annual report.</p>
<p>Species Goal 3: Provide conservation of southern tarplant within the Plan Area and minimize and mitigate impacts associated with Covered Activities.</p>	
<p><u>Species Objective 3.1</u>: OCTA will implement a restoration project in an area with known occurrences of southern tarplant. The restoration design plan includes elements to promote the expansion of southern tarplant as part of the restoration efforts.</p>	<p>Restore. OCTA has approved for funding the Harriet Weider Regional Park restoration project that has southern tarplant mapped in the project vicinity. The restoration project sponsor has agreed to include specific measures as part of the restoration project design plan to achieve the establishment of southern tarplant. Southern tarplant seeds have been harvested from mature plants near the restoration site, and they will be included in the restoration seed mix. OCTA will ensure the restoration project sponsor conducts focused surveys for southern tarplant as part of their monitoring efforts to quantify the population established through the restoration process.</p>
<p><u>Species Objective 3.2</u>: OCTA will establish policies and procedures that require OCTA to identify, track, mitigate, and report annually any unavoidable impacts on southern tarplant.</p>	<p>Policy. The Plan includes the Covered Plant Species Policy (see Section 5.6.2.2), which sets forth policies and procedures requiring OCTA to evaluate impacts based on project-specific field surveys of the Covered Activities and to mitigate any impacts (at a 3:1 ratio) using credits determined through field surveys of Preserves and actions taken to enhance, restore, and create populations of covered plant species as part of restoration projects approved for funding by OCTA. OCTA will maintain a ledger-type accounting system to track credits and debits and report status as part of the Plan’s annual report.</p>
<p>Species Goal 4: Provide conservation of arroyo chub within the Plan Area and minimize and mitigate impacts associated with Covered Activities.</p>	
<p><u>Species Objective 4.1</u>: OCTA will restore and enhance riparian habitat in the areas that potentially support arroyo chub and conserve natural habitat in the headwaters of a stream supporting arroyo chub to protect in-stream water quality.</p>	<p>Restore and Acquire. The City Parcel restoration project approved for funding by OCTA results in 13.0 acres of riparian restoration along lower reaches of Trabuco Creek. This restoration effort includes removal of nonnative plant species, removal of debris and trash, and planting of native plant species. These restoration activities will contribute to the improvement of the natural hydrological functions and water quality for this important coastal stream course and will improve Trabuco Creek as habitat for arroyo chub. In addition, OCTA has acquired the Ferber Ranch, Hafen, and O’Neill Oaks Preserves, which are located in headwaters of Trabuco Creek. The protection of 540.7 acres of natural habitat in this location contributes to the protection of water quality, sedimentation, and hydrological processes important for arroyo chub habitat downstream in Trabuco Creek.</p>

Table ES-2. Biological Goals, Objectives, and Conservation Actions (cont.)

Biological Goal or Objective	Conservation Actions ¹
<p><u>Species Objective 4.2</u>: OCTA will implement a restoration project focused on improving habitat conditions for arroyo chub, such as improving water quality, removing nonnative aquatic species, or modifying check dams to allow passage, to support sustainable populations in occupied areas.</p>	<p>Restore. OCTA will fund a future restoration project that will achieve a direct benefit to an existing population of arroyo chub. This restoration project could include actions to improve water quality in a subwatershed known to have arroyo chub (e.g., in Bell Canyon), removal or modification of check dams to facilitate fish passage (e.g., along San Juan Creek in U.S. Forest Service lands), and/or a focused nonnative fish removal within a select tributary (e.g., fish trapping of source populations of nonnatives in Oso Creek).</p>
<p><u>Species Objective 4.3</u>: OCTA will establish policies and procedures to avoid and minimize impacts on arroyo chub and its habitat.</p>	<p>Policy. The Plan includes the Aquatic Resources and Species Policy that outlines appropriate avoidance and minimization measures for construction activities in aquatic resources, such as rivers, creeks, and riparian areas. The Construction Lead will retain a qualified biologist during any project that could impact potential arroyo chub habitat to determine if arroyo chub might be present and subject to potential injury or mortality from construction activities. When arroyo chub are present, the project biologist will identify appropriate methods to capture, handle, exclude, and/or relocate those individuals. All fish exclusion and salvage activities will adhere to accepted National Oceanic and Atmospheric Administration Fisheries Service and CDFW protocols. Other policies that will provide for the protection of arroyo chub include the Avoidance and Minimization of Sensitive Biological Areas, Wildlife Crossing Policy, Stormwater and Water Quality BMPs, Wildfire Protection Techniques, and Wetland and Riparian Streambed Protection Program.</p>
<p>Species Goal 5: Provide conservation of coast horned lizard within the Plan Area and minimize and mitigate impacts associated with Covered Activities.</p>	
<p><u>Species Objective 5.1</u>: OCTA will acquire Preserves with natural habitat that includes areas with loose, fine soils with high sand fraction, open areas with limited overstory for basking, and other features known to support coast horned lizard and OCTA will ensure that appropriate management monitoring actions are incorporated into the RMPs for each Preserve that includes suitable habitat for coast horned lizard.</p>	<p>Acquire. OCTA has acquired seven Preserves—Aliso Canyon, Ferber Ranch, Hafen, Hayashi, MacPherson, O’Neill Oaks, and Saddle Creek South—totaling 1,232.5 acres of natural habitat. During baseline biological surveys completed for these Preserves in 2012 and 2015, it was noted that each of these Preserves provides quality habitat features for coast horned lizard.</p>
<p>Species Goal 6: Provide conservation of orangethroat whiptail within the Plan Area and minimize and mitigate impacts associated with Covered Activities.</p>	
<p><u>Species Objective 6.1</u>: OCTA will acquire Preserves that have documented occurrences of orangethroat whiptail. OCTA will ensure that appropriate management and monitoring actions are incorporated into the RMPs for each Preserve to protect and maintain habitat to support sustainable populations of orangethroat whiptail.</p>	<p>Acquire. During the baseline biological surveys of the seven acquired Preserves, it was noted that all of these Preserves provide quality habitat features for orangethroat whiptail and occurrences were identified on the Ferber Ranch, O’Neill Oaks and MacPherson Preserves.</p>

Table ES-2. Biological Goals, Objectives, and Conservation Actions (cont.)

Biological Goal or Objective	Conservation Actions ¹
Species Goal 7: Provide conservation of western pond turtle within the Plan Area and minimize and mitigate impacts associated with Covered Activities.	
<u>Species Objective 7.1:</u> OCTA will acquire a Preserve(s) with the potential to expand western pond turtle populations, potentially via translocation. OCTA will enhance the riparian and streambed habitat within the Preserve(s) to create and/or improve permanent and intermittent water sources that could provide habitat for western pond turtle.	Acquire. OCTA has acquired the Hayashi Preserve in the Chino Hills area that has had incidental observations of western pond turtle (observed in 2011) by Chino Hills State Park staff. OCTA has undertaken steps to remove grazing within the Soquel Canyon riparian zone (using fencing) to allow the riparian habitat along this drainage to passively recover and expand. OCTA will include appropriate management actions to protect and/or enhance western pond turtle habitat and locations, such as monitoring and as-needed adaptive management through collaboration with, and agreement between, OCTA and the Wildlife Agencies, as part of the Preserve RMP.
<u>Species Objective 7.2:</u> OCTA will implement a restoration project that will directly benefit known populations of western pond turtle by removing nonnative invasive plant species degrading the stream course, expanding ponds and open water, and/or exposing potential basking sites.	Restore. OCTA has approved for funding the Aliso Creek restoration project, which involves 55 acres of riparian and transitional habitat restoration, including the removal of dense stands of arundo that have clogged the stream course and substantially degraded the quality of the stream as habitat for western pond turtle. There are four known occurrences of western pond turtle within the restoration project site. The restoration actions will improve western pond turtle habitat by improving water quality and aquatic habitat (exposing ponds and basking sites), enhancing aestivation habitat and access to aestivation habitat, and improving upland nesting habitat.
<u>Species Objective 7.3:</u> OCTA will establish policies and procedures to avoid and minimize impacts on western pond turtle and its habitat.	Policy. The Plan includes the Aquatic Resources and Species Policy that outlines appropriate avoidance and minimization measures for construction activities in aquatic resources, such as rivers, creeks, and riparian areas. Prior to ground-disturbing activities in or near aquatic habitats, OCTA will conduct preconstruction surveys for western pond turtles to determine their presence or absence within the construction footprint. If western pond turtles are found within the construction footprint, the occupied habitat and appropriate buffer, as determined by a qualified biologist, will be avoided to the maximum extent practicable. If avoidance is not possible and the species is determined to be present in work areas, the biologist may capture turtles prior to construction activities and relocate them to nearby suitable habitat a minimum of 300 feet downstream from the work area. Alternatively, if recommended/approved by the Wildlife Agencies, the turtles may be captured and either temporarily held or relocated to an appropriate nearby location. Other policies that will provide for the protection of western pond turtle include the Avoidance and Minimization of Sensitive Biological Areas, Wildlife Crossing Policy, Stormwater and Water Quality BMPs, Wildfire Protection Techniques, and Wetland and Riparian Streambed Protection Program.

Table ES-2. Biological Goals, Objectives, and Conservation Actions (cont.)

Biological Goal or Objective	Conservation Actions ¹
Species Goal 8: Provide conservation of cactus wren within the Plan Area and minimize and mitigate impacts associated with Covered Activities.	
<u>Species Objective 8.1:</u> OCTA will protect and manage blocks of occupied cactus wren habitat to support sustainable populations and maintain habitat linkages between cactus wren populations within the Plan Area.	Acquire. OCTA has acquired four Preserves—Ferber Ranch, Hafen, O’Neill Oaks, and Saddle Creek South in the Trabuco Canyon area—that support nesting populations of cactus wren and add to the protection of an important block of cactus scrub patches between the Orange County Southern Subregion HCP and the Central-Coastal NCCP/HCP reserve systems. During the 2012 baseline biological surveys of the Preserves, cactus wren occurrences were recorded on these Preserves.
<u>Species Objective 8.2:</u> OCTA will implement restoration project(s) focused on creating cactus scrub habitat to expand habitat in areas of known cactus wren populations.	Restore. OCTA has approved for funding two restoration projects—UC Irvine Ecological Reserve and Chino Hills State Park—that include 14.5 acres of cactus scrub habitat in locations known to support cactus wren.
<u>Species Objective 8.3:</u> OCTA will establish policies and procedures to avoid and minimize impacts on cactus wren habitat, including cactus scrub.	Policy: The Plan includes the policies that will require covered freeway improvement projects to be designed in a manner that avoids and/or minimizes impacts on sensitive biological resources, including cactus scrub. Temporary staging areas, access roads, and other project components that have the flexibility to be sited outside of sensitive areas will be incorporated into the project design. Best management practices will be followed to delineate environmentally sensitive areas and provide for training and monitoring to ensure these areas are protected. If temporary impacts on cactus sage scrub cannot be avoided, these areas will be restored to their previous conditions. Other policies that will provide for the protection of cactus wren include the Nesting Birds Policy and Wildfire Protection Techniques.
Species Goal 9: Provide conservation of coastal California gnatcatcher within the Plan Area and minimize and mitigate impacts associated with Covered Activities.	
<u>Species Objective 9.1:</u> OCTA will protect and manage blocks of occupied gnatcatcher nesting habitat to support sustainable populations and maintain habitat linkages between coastal California gnatcatcher populations within the Plan Area.	Acquire. OCTA has acquired six Preserves—Aliso, Canyon, Ferber Ranch, Hafen, MacPherson, O’Neill Oaks, and Saddle Creek South—that protect coastal sage scrub habitat and/or support nesting populations of coastal California gnatcatchers. These Preserves add to the protection of important blocks of coastal sage scrub between the Orange County Southern Subregion HCP and Central-Coastal NCCP/HCP reserve systems and provide suitable habitat at a low elevation for movement of gnatcatchers. During the baseline biological surveys of the Preserves, occurrences of coastal California gnatcatchers were noted at the Ferber Ranch and O’Neill Oaks Preserves and adjacent to the Aliso Canyon Preserve. Previous sightings have been recorded at the Saddle Creek South Preserve. Coastal California gnatcatchers were not observed at MacPherson, although coastal sage scrub habitat within this Preserve is high quality and is in large enough patches to support pairs. Although the MacPherson Preserve is near the edge of the elevation range of coastal California gnatcatcher, the location of this Preserve could serve as a habitat refugia from fire and/or a stepping stone for regional connectivity.

Table ES-2. Biological Goals, Objectives, and Conservation Actions (cont.)

Biological Goal or Objective	Conservation Actions ¹
<p><u>Species Objective 9.2:</u> OCTA will restore and/or enhance coastal sage scrub habitat to expand coastal California gnatcatcher habitat.</p>	<p>Restore. OCTA has approved funding for ten restoration projects that include restoration of coastal sage scrub and cactus scrub habitat, totaling 140.8 acres. The Big Bend, City Parcel, Fairview Park, Harriett Weider Regional Park, Lower Silverado Canyon, UC Irvine Ecological Reserve, Chino Hills State Park, and North Coal Canyon restoration projects will restore coastal sage scrub and cactus scrub habitat in locations important for providing for coastal California gnatcatcher movement and dispersal. The coastal sage scrub restoration that is part of the West Loma and Aqua Chinon/Bee Flat Canyon restoration projects will improve coastal California gnatcatcher habitat within the Central-Coastal NCCP/HCP reserve system.</p>
<p><u>Species Objective 9.3:</u> OCTA will establish policies and procedures to avoid and minimize impacts on coastal California gnatcatcher habitat, including coastal sage scrub.</p>	<p>Policy: The Plan includes policies that will require covered freeway improvement projects to be designed in a manner that avoids and/or minimizes impacts on sensitive biological resources, including coastal sage scrub. Temporary staging areas, access roads, and other project components that have the flexibility to be sited outside of sensitive areas will be incorporated into the project design. Best management practices will be followed to delineate environmentally sensitive areas and provide for training and monitoring to ensure these areas are protected. If temporary impacts on coastal sage scrub cannot be avoided, the areas will be restored to their previous conditions. Other policies that will provide for the protection of coastal California gnatcatcher include the Nesting Birds Policy and Wildfire Protection Techniques.</p>
<p>Species Goal 10: Provide conservation of least Bell’s vireo within the Plan Area and minimize and mitigate impacts associated with Covered Activities.</p>	
<p><u>Species Objective 10.1:</u> OCTA will acquire a Preserve with the potential to enhance riparian habitat to expand least Bell’s vireo habitat.</p>	<p>Acquire. OCTA has acquired the Hayashi Preserve in the Chino Hills area, which has an existing riparian corridor along Soquel Canyon that has been historically disturbed by grazing. OCTA has taken steps to remove grazing from the riparian corridor by installing fencing to allow for the passive restoration of riparian habitat. In similar situations in the Chino Hills State Park, shortly after grazing was removed from the riparian zone, the habitat recovered and least Bell’s vireo moved in. There are known least Bell’s vireo occurrences above and below the Hayashi property, and, as the riparian habitat recovers on this Preserve, there is a strong likelihood it will support least Bell’s vireo.</p>
<p><u>Species Objective 10.2:</u> OCTA will restore and/or enhance riparian habitat adjacent to occupied least Bell’s vireo habitat.</p>	<p>Restore. OCTA has approved funding for the Aliso Creek and City Parcel restoration projects, which include restoration of riparian habitat totaling 68.0 acres. Each of these restoration projects has documented occurrences of least Bell’s vireo within the project sites. The Aliso Creek restoration has had seven occurrences and City Parcel has had one occurrence that overlaps with the project sites. The riparian habitat restoration and enhancement will provide an immediate benefit to least Bell’s vireo nesting habitat.</p>

Table ES-2. Biological Goals, Objectives, and Conservation Actions (cont.)

Biological Goal or Objective	Conservation Actions ¹
<p><u>Species Objective 10.3</u>: OCTA will restore and/or enhance riparian habitat in areas not currently occupied by least Bell’s vireo to encourage future expansion of the species distribution within the Plan Area.</p>	<p>Restore. OCTA has approved funding for five restoration projects that include restoration of riparian habitat (totaling 41.4 acres) in locations with documented occurrences of least Bell’s vireo in the vicinity. These restoration projects are Fairview Park, Lower Silverado Canyon, Chino Hills, West Loma, and Agua Chinon/Bee Flat Canyon. These riparian habitat restoration projects will create least Bell’s vireo habitat and are expected to support least Bell’s vireo in the future.</p>
<p><u>Species Objective 10.4</u>: OCTA will establish policies and procedures to avoid and minimize impacts on least Bell’s vireo habitat, including riparian habitat.</p>	<p>Policy: The Plan includes policies that will require covered freeway improvement projects to be designed in a manner that avoids and/or minimizes impacts on sensitive biological resources, including riparian habitat. Temporary staging areas, access roads, and other project components that have the flexibility to be sited outside of sensitive areas will be incorporated into the project design. Best management practices will be followed to delineate environmentally sensitive areas and provide for training and monitoring to ensure these areas are protected. If temporary impacts on riparian habitat cannot be avoided, the areas will be restored to their previous conditions. Other policies that will provide for the protection of least Bell’s vireo include the Nesting Birds Policy and Wildfire Protection Techniques.</p>
<p>Species Goal 11: Provide conservation of southwestern willow flycatcher habitat within the Plan Area and minimize and mitigate impacts associated with Covered Activities.</p>	
<p><u>Species Objective 11.1</u>: OCTA will restore and/or enhance riparian habitat adjacent to suitable southwestern willow flycatcher habitat.</p>	<p>Restore. OCTA has approved for funding the Aliso Creek restoration project, which includes 55.0 acres of riparian habitat restoration. The Aliso Creek restoration project has had three occurrences of southwestern willow flycatcher within the project site. The riparian habitat restoration and enhancement will provide an immediate benefit to southwestern willow flycatcher habitat.</p>
<p><u>Species Objective 11.2</u>: OCTA will establish policies and procedures to avoid and minimize impacts on southwestern willow flycatcher habitat, including riparian habitat.</p>	<p>Policy: The Plan includes policies that will require covered freeway improvement projects to be designed in a manner that avoids and/or minimizes impacts on sensitive biological resources, including riparian habitat. Temporary staging areas, access roads, and other project components that have the flexibility to be sited outside of sensitive areas will be incorporated into the project design. Best management practices will be followed to delineate environmentally sensitive areas and provide for training and monitoring to ensure these areas are protected. If temporary impacts on riparian habitat cannot be avoided, these areas will be restored to their previous conditions. Other policies that will provide for the protection of southwestern willow flycatcher include the Nesting Birds Policy and Wildfire Protection Techniques.</p>

Table ES-2. Biological Goals, Objectives, and Conservation Actions (cont.)

Biological Goal or Objective	Conservation Actions ¹
Species Goal 12: Provide conservation of bobcat within the Plan Area and minimize and mitigate impacts associated with Covered Activities.	
<u>Species Objective 12.1:</u> OCTA will protect and manage natural habitat that includes a combination of land cover types important for wildlife movement of mammals such as bobcat.	Acquire. OCTA has acquired seven Preserves in the Trabuco/Silverado Canyons, Aliso and Woods Canyon, and Chino Hills areas that include 1,232.5 acres of predicted suitable habitat for bobcat. These Preserves are located in areas important for regional conservation and provide connectivity to other protected lands. They provide a diverse land cover beneficial for mammal movement. Incidental observations of bobcat have been noted on the Hayashi Preserve, and photo monitoring on the O’Neill Oaks and Ferber Ranch Preserve has detected bobcat as well.
<u>Species Objective 12.2:</u> OCTA will implement a restoration project(s) designed to improve wildlife movement by mammals such as bobcat.	Restore. OCTA has approved for funding the West Loma restoration project, which includes fence realignment around a key wildlife corridor in the vicinity of the 241 toll road. With fencing improvements and the restoration of habitat along the wildlife corridor, the crossing becomes more attractive, reduces road kill, and improves connectivity for bobcat and other species.
<u>Species Objective 12.3:</u> OCTA will restore or enhance habitat through restoration projects that improve habitat connectivity and wildlife movement for bobcat.	Restore. OCTA has approved for funding four restoration projects in areas highly important for habitat connectivity and wildlife movement. These restoration projects include North Coal Canyon (located in the Coal Canyon Linkage mapped by CBI [CBI 2009]), Big Bend (essential connection between Aliso and Wood Canyons Wilderness Park to the Laguna Coast Wilderness Park), Aliso Creek (riparian corridor linking several open space Preserves), and the City Parcel (located in the Trabuco and San Juan Creeks Linkage mapped by CBI [CBI 2009]).
<u>Species Objective 12.4:</u> OCTA will establish policies and procedures to protect and maintain wildlife movement corridors.	Policy: The Plan includes the Wildlife Crossing Policy that requires OCTA to perform preconstruction surveys to evaluate if an existing structure contributes to important wildlife movement. If it is determined that an existing structure does function as an important wildlife crossing, the Construction Lead will implement appropriate design features to ensure that the wildlife crossing maintains or improves functionality after the freeway construction improvements are completed.
Species Goal 13: Provide conservation of mountain lion within the Plan Area and minimize and mitigate impacts associated with Covered Activities.	
<u>Species Objective 13.1:</u> OCTA will protect and manage natural habitat that includes a combination of land cover types important for wildlife movement of large mammals such as mountain lion.	Acquire. OCTA has acquired six Preserves in the Trabuco/Silverado Canyon and Chino Hills areas that include 1,013.3 acres of predicted suitable habitat for mountain lion. These Preserves are located in areas important for regional conservation and provide connectivity to other protected lands. They provide a diverse land cover beneficial for large mammal movement. Recent observations of mountain lion have been noted on the O’Neill Oaks and Ferber Ranch Preserves.
<u>Species Objective 13.2:</u> OCTA will implement a restoration project(s) designed to improve wildlife movement by large mammals such as mountain lion.	Restore. OCTA has approved funding for the West Loma restoration project, which includes fence realignment around a key wildlife corridor in the vicinity of the 241 toll road. With fencing improvements and the restoration of habitat along the wildlife corridor, the crossing becomes more attractive, reduces road kill, and improves connectivity.

Table ES-2. Biological Goals, Objectives, and Conservation Actions (cont.)

Biological Goal or Objective	Conservation Actions ¹
<p><u>Species Objective 13.3</u>: OCTA will restore or enhance habitat through restoration projects that improve habitat connectivity and provide benefits to wildlife movement for mountain lion.</p>	<p>Restore. OCTA has approved funding for the North Coal Canyon restoration project (located in the Coal Canyon Linkage mapped by CBI [CBI 2009]) that is a critical wildlife linkage across Highway 91. This linkage can provide movement opportunities for mountain lions to the Chino Hills State Park. Other restoration projects in the eastern portion of the County (Chino Hills State Park, Lower Silverado Canyon, West Loma, Aqua Chinon/Bee Flat Canyon) includes restoration of riparian or scrub habitat that can provide cover for mountain lion.</p>
<p><u>Species Objective 13.4</u>: OCTA will establish policies and procedures to avoid and minimize impacts to wildlife movement corridors.</p>	<p>Policy: The Plan includes a Wildlife Crossing Policy that requires OCTA to perform preconstruction surveys to evaluate if an existing structure contributes to important wildlife movement. If it is determined that an existing structure does function as an important wildlife crossing, the Construction Lead will implement appropriate design features to ensure that the wildlife crossing maintains or improves functionality after the freeway construction improvements are completed.</p>

¹ Conservation actions involving restoration projects include an estimate of conserved habitats based on conceptual restoration design plans. The final acreage of restored habitat may be refined during final restoration design and during implementation. Attainment of objectives dependent on restoration actions will be achieved once the restoration project meets the restoration design success criteria.

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1.1 Overview

The M2 Natural Community Conservation Plan/Habitat Conservation Plan (M2 NCCP/HCP or Plan) is intended to provide an effective framework to protect and enhance natural resources in Orange County, while improving and streamlining the environmental permitting process for impacts of Covered Activities on sensitive, threatened, and endangered species and their habitats. Once approved, the Plan will allow the Orange County Transportation Authority (OCTA) to streamline the permitting for take authorization of Covered Species obtained from the U.S. Fish and Wildlife Service (USFWS) and from the California Department of Fish and Wildlife (CDFW), collectively the “Wildlife Agencies.” Take authorization would be issued for a collection of activities and projects in Orange County that would otherwise require project-by-project review and permitting, which is generally costly and time-consuming for applicants and often results in uncoordinated and biologically ineffective mitigation. In addition, the Plan will provide comprehensive species, wetlands, and ecosystem conservation and provide for conservation and management of threatened and endangered species in southern California.

1.1.1 Background

On November 6, 1990, Orange County voters approved Measure M, a half cent local transportation sales tax for 20 years. Currently, all of the major projects promised to and approved by the voters in 1990 are under way or complete. Funds that go to cities and the County of Orange to maintain and improve local streets and roads, along with transit-fare reductions for seniors and persons with disabilities, were components of Measure M, which ended on March 31, 2011. While the promises made in Measure M have been fulfilled, continued investment is still needed as Orange County continues to grow.

According to OCTA’s Long-Range Transportation Plan (OCTA 2010), over the next 25 years Orange County’s population is projected to grow by 14%, and employment is expected to grow by more than 10%. Additionally, daily vehicle miles traveled (VMT) in the county is expected to increase by 30% by 2035, decreasing system-wide average speed by 34% over the same timeframe (OCTA 2010). It is anticipated that by 2035 about 50% of Orange County’s freeways and about 20% of Orange County’s roadways will operate under congested conditions during peak hours (OCTA 2010). Responding to this continued growth and broad support for investment in Orange County’s transportation system, OCTA considered the transportation projects and programs that would be possible if Measure M were renewed. OCTA, together with the 34 cities of Orange County, the Orange County Board of Supervisors, and thousands of Orange County citizens, participated in developing a Transportation Investment Plan for consideration by the voters.

In 2006, Orange County voters approved the renewal of Measure M (M2), a transportation sales tax designed to raise money to improve Orange County’s transportation system. As part of this program, a minimum of 5%, or roughly over \$285 million (based on 2016 projections), of the freeway program revenue will be set aside for the M2 Environmental Mitigation Program (EMP) to provide funding for programmatic mitigation of the environmental impacts of the M2 freeway improvement projects. The goals of the EMP are to engage in comprehensive, rather than piecemeal, mitigation to provide higher-value environmental benefits such as habitat protection, wildlife corridors, and

resource preservation, in exchange for a streamlined project review and permitting process for the freeway program as a whole.

In January 2010, the OCTA Environmental Oversight Committee (EOC) and Board of Directors approved the Master Agreement and Planning Agreement to establish the process, roles, responsibilities, and commitments for the preparation of the M2 NCCP/HCP. The goal of this effort is to provide an effective framework to protect and enhance natural resources in Orange County, while improving and streamlining the environmental permitting process for impacts of M2-related projects and activities on sensitive, threatened, and endangered species and their habitats.

1.1.2 Purpose

The purpose of the Plan is to offset project-related impacts on threatened and endangered species and their habitat in a manner that protects and enhances ecological diversity and function in Orange County, and enhances the integrity and connectivity of the existing protected lands in Orange County. To that end, the Plan describes how the conservation actions undertaken by OCTA to acquire Preserves, fund restoration projects, and implement avoidance and minimization measures will achieve a level of conservation that exceeds minimum required mitigation and provides for conservation of Covered Species and their habitats. The Plan also describes the responsibilities associated with operating and maintaining the Preserves acquired to offset the anticipated impacts, and covers potential impacts on Covered Species associated with Preserve management and monitoring. As a Natural Community Conservation Plan (NCCP), the Plan will provide for conservation and management of Covered Species in perpetuity and help preclude the need to list additional Covered Species in the future.

OCTA is requesting CDFW to issue a permit that authorizes take for all of the Covered Species under the Natural Community Conservation Planning Act (NCCPA). OCTA is also requesting USFWS to issue a permit under the federal Endangered Species Act (ESA) to authorize incidental take of federally listed wildlife species on the Covered Species list and other wildlife species that may become listed during the permit term, and to extend regulatory assurances for plant species covered under the Plan. The Plan includes a conservation strategy to compensate for impacts on Covered Species. The conservation strategy provides for the conservation and management of Covered Species and their habitats. It is anticipated that CDFW and USFWS will issue take permits to OCTA under the NCCPA and ESA, respectively. OCTA will then be able to use those permits for the M2 covered freeway improvement projects and Preserve management activities that are covered by the Plan. CDFW and USFWS will also provide regulatory assurances to OCTA that no further commitments of funds or land will be required to address impacts on Covered Species beyond what is described in the Plan (see Chapter 8, “Plan Implementation”) without the consent of OCTA.

The Plan is intended to serve as the basis for subsequent applications for regional regulatory permits. This plan includes Streambed Program Guidelines (Appendix E) that has been developed in collaboration with CDFW in order to simplify the Streambed Alteration Agreement (in accordance to Section 1602 of the California Fish and Game Code) process. OCTA intends to cooperate with the San Diego and Santa Ana Regional Water Quality Control Boards (RWQCBs), the State Water Resources Control Board (State Water Board), and the U.S. Army Corps of Engineers (USACE) to develop and operate streamlined regional permit programs for aquatic resources under the Porter-Cologne Water Quality Control Act (Porter Cologne), and Sections 401 and 404 of the federal Clean Water Act (CWA).

1.2 Scope of the M2 Natural Community Conservation Plan/Habitat Conservation Plan

1.2.1 Permit Duration

OCTA will be the sole Permittee seeking permits from CDFW and USFWS with terms of 40 years from the date of NCCP/HCP permit issuance. Accordingly, all assessments in the Plan are based on a 40-year time period. Prior to permit expiration, OCTA may apply to renew or amend the Plan and its associated permits and authorizations. Forty years was chosen as the permit duration because it is a reasonable timeframe in which to forecast transportation improvement projects. Furthermore, the M2 sales tax revenue collection ends in 2041, and an approximate 10-year period beyond that date enables closeout of the M2 program. The 40-year term will also be sufficient to implement the conservation strategy, including establishing the Preserves and management endowments and completing the restoration projects.

1.2.2 Geographic Scope

1.2.2.1 Plan Area

OCTA and EOC began the planning process by defining a broad area—the *Plan Area*—in which all planning would occur for the Plan. The Plan Area includes the entirety of Orange County, totaling 511,476 acres (Figures 1-1 and 1-2). The Plan Area is located south of Los Angeles County, north of San Diego County, and west of Riverside County. The western county line is the Pacific Ocean. The Plan Area was defined as the area in which impacts would be evaluated and conservation would occur.

1.2.2.2 Permit Area

The Permit Area is the area in which OCTA is requesting authorization from CDFW and USFWS for projects and activities that may result in take of Covered Species (Figure 1-2). The Permit Area includes those lands in the Plan Area that are defined by one or both of the following parameters.

- The lands along existing freeways (Interstate [I-] 5, I-405, I-605, State Route [SR-] 22, SR-55, SR-57, SR-91) in which M2 freeway improvement projects will be constructed (see Chapter 3, “Covered Activities”)
- The boundary of any land acquired in fee title or conservation easement and managed under the Plan (i.e., Preserves)

1.2.3 Covered Species

As required by the NCCPA, the Plan will protect native biological diversity, habitat for native species, natural communities, and local ecosystems. This broad scope will conserve a wide range of natural resources, including native species that are common or rare. However, the permits issued by the Wildlife Agencies will address a defined set of Covered Species that are currently listed as threatened or endangered or that may become listed during the permit term, that may be impacted by Covered Activities, and that will benefit from Plan-related conservation and management that contribute to species recovery (see Section 1.3.1.2, “Natural Community Conservation Planning Act” for the full list of requirements for Covered Species under the NCCPA).



Legend

 Plan Area



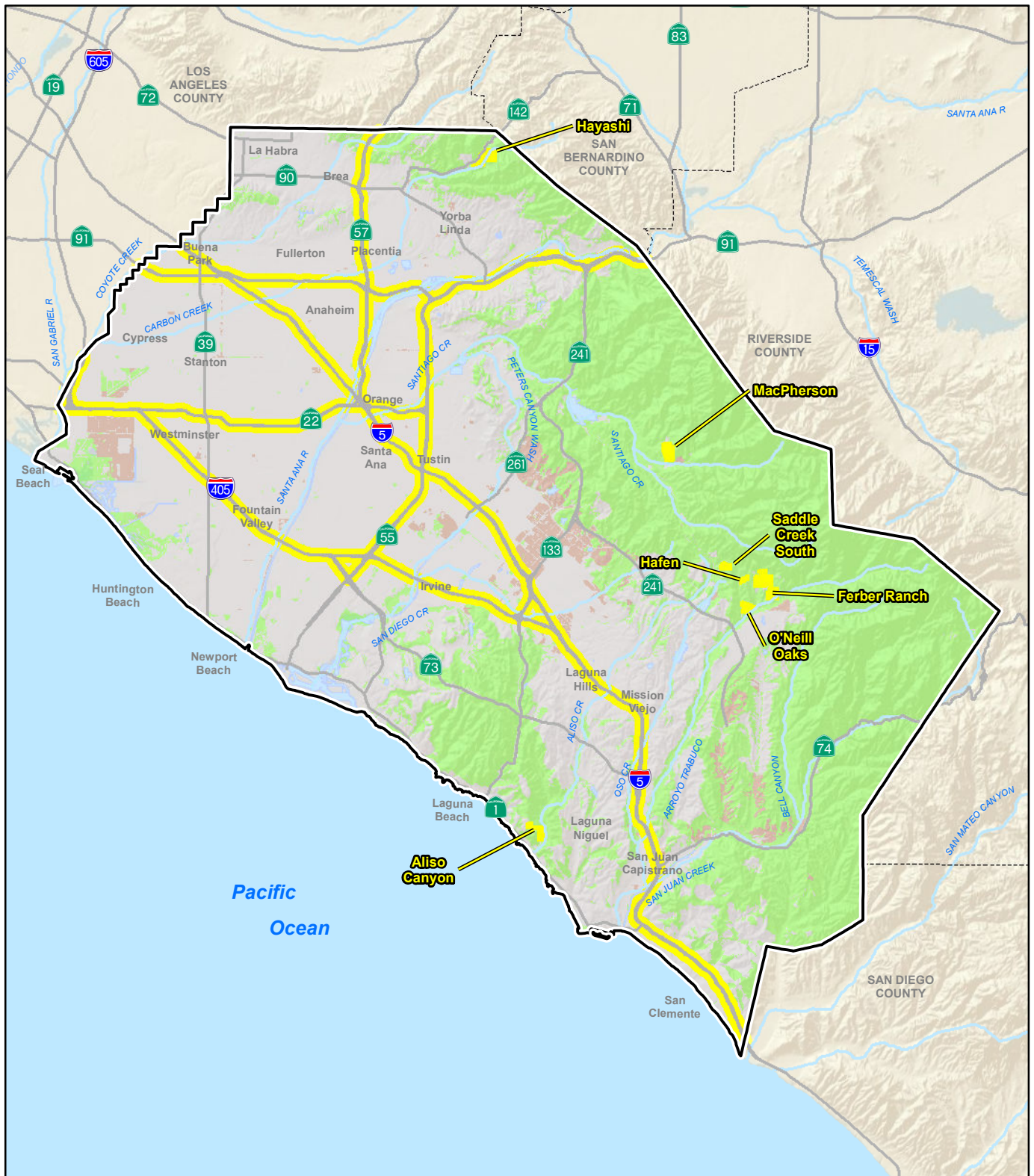
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Regional Location

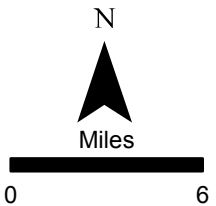
Figure 1-1



Legend

- Plan Area
- Permit Area
- Natural Habitats
- Agriculture
- Developed

Vegetation Source: TAIC/ICF 2013



Plan and Permit Area

Figure 1-2

This Plan addresses 13 listed and non-listed species (Table 1-1): 10 wildlife species and 3 plant species. These species were identified on the basis of an initial assessment of the potential occurrence of listed and non-listed but sensitive species and their habitat in the Plan Area, and the potential effect of proposed Covered Activities and conservation measures on listed species or species that could become listed during the term of the Plan. A total of 38 special-status species with the potential to occur in the Plan Area were evaluated for coverage in the Plan and screened according to specific criteria. From this list, 13 species were selected for coverage. See Appendix C.4 for a detailed description of the Covered Species selection criteria and methods, and evaluation results.

Table 1-1. Covered Species

Common Name	Scientific Name	Special-Status ¹
Plants		
Intermediate mariposa lily	<i>Calochortus weedii</i> var. <i>intermedius</i>	CNPS:1B.2
Many-stemmed dudleya	<i>Dudleya multicaulis</i>	CNPS:1B.2
Southern tarplant	<i>Centromadia parryi</i> ssp. <i>australis</i>	CNPS:1B.1
Fish		
Arroyo chub	<i>Gila orcutti</i>	CDFW:SSC
Reptiles		
Coast horned lizard	<i>Phrynosoma blainvillii</i>	CDFW:SSC
Orangethroat whiptail	<i>Aspidoscelis hyperythra</i>	CDFW:WL
Western pond turtle	<i>Emys marmorata</i>	CDFW:SSC
Birds		
Cactus wren	<i>Campylorhynchus brunneicapillus</i>	USFWS:BCC; CDFW:SSC
Coastal California gnatcatcher	<i>Polioptila californica californica</i>	FT; CDFW:SSC
Least Bell's vireo	<i>Vireo bellii pusillus</i>	FE; SE
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	FE; SE
Mammals		
Bobcat	<i>Lynx rufus</i>	--
Mountain lion ²	<i>Puma concolor</i>	CDFW:SPM

¹ CNPS: Taxa with a California Rare Plant Rank of 1B are considered rare, threatened, or endangered in California and elsewhere, and the majority are endemic to California. A Threat Rank of 0.1 indicates that it is seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat). Threat Rank 0.2 indicates that it is moderately threatened in California (20–80% of occurrences threatened/moderate degree and immediacy of threat).

ABBREVIATIONS: CNPS = California Native Plant Society; CDFW = California Department of Fish and Wildlife; SSC = California Species of Special Concern; WL = California Watch List; SPM = California Specially Protected Mammal; USFWS = U.S. Fish & Wildlife Service; BCC = Birds of Conservation Concern; FT = Federally Threatened; FE = Federally Endangered; SE = State Endangered.

² Mountain lion, designated as a CDFW Specially Protected Mammal Species, is included on the list of Covered Species for the federal HCP permit but not under the state NCCP permit.

The Plan includes conservation measures to protect all 13 Covered Species, whether or not they are currently listed. Accordingly, any non-listed Covered Species would not require additional conservation measures in the Plan Area should that species be listed in the future.

1.2.4 Covered Activities

The primary goal of the Plan is to obtain authorization for take of Covered Species¹ under the NCCPA and ESA for the implementation of Covered Activities. Covered Activities include all habitat or ground-disturbing impacts resulting from the M2 transportation planning and project implementation process. These include the following freeway improvement projects within 13 freeway segments, as defined by OCTA:

- Project A: Interstate 5 (I-5) Improvements between State Route 55 (SR-55) and “Orange Crush” Area (State Route 57 [SR-57])
- Project B: I-5 Improvements from SR-55 to El Toro “Y” Area
- Project C: North and South Portions of I-5 Improvements between the El Toro Interchange and Avenida Pico
- Project D: I-5 Local Interchange Improvements
- Project E: State Route 22 (SR-22) Access Improvements
- Project F: SR-55 Improvements between Interstate 405 (I-405) and SR-22
- Project G: State Route-57 (SR-57) between Orangewood Avenue and Lambert Road Northbound—General Purpose Lane Improvements
- Project H: State Route 91 (SR-91) from SR-57 to I-5 Westbound—General Purpose Lane Improvements
- Project I: SR-91 Improvements from SR-57 to SR-55 Interchange
- Project J: SR-91 Improvements from SR-55 to the Orange/Riverside County Line
- Project K: I-405 Widening Project from SR-55 to Interstate 605 (I-605)
- Project L: I-405 Improvements between SR-55 and I-5
- Project M: I-605 Freeway Access Improvements

Covered Activities also include the potential for a small amount of take of Covered Species to occur in the Preserves as a result of ongoing habitat management, restoration, and monitoring activities by Preserve Managers. These routine activities will also be covered by the Plan, as will improvements to, and where appropriate, creation of, new trails. For details on the Covered Activities, see Chapter 3, “Covered Activities.”

During development of the Plan, several project types and activities were considered but rejected for coverage. Take coverage for these activities would require direct and separate consultation with CDFW and USFWS. These projects and activities include, but are not limited to, the following.

- Flood protection projects
- Flood protection facility operation and maintenance

¹ “Take” under the federal ESA does not apply to listed plant species; therefore take of listed plant species is not prohibited under the ESA, and a federal incidental take permit is not required for plant species covered by the Plan. USFWS recommends that permit applicants include conservation measures for listed plants in habitat conservation plans and typically extends regulatory assurances for covered plant species in recognition of such plan conservation measures. Any reference to “take” of covered plant species in the Plan and EIR/EIS means, with regard to the federal incidental take permit, impacts on covered plant species.

- Utility construction and maintenance, including cell phone towers
- Road operation and maintenance (excluding approved roads and trails for land management and recreation within Preserves)
- Emergency activities beyond those described in Chapter 3, “Covered Activities”

1.2.5 Relationship to Other Protected Areas

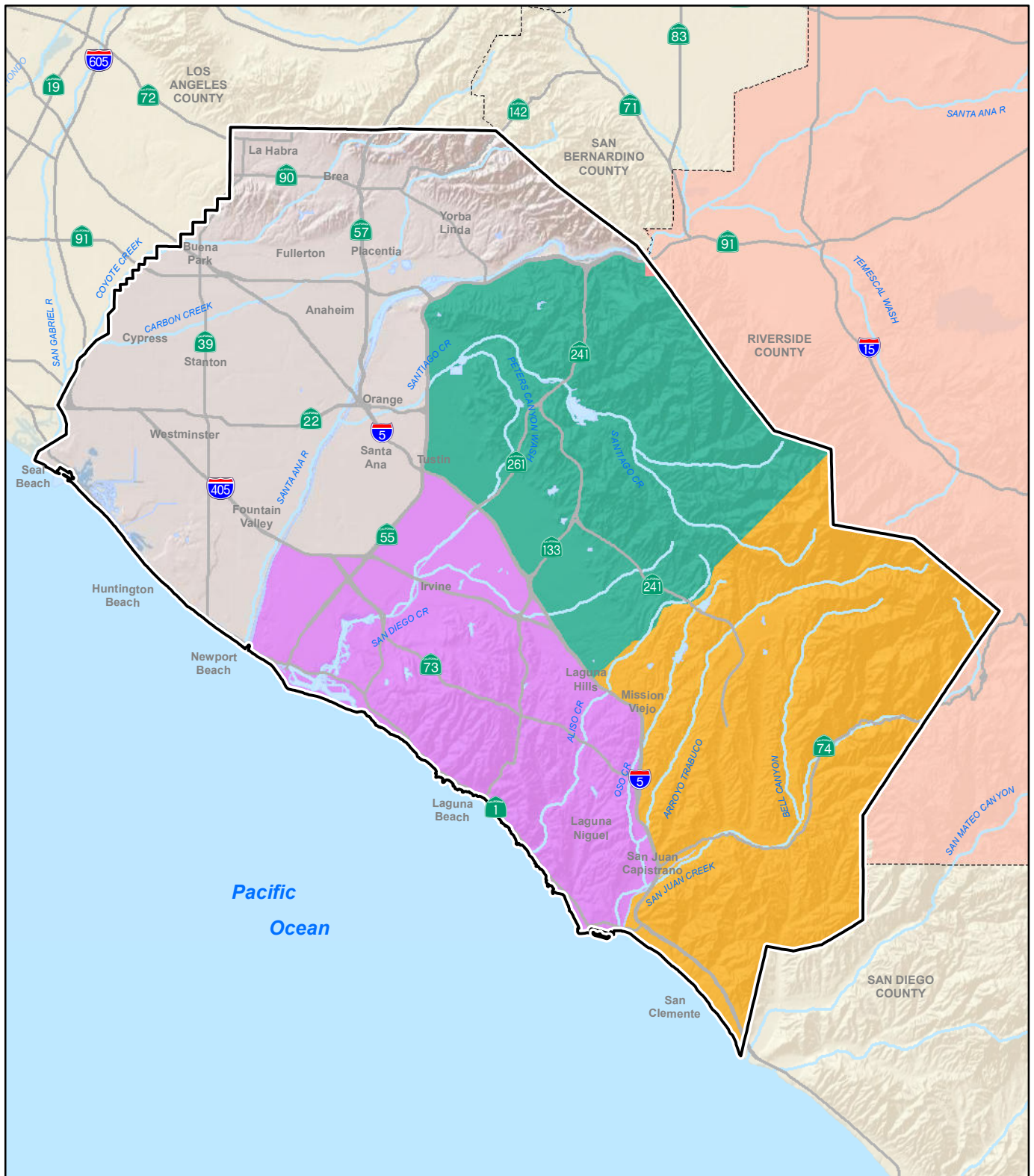
More than 70% of the natural habitat in Orange County is in some form of habitat protection or is zoned for open space and/or conservation by various jurisdictions. Two subregional plans (Orange County Central-Coastal NCCP/HCP and Orange County Southern Subregion HCP) have been approved by USFWS in the Plan Area, establishing a habitat reserve network and perpetual land management program. In addition, the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) borders the Plan Area to the east (Figure 1-3). Finally, other protected or semi-protected areas are found in the Plan Area in the form of public lands (local, state, and federal) and privately held conservation areas. The Plan will expand and complement the existing reserve network by focusing on prioritized Preserve acquisitions to conserve unprotected areas in core habitat areas and linkages, and funding of restoration projects that will contribute to the enhancement of habitat for Covered Species on lands currently protected and managed to maintain biological values.

1.2.5.1 County of Orange Central-Coastal Natural Community Conservation Plan/Habitat Conservation Plan






The County of Orange Central and Coastal NCCP/HCP (Central-Coastal NCCP/HCP) has a 75-year permit issued on July 10, 1996. The geographic area of the Central-Coastal NCCP/HCP encompasses 208,000 acres; it provides coverage for 39 species, including 6 federally listed species. The plan has a reserve system totaling 37,378 acres that consists primarily of coastal sage scrub. Other important vegetation communities found in the reserve include oak woodland, native grassland, chaparral, Tecate cypress, and riparian communities. The reserve system is broken up into two approximately equal sections. The Coastal Reserve extends from Newport Bay through Laguna Beach and north to Irvine. The Central Reserve is located in the foothills of Orange County and extends north of Irvine to the Santa Ana River. A 501(c)(3) nonprofit corporation, the Natural Communities Coalition (NCC) was formed to coordinate the management of the Central-Coastal NCCP/HCP and to ensure the persistence of the reserve’s natural communities.

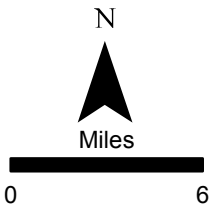
1.2.5.2 Orange County Southern Subregion Habitat Conservation Plan

The Orange County Southern Subregion HCP has a 75-year permit issued January 10, 2007. The geographic area of the Orange County Southern Subregion HCP encompasses 132,000 acres; it provides coverage for 32 species, including 7 federally listed species. The plan creates a preservation area in the southern portion of the county totaling 32,818 acres. The preserve area includes large swaths of adjoining property owned by family-held Rancho Mission Viejo (16,536 acres) and the County of Orange (11,950 acres). The preserve system includes sensitive vegetation communities, including coastal sage scrub, grasslands, and oak woodlands, as well as important watersheds, including major portions of San Juan Creek and San Mateo Creek watersheds. The non-profit Rancho Mission Viejo Land Conservancy was formed to ensure the long-term management and monitoring of biological resources in the preservation area through implementation of a Habitat Reserve Management Program (HRMP).



Legend

-  Plan Area
-  Orange County Central-Coastal NCCP/HCP-Central Subregion
-  Orange County Central-Coastal NCCP/HCP-Coastal Subregion
-  Orange County Southern Subregion HCP
-  Western Riverside MSHCP



Regional Conservation Planning Efforts

Figure 1-3

1.2.5.3 Western Riverside County Multiple Species Habitat Conservation Plan

Located adjacent to Orange County and the Plan Area, the Western Riverside County MSHCP is a large, complex regional NCCP/HCP that has a 75-year permit issued in 2004. The planning area covers 1.26 million acres of the western portion of Riverside County. It includes all unincorporated Riverside County land west of the crest of the San Jacinto Mountains to the Orange County line, as well as 14 jurisdictional areas (Riverside County TLMA 2011). The plan conserves roughly 500,000 acres of habitat and 146 species, including 26 federally listed species. The preserve system includes sensitive vegetation communities, including riparian, riverine, and vernal pool ecosystems and coastal sage scrub habitat.

1.2.5.4 Other Open Space Areas

A variety of local, state, federal, and private open space land exists in the Plan Area, including United States Department of Agriculture Forest Service land and county and city parks (see Chapter 2, “Physical Setting, Land Use, and Biological Resources,” for locations and descriptions of larger open space areas in the county). As previously stated, roughly 75% (approximately 156,000 acres) of Orange County’s natural habitat is currently in, or targeted for, some form of public or private habitat protection or otherwise designated open space. A protected area database (PAD) was developed by the Conservation Biology Institute (CBI) as part of the preparation of the Conservation Assessment of Orange County (CBI 2009) to create a regional database mapping of the distribution of existing protected lands. This database has been updated during the preparation of this Plan to incorporate current information of protected lands.

1.3 Regulatory Setting

The Plan is designed primarily to comply with the NCCPA and ESA. The Plan is also consistent with other state and federal wildlife and related laws and regulations, each of which is referenced below and described in greater detail in subsections 1.3.2–1.3.6.

- California Fish and Game Code Sections 3511, 4700, 5050, and 5515 (Fully Protected Species)
- California Fish and Game Code Section 3503 (Bird Nests)
- California Fish and Game Code Section 3503.5 (Birds of Prey)
- Migratory Bird Treaty Act (MBTA)
- Bald Eagle and Golden Eagle Protection Act (Eagle Act)
- California Environmental Quality Act of 1970 (CEQA)
- National Environmental Policy Act of 1969 (NEPA)
- CWA Sections 401, 402, and 404
- Porter-Cologne Water Quality Control Act
- Fish and Game Code Sections 1601–1607 (Lake or Streambed Alteration Agreement)
- National Historic Preservation Act

1.3.1 State and Federal Endangered Species Laws

1.3.1.1 California Endangered Species Act

The California Endangered Species Act (CESA) prohibits take of wildlife and plants listed as threatened or endangered by the California Fish and Game Commission. *Take* is defined under the California Fish and Game Code as any action or attempt to “hunt, pursue, catch, capture, or kill.” Therefore, take under CESA does not include “the taking of habitat alone or the impacts of the taking.”² Rather, the courts have affirmed that under CESA, “taking involves mortality.”

CESA allows exceptions to the take prohibition for take that occurs during otherwise lawful activities. The requirements of an application for incidental take under CESA are described in Section 2081 of the California Fish and Game Code. Incidental take of state-listed species may be authorized if an applicant submits an approved plan that minimizes and “fully mitigates” the impacts of this take.

1.3.1.2 Natural Community Conservation Planning Act

In 1991, California’s NCCPA (California Fish and Game Code, Section 2800 et seq.) was enacted to implement broad-based planning that balances appropriate development and growth with conservation of wildlife and habitat. Pursuant to the NCCPA, local, state, and federal agencies are encouraged to prepare NCCPs to provide comprehensive management and conservation of multiple species and their habitats under a single plan, rather than through preparation of numerous individual plans on a project-by-project basis. The NCCPA is broader in its orientation and objectives than are the CESA and ESA. Additionally, preparation of an NCCP is a voluntary action. The primary objective of the NCCP program is to conserve natural communities at the ecosystem scale while accommodating compatible land use. To be approved by CDFW, an NCCP must provide for the conservation of species and protection and management of their habitat and natural communities in the Plan Area in-perpetuity. *Conservation* is defined by the NCCPA and the California Fish and Game Code as actions that result in the delisting of State-listed species. Thus, NCCPs must contribute to the recovery of listed species or prevent the listing of non-listed species rather than just mitigate the effects of Covered Activities. This recovery standard is one of the major differences between an NCCP and an HCP prepared to satisfy the ESA or CESA.

An approved NCCP provides for take of species whose conservation and management are provided for in the Plan (California Fish and Game Code Section 2835). The 1991 NCCPA was repealed and replaced with a substantially revised and expanded NCCPA in 2002. The revised NCCPA established new standards and guidance on many facets of the program, including scientific information, public participation, biological goals, interim project review, and approval criteria. The new NCCPA took effect on January 1, 2003. To approve an NCCP under the current NCCPA, CDFW must make a series of findings. These findings are provided in Table 1-2 with the accompanying sections of the Fish and Game Code where each finding is supported.

- The plan must be consistent with the Implementing Agreement (Appendix B).
- The plan must provide for the conservation and management of the Covered Species.
- The plan must protect habitat, natural communities, and species diversity on the landscape level (descriptions of these and other NCCP terms are provided in Chapter 2, “Physical Setting, Land Use, and Biological Resources,” and Appendix C, “Biological Resources Background Information”).

² *Environmental Council of Sacramento v. City of Sacramento*, 142 Cal. App. 4th 1018 (2006).

- The plan must conserve the ecological integrity of large habitat blocks, ecosystem function, and biodiversity.
- The Plan Area must have protected and maintained habitat areas that are large enough to support sustainable populations of Covered Species.
- The plan must provide a range of environmental gradients and habitat diversity to support shifting species distributions.
- The plan must sustain movement of species among reserves.
- Mitigation and conservation must be roughly proportional to impacts in timing and extent.
- Funding for conservation, monitoring, and adaptive management must be adequately ensured.

This Plan is intended to comply with the NCCPA to conserve the ecosystems of Orange County and consequently to provide authorization to take Covered Species in accordance with Section 2835 of the California Fish and Game Code.

Table 1-2. Checklist for NCCP Act Requirements

Requirement (Fish and Game Code Section)	Applicable NCCP/HCP Plan Sections ¹
The plan was developed in accordance with the process identified in the planning agreement per Section 2810. (2820(a)(1))	Chapter 1, "Introduction"
The plan integrates adaptive management strategies that are periodically evaluated and modified based on information from monitoring programs and other sources; these strategies assist conservation of covered species and ecosystems within the plan area. (2820(a)(2))	Chapter 7, "Management and Monitoring"
The plan protects habitat, natural communities, and species diversity on a landscape or ecosystem basis through the creation and long-term management of habitat reserves or other measures that provide equivalent conservation of covered species appropriate for land, aquatic, and marine habitats within the plan area. (2820(a)(3))	Chapter 1, "Introduction," Section 1.1.2, "Purpose" Chapter 5, "Conservation Strategy" and Chapter 6, "Conservation Analysis"
The plan conserves, restores, and manages representative natural and semi-natural landscapes to maintain the ecological integrity of large habitat blocks, ecosystem function, and biological diversity. (2820(a)(4)(A))	Chapter 5, "Conservation Strategy" and Chapter 6, "Conservation Analysis"
The plan establishes one or more reserves or proposes other measures that provide equivalent conservation of covered species within the plan area and linkages between them and adjacent habitat areas outside of the plan area. (2820(a)(4)(B))	Chapter 5, "Conservation Strategy" and Chapter 6, "Conservation Analysis"
The plan area must have protected and maintained habitat areas that are large enough to support sustainable populations of covered species. (2820(a)(4)(C))	Chapter 5, "Conservation Strategy" and Chapter 6, "Conservation Analysis"
The plan incorporates a range of environmental gradients (such as slope, elevation, aspect, and coastal or inland characteristics) and high habitat diversity; this provides for shifting distributions of species due to changed circumstances. (2820(a)(4)(D))	Chapter 5, "Conservation Strategy" and Chapter 6, "Conservation Analysis"
The plan sustains the effective movement and interchange of organisms between habitat areas to maintain ecological integrity of habitat within the plan area. (2820(a)(4)(E))	Chapter 5, "Conservation Strategy" and Chapter 6, "Conservation Analysis"

Requirement (Fish and Game Code Section)	Applicable NCCP/HCP Plan Sections ¹
The plan identifies allowable activities and restrictions within reserve areas compatible with conservation of species, habitats, natural communities, and associated ecological functions. (2820(a)(5))	Chapter 3, "Covered Activities," Section 3.2.3, "Covered Activities in the Natural Community Conservation Plan/Habitat Conservation Plan Preserves"
The plan contains specific conservation measures that meet the biological needs of covered species and that are based on the best available scientific information about the status of covered species and the impacts of permitted activities on those species. (2820(a)(6))	Chapter 2, "Physical Setting, Land Use, and Biological Resources," Chapter 5, "Conservation Strategy"
The plan contains a monitoring program. (2820(a)(7))	Chapter 7, "Management and Monitoring," Section 7.2.7, "Adaptive Management and Monitoring of the Preserves"
The plan contains an adaptive management program. (2820(a)(8))	Chapter 7, "Management and Monitoring," Section 7.2.7, "Adaptive Management and Monitoring of the Preserves"
The plan includes an estimated timeframe and process for implementing reserves or other conservation measures, including obligations of landowners and plan signatories and consequences for failure to acquire lands in a timely manner. (2820(a)(9))	Chapter 5, "Conservation Strategy"
The plan ensures adequate funding to carry out the conservation measures identified in the plan. (2820(a)(10))	Chapter 8, "Plan Implementation," Section 8.3, "Plan Funding"
The plan defines species coverage, including any conditions of coverage. (2820(b)(1))	Chapter 6, "Conservation Analysis"
The plan establishes long-term protection of habitat reserves or provides equivalent conservation of covered species. (2820(b)(2))	Chapter 7, "Management and Monitoring"
The plan defines specific terms and conditions, which, if violated, would result in the suspension or revocation of the permit, in whole or in part. CDFW will include a provision requiring notification to the plan participant of a specified period of time to cure any default prior to suspension or revocation of the permit in whole or in part. These terms and conditions will address, but are not limited to, provisions specifying the actions CDFW will take under all of the following circumstances (2820(b)(3)):	Chapter 8, "Plan Implementation"
<ul style="list-style-type: none"> • The plan participant fails to provide adequate funding. (2820(b)(3)(A)) • The plan participant fails to maintain the rough proportionality between impacts on habitat or covered species and conservation measures. (2820(b)(3)(B)) • The plan participant adopts, amends, or approves any plan or project without the concurrence of the Wildlife Agencies that is inconsistent with the objectives and requirements of the approved plan. (2820(b)(3)(C)) • The level of take exceeds that authorized by the permit. (2820(b)(3)(D)) 	
The plan specifies procedures for amendment of the plan and the implementation agreement. (2820(b)(4))	Chapter 8, "Plan Implementation"

Requirement (Fish and Game Code Section)	Applicable NCCP/HCP Plan Sections ¹
The plan ensures implementation of a monitoring program and adaptive management program. (2820(b)(5))	Chapter 7, “Management and Monitoring,” Chapter 8, “Plan Implementation”
The plan provides for oversight of plan implementation to assess mitigation performance, funding, and habitat protection measures. (2820(b)(6))	Chapter 7, “Management and Monitoring,” Chapter 8, “Plan Implementation”
The plan provides for periodic reporting to the Wildlife Agencies and the public for purposes of information and evaluation of plan progress. (2820(b)(7))	Chapter 8, “Plan Implementation”
The plan provides mechanisms to ensure adequate funding to carry out the conservation actions identified in the plan. (2820(b)(8))	Chapter 8, “Plan Implementation,” Section 8.3, “Plan Funding”
The plan ensures that mitigation and conservation measures are roughly proportional in time and extent to the impact on habitat or covered species authorized under the plan. These provisions identify the conservation measures including assembly of reserves where appropriate and implementation of monitoring and management activities that the landowner will maintain or carry out in rough proportion to the impact on habitat or covered species and the measurements that will be used to determine if this occurs. (2820(b)(9))	Chapter 5, “Conservation Strategy”
The plan stipulates that if a participant does not maintain proportionality between take and conservation measures specified in the implementation agreement and does not either (a) cure the default within 45 days or (b) enter into an agreement with CDFW within 45 days to expeditiously cure the default, CDFW will suspend or revoke the permit, in whole or in part. (2820(c))	Chapter 8, “Plan Implementation”
The plan requires that data and reports associated with monitoring programs be available for public review; the landowner must also conduct public workshops on an annual basis to provide information and evaluate progress toward attaining the conservation objectives of the plan. (2820(d))	Chapter 7, “Management and Monitoring,” Chapter 8, “Plan Implementation”

¹Only the primary applicable sections of the Plan are listed. Other sections may apply or be cross-referenced by the sections listed in this table.

1.3.1.3 Federal Endangered Species Act

USFWS and the National Marine Fisheries Service (NMFS) administer the ESA. The ESA requires USFWS and NMFS to maintain lists of threatened and endangered species and affords substantial protection to listed species. NMFS’s jurisdiction under the ESA is limited to the protection of marine mammals (with a number of exceptions, including polar bears, manatees, and sea otters), marine fishes, and anadromous fishes³; all other species are subject to USFWS jurisdiction.

USFWS and NMFS can list species as either *endangered* or *threatened*. An endangered species is at risk of extinction throughout all or a significant portion of its range (ESA Section 3[6]). A threatened species is likely to become endangered in the foreseeable future (ESA Section 3[19]). Section 9 of the ESA prohibits the take of any fish or wildlife species listed under the ESA as endangered and most

³ *Anadromous fishes* are fish that spend part of their life cycle in the ocean and part in fresh water. NMFS has jurisdiction over anadromous fish that spend the majority of their life cycle in the ocean.

species listed as threatened.⁴ *Take*, as defined by the ESA, means “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” *Harm* is defined as “any act that kills or injures the species, including significant habitat modification.” Section 9 prohibits the “removal or reduction to possession” of any listed plant species “under federal jurisdiction” (i.e., on federal land). Even though take under the ESA does not apply to plants and there is no prohibition of take of plants, the Plan covers three plants. These plants are covered in order to meet regulatory obligations under Section 7 of the ESA and to comply with the CESA. Plants are also included as Covered Species to provide *no-surprises* assurances for these species.

The ESA includes mechanisms that provide exceptions to the Section 9 take prohibitions. These are addressed in the ESA under Section 7 (federal actions) and Section 10 (non-federal actions).

Section 7

Section 7 of the ESA requires all federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of federally designated critical habitat. To ensure that its actions do not result in jeopardy to listed species or in the adverse modification of critical habitat,⁵ each federal agency must consult with USFWS or NMFS—or both—regarding discretionary federal agency actions that may affect listed species. Consultation begins when the federal agency submits a written request for initiation to USFWS or NMFS, along with the agency’s biological assessment (BA) of its proposed action (if necessary), and USFWS or NMFS accepts that sufficient information has been provided to initiate consultation. If USFWS or NMFS concludes that the action is not likely to adversely affect a listed species, the action may be conducted without further review under the ESA. Otherwise, USFWS or NMFS must prepare a written biological opinion (BO) describing how the agency’s action will affect the listed species and its critical habitat. The issuance of a Section 10 permit for this Plan is a federal action that triggers a Section 7 consultation. USFWS will consult internally to address this requirement.

If the BO concludes that the proposed action would jeopardize the continued existence of a listed species or adversely modify its critical habitat, the opinion must include “reasonable and prudent alternatives” that would avoid that result. If the BO concludes that the project as proposed would involve the take of a listed wildlife species, but not to an extent that would jeopardize the species’ continued existence, the BO must include an incidental take statement. *Incidental take* is take that is “incidental to, and not intended as part of, an otherwise lawful activity” (Code of Federal Regulations [CFR], Title 64, Section 60728). The incidental take statement specifies an amount of take that may occur as a result of the action and may include reasonable and prudent measures to minimize the impact of the take. If the action complies with the BO and incidental take statement, it may be implemented without violation of the ESA, even if incidental take occurs.

Section 10

Until 1982, state, local, and private entities had no means to acquire incidental take authorization as federal agencies could under Section 7. Private landowners and local and state agencies risked being in direct violation of the ESA no matter how carefully their projects were implemented. This

⁴ The protection of threatened species under Section 9 is discretionary through a rule issued under Section 4(d) of the ESA. Until a “4(d) rule” is issued by NMFS, threatened anadromous fish or marine species are not protected by the ESA. By regulation, USFWS automatically affords Section 9 protection to threatened species at the time of listing. These protections later can be modified by USFWS through a 4(d) rule.

⁵ *Critical habitat* is generally defined under the ESA and its implementing regulations as specific geographic areas, whether occupied by listed species or not, that are determined to be essential for the conservation and management of listed species, and that have been formally described in the *Federal Register*.

statutory dilemma led Congress to amend Section 10 of the ESA in 1982 to authorize the issuance of an incidental take permit to non-federal project proponents upon completion of an approved conservation plan. The term *conservation plan* has evolved into *habitat conservation plan* (HCP).

In cases where federal land, funding, or authorization is not required for an action by a non-federal entity, the take of listed species must be permitted by USFWS and/or NMFS through the Section 10 process. Private landowners, corporations, state agencies, local agencies, and other non-federal entities must obtain a Section 10(a)(1)(B) incidental take permit for take of federally listed wildlife species “that is incidental to, but not the purpose of, otherwise lawful activities.”

There is no take prohibition for listed plants; however, certain actions are prohibited with regard to plants under the ESA. Under Section 9(a)(2)(B) of the ESA, endangered plants are protected from “removal, reduction to possession, and malicious damage or destruction” in areas that are under federal jurisdiction. Section 9(a)(2)(B) of the ESA also provides protection to plants from removal, cutting, digging up, damage, or destruction where the action takes place in violation of any state law or regulation or in violation of a state criminal trespass law. Similar protections have been extended to federally listed threatened plant species by regulation at 50 CFR 17.71. Thus, the ESA does not prohibit the take of federally listed plants but does prohibit certain actions on private or other non-federal lands in violation of state law. Therefore, Section 10 incidental take permits are necessary only for take of wildlife species. The Section 7(a)(2) prohibition against jeopardy, however, applies to plants, and USFWS may not issue a Section 10(a)(1)(B) incidental take permit if the issuance of that permit would result in jeopardy to a listed plant species.

To receive a Section 10(a)(1)(B) incidental take permit, the permit applicant is required to provide the following.

- A complete description of the activity sought to be authorized.
- The common and scientific names of the species sought to be covered by the permit, as well as the number, age, and sex of such species, if known.
- An HCP.

The HCP must specify the following mandatory elements.

- The impact that will likely result from the taking of covered species.
- The steps the applicant will take to monitor, minimize, and mitigate such impacts; the funding that will be available to implement such steps; and the procedures to be used to deal with unforeseen circumstances.⁶
- The alternative actions to taking of covered species the applicant considered and the reasons why such alternatives are not proposed to be utilized.
- Such other measures that the Director [of the Department of Interior or Commerce] may require as being necessary or appropriate for purposes of the plan (50 CFR 17.22[b]).

The M2 NCCP/HCP is intended to satisfy these requirements.

To receive an incidental take permit, Section 10(a)(2)(B) of the ESA requires that the following criteria be met.

- The taking will be incidental to otherwise lawful activities.

⁶ *Unforeseen circumstances* are defined at 50 CFR 17.3 as changes in circumstances affecting a covered species or geographic area covered by the HCP that could not reasonably have been anticipated by the plan developers, and that result in a substantial and adverse change in the status of a covered species.

- The applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking.
- The applicant will ensure adequate funding for the HCP and procedures to deal with unforeseen circumstances.
- The taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild.
- The applicant will ensure that other measures that the Services (USFWS and NMFS) may require as being necessary or appropriate will be provided.
- The Services have received such other assurances as may be required that the HCP will be implemented.

Prior to the approval of an HCP, USFWS and/or NMFS are required to undertake an *internal* Section 7 consultation because issuance of an incidental take permit is a federal action (see the discussion of ESA Section 7, above.). Elements specific to the Section 7 process (e.g., analysis of impacts on designated critical habitat, analysis of impacts on listed plant species, and analysis of indirect and cumulative impacts on listed species) are included in the Plan to meet the requirements of Section 7.

1.3.2 Other State and Federal Wildlife Laws and Regulations

1.3.2.1 California Fully Protected Species

In the 1960s, before the CESA was enacted, the California Legislature identified species for specific protection under the California Fish and Game Code. These fully protected species may not be taken or possessed at any time, and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock. Fully protected species are described in Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) of the California Fish and Game Code. These protections state that “...no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected [bird], [mammal], [reptile or amphibian], [fish].” On October 8, 2011, Senate Bill (SB) 618 was signed into law. The bill revises the definition of “covered species” under the NCCPA to include fully protected species. As a result of SB 618, the “taking” of fully protected species can now be authorized in cases where the take is incidental and the fully protected species is being conserved and managed under an NCCP approved by CDFW. No fully protected species are covered by the Plan. Fully protected species expected to occur in the Plan Area include, but are not restricted to, those listed below.

- Light-footed Ridgway’s rail (*Rallus obsoletus levipes*)
- White-tailed kite (*Elanus leucurus*)
- Golden eagle (*Aquila chrysaetos*)
- Bald eagle (*Haliaeetus leucocephalus*)
- California least tern (*Sternula antillarum*)
- Brown pelican (*Pelecanus occidentalis*)

1.3.2.2 California Fish and Game Code 3503 (Bird Nests)

Section 3503 of the Fish and Game Code makes it “unlawful to take, possess or needlessly destroy the nests or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto.” Therefore, CDFW may issue permits authorizing take pursuant to the CESA or

NCCPA. The Plan contains conservation measures to avoid such take to the maximum extent practicable in order to comply with Section 3503. However, some take of covered birds still may occur; the NCCP permit will serve as the authorization for take of nests or eggs of covered birds pursuant to Section 3503.

1.3.2.3 California Fish and Game Code 3503.5 (Birds of Prey)

Section 3503.5 of the Fish and Game Code prohibits the take, possession, or destruction of any birds of prey or their nests or eggs “except as otherwise provided by this code or any regulation adopted pursuant thereto.” CDFW may issue permits authorizing take pursuant to the CESA or NCCPA. There are no birds of prey covered by the Plan. However, the Plan contains conservation measures to avoid such take in order to comply with Section 3503.5.

1.3.2.4 Migratory Bird Treaty Act

The MBTA of 1918, as amended, implements various treaties and conventions between the U.S. and Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Under the MBTA, taking, killing, or possessing migratory birds is unlawful as is taking of any parts, nests, or eggs of such birds (U.S. Government Code [USC], Title 16, Section 703). The definition of *taking* is different under the MBTA than under the ESA and includes only the death or injury of individuals of a migratory bird species or its eggs. *Take* under the MBTA does not include the concepts of harm and harassment as defined by the ESA. The MBTA defines migratory birds broadly; all covered birds in this NCCP/HCP are considered migratory birds under the MBTA.

USFWS provides guidance regarding the incidental take of ESA-listed migratory birds (Appendix 5 in the HCP Handbook). According to these guidelines, an incidental take permit can function as a Special Purpose Permit under the MBTA (50 CFR 21.27) for the take of all ESA-listed covered species in the amount and/or number and subject to the terms and conditions specified in an HCP. Any such take will not be in violation of the MBTA of 1918, as amended (16 USC 703-12). The following Covered Species are protected by the MBTA.

- Cactus wren (*Campylorhynchus brunneicapillus*)
- Coastal California gnatcatcher (*Poliophtila californica californica*)
- Least Bell’s vireo (*Vireo bellii pusillus*)
- Southwestern willow flycatcher (*Empidonax traillii extimus*)

Of these four species, the coastal California gnatcatcher, least Bell’s vireo, and southwestern willow flycatcher are listed under the ESA. Accordingly, once issued, the incidental take permit will automatically function as a Special Purpose Permit under the MBTA, as specified under 50 CFR 21.27, for these species for a 3-year term subject to renewal by OCTA. The cactus wren is not listed under the ESA, and, therefore, no MBTA coverage can be provided for this species through the Plan. Should the cactus wren become listed under the ESA during the permit term, the ESA permit would also constitute an MBTA Special Purpose Permit for this species for a 3-year term as specified under 50 CFR 21.27, subject to renewal by OCTA.

Non-listed Covered Species as well as other migratory birds not covered by the permit would benefit from seasonal restrictions on construction and other conservation measures described in the Plan. The acquisition of the Preserves and funding of restoration projects also will be a significant “benefit to the migratory bird resources” as required by the Special Purpose Permit. However, until a covered bird is listed under the ESA, it will be the responsibility of OCTA or the California Department of Transportation (Caltrans) to comply fully with the MBTA.

1.3.2.5 Bald Eagle and Golden Eagle Protection Act

The Eagle Act prohibits the taking or possession of and commerce in bald and golden eagles, with limited exceptions. Under the Eagle Act, it is a violation to “...take, possess, sell, purchase, barter, offer to sell, transport, export or import, at any time or in any manner, any bald eagle commonly known as the American eagle, or golden eagle, alive or dead, or any part, nest, or egg, thereof...” Here, *take* is defined as to include pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, and disturb. *Disturb* is further defined in 50 CFR 22.3 as follows:

to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.

Recent revisions to regulations implementing the Eagle Act authorize take of bald eagles and golden eagles under the following conditions: (1) where the take is compatible with the preservation of the bald eagle and golden eagle, (2) is necessary to protect an interest in a particular locality, (3) is associated with but not the purpose of an otherwise lawful activity, (4) for individual instances of take where the take cannot be avoided or (5) for programmatic take where the take is unavoidable even though advanced conservation practices are being implemented (50 CFR 22.26). Permits issued under this regulation usually authorize disturbance only; however, in limited cases a permit may authorize lethal take that results from but is not the purpose of an otherwise lawful activity.

Neither the bald nor the golden eagle is a Covered Species under the Plan. The Plan does not seek a permit under the Eagle Act because disturbance, injury or death of eagles or eggs, or disturbance of nests is not anticipated in association with Covered Activities or overall Plan implementation.

1.3.3 California Environmental Quality Act

CEQA requires that significant environmental impacts of proposed projects be reduced to less-than-significant levels through adoption of feasible avoidance, minimization, or mitigation measures unless overriding considerations are identified and documented. CEQA applies to certain activities in California undertaken by either a public agency or a private entity that must receive some discretionary approval from a California government agency. In issuing the NCCP permit, CDFW must comply with CEQA. Similarly, the action of the Permittees in adopting the Plan is subject to CEQA compliance. OCTA is serving as the lead agency under CEQA. To comply with CEQA, OCTA released a draft joint environmental impact report/environmental impact statement (EIR/EIS) on November 7, 2014. The public comment period on the EIR/EIS closed on February 6, 2015. The final EIR/EIS will accompany the final NCCP/HCP.

The final EIR/EIS prepared for this NCCP/HCP is intended to provide programmatic CEQA compliance for all Covered Activities covered by the Plan regarding impacts on Covered Species and jurisdictional wetlands and waters (see Section 1.3.5 below for a definition and discussion of *jurisdictional wetlands and waters* as they relate to the Plan). As an individual Covered Project is implemented in the future that will receive take coverage under the NCCP/HCP, that project must comply with CEQA at a project-level detail. It is expected that the conservation provided by the Plan will be sufficient to meet all CEQA mitigation standards for impacts on the Covered Species and natural communities that are addressed by the Plan. The Plan implements a conservation strategy designed to achieve a comprehensive set of biological goals and objectives. Furthermore, as an NCCP, the Plan provides for broad-based planning to preserve natural communities at the ecosystem scale.

1.3.4 National Environmental Policy Act

NEPA requires federal agencies to include in their decision-making process appropriate and careful consideration of the environmental effects of a proposed action and of possible alternatives. Documentation of the significant environmental effects of a proposed federal action and reasonable alternatives to the action must be made available for public notice and review. This analysis is documented in an environmental impact statement (EIS). NEPA's requirements are more procedural than substantive in that NEPA requires disclosure of environmental effects and mitigation possibilities, but includes no actual mandate to require mitigation.

The issuance by USFWS of an incidental take permit under section 10 of the ESA constitutes a federal action. Therefore, USFWS must comply with NEPA. To satisfy NEPA requirements, USFWS released a draft EIS on November 7, 2014, for a 90-day comment period that closed on February 6, 2015. The final EIS will accompany the final NCCP/HCP.

1.3.5 Federal and State Wetland Laws and Regulations

The CWA is the primary federal law that protects the physical, chemical, and biological integrity of the nation's waters, including lakes, rivers, wetlands, and coastal waters. Programs conducted under the CWA are directed at both point-source pollution (e.g., waste discharged from outfalls and filling of waters) and nonpoint-source pollution (e.g., runoff from roads, freeways, and bridges). Under Sections 401, 402, and 404 of the CWA, the U.S. Environmental Protection Agency (EPA), federal agencies, and state agencies set effluent limitations and issue permits. These permits are the primary regulatory tools of the CWA. The EPA oversees all CWA permits.

1.3.5.1 Clean Water Act Section 404

Pursuant to Section 404 of the CWA, the USACE regulates the discharge (temporary or permanent) of dredged or fill material into waters of the United States (WoUS), including wetlands. A discharge of fill material includes activities such as grading, placing riprap for erosion control, pouring concrete, laying sod, and stockpiling excavated material into WoUS. Activities that generally do not involve a regulated discharge (if performed specifically in a manner to avoid discharges) include driving pilings, performing certain drainage channel maintenance activities, constructing temporary mining and farm/forest roads, and excavating without stockpiling.

USACE issues two types of permits under Section 404: general permits (either nationwide permits [NWP] or regional permits) and standard permits (either letters of permission or individual permits). General permits are issued by USACE to streamline the Section 404 process for nationwide, statewide, or regional activities that have minimal direct or cumulative environmental impacts on the aquatic environment. Standard permits are issued for activities that do not qualify for a general permit (i.e., that may have more than a minimal adverse environmental impact). The Los Angeles District of the USACE will review and consider issuing permits for projects in the NCCP/HCP Plan Area that propose to fill WoUS. This process has begun independent of the Plan and includes obtaining a standard individual permit to provide the permitting framework for obtaining letters of permission at the project level and to approve the mitigation in advance.

The Plan will not provide permits under Section 404 of the CWA for impacts on wetlands or other waters from Covered Activities. However, the 404 permitting process is expected to be streamlined substantially as a result of the Plan. Issuance of a Section 404 permit often requires the USACE to consult with USFWS to comply with Section 7 of the ESA. This consultation would address the federally listed species covered by the Plan. Accordingly, provided that Covered Activities requiring Section 404 permits are consistent with the Plan, it is expected that USFWS will not require any mitigation beyond that already required by the Plan. The Section 7 BO issued for the Plan also can

serve as the basis for any future BOs in the Study Area for Covered Activities. In addition, the conservation actions for impacts on wetlands in the Plan may fully satisfy USACE requirements for wetland mitigation.

1.3.5.2 Clean Water Act Section 401 and the Porter-Cologne Water Quality Control Act

Under CWA Section 401, states have the authority to certify federal permits for discharges to waters under state jurisdiction. States may review proposed federal permits (e.g., CWA Section 404 permits) for compliance with state water quality standards. A permit cannot be issued if the state denies certification. In California, the State Water Board and the RWQCBs are responsible for the issuance of CWA Section 401 certifications. Orange County is overlapped by both the San Diego and Santa Ana RWQCBs. Therefore, the State Water Board likely will review any CWA Section 404 permit applications for projects in the NCCP/HCP Plan Area.

Porter-Cologne is the primary state law concerning water quality. It authorizes the State Water Board and RWQCBs to prepare management plans such as Regional Water Quality Plans (or Basin Plans) to address the quality of groundwater and surface water. Porter-Cologne also authorizes the RWQCBs to issue Waste Discharge Requirements (WDRs) defining limitations on allowable discharge to waters of the state. In addition to issuing CWA Section 401 certifications on CWA Section 404 applications to fill waters, the RWQCBs may issue WDRs for such activities. Because the authority for WDRs is derived from Porter-Cologne and not the CWA, WDRs may apply to a somewhat different range of aquatic resources than do CWA Section 404 permits and CWA Section 401 Water Quality Certifications. Applicants that obtain a permit from the USACE under Section 404 also must obtain certification of that permit from the RWQCB.

The Plan does not include certifications under Section 401 or WDRs under Porter-Cologne. A Section 401 Water Quality Certification is being obtained separately for the Covered Activities. However, project proponents implementing Covered Activities that comply with the terms of the Plan should find their permit process streamlined with the RWQCB or State Water Board because the Plan provides a comprehensive means to address the needs of threatened and endangered species in the Study Area.

1.3.5.3 Clean Water Act Section 402, National Pollutant Discharge Elimination System

CWA Section 402 controls direct discharges into navigable waters. Direct discharges or “point-source” discharges are from sources such as pipes and sewers. National Pollutant Discharge Elimination System (NPDES) permits are issued by the state with oversight by EPA. A facility that intends to discharge into the nation's waters must obtain a permit before initiating a discharge. A permit applicant must provide quantitative analytical data identifying the types of pollutants present in the facility's effluent. The 402 permit then will set forth the conditions and effluent limitations under which a facility may make a discharge. The Plan does not include certifications under Section 402 or NPDES permits under the CWA. These authorizations, if required, must be obtained separately.

1.3.5.4 Lake or Streambed Alteration Agreement

CDFW has jurisdictional authority over streams and lakes and wetland resources associated with these aquatic systems under California Fish and Game Code Section 1600 et seq., which was repealed and replaced in October 2003 with the new Section 1600–1616 that took effect on January 1, 2004 (Senate Bill 418 Sher). CDFW has the authority to regulate work that will “substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed,

channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.”

Activities of any person, state or local governmental agency, or public utility are regulated by CDFW under Section 1602 of the California Fish and Game Code. CDFW enters into a streambed or lakebed alteration agreement with the project proponent and can impose conditions on the agreement to ensure no net loss of values or acreage of the stream, lake, associated wetlands, and associated riparian habitat.

The lake or streambed alteration agreement is not a permit, but rather a mutual agreement between CDFW and the project proponent. Because CDFW includes under its jurisdiction streamside habitats that may not qualify as wetlands under the federal CWA definition, as well as a broader definition of the lateral jurisdiction, CDFW jurisdiction may be broader than USACE jurisdiction.

A project proponent must submit a notification of streambed alteration to CDFW before construction. The notification requires an application fee for streambed alteration agreements, with a specific fee schedule to be determined by CDFW. CDFW can enter into streambed alteration agreements that cover recurring operation and maintenance activities and can enter into long-term agreements to cover development and other activities described in regional plans. Many of the concerns raised by CDFW during streambed alteration agreement negotiations are related to special-status species. Activities covered by the Plan that need a streambed alteration agreement are expected to partially or fully meet the standards of the streambed alteration agreement through compliance with the Plan.

An appendix to the Plan (Appendix E, “Streambed Program Guidelines”) outlines the process for project-level Lake or Streambed Alteration Agreement (LSAA) notifications for the Covered Activities pursuant to California Fish and Game Code (sections 1600–1616). The Streambed Program will guide streambed permitting within the Plan Area through individual project review and the associated CEQA process. For unavoidable permanent impacts on streambeds and associated riparian habitat, compensatory mitigation will be provided at the mitigation sites identified in Appendix E to achieve no-net-loss standards. Additionally, for temporary impacts on streambed and associated riparian habitat, compensation will occur on site, when appropriate, to achieve no-net-loss standards. Restoration plans, as approved by the Wildlife Agencies and USACE (if warranted), will be implemented at the sites.

As appropriate, CDFW and USFWS will attempt to align the conservation measures for CDFW 1600 agreements, USFWS Section 7 consultations, and USACE permit requirements with the commitments in the Plan.

1.3.5.5 Definition of Jurisdictional Wetlands and Waters

The term *jurisdictional wetlands and waters* is used in the Plan to refer to state and federally regulated wetlands and other water bodies that cannot be filled or altered without permits from USACE under Section 404 of the CWA, the State Water Board or the RWQCBs under either Section 401 of the CWA or Porter-Cologne, or CDFW under Fish and Game Code Section 1602 as of the date the Plan takes effect.

Federal regulations define the waters that are subject to federal jurisdiction or WoUS (that is, waters that cannot be filled without permits from the USACE under Section 404 of the CWA) as follows:

- (1) all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- (2) all interstate waters including interstate wetlands;
- (3) all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie

potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters...; (4) all impoundments of waters otherwise defined as waters of the United States under the definition; (5) tributaries of waters identified in paragraphs (1)–(4) of this section; (6) the territorial seas; and (7) wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (1)–(6) of this section. (33 CFR 328.3)

The USACE publishes protocols for delineating WoUS and certifies the adequacy of such delineations. The USACE delineation protocols require that an area meet three criteria to be designated as a jurisdictional wetland:

1. Wetland hydrology (inundation or saturation)
2. Hydric soils
3. Hydrophytic vegetation

Streams and other drainages and water bodies such as lakes or ponds do not have to meet these three criteria to be considered a WoUS, but they do have to meet other criteria established by federal law and regulations.

The State Water Board and RWQCBs regulate impacts on waters covered by federal regulations as well as some additional waters. The State Water Board and RWQCBs also regulate the fill of wetland areas that meet the federal definition in CFR Section 328.3, above, but are outside of federal jurisdiction because they are isolated, intrastate, nonnavigable waters, as stated in the U.S. Supreme Court ruling in *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, 531 U.S. 159 (2001) (SWANCC), or because they do not meet the standard for regulation identified by the U.S. Supreme Court in *Rapanos et ux., et al. v. United States*, 547 U.S. 126 S. Ct. 2208 (2006) (Rapanos). A Preliminary Jurisdictional Determination (PJD) is being obtained from the USACE so non-federal waters subject to State Water Board and RWQCB jurisdiction only are not expected to occur within the Plan area.

The CDFW regulates impacts on lakes and within the banks of streams. Waters subject to CDFW regulation typically are delineated more broadly than the USACE-supervised delineation process. For example, federal jurisdiction extends to the ordinary high water mark, and CDFW jurisdiction will extend up to the top of the bank or out to the edge of the riparian zone (whichever is farther). Both delineation methods typically are presented in one technical document and will be presented as such for the Plan to support the permit process.

The Plan requires mitigation or payment of fees for the fill of any waters that are considered jurisdictional under either Sections 401 and 404 of the CWA (plus any isolated, nonnavigable intrastate waters no longer regulated by the USACE in light of SWANNC or Rapanos and currently regulated by the State Water Board or RWQCBs, which are not expected as a result of the PJD described above) or Section 1602 of the Fish and Game Code.

1.3.6 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470 et seq.), requires federal agencies to take into account the effects of their proposed actions on properties eligible for inclusion in the National Register of Historic Places. *Properties* is defined as cultural resources, which includes prehistoric and historic sites, buildings, and structures that are listed on or eligible for listing on the National Register of Historic Places. An *undertaking* is defined as a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency; those carried out with federal financial assistance; those requiring a federal permit, license, or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a federal

agency. The issuance of an incidental take permit is an undertaking subject to Section 106 of the NHPA. The USFWS has determined that the area of potential effects for the present undertaking is that area where on-the-ground project activities will result in take of species. The NHPA and the potential effects of the conservation strategy on resources subject to the NHPA are discussed in detail in the EIR/EIS.

1.4 Overview of the Natural Community Conservation Plan/Habitat Conservation Plan Planning Process

1.4.1 Organization of the Planning Process

The M2 NCCP/HCP has involved and will continue to involve many agencies and organizations in its preparation and implementation. Development of the Plan components was administered by the Transportation 2020 Committee (T2020 Committee) up to early 2011 as well as the Executive Committee from early 2011 to present activities, governed by a Board of Directors. The Board of Directors is advised by the T2020 Committee, Executive Committee, Regional Planning and Highways Committee, the EOC, the Science Advisors, and the consultant team. Each body is described below.

1.4.1.1 Board of Directors

An 18-member Board of Directors (Board) governs OCTA. The Board consists of five county supervisors, ten city members, two public members, and the Director of Caltrans as a nonvoting member. Board members vote on key policy and budget decisions of the T2020 Committee and Executive Committee. The Board of Directors is advised by the T2020 Committee, Executive Committee, the EOC, the consultant team, and the Science Advisors.

1.4.1.2 Transportation 2020 Committee/Executive Committee/Regional Planning and Highways Committee

The T2020 Committee is tasked with developing policy recommendations and monitoring the implementation of M2. The appointed committee is composed of seven officials and is responsible for administration of the M2 NCCP/HCP.

The Executive Committee is responsible for monitoring the overall activities at OCTA (including some of the M2 programs), developing new policy and strategy recommendations for the Board of Directors, and reviewing policy issues as deemed necessary by the Chair.

The Regional Planning and Highways Committee is responsible for reviewing the planning, programming, and delivery of regional planning and highway programs and makes recommendations to the Board of Directors. The committee also reviews and makes recommendations to the Board regarding OCTA's compliance with federal and state regional planning and programming requirements. Local agency eligibility and compliance with M2 safeguards and requirements also are reviewed by this committee.

1.4.1.3 Environmental Oversight Committee

The EOC was formed in October 2007, following approval by the Board of Directors. The EOC makes recommendations on the allocation of environmental freeway mitigation funds and monitors the

execution of the M2 NCCP/HCP between OCTA and state and federal resource agencies. Composed of 12 members, the EOC has been meeting on a monthly basis to advance implementation of key M2 projects, including the freeway mitigation program. The EOC has been responsible for the oversight and review of the 5-year M2 Early Action Plan (EAP) to evaluate, select, and fund Preserve acquisitions and restoration projects.

1.4.1.4 Science Advisors

Under its Five-Point Policy, USFWS “encourage[s] the use of scientific advisory committees during development and implementation of an HCP” (*Federal Register* [FR], volume 65, no. 106 35256, June 1, 2000). Independent scientific input is required by the NCCPA (Section 2810[b][5]). Accordingly, OCTA felt strongly that independent scientific input early in the planning process was critical to the success of the Plan. In early 2011, the Science Advisors were invited to provide independent scientific input to OCTA for development of the NCCP/HCP. The Science Advisors were chosen based on their knowledge of the county’s ecology, including their technical expertise as it relates to the species and habitats addressed in the Plan. Criteria for panel selection included:

- Expertise in the ecology or population biology of one or more key Covered Species in the Plan.
- Expertise in conservation biology and its application to preserve design.
- No affiliation with OCTA, the NCCP/HCP consultants, USFWS, or CDFW.

The Science Advisors met on April 1, 2011, to discuss key scientific issues and address questions posed by staff from OCTA, CBI, regulatory agencies, and the consultants. The Science Advisors provided independent scientific review of and input to the following elements of the NCCP/HCP development process:

- Process for selection of the proposed Covered Species.
- Species profiles describing the ecology, distribution in the Plan Area, status, and potential threats to each proposed Covered Species.
- Natural community profiles describing the composition, distribution in the Plan Area, status, and potential threats to the natural community.
- Predicted species distribution model and associated documented locations for each proposed Covered Species.
- Conservation goals for Covered Species and natural communities.
- Conservation strategy to achieve conservation goals.

A copy of the Science Advisors final report is included as Appendix I, “Science Advisors Report.”

1.4.1.5 Consultant Team

The Plan was prepared by a consultant team under the guidance and direction of the T2020 Committee/Executive Committee, OCTA staff, and the Board of Directors. The consultant team consisted of scientific, planning, legal, and other technical staff from ICF International (formerly Jones & Stokes) in San Diego and subconsultants Technology Associates International Corporation (TAIC), Onaka Planning & Economics, Consensus, Inc., Conservation Biology Institute (CBI), and Conservation Land Group. Ebbin Moser + Skaggs, LLP (EMS) provided legal review and input of the Plan and was responsible for development of the Implementing Agreement.

1.4.2 Local Agency and Wildlife Agency Technical Coordination

Representatives of the EOC Working Group, consultants, and the Wildlife Agencies held frequent meetings to address project coordination and technical issues during the preparation of the Plan. Members of the Wildlife Agencies provided review and guidance of a number of key elements of the Plan.

1.4.3 Public Outreach and Involvement

Public outreach and involvement has been addressed through the regular meetings of the EOC and through a public workshop in conjunction with the public review of the EIR/EIS. The following items were managed through the public forum of the EOC.

- Access to information by all interested and affected parties, groups, and agencies.
- Clear and understandable information about the NCCP/HCP and its potential impacts on the physical, biological, economic, and social environment.
- Meaningful opportunities for the public and agencies to actively engage interested parties in the development and evaluation of proposed conservation measures and strategies.
- Identification of key issues that must be addressed in the CEQA/NEPA review process.

OCTA has developed the Plan in compliance with USFWS's public involvement guidelines (USFWS 1996) and the requirements of the NCCPA. Public workshops were held on November 20 and December 3, 2014, to receive public input on the Plan and EIR/EIS.

1.5 Document Organization

The Plan and supporting information are presented in the chapters and appendices listed below.

Chapter 1, "Introduction," discusses the background, purpose, and objectives of the Plan; reviews the regulatory setting; and summarizes the NCCP/HCP process.

Chapter 2, "Physical Setting, Land Use, and Biological Resources," describes the existing geography, land use, and biological resource conditions of the Plan Area.

Chapter 3, "Covered Activities," describes the activities covered under the Plan and the associated take permits.

Chapter 4, "Impact Assessment and Level of Take," presents the impact analyses of the Covered Activities.

Chapter 5, "Conservation Strategy," summarizes the Plan Biological Goals and Objectives and describes the Conservation Strategy.

Chapter 6, "Conversation Analysis," analyzes whether the Conservation Strategy achieves the Plan goals.

Chapter 7, "Management and Monitoring," discusses the monitoring requirements and adaptive management procedures associated with implementing Preserve management.

Chapter 8, "Plan Implementation," details the roles and responsibilities of the entities responsible for Plan implementation, including descriptions of Plan funding, annual reporting requirements,

steps for amending the Plan, and requirements for addressing changed and unforeseen circumstances.

Chapter 9, "List of Preparers," identifies the individuals involved in the preparation of the Plan.

Chapter 10, "Literature Cited," provides a comprehensive bibliography of references cited in the text.

Appendix A, "Acronyms and Glossary," provides a list acronyms and glossary of key terms used in the Plan.

Appendix B, "Implementing Agreement," outlines the conditions, duties, and responsibilities of OCTA and Wildlife Agencies under this Plan.

Appendix C, "Biological Resources Background Information" contains the following sub-appendices:

Appendix C.1, "Natural Community Profiles," provides a more detailed description of natural communities within the Plan area.

Appendix C.2, "Covered Species Accounts," includes a description of the life history, habitat requirements and ecology, distribution and population trends, and threats for each Covered Species.

Appendix C.3, "Covered Species Models," provides a description of the specific steps and assumptions used to develop species distribution models.

Appendix C.4, "Covered Species Evaluation and Selection," describes the methods and results of the analyses used to develop the Covered Species list.

Appendix C.5, "CBI Conservation Assessment," includes a more detailed description of the landscape-level analyses completed by CBI to map biological core and linkage areas and prioritized conservation areas within the Plan area.

Appendix C.6, "Baseline Biological Survey Reports" includes the summary reports prepared by Bonterra for surveys completed in 2012 and Bonterra/Psomas for surveys in 2015.

Appendix C.7, "Additional Species Occurrence Maps" includes hard copy maps of species occurrences information from the Irvine Ranch Conservancy (IRC) and County of Orange for Aliso Creek that could not be shared in electronic format.

Appendix D, "Evaluation Criteria for Selection of Preserves and Restoration Projects," includes copies of the evaluation criteria forms used to evaluate proposals for property acquisitions and restoration projects.

Appendix E, "Streambed Program Guidelines," outlines the process for project-level LSAA notifications for the Covered Activities.

Appendix F, "Impact Tracking Template," provides a spreadsheet showing how OCTA will be responsible for tracking impacts during implementation.

Appendix G, "Caltrans Wildlife Crossing Guidance Manual," includes a copy of the manual, which identifies the appropriate monitoring and design measures to be implemented under the Wildlife Crossing Policy.

Appendix H, "Resource Management Plan Outline," includes an outline to be used in the preparation of Preserve Resource Management Plans.

Appendix I, "Science Advisors Report," includes a copy of the Independent Science Advisors Report completed for the OCTA M2 NCCP/HCP on July, 2011.

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Physical Setting, Land Use, and Biological Resources

2.1 Introduction

This chapter presents an overview of the physical setting, land use, and biological resources of the Plan Area. It describes the baseline physical and biological conditions upon which the impact analyses (Chapter 4, “Impact Assessment and Level of Take”), conservation strategy (Chapter 5, “Conservation Strategy”), and conservation analysis (Chapter 6, “Conservation Analysis”) are based. The chapter also describes how existing data were used and new data were collected to create the baseline inventory.

2.2 Physical Setting

This section describes the physical setting of the Plan Area, including physical geography, soils, hydrology, and climate.

2.2.1 Geography

The Plan Area (511,476 acres) includes the entirety of Orange County, located in southern coastal California. Orange County is bordered by Los Angeles County—the nation’s most populous county—to the north, San Bernardino and Riverside Counties to the northeast and east, San Diego County to the southeast, and the Pacific Ocean to the west.

Orange County falls in the South Coast Ecoregion of the California Floristic Province. The South Coast Ecoregion is considered a biodiversity “hotspot,” supporting more endemic and imperiled species than any other region in the U.S. (Stein et al. 2000), in large part because of its diversity of geologic substrates, topographic features, climatic regimes, soil types, and other physical factors. The South Coast Ecoregion is divided into two major biogeographic units, called ecological sections, by the U.S. Department of Agriculture (USDA) Forest Service (USFS) (Miles and Goudey 1997): the Southern California Coast section and the Southern California Mountains and Valleys section. These ecological sections are divided further into subsections. Three Coast and one Mountains and Valley subsections occur in the county: the Los Angeles Plain, the Coastal Hills, the Coastal Terraces, and the Santa Ana Mountains subsections, respectively (Figure 2-1).

- The Los Angeles Plain ecological subsection, or coastal plain of the Los Angeles basin, dominates the northwestern portion of Orange County. This subsection ranges from sea level along the coast to about 1,000 feet (above mean sea level [msl]) inland and is characterized by nearly level floodplains and terraces and gently sloping alluvial fans. Historically, this region supported salt marsh and dunes along the immediate coast; grassland, scrub, and chaparral on slopes; riparian habitat along drainages; and limited oak and walnut woodlands. Today this subsection is highly urbanized, with natural habitat existing largely as isolated remnants.
- The Coastal Hills subsection includes the foothills west of the Santa Ana Mountains, from the Santa Ana River southward, including the coastal foothills (e.g., San Joaquin Hills). Elevation in this subsection ranges from about 500 to 2,000 feet above msl. Vegetation includes coastal sage scrub, chaparral, oak woodland, riparian associations along drainages, and extensive grasslands in the southern portion of the county. More than 100 threatened or endangered species are associated with coastal sage scrub vegetation (Atwood 1993) and the coastal foothills—along

with the more limited coastal terraces—support a great diversity of endemic North American plant species (Stebbins and Major 1965, Stein et al. 2000). This region also is favored by humans and, as a consequence, is highly developed. The resultant removal and fragmentation of the region's natural communities threaten many species with extinction.

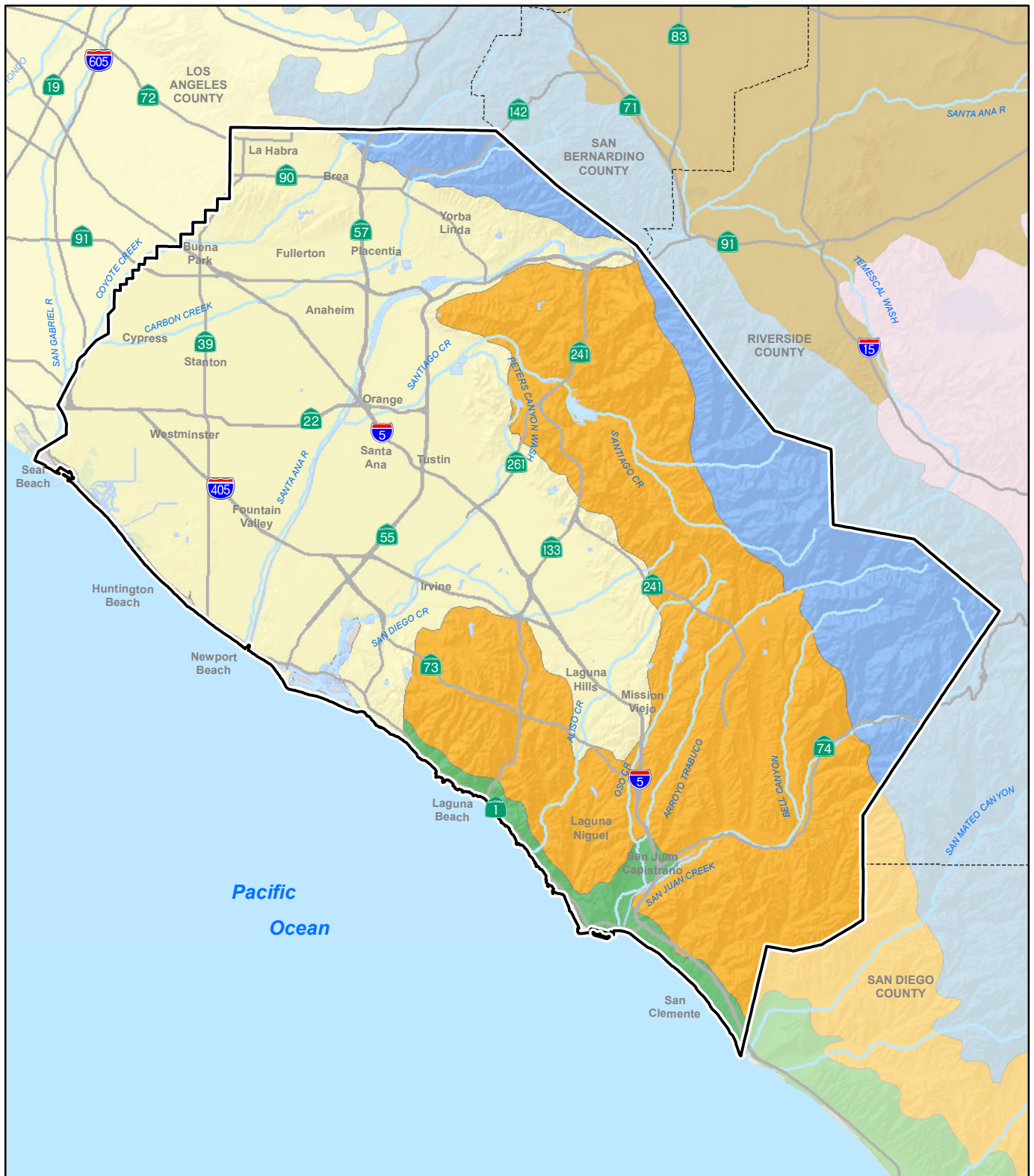
- The Coastal Terraces subsection is relatively limited in Orange County, occurring primarily along the coast of southern Orange County. This subsection is characterized by level to gently sloping marine terraces and may support beaches or dunes along the immediate coast. Elevation ranges from sea level to about 1,500 feet above msl. Vegetation includes dunes, salt marsh, grassland, coastal sage scrub, chaparral, and riparian associations. Similar to the Coastal Hills, the Coastal Terraces subsection has been severely impacted by development; remaining natural lands are limited and typically support sensitive biological resources.
- The Santa Ana Mountains subsection occupies the northern and eastern portions of the county; it includes the low-lying Puente and Chino Hills northwest of the Santa Ana River and most of the Santa Ana Mountains southeast of the river (Miles and Goudey 1997). The Chino Hills form the northern border of the county and are contiguous with the Puente Hills in Los Angeles County. The Santa Ana Mountains form the eastern boundary of the county, providing a natural barrier from urban development in Riverside County. Elevation in this subsection ranges from about 300 feet above msl near the Santa Ana River to 5,687 feet above msl on Santiago Peak. Key drainages are the Santa Ana River and Santiago, Aliso, Trabuco, and San Juan Creeks. Vegetation includes grasslands, scrub, chaparral, oak woodlands, and coniferous forests.

2.2.2 Soils

Soils in the Plan Area vary greatly. Soil differences arise from a variety of factors, including physical and mineral composition of soil parent material, relief or slope of the land, climate, biological activity, and length of time the forces of formation have acted on the soil material (USDA SCS 1978). Soil type and texture is often a factor in determining the distribution of Covered Species. Information on soil type and texture was used as part of the predicted suitable habitat models for many-stemmed dudleya and coast horned lizard (see Appendix C.3). As background information, a generalized map of the soils for the Plan Area is included as Figure 2-2, in which the current soil survey for Orange County (USDA NRCS 2008) is aggregated into nine soil associations.

2.2.3 Hydrology

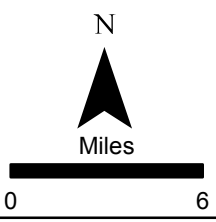
Based on the USGS Watershed Boundary Dataset (WBD), there are six watersheds (hydrologic unit code [HUC] 8) in Orange County and 11 subwatersheds (HUC 10) (Figure 2-3). The watershed boundaries are used in this Plan to evaluate the distribution of conservation actions across the Plan Area. Each of the watersheds has experienced different degrees of development, as summarized below in Table 2-1.



Legend

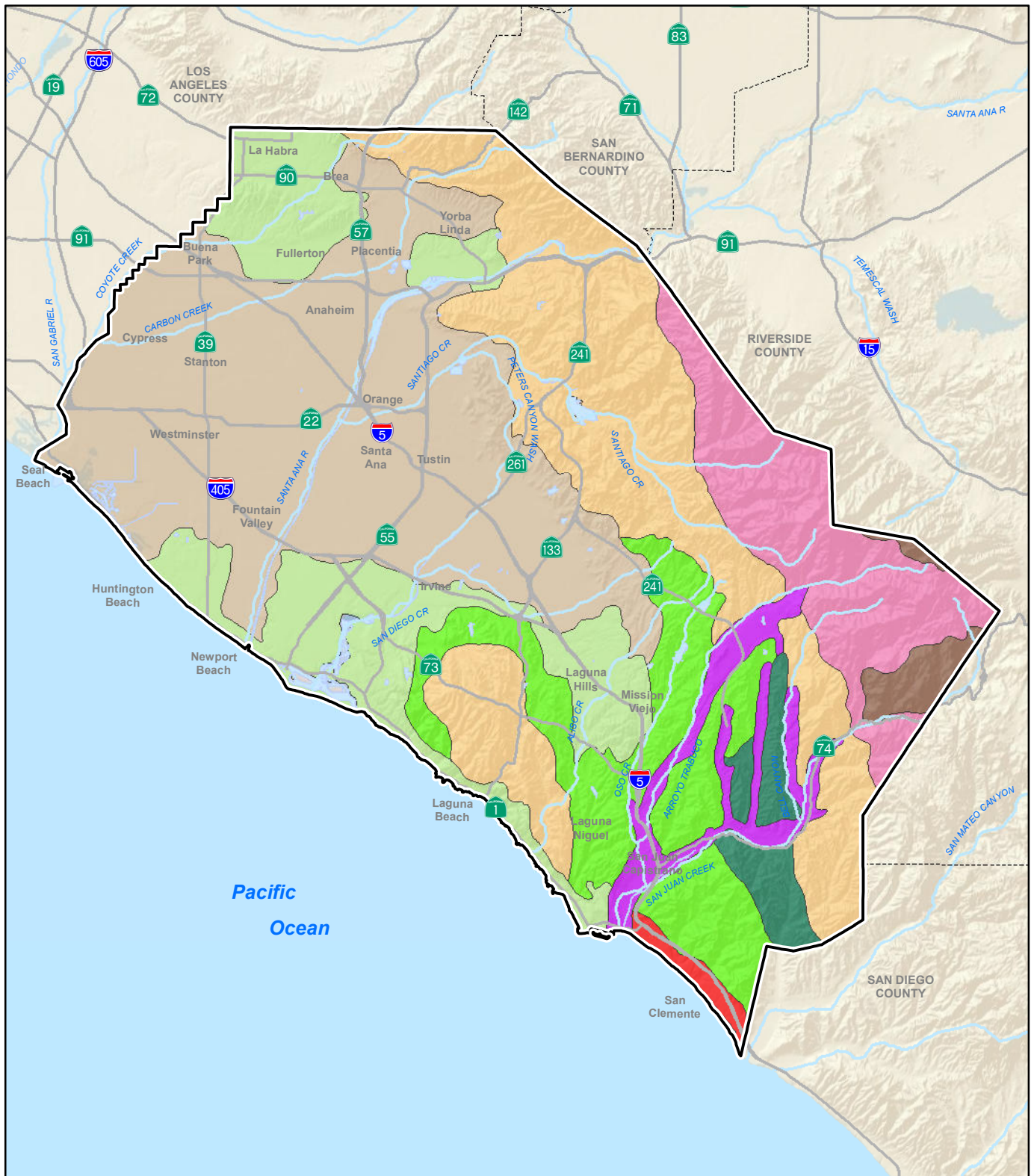
- Plan Area
- Coastal Hills
- Coastal Terraces
- Fontana Plain-Calimesa Terraces
- Los Angeles Plain
- Perris Valley and Hills
- Santa Ana Mountains

Source: USDA Forest Service 2007



USDA Forest Service Ecological Subsections

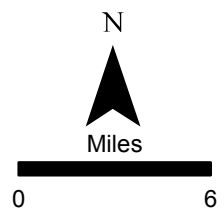
Figure 2-1



Legend

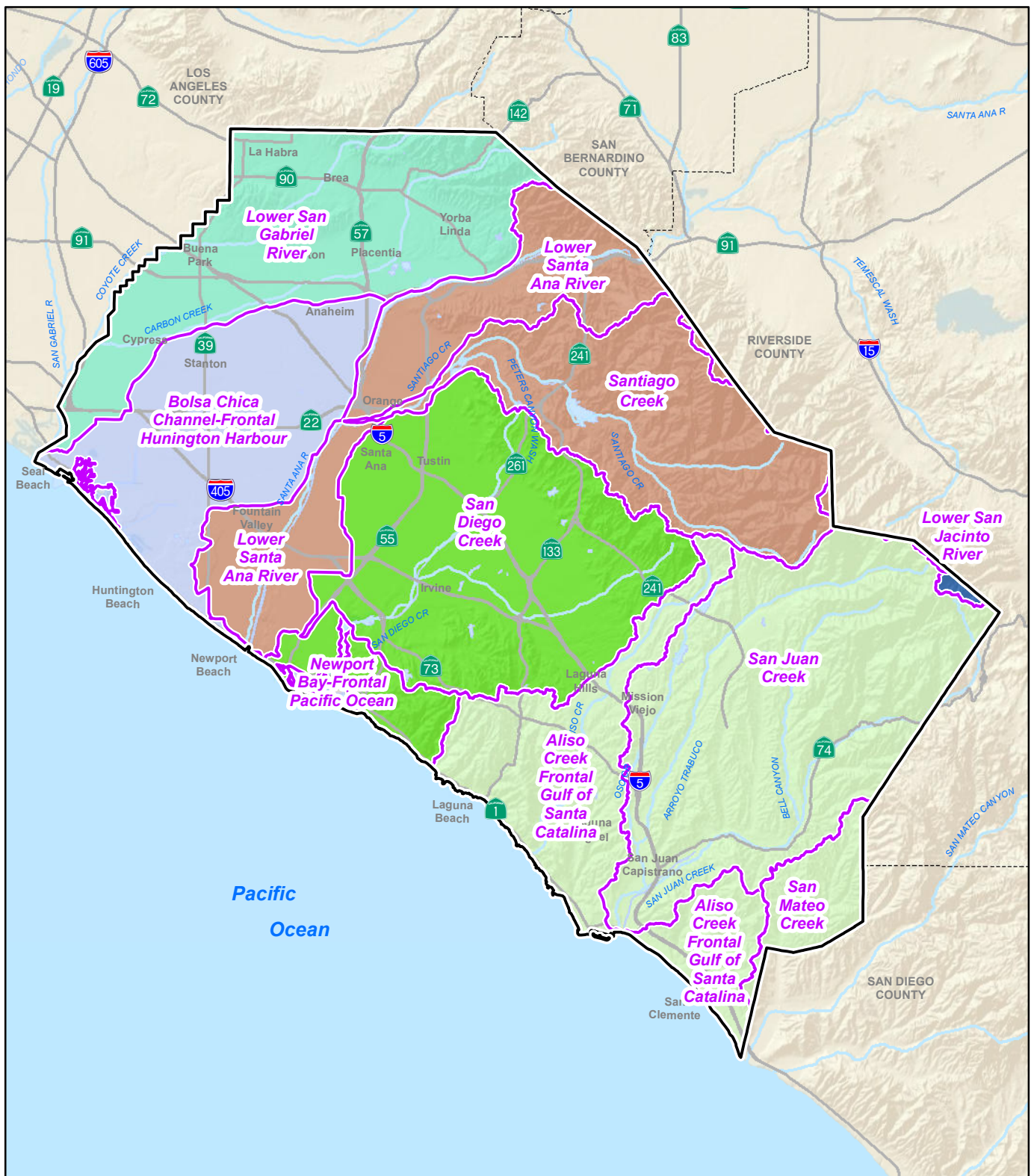
- Plan Area
- Alo-Bosanko-Calleguas
- Anaheim-Soper-Fontana
- Cienega-Rock Outcrop-Sesame
- Elder-Tujunga-Salinas
- Friant-San Miguel-Exchequer
- Las Flores-Antioch-Gaviota
- Marina-Chesterton-Urban Land
- Urban Land-Hanford-Sorrento
- Urban Land-Ramona-Zamora

Source: NRCS 2008



Soil Associations

Figure 2-2



Legend

- | | | | |
|--|------------------|--|--------------------|
| | Plan Area | | San Jacinto |
| | Aliso-San Onofre | | Santa Ana |
| | Newport Bay | | Seal Beach |
| | San Gabriel | | Watershed Subbasin |

N

 Miles

 0 6

Source: Watershed Boundary Delineation (WBD) Project 2008 (USGS, USACE, NRCS, BLM).



Watersheds

Figure 2-3

Table 2-1. Watersheds and Subwatersheds of the Plan Area

Watershed (HUC8)	Subwatershed (HUC10)	Percent of Watershed Developed
San Gabriel		84%
	Lower San Gabriel River	84%
San Jacinto		0%
	Lower San Jacinto River	0%
Aliso-San Onofre		37%
	Aliso Creek-Frontal Gulf of Santa Catalina	60%
	San Juan Creek	29%
	San Mateo Creek	5%
Santa Ana		42%
	Lower Santa Ana River	79%
	Santiago Creek	9%
	Temescal Wash	0%
Seal Beach		94%
	Bolsa Chica Channel- Huntington Harbour	94%
Newport Bay		77%
	Newport Bay-Frontal Pacific Ocean	77%
	San Diego Creek	77%

2.2.4 Climate

Southern California is known for its generally mild weather and Mediterranean climate, typically characterized by relatively small changes in seasonal temperature, a dry summer, and a rainy winter. The dry summer season is maintained by the semipermanent eastern Pacific high pressure area, triggering warm dry air from above to come in contact with the cool ocean air under an inversion below. This pattern creates a blanket of low, heavy clouds known as the marine layer, which is a dominant feature in the coastal areas and foothills of southern California, including Orange County. The marine layer develops and extends inland most nights and dissipates by mid- to late morning, depending on variations in the Pacific high pressure that affect the thickness of the marine layer. While occasional Santa Ana winds from the east bring higher summer temperatures, the marine layer typically keeps temperatures from the low 70s to 80s (degrees [°] Fahrenheit [F]) in summer months (Table 2-2).

Significant precipitation is rare between May and October, primarily because of the effect of the stable marine layer. When rain does occur during the summer season, it typically is associated with subtropical moisture and isolated thundershowers.

During the rainy season (November through April), the northern hemisphere polar jet stream displaces the eastern Pacific high pressure ridge over Orange County. The colder air brought by the jet stream prevents the marine layer from forming as often, and Pacific storms and cold fronts move across California from northwest to southeast, dropping the majority of the precipitation received in Orange County. The average annual precipitation for the county is variable and terrain-dependent, ranging from approximately 12 inches at the ocean to about 15 to 20 inches in parts of the eastern foothills. At the Tustin Irvine Ranch weather station, the average seasonal rainfall is 12.82 inches, the annual average high temperature is 75.6°F, and the average low is 49.6°F (Table 2-2).

Table 2-2. Monthly Climate Summary for Tustin Irvine Ranch Weather Station, California¹

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (°F)	67.0	68.1	69.4	72.9	75.4	79.0	84.0	85.5	84.7	79.7	73.9	68.2	75.6
Average Min. Temperature (°F)	40.5	42.4	44.3	47.7	52.2	55.8	59.2	59.5	57.0	51.9	44.4	40.7	49.6
Average Total Precipitation (in.)	2.53	2.73	2.21	1.01	0.26	0.07	0.01	0.08	0.27	0.36	1.32	1.99	12.82

Source: Western Regional Climate Center 2003.

¹ Period of Record: December 1, 1927 to June 30, 2003.

2.3 Land Use

2.3.1 Existing Conditions

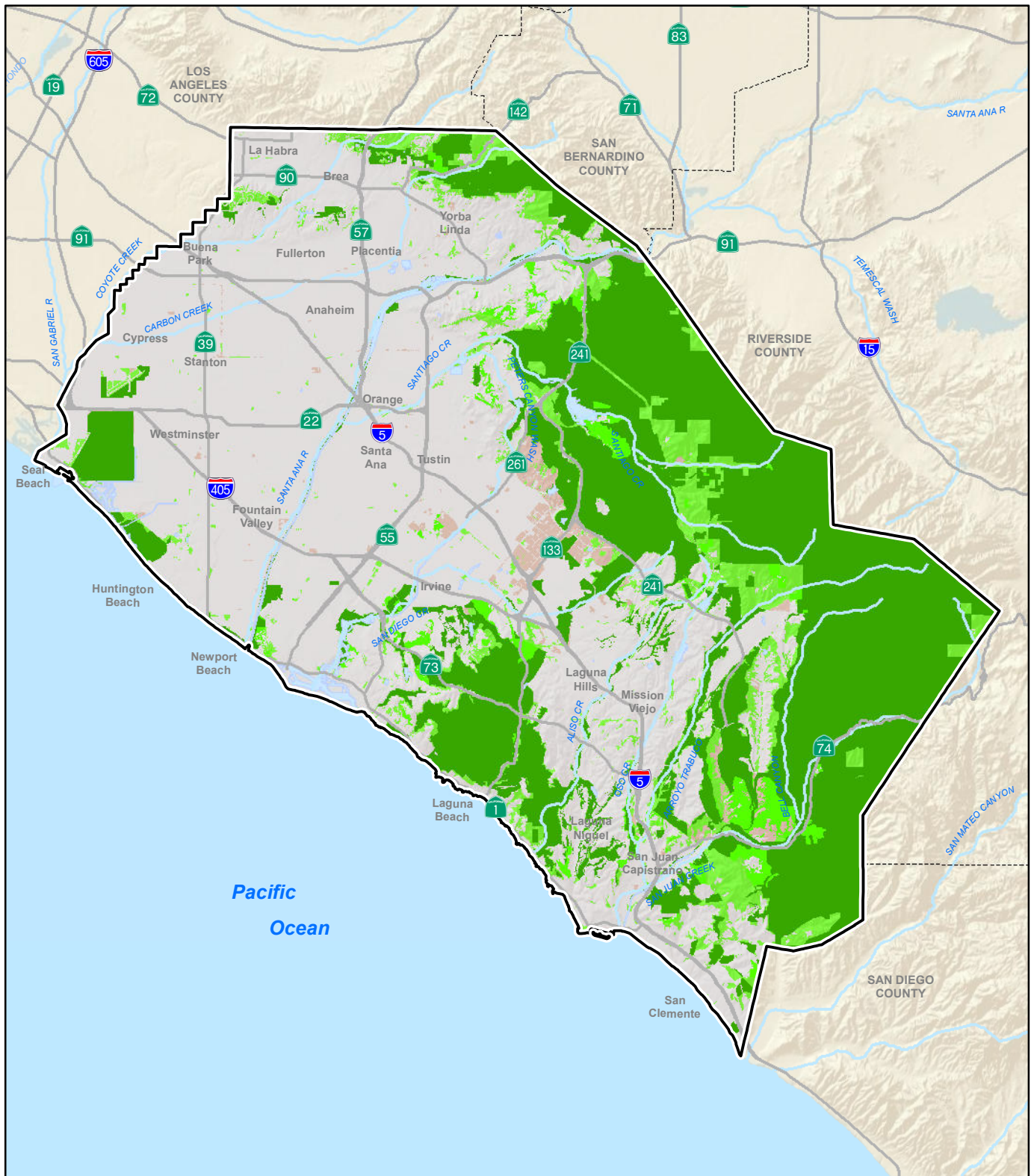
Orange County holds the distinction of being both the smallest county in southern California and the state's second most populous county, behind Los Angeles and ahead of San Diego. The result of this combination is reflected in the landscape; nearly 60% of Orange County is developed or otherwise altered. There is no defined urban center in the county; it is mostly suburban, with the exception of some traditionally urban areas at the centers of the older cities of Anaheim, Santa Ana, Orange, Huntington Beach, and Fullerton. The majority of Orange County's population resides in one of two shallow coastal valleys, the Santa Ana Valley and Saddleback Valley.






Orange County continues to grow and change. Over the past 50 years, the county has evolved from a rural suburb to a flourishing metropolitan community. According to OCTA's Long-Range Transportation Plan (2010), over the next 25 years the population is projected to grow by 14% and employment is expected to grow by more than 10%. Additionally, daily VMT in Orange County is expected to increase by 30% by 2035, decreasing system-wide average speed by 34% over the same period (OCTA 2010). It is anticipated that by 2035 approximately 50% of Orange County's freeways and about 20% of Orange County's roadways will operate under congested conditions during peak hours (OCTA 2010).

Orange County's freeway and roadway networks are nearing build-out in terms of available right-of-way (OCTA 2006). Physical expansion of these facilities is constrained by environmental impacts, lack of right-of-way, lack of funding, and community concerns with major widening projects. With travel demand continuing to grow, Orange County is hoping to employ multiple strategies to improve networks and relieve congestion at specific locations (OCTA 2006).

2.3.2 Existing Open Space and Parkland

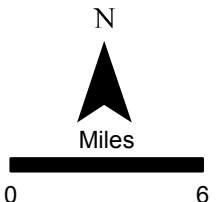
Of the 511,476-acre Plan Area, roughly 209,351 acres is undeveloped, natural habitat. Of this natural habitat, 156,819 acres (approximately 75%) is currently protected (Figure 2-4). For purposes of this Plan, currently protected lands include areas with existing conservation easements, zoned for open space and/or conservation by various jurisdictions, or in public ownership with the expectation to remain as open space. These areas vary in size, ranging from local open space easements to National Forest land. The following sections provide an overview of open space agencies with holdings in the Plan Area and identify the major land ownership of open space and parkland (Figure 2-5). The Plan's conservation strategy is based on improving existing open space through restoration and enhancing linkages and connectivity between these protected areas through Preserve acquisitions.



- Legend**
-  Plan Area
 -  Protected Lands
 -  Unprotected Natural Habitat
 -  Agriculture
 -  Developed

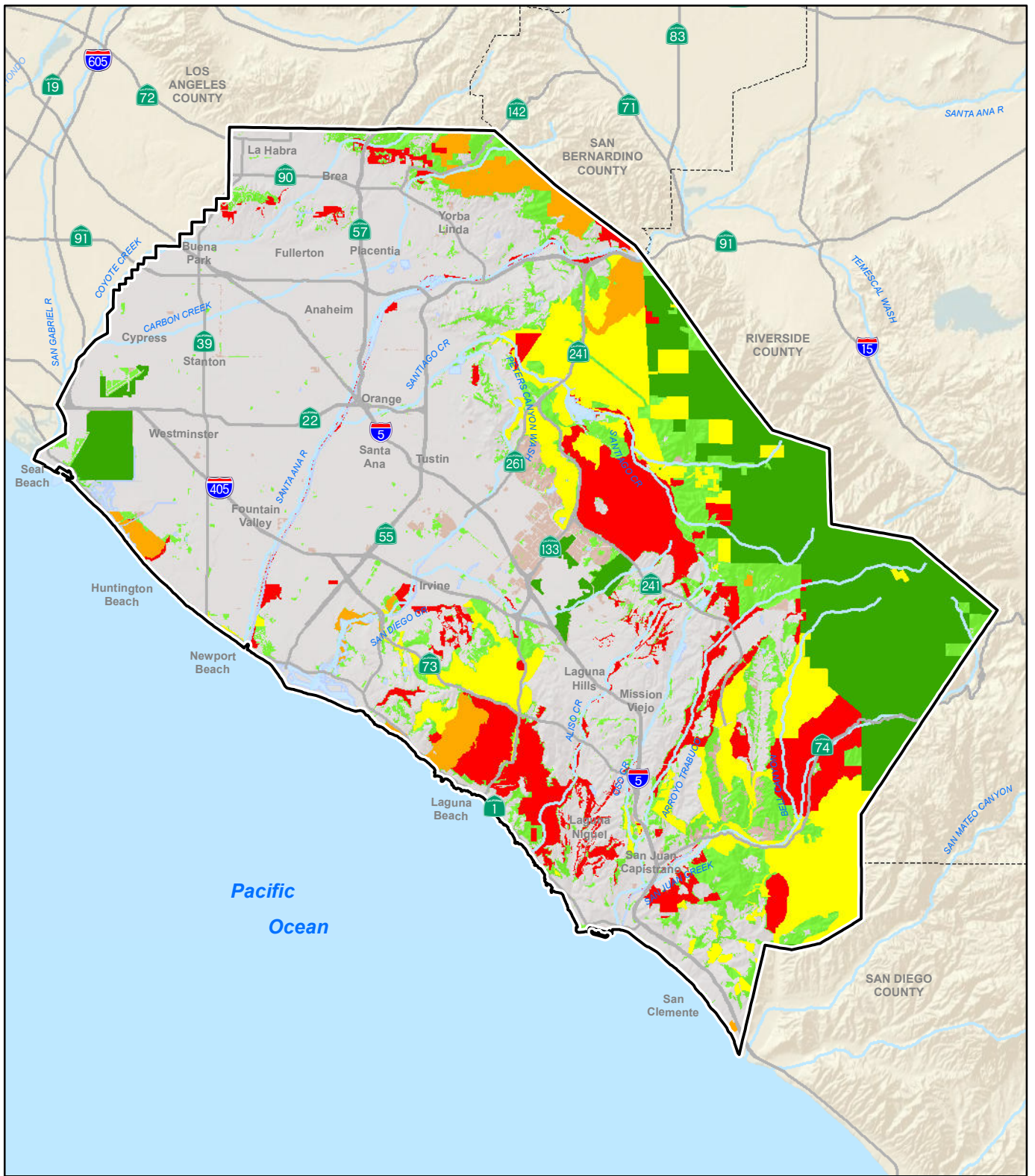
Note: Protected lands were mapped at a regional scale and some information may be outdated. A more focused review of protected lands at a parcel-by-parcel level was completed for areas in the vicinity (approximately 2 miles) of the OCTA-acquired Preserves.

Source:
Protected Lands: CBI 2009, TAIC/ICF/OCTA 2013
Vegetation: TAIC/ICF 2013



Protected Lands and Unprotected Natural Habitat

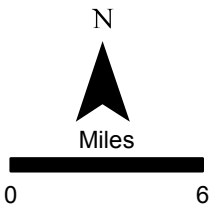
Figure 2-4



Legend

- | | |
|-----------|------------------------------|
| Plan Area | Unprotected Natural Habitats |
| Federal | Agriculture |
| State | Developed |
| Local | |
| Private | |

Note: Protected lands were mapped at a regional scale and some information may be outdated. A more focused review of protected lands at a parcel-by-parcel level was completed for areas in the vicinity (approximately 2 miles) of the OCTA-acquired Preserves.



Source: CBI 2009, TAIC/ICF/OCTA 2013



Land Ownership of Protected Lands

Figure 2-5

2.3.2.1 United States Department of Agriculture Forest Service

The USFS administers 193 million acres of forests and grasslands. The USFS owns and manages the 460,000-acre Cleveland National Forest (CNF), the southernmost national forest in California. The CNF is divided into three ranger districts: Descanso (San Diego County), Palomar (San Diego County), and Trabuco (Orange County). Within the Plan Area, much of the Santa Ana Mountains is managed by the Trabuco Ranger District.

The Plan Area includes approximately 51,000 acres of the CNF, consisting of 2 of the 11 geographical units making up the forest. These geographical units are referred to as "Places" in the CNF Land Management Plan and are defined by landscape character (USFS 2005). The two units, Silverado Place and San Mateo Place, support a number of threatened, endangered, and sensitive species, including the arroyo toad (*Anaxyrus californicus*), coastal California gnatcatcher (*Poliioptila californica californica*), least Bell's vireo (*Vireo bellii pusillus*), and a number of plant species, and they provide habitat linkages for several Orange County parks (USFS 2005). Elevations of the CNF lands in the Plan Area range from 500 to over 5,000 feet above msl, with over 77% within the higher elevations of the Plan Area (over 2,000 feet above msl).

The USFS also administers the San Mateo Canyon Wilderness Area, located in the southern portion of the San Mateo Place. Approximately 1,900 acres of this 38,484-acre wilderness area is found within the Plan Area. The Wilderness Act requires wilderness areas to be managed such that they are "unimpaired for the future use and enjoyment as wilderness" (Wilderness Act 1964). To this end, motorized equipment and equipment used for mechanical transport are generally prohibited within San Mateo Canyon.

The USFS lands are not conserved through irrevocable easements, although they are largely expected to remain as open space and are considered a large block of protected land in Orange County. The Plan evaluates opportunities to complement and enhance the existing CNF network of protected lands.

2.3.2.2 U.S. Fish and Wildlife Service

The USFWS administers the Seal Beach National Wildlife Refuge (NWF) to protect and preserve the habitat necessary for the perpetuation of the endangered California least tern (*Sterna antillarum browni*) and light-footed clapper rail (*Rallus longirostris levipes*) and to provide quality habitat for migrant waterfowl, shorebirds, and other water birds. The refuge is located within the Seal Beach Naval Weapons Station and consists of 965 acres of saltwater marsh in the Anaheim Bay estuary.

2.3.2.3 Federal Bureau of Investigation

Covering approximately 1,033 acres, the former El Toro Marine Corps Air Station recently underwent a 900-acre transfer of custodianship from the Federal Aviation Administration to that of the Federal Bureau of Investigation (FBI), to maintain adequate law enforcement training facilities for the FBI and its law enforcement partners in southern California. The El Toro property has high conservation value for the gnatcatcher and other sensitive habitats and species, and it is an important component of habitat connectivity within the Central Subarea.

2.3.2.4 California Department of Fish and Wildlife

CDFW is one of three government entities (in addition to Orange County Parks and the City of Newport Beach) responsible for management of the public open space in and around the Upper Newport Bay. Specifically, CDFW is responsible for managing the 752-acre Upper Newport Bay Ecological Reserve, which consists primarily of tidelands and certain adjacent upland areas. The reserve is one of southern California's few remaining estuaries in addition to being a saltwater marsh habitat. It provides habitat for almost 200 species of birds and is a major flyway for migratory birds. The entire ecological reserve falls within the Plan Area.

The CDFW also administers the Bolsa Chica Ecological Reserve in Huntington Beach. This ecological reserve is designated by CDFW to protect coastal wetland habitat and threatened and endangered species. The reserve's approximately 1,300 acres are bounded by Warner Avenue to the north, Seapoint Avenue to the south, Pacific Coast Highway to the west, and residential development to the east.

Coal Canyon Ecological Reserve is 11 miles west of Corona, just off SR-91 freeway in Orange County. This ecological reserve is 953 acres and is sandwiched between the CNF to the east, Chino Hills State park to the north, and the Irvine Ranch Land Reserve to the south. Nestled in the Santa Ana Mountains, the vegetation is dominantly chaparral and chamise-chaparral and supports the last remaining stand of Tecate cypress (*Hesperocyparis forbesii*) in Orange County, a rare and endemic species restricted to southern California in several small, disjunct populations.

Laguna Laurel is a 77-acre ecological reserve owned and managed by CDFW in Laguna Canyon in the City of Laguna Beach. Access is solely through the Laguna Coast Wilderness Park, which is managed by Orange County Parks. This ecological reserve is part of the last remaining coastal canyon areas in southern California and is composed of coastal sage scrub communities with oak and sycamore woodlands.

The CDFW-owned Hafen property is 100 acres of conserved open space located in rural Trabuco Canyon in southeastern Orange County within the foothills of the Santa Ana Mountains. This property is adjacent to the OCTA-purchased Hafen and Ferber Ranch Preserve properties. It supports extensive oak woodlands, chaparral, coastal sage scrub, grassland, and riparian areas. It also includes major ridgelines and riparian corridors of the Arroyo Trabuco/Trabuco Creek, the headwaters of which are in the nearby CNF. This property provides a low elevation habitat linkage between the Orange County Southern Subregion HCP Reserve to the south and the Central-Coastal NCCP/HCP Central Reserve to the north. It is expected to support gnatcatchers, cactus wrens, intermediate Mariposa lily, and Matilija poppy (*Romneya coulteri*).

2.3.2.5 California Department of Parks and Recreation

The California Department of Parks and Recreation (State Parks) manages more than 270 park units throughout California, totaling nearly 1.4 million acres. State Parks owns seven parks that occur within the Plan Area. Four of these properties (Corona Del Mar, San Clemente, Bolsa Chica, and Doheny) are state beaches primarily used for recreation and contain little ecological value. However, the remaining three ecologically significant state parks in the Plan Area are discussed below.

Huntington State Beach

Stretching from Beach Boulevard in Huntington Beach south to the Santa Ana River, Huntington State Beach is an important nesting sanctuary for the California least tern and provides habitat for the federally threatened western snowy plover (*Charadrius alexandrinus nivosus*). The park consists of approximately 100 acres of southern California coastline. The popular park also supports extensive recreational opportunities. Huntington Beach Wetlands (118 acres of wetland habitat),

owned by the Huntington Beach Wetlands Conservancy, is located adjacent to the beach, on the east side of the Pacific Coast Highway.

Crystal Cove State Park

Crystal Cove State Park is located off the Pacific Coast Highway, between Corona del Mar and Laguna Beach. The park consists of approximately 2,800 acres of coastline, wooded canyons, open bluffs, and offshore waters and supports a wide variety of sensitive, threatened, and endangered species.

Chino Hills State Park

Chino Hills State Park consists of 14,102 acres in the hills of Santa Ana Canyon, with portions of the park found in Orange, Riverside, and San Bernardino Counties. Ranging from 430 to 1,781 feet above msl, the park straddles the northern end of the Santa Ana Mountains and the southeastern portion of the Puente-Chino Hills, which together form the northern end of the Peninsular Ranges in southern California. This formation interrupts the generally flat Los Angeles Basin with a variety of rolling hills, mountains, and canyons on its south and east sides. Nearly 6,994 acres of the park occur within the Plan Area. The park serves as a critical link in the Puente-Chino Hills biological corridor. Three habitat linkages—Coal Canyon, Sonome Canyon, and Prado Basin—have been identified as important to the biological survival of the park (California Department of Parks and Recreation Southern Service Center 1999). The southern park boundary is less than 1 mile from the CNF boundary. The park supports 14 different vegetation series (dominated by grasslands), 3 known sensitive plant taxa, and 23 documented sensitive wildlife taxa (California Department of Parks and Recreation Southern Service Center 1999).

2.3.2.6 Orange County Parks

The vision statement of Orange County Parks is to preserve Orange County’s parks in perpetuity for the recreation, education, and inspiration of all visitors (County of Orange, Resources and Development Management Department 2007). Orange County Parks manages nearly 62,493 acres of County-owned land, including roughly 32,000 acres of urban and wilderness parks, 7 miles of beaches and other coastal facilities, and 27,000 acres of open space lands. The County of Orange is responsible for the management of approximately 70% of the Central-Coastal NCCP/HCP Reserve. In recent years it has contracted with the Irvine Ranch Conservancy (IRC) to fulfill some of the management obligations in the Central Reserve. Significant parks owned and managed by Orange County Parks are shown in Table 2-3.

Table 2-3. Open Space Managed by Orange County Parks

Park Name	Acreage
Irvine Ranch Open Space	22,616
Aliso and Wood Canyons Wilderness Park	4,500
Laguna Coast Wilderness Park	4,151
O’Neill Regional Park	3,594
Ronald W. Caspers Wilderness Park	2,086
Thomas F. Riley Wilderness Park	536
William R. Mason Regional Park	441
Brush Canyon	389
Featherly Regional Park	358
Laguna Niguel Regional Park	291

2.3.2.7 City Parks

Orange County cities within the Plan Area support a network of parks and open space. Most of these parks are managed for intensive recreational use and include such features as athletic facilities, community centers, turf fields, picnic areas, and trails. However, there are several city-owned parks that provide valuable habitat for sensitive and threatened and endangered species including, but not limited to, Buck Gully (in Newport Beach), Fairview Park (Costa Mesa), Bommer Canyon (Irvine), Northwest Open Space (San Juan Capistrano), and Salt Creek Regional Park (Laguna Niguel). Non-Reserve Open Space, a formal designation in the Central-Coastal NCCP/HCP, also supports important natural communities (e.g., grassland) in the City of Irvine.

2.3.2.8 The Reserve at Rancho Mission Viejo

The Reserve is a non-profit land management entity established to accept Rancho Mission Viejo lands for inclusion into the habitat reserve under the Orange County Southern Subregion HCP (The Reserve at Rancho Mission Viejo 2016). The Orange County Southern Subregion HCP has been designed to ultimately create a permanent habitat reserve consisting of 1) 11,950 acres of former ranch lands now owned by the County of Orange—Orange County Parks (O'Neill Regional Park, Riley Wilderness Park, and Caspers Wilderness Park), and 2) 20,868 acres to be dedicated into The Reserve at Rancho Mission Viejo as development occurs over time under the Orange County Southern Subregion HCP. The Reserve presently totals approximately 3,336 acres, including The Richard and Donna O'Neill Conservancy, Ladera Ranch Open Space, and other dedicated open space associated with the new village of Sendero on Rancho Mission Viejo (The Reserve at Rancho Mission Viejo 2016).

2.3.2.9 Transportation Corridor Agencies (TCA)

The Transportation Corridor Agencies (TCA) conduct environmental protection and management programs to balance construction of the 73, 133, 241, and 261 Toll Roads with the impacts on the natural environment (The Toll Roads of Orange County 2016). The TCA have preserved, in perpetuity, 16 different open space properties throughout Orange County including, but not limited to, Bonita Creek and Reservoir (28.3 acres), Canada Gobernadora (32.2 acres), Coyote Canyon Landfill (122 acres), and Glenwood Drive Mitigation Site (7.3 acres). Other habitat and wildlife protection initiatives undertaken by the TCA include the SR 241 Wildlife Protective Fence, restoration at Strawberry Farms Mitigation Site, and reserve management of Upper Chiquita Canyon Conservation Area and Live Oak Preservation Area (adjacent to the Saddle Creek South Preserve acquired by OCTA) (The Toll Roads of Orange County 2016).

2.3.2.10 Private Conservation Areas

A variety of privately owned and/or privately managed conservation areas have been established within the Plan Area. Significant private conservation areas are listed by ownership and described below.

National Audubon Society

The National Audubon Society owns and manages the 4,000-acre Starr Ranch Sanctuary, which is located in the foothills of the Santa Ana Mountains in southeastern Orange County. The sanctuary is bordered by the CNF to the north and east, the Ronald W. Caspers Regional Park to the south, and the Dove Canyon and Coto de Caza developments to the west. The mission of the Starr Ranch Sanctuary is to offer innovative approaches to land management and environmental education that will influence the way Orange County citizens appreciate, conserve, and manage wildlands.

The Trust for Public Land

Founded in 1972, The Trust for Public Land (TPL) has completed more than 4,250 park and conservation projects totaling more than 3 million acres (The Trust for Public Land 2011). Within the Plan Area, TPL owns and manages the 717-acre Baker Canyon. The property supports a variety of vegetation communities, including chaparral, nonnative grasslands, and riparian habitats. The property was acquired by TPL using Proposition 12 (Parks Bond Act) funds, which allocated funds for acquisition of lands for watershed or habitat protection. Thus, the property is managed primarily for the benefit of wildlife and habitats.

The Wildlands Conservancy

The Wildlands Conservancy owns and operates California's largest non-profit preserve system, totaling more than 145,000 acres (Wildlands Conservancy 2011). The Wildlands Conservancy's 897-acre Mariposa Reserve is located in the Plan Area on Black Star Canyon Road, 5 miles north of Santiago Canyon Road in the foothills of Orange County. The Wildland Conservancy owns and manages this property as a habitat reserve surrounded by the Cleveland National Forest. Important habitats include: coastal sage scrub, valley needlegrass grassland, sycamore riparian woodland, coast live oak riparian forest, rock cliffs and outcroppings, and chaparral. The reserve is important to many imperiled birds and is often traveled by two radio-collared mountain lions. There are abundant spring wildflower displays dominated by mariposa lilies.

Development HCPs

The Coyote Hills East HCP was permitted by Chevron USA under Section 10(a) of the ESA. Located in the City of Fullerton, this project included the construction of a golf course and homes, maintenance of oil infrastructure, and restoration of 120 acres of coastal sage scrub for the resident California gnatcatcher population. Revegetation included retention of native soils, mulching, planting, seeding and regular maintenance for weed abatement, plant replacement, and pest control. Another HCP in Orange County is the Shell-Metropolitan Water District HCP in Brea.

2.4 Biological Resources

2.4.1 Natural Communities

The primary data source used to evaluate natural communities across the Plan Area was the USFS Existing Vegetation (EVeg) dataset. This dataset, which initially was selected by CBI for the Conservation Assessment (see Section 2.4.3) because it provides a consistent mapping source for the entire Plan Area, has a 2.5-acre minimum mapping unit. A map of the natural communities within the Plan Area is shown in Figure 2-6. Each natural community is composed of several land-cover types, each with distinctly different plant species compositions. The vegetation types were classified in the original USFS EVeg data according to the CDFW Wildlife Habitat Relationships (CWHR) classification scheme, which is based on the vegetation classification system developed for the *Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995). The vegetation classification system is included in Table 2-4. Detailed descriptions for the major natural communities are provided in Appendix C.1.

The vegetation mapping data used for the Plan were updated by CBI and TAIC using 2008 aerial photography to reflect newly developed areas not captured in the EVeg source data. Updates to the vegetation dataset were limited in scope and focused primarily on relatively large blocks of habitat that had been recently developed or cleared so that they no longer supported native vegetation. The

purpose of the vegetation data update process was to identify and update significant changes that could affect the landscape-scale conservation planning and analysis for the NCCP/HCP, and the process was not comprehensive at a fine scale. Therefore, smaller areas of new development would not have been detected and updated.

Preserve-level vegetation mapping was completed in 2012 as part of baseline biological surveys for the Ferber Ranch, Hafen, Hayashi, O'Neill Oaks, and Saddle Creek South Preserves and in 2015 for the MacPherson and Aliso Canyon Preserves (Appendix C.6). This vegetation mapping was completed using field surveys following *A Manual of California Vegetation 2nd Edition* classification system (Sawyer et al. 2009). The more detailed vegetation mapping will be used for ongoing management and monitoring of the preserves. For the biological analyses in the Plan, the preserve-level vegetation data was cross-walked into the EVeg classification scheme and integrated into the vegetation GIS database.

Table 2-4. Natural Communities and Land-Cover Types in the Plan Area

Natural Community	Land-Cover Type	Total Acres in Plan Area
Coniferous forest		1,930
	Bigcone Douglas-fir (<i>Pseudotsuga macrocarpa</i>)	1,480
	Coulter pine (<i>Pinus coulteri</i>)	73
	Knobcone pine (<i>Pinus attenuata</i>)	63
	Tecate cypress (<i>Cupressus forbesii</i>)	314
Woodland		13,995
	California walnut (<i>Juglans californica</i>)	843
	Canyon live oak (<i>Quercus chrysolepis</i>)	2,048
	Coast live oak (<i>Quercus agrifolia</i>)	10,591
	Coastal mixed hardwood	512
	Interior mixed hardwood	1
Chaparral		82,965
	Ceanothus mixed chaparral	2,451
	Chamise (<i>Adenostoma fasciculatum</i>)	7,945
	Lower montane mixed chaparral	57,974
	Scrub oak	3,475
	Soft scrub mixed chaparral	6,204
	Southern mixed chaparral	267
	Sumac shrub	5,614
	Upper montane mixed chaparral	35
Scrub		59,427
	Buckwheat	1,540
	California sagebrush (<i>Artemisia californica</i>)	53,761
	Coastal bluff scrub	374
	Coastal cactus	2,738
	Coyote brush (<i>Baccharis pitularis</i>)	182
	Riversidean alluvial scrub	731
	Scalebroom (<i>Lepidospartum squamatum</i>)	102

Natural Community	Land-Cover Type	Total Acres in Plan Area
Grassland		41,635
	Annual grasses and forbs (generally nonnative)	39,671
	Perennial grasses and forbs (generally native)	1,964
Riparian		4,457
	Baccharis (riparian)	322
	California sycamore (<i>Platanus racemosa</i>)	935
	Fremont cottonwood (<i>Populus fremontii</i>)	119
	Riparian mixed hardwood	1,062
	Riparian mixed shrub	489
	Willow	740
	Willow (shrub)	790
Wet meadows/marsh		2,235
	Pickleweed-cordgrass	1,882
	Tule-cattail	318
	Wet meadows	35
Water		2,696
	NATURAL COMMUNITIES SUBTOTAL	209,340
Agriculture		12,870
Barren		1,662
Developed/Disturbed		287,604
	TOTAL	511,476

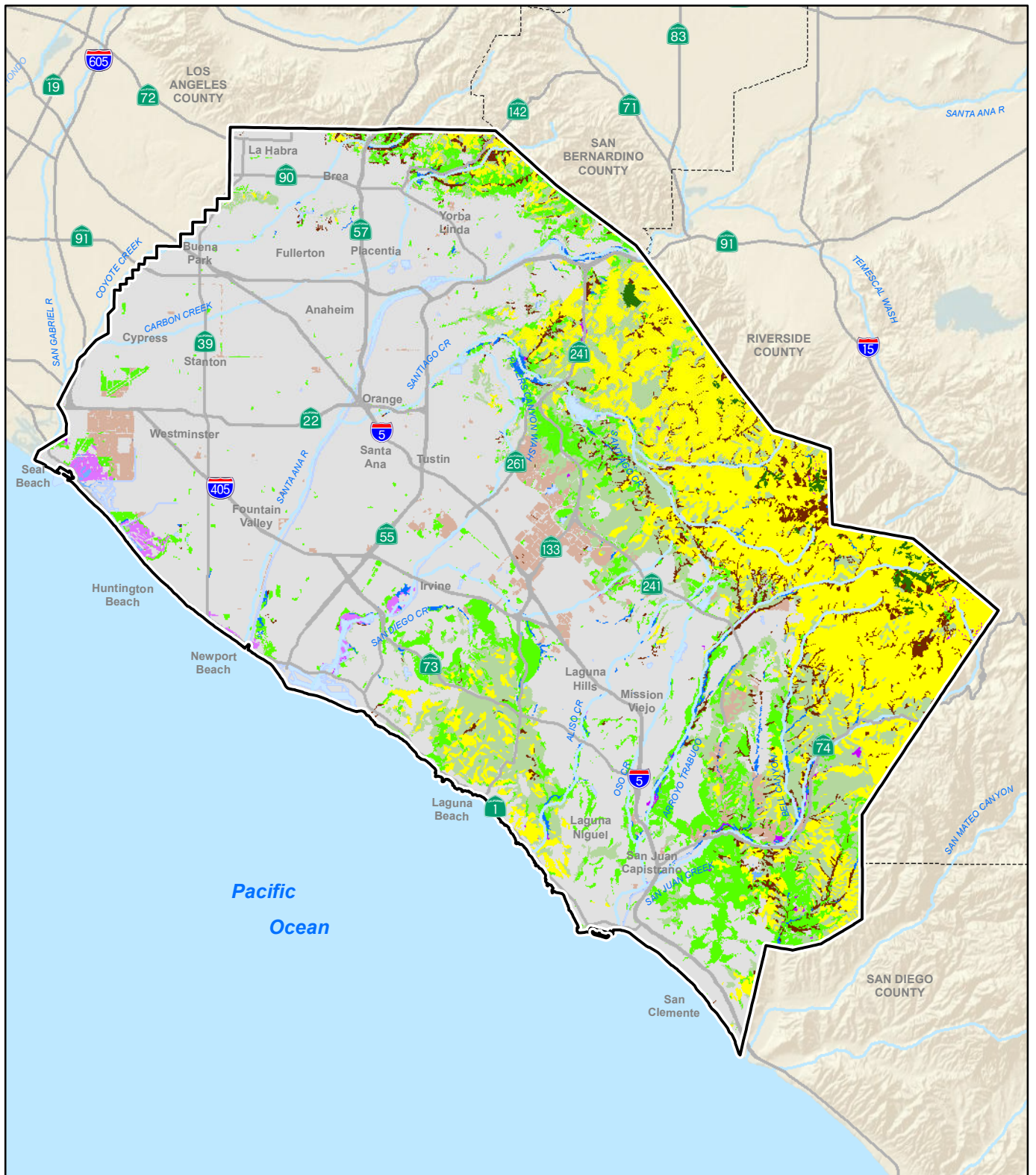
2.4.2 Covered Species

2.4.2.1 Species Accounts

Detailed species accounts of the 13 Covered Species (Table 1-1) are provided in Appendix C.2. These accounts summarize ecological information, distribution, status, threats, population trends, and conservation and management activities in the Plan Area. The accounts represent the best available scientific data for each species on which to base the Plan. The species accounts are not intended to summarize all biological information known about a species. Rather, each account summarizes scientific information that is relevant to the Plan. Each account is designed for easy reference; all literature cited in the account is provided within it. The biological data in these accounts were used to inform species distribution modeling (Section 2.4.2.2), impact analysis (Chapter 4), conservation strategy (Chapter 5) and conservation assessment (Chapter 6).

2.4.2.2 Species Distribution Models

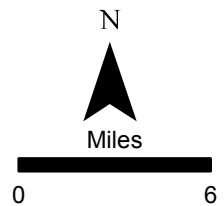
Regional conservation planning relies on landscape-scale data because it is time-consuming and often infeasible to collect detailed, site-specific information on the large scale typical of multiple habitat and species plans. Therefore, species habitat distribution modeling has been a major component of many NCCP/HCP planning efforts in California. The role of species and habitat modeling in the conservation planning process is to provide an objective way of analyzing and evaluating biological information across a large study area. Although species habitat modeling is not a replacement for field data, this approach is an important part of the conservation planning process because of the following:



Legend

- | | |
|-------------------|-------------------|
| Plan Area | Woodland |
| Scrub | Coniferous Forest |
| Chaparral | Water |
| Grassland | Barren |
| Wet Meadows/Marsh | Agriculture |
| Riparian | Developed |

Source: CBI 2009, TAIC/Bonterra 2012



Vegetation Communities

Figure 2-6

- Lack of comprehensive species data in the Plan Area.
- Difficulty of conducting supplemental surveys on private land.
- Need for prediction and extrapolation in areas lacking adequate data.
- Need for synthesis and analysis of multiple data sources across the entire Plan Area.

Species distribution modeling and analysis are used to extrapolate biological data in a consistent and comprehensive manner across a study area. Extrapolation of these data avoids the geographic bias often inherent in occurrence data (e.g., CNDDDB). Species distribution models, used in parallel with field data for known species locations, guide conservation planning analysis and decisions.

Model Structure and Development Methods

Species distribution models are designed to estimate the extent and location of key habitat characteristics of each species and to be repeatable and scientifically defensible, while remaining as simple as possible. For the purposes of the Plan, species distribution models were developed from the species accounts and were based on models developed for the same species for other conservation programs in or near the Plan Area, when they were available. Land-cover types are identified as suitable habitat based on the known or presumed habitat requirements and use patterns of each species. When supported by appropriate data, the models also incorporate physical parameters, including, but not limited to, the following:

- Elevation range using elevation range categories in 500-foot increments (e.g., 0–500 feet above msl, 500–1,000 feet above msl, etc.).
- Soil type based on 16 categories (clay, clay [assumed], clay loam, silty clay loam, silt loam, loam, loam [assumed], very fine sandy loam, fine sandy loam, sandy loam, coarse sandy loam, loamy sand, sand, coarse sand, rock [assumed], and unknown [tidal flat and water]) (USDA SCS 1978).
- Slope steepness based on three categories (flat 0–10%, moderate 11–25%, steep >25%).
- Landforms based on 13 categories (alluvial fans, alluvial plains remnants, alluvial plains, fans, floodways, beach plains, beaches, tidal flats, terraces, foothills, hills, mountains, and uplands).
- Tree density based on four broad categories (open cover, sparse cover, moderate cover, and dense cover).
- Ecoregion subsection (Miles and Goudey 1997).

The draft predicted species distribution model results were evaluated relative to the distribution of known occurrences in the Plan Area to assess the accuracy of the model. When known occurrences were located in areas not predicted by the draft model, the geographic information system (GIS) data layers were examined in these areas to identify any additional species-habitat relationship that potentially should be included in the model to improve accuracy. Such changes to the draft model were made only when the change was generally consistent with known species' habitat requirements as described in the species profile. Species distribution models and model descriptions for Covered Species are included in Appendix C.3.

Model Uses and Limitations

Species distribution models were developed for the Plan to assist in the quantification of impacts of Covered Activities on species. To quantify species impacts, project footprints were overlain with species distribution models in GIS (see Chapter 4, "Impact Assessment and Level of Take"). Species models also were used during the development of the Plan's conservation strategy, albeit in a limited fashion. Species distribution models were used together with input from species experts to

identify important areas for conservation. This approach differs from many other NCCP/HCPs in that it incorporates expert opinion into preserve design. Many NCCP/HCPs have used optimization models (e.g., MARXAN) that rely heavily on species distribution models to identify potential preserve designs. However, the general conservation approach for this Plan is to build upon and link the substantial existing preserve network in the Plan Area through acquisition of unprotected natural habitat known to include suitable habitat for Covered Species. Therefore, input from species experts familiar with the Plan Area and field reconnaissance are the primary information sources used for selection of the Plan's Preserves.

The species distribution models are intended to be used only for planning purposes at the scale of the Plan Area, and not for project-level site evaluation. The precision of the habitat distribution models is limited by several factors, including the 2.5-acre minimum mapping units used to map each land-cover type. Areas of suitable habitat smaller than the mapping thresholds were not mapped and therefore could not be incorporated into the models. This constraint limited the degree of resolution of some habitat features potentially important to some species. Therefore, these models should be used only at the regional scale (i.e., scale of the Plan Area) rather than for site-specific planning. In addition, these models are not intended to be used for project-level CEQA analysis, including determinations on the level of CEQA compliance required (e.g., whether a Categorical Exemption is warranted).

The species distribution models were limited to distinguishing habitat uses based on key life history requirements—such as breeding, foraging, and dispersal—that are tied to land-cover types. The data do not allow further distinctions of habitat quality on a regional scale. To account for these limitations, conservative estimates of habitat parameters were used. This approach tends to overestimate the actual extent of suitable or required habitat for a species, but is consistent with current conservation planning practices when data are limited (Noss et al. 1997).

2.4.2.3 Known Occurrences

Various occurrence data sources were used to provide documentation of known locations for individual species. While not comprehensive across the Plan Area or even within the Covered Activity footprints, Preserves, and restoration locations, the occurrence information does provide the locations of confirmed sightings of a species in a specific area. The occurrence information was used in combination with predicted species models to evaluate and refine the Covered Species list, characterize potential impacts and take, and evaluate the Conservation Strategy to determine if the Plan conservation actions meet the criteria for species coverage. Occurrence data sources included the following.

- **California Natural Diversity Database (CNDDDB):** A database maintained by CDFW that contains confirmed locations for both plant and wildlife species.
- **USFWS:** A USFWS database containing confirmed species points for both plant and wildlife species.
- **USFS:** A USFS database containing confirmed species points for both plant and wildlife species on USFS lands only.
- **Supplemental species locality database.** Additional occurrence information pertinent to this Plan was collected from other hard copy and personal communication data sources. This information was input to the GIS database when available, referenced in the text as appropriate, or included as hard copy maps only in Appendix C.7 if data could not be shared electronically.

- **Preserve Baseline Surveys (2012, 2015).** Baseline surveys of the Ferber Ranch, Hafen, Hayashi, O'Neill Oaks, and Saddle Creek South Preserves were completed in 2012 and in 2015 for the MacPherson and Aliso Canyon Preserves (see Appendix C.6).

An occurrence is represented as a polygon with information regarding the number of individuals (or population) recorded at that location. If the number of individuals was not recorded, the occurrence was assumed to represent a single individual. In several instances there was duplication, overlap, and redundancy of occurrence information between the different data sources. To complete the assessment of Plan impacts and conservation analysis, the occurrence information was filtered to remove overlap along the covered freeway improvement project impact footprints and within the Preserves and restoration project locations. A systematic approach was taken to use the most current and detailed occurrences. If there was overlap, the occurrences that were older and/or more general were ignored until no overlap existed.

In some instances, additional occurrence information was available in hard copy format only and could not be provided in electronic format to be included in the occurrence database due to proprietary data limitations. Hardcopy maps of occurrence information that was particularly relevant and useful for the project are included in Appendix C.7, "Additional Species Occurrence Maps from Other Sources." Other incidental occurrence information has been provided through personal communication or camera monitoring. These occurrences are referenced in the document as appropriate.

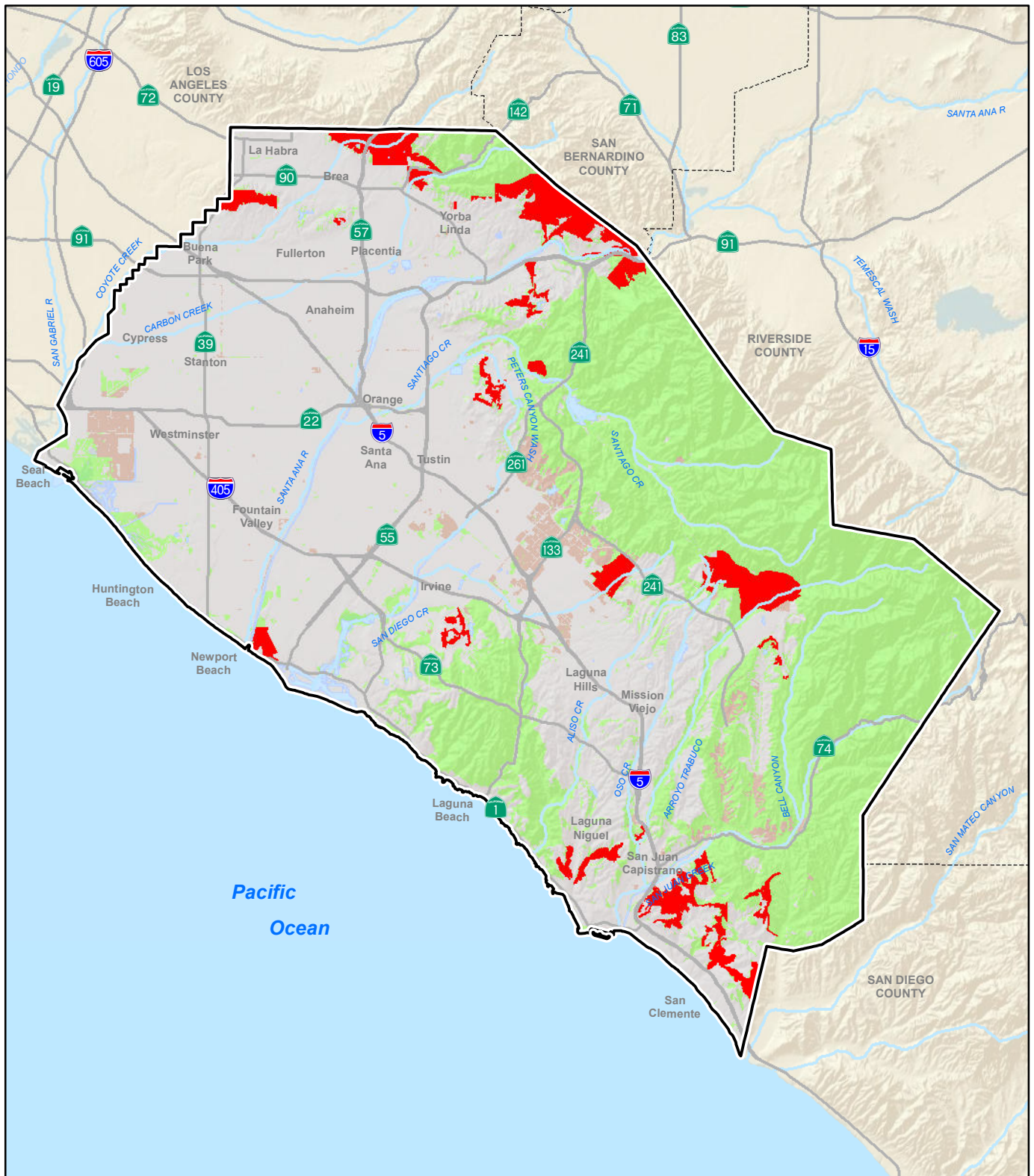
2.4.2.4 Critical Habitat

Critical habitat is designated through rulemaking issued by USFWS and National Oceanic and Atmospheric Administration (NOAA) Fisheries for specific areas that have the physical and biological features essential to the conservation of federally listed species. Section 7 of the ESA prohibits federal agencies from taking actions that are likely to result in the destruction or adverse modification of designated critical habitat.

The only Covered Species with designated critical habitat in the Plan Area is the coastal California gnatcatcher (Figure 2-7).

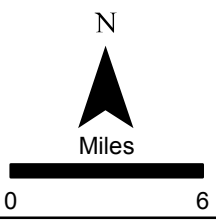
- **Coastal California Gnatcatcher.** In October 2000, final critical habitat for the coastal California gnatcatcher was designated (65 FR 63680-63743) and revised in December 2007 (72 FR 72010-72213). Thirteen critical habitat units are established by the designation, two of which occur completely within the Plan Area (Units 6 and 7) and one that occurs partially within the Plan Area (Unit 9). Approximately 18,747 acres of designated coastal California gnatcatcher critical habitat are found within the Plan Area.

Critical habitat is also designated within the Plan Area for the federally listed arroyo toad, Braunton's milk-vetch, Riverside fairy shrimp, San Diego fairy shrimp, Santa Ana sucker, thread-leaved brodiaea, and western snowy plover. However, these species are not Covered Species under the Plan because it was determined it is unlikely these species will be impacted by the Covered Activities.



Legend

-  Plan Area
-  Final California Gnatcatcher
-  Natural Habitats
-  Agriculture
-  Developed



Source: USFWS 2011



Critical Habitat in Plan Area

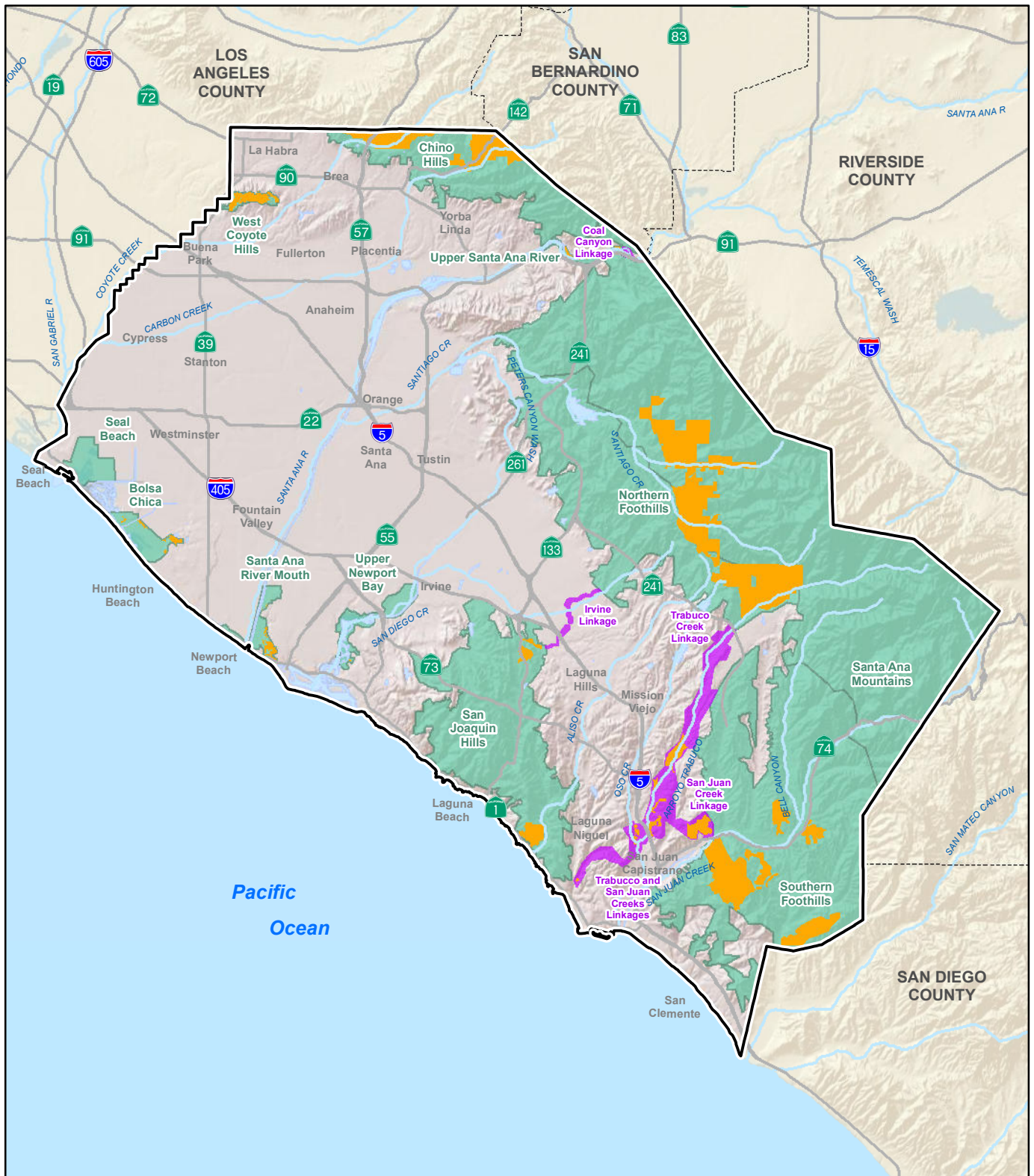
Figure 2-7

2.4.3 Landscape Level Conservation Assessment

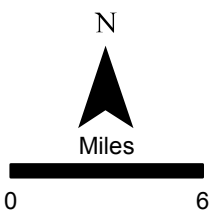
OCTA contracted with CBI to complete a formal conservation assessment for the purposes of identifying key areas of natural habitat in the Plan Area (CBI 2009). The objectives of CBI's effort were as follows:

- Develop an objective, science-based process for focusing decision-making on regional conservation priorities.
- Using existing data and applying NCCP tenets of conservation planning, map the distribution of conservation values of undeveloped lands in Orange County, including both protected and unprotected lands.
- Identify components of a regional preserve network, focusing on adding to existing preserve areas to build large core habitat areas with habitat linkages between them to enhance their persistence.
- Develop specific conservation objectives to maximize conservation values for each core and linkage area.
- Based on these objectives, identify areas where conservation of biological resources should be prioritized to improve landscape integrity and connectivity, protect rare species and their habitats, and ensure long-term persistence of natural processes.

As a result of this process, 11 Core Habitat Areas and four existing or potentially viable linkages that include both protected and unprotected natural lands were identified in the Plan Area (Figure 2-8). CBI completed additional analyses to further refine and identify individual parcels within unprotected natural lands, designated as "priority conservation areas," based on their (a) position on the interior or edge of the core area and (b) proximity to protected open space. The priority conservation areas are defined as those currently unprotected lands for which acquisition would be a "no regrets" decision, based on their contribution to the regional Preserve System. A more detailed discussion of the CBI Conservation Assessment is included in Appendix C.5.



- Legend**
- Core Habitat Areas
 - Linkages
 - Priority Conservation Areas



Sources: Core, Linkage, and Priority Conservation Areas: CBI 2009



Core Habitat, Linkages, and Priority Conservation Areas

Figure 2-8

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3.1 Covered Activities

This chapter describes the activities within the Plan Area for which the M2 NCCP/HCP will provide conservation, avoidance, and minimization of impacts for Covered Species and their habitats. These are the Covered Activities for which take authorization will be obtained. The Plan includes coverage for two major categories of Covered Activities:

- Covered freeway improvement projects: Freeway improvement projects proposed by OCTA along 13 freeway segments; see Section 3.1.1, “Covered Freeway Improvement Projects”.
- Preserve management activities: Preserve management, restoration, and monitoring activities within the OCTA acquired Preserves; see Section 3.1.2, “Covered Activities within the Natural Community Conservation Plan/Habitat Conservation Plan Preserves”.

There are 13 discrete proposed freeway segments in which freeway projects have been identified for coverage under the Plan. These proposed projects are designed to reduce congestion, increase capacity, and smooth traffic flows of Orange County’s important transportation infrastructure. In addition, activities related to ongoing habitat management, restoration, and monitoring activities by Preserve Managers and activities necessary to provide limited public and emergency access (e.g., construction or maintenance of roads and trails) have been identified for coverage. These activities are discussed in detail below.

3.1.1 Covered Freeway Improvement Projects

Freeway projects covered by the M2 NCCP/HCP include the capital projects proposed by OCTA through its M2 transportation planning and project implementation process. The current status and phasing of each of these freeway projects is listed in Table 3-1 and project locations are shown in Figure 3-1. Some of the proposed projects will be completed prior to approval of the Plan. For example, Project L has not been initiated but the technical documents are being drafted prior to Plan adoption. To ensure consistency with the Plan, OCTA coordinated with the Wildlife Agencies to ensure that Project L incorporated the appropriate minimization measures identified in Section 5.6 of the Plan as impacts to natural habitat and/or habitat for Covered Species were anticipated. All other freeway projects that have been initiated and/or completed prior to Plan adoption would not result in impacts to natural habitat and/or Covered Species habitat and therefore, do not require mitigation.

Table 3-1. Covered Freeway Capital Projects Status and Phasing

Project	Segment	Estimated Construction Start Date	Estimated Construction Completion
A (I-5)	1 (SR-55 to SR-57)	Early-2018	Early-2020
	2 (I-5/SR-55 interchange)	TBD	TBD
B (I-5)	1 (I-405 to SR-55)	TBD	TBD
C (I-5)	1 (El Toro interchange to SR-73)	Mid-2018	Late 2022

Project	Segment	Estimated Construction Start Date	Estimated Construction Completion
D (I-5)	2 (Pacific Coast Highway to Pico)	Mid-2014	Mid-2018
	I-5/Avenida Pico interchange ¹	Late 2014	Mid-2018
	I-5/Ortega Highway interchange	Late 2012	Early 2016
	I-5/Avery Parkway interchange ²	Early 2019	Late 2022
	I-5/La Paz Road interchange ²	Mid-2018	Late 2022
E (SR-22)	I-5/El Toro interchange	TBD	TBD
	Interchange improvements at Euclid St, Brookhurst St, and Harbor Blvd	TBD	TBD
F (SR-55)	1 (I-405 to I-5)	Mid-2021	Mid-2024
	2 (I-5 to SR-22)	TBD	TBD
G (SR-57)	1a (Orangewood to Katella)	TBD	TBD
	1b (Katella to Lincoln)	Late 2011	Early 2015
	2a (Orangethorpe to Yorba Linda)	Late 2010	Late 2014
	2b (Yorba Linda to Lambert Road)	Late 2010	Mid-2014
	3 (Lambert Interchange)	TBD	TBD
H (SR-91)	4 (Lambert Road to Tonner Canyon Road)	TBD	TBD
	1 (I-5 to SR-57)	Early 2013	Mid-2016
I (SR-91)	1 (SR-91/Tustin Avenue interchange)	Late 2013	Mid-2016
	2 (SR-57 to SR-55)	TBD	TBD
J (SR-91)	1 (SR-55 to SR-241 [Weir Canyon])	Mid-2011	Early 2013
K (I-405)	1 (SR-55 to I-605)	Late 2016	Early 2023
L (I-405)	1 (I-5 to SR-55)	TBD	TBD
	2 (I-5/Lake Forest interchange)	TBD	TBD
M (I-605)	1 (I-605/Katella Ave interchange) ³	TBD	TBD

¹ Integrated into Project C2 (Pacific Coast Highway to Pico)

² Integrated into Project C1 (El Toro Interchange to SR-73)

³ Integrated into Project K

3.1.1.1 Project A: Santa Ana Freeway (Interstate 5) Improvements between Costa Mesa Freeway (State Route 55) and “Orange Crush” Area (State Route 57)

The objective of Project A is to increase freeway capacity and reduce congestion on the Santa Ana Freeway (I-5). Project A would affect two segments: Segment 1, extending from SR-55 to SR-57, and Segment 2, located at the I-5/SR-55 interchange. These improvements would add capacity on I-5 between SR-55 and SR-57 and relieve congestion at the I-5/SR-57 interchange, an area known as the “Orange Crush.” Construction would take place within the existing right-of-way. Interchange improvements would occur between the Fourth Street and Newport Avenue ramps on I-5 and between Fourth Street and Edinger Avenue on SR 55 as it crosses SR-55 and SR-57. Project-specific improvements are subject to approved plans developed in coordination with local jurisdictions and affected communities.

3.1.1.2 Project B: Interstate 5 Improvements from State Route 55 to the El Toro “Y” Area

The objective of Project B is to increase freeway capacity and reduce congestion on I-5 between SR-55 and I-405, an area known as the El Toro “Y.” These improvements would consist of construction of new lanes and improvements to existing interchanges. Project B construction would take place within the existing right-of-way. Specific improvements are subject to approved plans developed in cooperation with local jurisdictions and affected communities.

3.1.1.3 Project C: North and South Portions of Interstate 5 Improvements between the El Toro Interchange and Avenida Pico

The objective of Project C is to increase freeway capacity and reduce freeway congestion on I-5 south of the El Toro “Y.” It is also intended to improve and update key interchanges on I-5 to relieve street congestion around older interchanges and on ramps.

The north portion of Project C (Segment 1) would improve I-5 south of the El Toro “Y” by constructing new lanes from the vicinity of the El Toro interchange in Lake Forest to the vicinity of SR-73 in Mission Viejo. The south portion of Project C (Segment 2) involves improvements similar to those proposed for the north portion between Pacific Coast Highway and Avenida Pico to reduce freeway congestion in San Clemente.

Project C also involves major improvements to local interchanges. Project C, Segment 2, includes the I-5/Avenida Pico interchange. Project C, Segment 1, includes the I-5/Avery Parkway interchange and the I-5/La Paz Road interchange. Project C construction takes place within the existing right-of-way. Specific improvements are subject to approved plans developed in cooperation with local jurisdictions and affected communities.

3.1.1.4 Project D: I-5 Local Interchange Improvements

Project D would update and improve the following key interchanges on I-5:

- I-5/Avenida Pico interchange—integrated into Project C, Segment 2
- I-5/Ortega Highway interchange
- I-5/Avery Parkway interchange—integrated into Project C, Segment 1
- I-5/La Paz Road interchange—integrated into Project C, Segment 1
- I-5/El Toro interchange

These interchanges occur in southern Orange County, in the vicinity of Mission Viejo, Laguna Niguel, San Juan Capistrano, and San Clemente. Improvements are subject to approved plans developed in cooperation with local jurisdictions and affected communities.

3.1.1.5 Project E: Garden Grove Freeway (State Route 22) Access Improvements

Project E would improve interchanges along SR-22 at Euclid Street, Brookhurst Street, and Harbor Boulevard in order to reduce freeway and surface street congestion near these interchanges.

Specific improvements are subject to approved plans developed in cooperation with local jurisdictions and affected communities.

3.1.1.6 Project F: State Route 55 Improvements

The objective of Project F is to increase freeway capacity and reduce congestion through the addition of new lanes to SR-55 between the Garden Grove Freeway (SR-22) and the San Diego Freeway (I-405). The south portion of Project F (Segment 1) is between I-405 and I-5. The north portion of Project F (Segment 2) is between I-5 and SR-22. These improvements include merging lanes between interchanges to smooth traffic flow. Project F would also provide freeway operational improvements for the portion of SR-55 between SR-91 and SR-22.

3.1.1.7 Project G: State Route 57 between Orangewood Avenue and Lambert Road Northbound General-Purpose Lane Improvements

The objective of Project G is to increase freeway capacity and reduce congestion associated with SR—57. This project is composed of several segments.

- Segment 1a: Construction of a northbound lane between Orangewood Avenue and Katella Avenue.
- Segment 1b: Construction of a northbound lane between Katella Avenue and Lincoln Avenue.
- Segment 2a: Construction of a northbound lane between Orangethorpe Avenue and Yorba Linda Boulevard.
- Segment 2b: Construction of a northbound lane between Yorba Linda Boulevard and Lambert Road.
- Segment 3: Improvements to the Lambert interchange.
- Segment 4: Construction of a northbound truck-climbing lane between Lambert Road and Tonner Canyon Road.

The improvements are designed and coordinated specifically to reduce congestion at the SR-57/SR-91 interchange.

All improvements associated with Project G would occur generally within the existing right-of-way. Specific improvements are subject to approved plans developed in coordination with local jurisdictions and affected communities.

3.1.1.8 Project H: Riverside Freeway (State Route 91) from State Route 57 to Interstate 5 Westbound General-Purpose Lane Improvements

Project H would add capacity in the westbound direction on SR-91 to smooth traffic flow and relieve congestion at the SR-57/SR-91 interchange. It would also provide operational improvements at on and off ramps to SR-91 between I-5 and SR-57.

These improvements would occur generally within the existing right-of-way. Specific improvements are subject to approved plans developed in cooperation with local jurisdictions and affected communities.

3.1.1.9 Project I: State Route 91 Improvements from State Route 57 to the State Route 55 Interchange

Project I would add freeway capacity to SR-91 between SR-57 and SR-55. Project I (Segment 1) includes improvements to the SR-91/SR-55 and SR-91/SR-57 interchange complexes and nearby local interchanges at Tustin Avenue and Lakeview Avenue.

Project construction would occur generally within the existing right-of-way. Specific improvements are subject to approved plans developed in cooperation with local jurisdictions and affected communities.

3.1.1.10 Project J: State Route 91 Improvements from State Route 55 to the Orange County/Riverside County Line

Project J would improve SR-91 from SR-55 to the Orange County/Riverside County boundary. The project would provide up to four new lanes of capacity between SR-241 and the Riverside county line by adding reversible lanes, building elevated sections, and improving connections to SR-241. These projects would be constructed in conjunction with similar coordinated improvements in Riverside County that extend to I-15.

Improvements in Riverside County are paid for from other sources. Specific improvements are subject to approved plans and are developed in cooperation with local jurisdictions and affected communities.

3.1.1.11 Project K: San Diego Freeway (Interstate 405) Widening Project from State Route 55 to the San Gabriel River Freeway (Interstate 605)

Project K would increase freeway capacity and reduce congestion associated with I-405. The proposed project would add new lanes to the San Diego Freeway between I-605 and SR-55, generally within the existing right-of-way. The project would update interchanges and widen all local overcrossings according to city and regional master plans.

The proposed improvements are coordinated with other planned I-405 improvements, including improvements to the I-405/SR-22/I-605 interchange area to the north and I-405/SR-73 improvements to the south. The improvements adhere to the recommendation of the I-405 major investment study adopted by OCTA in October 2005 and are developed in coordination with local jurisdictions and affected communities.

3.1.1.12 Project L: Interstate 405 Improvements between State Route 55 and Interstate 5

Project L would increase freeway capacity and reduce congestion associated with I-405. The proposed project would add new lanes to I-405 from SR-55 to I-5. The project would ease chokepoints at interchanges and add merging lanes near on and off ramps, such as Irvine Center Drive and SR-133. It would also improve overall freeway operations in the I-405/I-5 El Toro "Y" area. Project L, Segment 2, and include improvements at the Lake Forest interchange on I-5.

Project L would be constructed generally within the existing right-of-way. Specific improvements are subject to approved plans developed in cooperation with local jurisdictions and affected communities.

3.1.1.13 Project M: Interstate 605 Freeway Access Improvements

Project M would improve freeway access and arterial connections to I-605 that serve the communities of Los Alamitos and Cypress. The project is coordinated with other planned improvements along SR-22 and I-405. Specific improvements are subject to approved plans developed in cooperation with local jurisdictions and affected communities. This improvement would connect to interchange improvements at I-405 and SR-22 as well as new freeway lanes between I-405 and I-605. This project is integrated with Project K.

3.1.2 Other Minor Freeway Improvement Projects

In addition to the covered freeway improvement projects outlined above, other minor freeway improvement projects are eligible for coverage under the Plan as Covered Activities. These potential projects must be consistent with the scope of the covered freeway projects described above, occur within the Permit Area, and cannot result in the acreage impact caps established for the Plan to be exceeded (as determined and estimated by OCTA through the impact tracking). Further, these projects also cannot result in additional take of Covered Species, or be significantly different or have greater impacts to the environment than what was analyzed within the EIR/EIS for the NCCP/HCP, as determined by the Wildlife Agencies. If a future freeway improvement project meets these conditions, it can be added as a Covered Activity through a minor Plan amendment (see Section 8.5.3, “Minor Amendments”). If a future freeway improvement project is proposed that does not meet all of these criteria, it could be added as a Covered Activity through a major Plan amendment but would require additional conservation to offset impacts (see Section 8.5.4, “Major Amendments”).

3.1.3 Covered Activities within the Natural Community Conservation Plan/Habitat Conservation Plan Preserves

Some activities expected to occur within the Plan Preserves might adversely affect some Covered Species and their habitats (see Chapter 4, “Impact Assessment and Level of Take”). Most of these effects are expected to be temporary and of limited severity. Because they might result in take, these activities require coverage under the Plan. All Covered Activities within M2 NCCP/HCP Preserves will be designed to avoid or minimize take of Covered Species. The ESA and NCCPA permits will cover the activities of OCTA staff, the Preserve Manager, Monitoring Biologist personnel, and their contractors consistent with the Plan.

3.1.3.1 Recreational Facilities and Maintenance

This activity category includes the construction and maintenance of recreational facilities such as trails, parking lots, restrooms, wildlife observation platforms, and educational kiosks, which would be built in accordance with the Plan guidelines (see Chapter 7, “Management and Monitoring” for more details). This category also includes construction and maintenance of facilities needed to manage the Preserves, including, but not limited to, Preserve field offices, maintenance sheds, carpools, roads, bridges, fences, gates, and wells. All Preserve management structures will be

constructed to minimize impacts on Covered Species and sensitive vegetation communities. Facilities existing at the time of land acquisition will be used whenever possible. All new facilities will be sited and constructed consistent with site-specific Resource Management Plans, as described in Chapter 7.

3.1.3.2 Management Activities

This category includes all management actions required by the M2 NCCP/HCP or other actions that might be necessary to achieve M2 NCCP/HCP biological goals and objectives. Management actions that will be used within the Preserve System are described in detail in Chapter 7. These actions might include, but are not limited to, the activities listed below. It should be noted that many of these activities overlap.

- **Vegetation Management.** Pesticide/herbicide use is allowed under the M2 NCCP/HCP only to achieve biological goals and objectives (e.g., exotic plant control) in accordance with label instructions and in compliance with state and local laws. Pesticide use is proposed for coverage only under the NCCPA, not the ESA. Grazing and prescribed burning are not anticipated to be used for large-scale vegetation management but may be used selectively to target specific locations or vegetation management issues within the Preserves, provided they are consistent with the M2 NCCP/HCP biological goals and objectives.
- **Fire Management.** This includes mowing, selective thinning of vegetation, and fuel-break establishment.
- **On-site Vehicle Use.** Preserve management staff members may travel through the Preserves on foot or by mountain bicycle, truck, ATV, or other off-road vehicle on designated pathways to inspect or maintain facilities, move or manage livestock, and patrol trails.
- **Relocation of Covered Species.** Relocation may be undertaken within Preserves where impacts are unavoidable and relocation has a high likelihood of success (e.g., translocation of western pond turtle). Relocation is expected to occur in very limited circumstances.
- **Demolition or Removal of Structures or Roads.** May be used to increase public safety or to restore habitat.
- **Control of Introduced Predators.** Such predators may include feral cats and dogs, pigs, red fox, nonnative fish, and bullfrogs, among others.
- **Control of Rodents.** Such rodents may include nonnative squirrels, gophers, rabbits, rats, and mice. Control methods are limited to mechanical control methods only. Rodenticides are not authorized without prior written consent from the Wildlife Agencies. Brodifacoum, bromodiolone, diphacinone, and difethialone chemical products will not be authorized, no exceptions.

3.1.3.3 Habitat Enhancement, Restoration, and Creation

The Plan's conservation strategy identifies that habitat enhancement, restoration, and creation may be necessary within the OCTA Preserves. Enhancement activities generally fall under the Preserve management category. Habitat restoration and creation would generally be disruptive only in the short term; these activities would involve soil disturbance, removal of undesirable plants, and limited grading. All habitat restoration and creation is expected to result in a net long-term benefit for Covered Species and vegetation communities. However, these activities might have temporary or

short-term adverse effects and might result in limited take of Covered Species (see Chapter 4, “Impact Assessment and Level of Take”). All habitat enhancement, restoration, and creation activities conducted within Plan Preserves that are consistent with Plan requirements will be covered by the ESA and NCCPA permits. Habitat restoration activities funded by OCTA as part of the Plan conservation strategy and conducted outside OCTA-acquired Preserves (see Chapter 5, “Conservation Strategy”) are not covered by the Plan because, with the incorporation of appropriate avoidance and minimization measures, it is not anticipated that the restoration projects will result in take of species listed under the ESA or CESA. It will be the responsibility of the entity implementing the restoration project to conduct appropriate environmental review and permitting (see Section 3.3.6, “Funded Restoration Projects”).

3.1.3.4 Species Surveys, Monitoring, and Research

OCTA Preserve Managers and the Monitoring Biologist will conduct surveys for Covered Species, vegetation communities, and other resources within the Preserves on a regular basis for monitoring, research, and adaptive management purposes. These surveys might require physical capture and inspection of specimens to determine identity, mark individuals, or measure physical features, all of which are considered take under the ESA. Surveys for all Covered Species will be conducted by qualified biologists (see Table 7-2 for the definition of “qualified biologist” for each Covered Species). All such survey activity, consistent with the Plan, is covered by the ESA and NCCPA permits.

Research conducted by Preserve Manager and/or Monitoring Biologist personnel or their contractors on Plan Preserves will be covered by the ESA and NCCPA permits as long as the research projects have negligible effects on populations of Covered Species. Research resulting in take of Covered Species that is conducted by other individuals (e.g., academic scientists) will not be covered by the permits because the nature and impacts of these future research projects cannot be predicted at this time, and these researchers are not bound by the terms of the permit.

3.1.3.5 Responses to Changed Circumstances

Responses to Changed Circumstances within the Preserves that might affect populations of Covered Species are covered under the M2 NCCP/HCP (see Chapter 8, “Plan Implementation”). *Changed Circumstances* are defined under the USFWS’ “No Surprises” rule as “changes in circumstances affecting a species or geographic area covered by a conservation plan that can reasonably be anticipated by plan developers and the USFWS and that can be planned for.” Changed Circumstances for the M2 NCCP/HCP include the following reasonably foreseeable events: flood; fire; extended period of reduced precipitation; invasion by exotic species or disease; toxic spills, vandalism, and other illegal human activity; and listing and designation of critical habitat of non-Covered Species. The effects of climate change as they relate to Changed Circumstances are discussed in Chapter 8. Potential management actions following Changed Circumstances are also discussed in Chapter 8 and could include actions such as temporary erosion control features, more intensive weed control, and reseeded with native species following a fire; recontouring and replanting areas affected by flooding; and cleanup and restoration of an area affected by illegal dumping or a small toxic spill.

3.2 Compatible Uses within the NCCP/HCP Preserves

3.2.1 Recreation

Low-intensity recreational use of M2 NCCP/HCP Preserves is allowed on a case-by-case basis under the Plan guidelines (see Chapter 7, “Management and Monitoring”). Plan guidelines and site-specific Resource Management Plans will be developed with the goal of minimizing disturbance to Covered Species from low-intensity recreational activities, including hiking, wildlife observation, equestrian use, and non-motorized bicycling. Take of Covered Species by recreational activities and any type of activity prohibited by the Plan is not covered by the permits.

3.3 Activities Not Covered by the Natural Community Conservation Plan/Habitat Conservation Plan

During development of the Plan, several activities were considered but rejected for coverage; these are discussed below. Permits for these activities would require direct consultation with CDFW and USFWS.

3.3.1 Flood Protection Projects

The Orange County Flood Control District is responsible for providing flood protection within formally designated drainage areas (formed drainages) of Orange County. Construction of flood protection facilities, including detention basins, reservoirs, creeks, and canals, is funded by assessing taxes on real property in Orange County. The district and its property are administered, maintained, and operated by Orange County Public Works (Orange County Public Works 2010), which meets flood control program goals through an integrated process that involves feasibility, hydraulic, deficiency, floodplain, and value-engineering studies; the collection and analysis of data; and the design and construction of projects (Orange County Public Works 2010). Flood protection projects required within the Permit Area and implemented as standalone projects by the Orange County Flood Control District are not covered under the Plan. If improvements to flood protection facilities are required as part of a covered freeway improvement project and included as part of the project design, those improvements are covered as part of the covered freeway improvement project.

3.3.2 Flood Protection Facility Operation and Maintenance

All facilities operated by the Orange County Flood Control District require both routine scheduled and periodic unscheduled maintenance, which is driven by immediate needs. In addition, emergency repairs are occasionally needed following major storm events or natural disasters. Within the inventory area, maintenance of flood protection facilities subject to existing MOUs or Streambed/Lakebed Alteration Agreements with CDFW is subject to the requirements of the existing MOUs or agreements. If maintenance of a flood protection facility is required within the Permit Area, routine, periodic, and emergency operation and maintenance activities are not covered by the Plan. Such activities might include the following:

- Cleaning concrete channels

- Maintaining dams
- Cleaning ditches
- Servicing flapgates
- Grading access roads as needed to maintain access and safety
- Maintaining and cleaning hydraugers
- Mowing, applying herbicides, or trimming trees as needed to maintain design flood capacity, reduce fire hazards, or ensure the safety of the following:
 - Channels and reservoirs
 - Uplands in reservoir basins
 - Access roads
 - Levees
 - Rights-of-way
- Maintaining landscaping along flood control channels and other facilities
- Removing debris or log jams from channels, reservoirs, or trash racks
- Controlling rodents on levees, dams, and other structures to ensure structural integrity
- Repairing or replacing drainage structures, fences, or retaining walls
- Repairing channel banks damaged by erosion or slope failure
- Removing silt within non-tidal areas of natural channels or reservoirs to maintain design flood capacity
- Servicing sub-drains
- Providing emergency cleanup of material spills in channels, creeks, or reservoirs

3.3.3 Utility Construction and Maintenance

Public and private utility infrastructure, such as electric transmission lines, gas pipelines, petroleum pipelines, telecommunications lines, or cellular telephone stations, might cross or need to cross M2 NCCP/HCP Preserves. However, the construction of new utility infrastructure, including associated permanent and temporary access roads, in Preserves is not a Covered Activity. Additionally, routine and emergency maintenance and repairs to existing utilities within M2 NCCP/HCP Preserves are not covered by the Plan. If improvements to utilities are required as part of a covered freeway improvement project and included as part of the project design, those improvements are covered as part of the covered freeway improvement project.

3.3.4 Freeway Operation and Maintenance

Routine freeway operation and maintenance activities that occur within the Plan Area will not be covered by the Plan. Freeway operation and maintenance activities not covered by the Plan include, but are not limited to, these routine and emergency activities:

- Maintenance or replacement of signage

- Maintenance or replacement of traffic-control devices
- Inspection, maintenance, or replacement of guardrails, fences, or crash cushions (median or shoulder barriers should be replaced with structures that are both safe for vehicles and compatible with wildlife movement whenever possible; at a minimum, replacement should not make wildlife movement more difficult)
- Pavement maintenance or resurfacing
- Pavement striping or marker replacement
- Tree trimming or removal for safety
- Debris collection and removal on roads, trash racks, and shoulders
- Natural disaster damage repair
- Storm damage repair
- Vehicle accident repair and cleanup

3.3.5 Emergency Activities

An emergency is a situation involving disasters, casualties, national defense, or security and includes response activities that must be taken to prevent imminent loss of human life or property (USFWS 1996). The Wildlife Agencies will not obstruct an emergency response decision made by the Permittee where human life is at stake. Emergency activities are inherently not covered under the Plan, but many of the actions taken after an emergency, such as habitat restoration following fires or floods, are Covered Activities under the M2 NCCP/HCP (e.g., responses to Changed Circumstances).

3.3.6 Funded Restoration Projects

Restoration projects funded by OCTA as part of the Plan Conservation Strategy (see Section 5.5, "Restoration Projects") could result in various types of temporary and possibly permanent effects on Covered Species and their habitats. Although the net conservation value of these restoration projects is expected to have an overall positive balance, it is possible that these projects will have effects on individual Covered Species and their habitats, which will require an environmental compliance review and possibly permits for incidental take of species. It will be the responsibility of the Restoration Project Sponsors to identify and document potential effects and obtain separate permits, as necessary and appropriate, on their own to address the effects. Effects on Covered Species and their habitats resulting from the funded restoration projects will not rely on this Plan for incidental take coverage. With the incorporation of appropriate avoidance and minimization measures, it is not anticipated that the restoration projects will result in take of species listed under the ESA or CESA.

4.1 Introduction and Approach

This chapter addresses the effects of the Covered Activities described in Chapter 3, “Covered Activities,” on natural communities and Covered Species. Both direct and indirect effects are assessed herein. The acres of effects presented in this chapter represent total effects allowable under the Plan. The effect analysis was based on the two major categories of Covered Activities described in Chapter 3 and listed below.

- Freeway Improvement Projects (freeway projects proposed by OCTA and funded through M2 along 13 freeway road segments).
- Covered Activities within Preserves (preserve management, monitoring, and restoration activities.)

Definitions

The terms below are defined for the purposes of this Plan.

Effects are actions that affect biological resources, specifically undeveloped land cover types and Covered Species, in the Permit Area. Effects can be direct or indirect; they can also be cumulative.

Direct effects are defined as activities or projects that remove or alter land cover types or Covered Species habitat, populations, or occurrences (or portions thereof). Direct effects (e.g., ground disturbance, inundation) are caused by the project and occur at the time and place of project implementation. Direct effects can be either permanent or temporary (see definitions of permanent and temporary effects immediately below).

Permanent effects are direct effects that permanently remove or alter a land cover type or affect a land cover type for more than 1 year (e.g., road widening into a grassland habitat).

Temporary effects are direct effects (e.g., construction staging areas, temporary access roads) that alter land cover for less than 1 year and allow the disturbed area to recover to pre-project or ecologically improved¹ conditions within 1 year of completing construction.

Indirect effects are caused by or a result of a project action. Indirect effects can occur later in time and possibly at some distance, or they may occur at the time of the proposed action but beyond the footprint of a project or activity (i.e., the effects are beyond the area of land cover disturbance but still reasonably foreseeable). Although more difficult to detect and track, indirect effects can undermine species viability or habitat quality, especially if multiple indirect or direct effects work cumulatively to impair the species or degrade the habitat.

¹ *Ecologically improved* means that the site’s ecological functions are better than those present on the site prior to ground disturbance.

Cumulative impacts result from the proposed action's incremental impact when viewed together with past, present, and reasonably foreseeable future actions. Cumulative impacts are defined under both the ESA and NEPA. HCPs do not require a discussion of cumulative effects, as analyzed under NEPA. However, as stated in the HCP handbook, "the applicant should help ensure that those considerations required of the Services by Section 7 have been addressed in the HCP" (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1996:3-15). Accordingly, the Plan and Plan EIR/EIS includes an analysis of cumulative effects, as defined under ESA regulations, of non-federal activities that are reasonably certain to occur.

4.2 Type and Amount of Effects

In the following discussion, the type and amount of effects associated with the Covered Activities are grouped for the purposes of analysis and in accordance with the description of Covered Activities presented in Chapter 3, "Covered Activities."

4.2.1 Freeway Improvement Projects

Covered freeway improvement projects consist of the projects proposed by OCTA under M2 along 13 freeway segments. The freeway improvement projects are, in all instances, along existing freeways and include lane additions, interchange improvements, and associated facility (storm drains, utilities, etc.) upgrades. Covered freeway improvement projects do **not** include the construction of new freeways through blocks of natural habitats. The effects from these projects are associated with habitat and ecosystems occurring along existing freeways. These projects are the primary source of the potential effects considered in this Plan.

4.2.1.1 Direct Effects

Freeway improvement projects are expected to result in permanent direct effects with the conversion of land from undeveloped to developed. Temporary direct effects on land cover are also expected as a result of staging areas and other temporary uses of non-developed land for construction purposes. However, proposed freeway improvement projects, which are designed to increase the width of existing facilities, would result primarily in the conversion of disturbed land along the edges of existing facilities to developed land. Further isolation of remaining natural habitat within the Plan Area is unlikely because construction of new roads is not proposed.

For the purposes of this Plan, OCTA developed "planning-level" footprints for each of the freeway improvement projects (see Table 3-1). At this stage of project design, these footprints do not distinguish between permanent and temporary effects.² For the effects evaluation, the entire footprints were considered direct effects. Table 4-1 provides a summary of the amount of direct effects from the freeway improvement projects.

² Permanent and temporary effect footprints for freeway improvement projects are not currently available. Therefore, direct effect calculations for these projects do not distinguish between permanent and temporary effects. Despite this, it is reasonable to assume that each freeway improvement project will be associated with both permanent and temporary direct effects.

Table 4-1. Freeway Improvement Projects—Direct Effects

Project	Segment	Total Direct Effect Footprint (acres)	Natural Habitat within Direct Effect Footprint (acres) ¹
A (I-5)	--	258.5	11.1
B (I-5)	--	339.7	5.2
C (I-5)	1 (El Toro to SR-73)	203.5	0
	2 (PCH to Pico)	156.2	5.7
D (I-5)	--	73.1	0.2
E (SR-22)	--	121.8	0
F (SR-55)	--	400.6	10.8
G (SR-57)	--	369.1	22.9
H (SR-91)	--	122.1	0
I (SR-91)	--	184.9	9.5
J (SR-91)	--	322.1	36
K (I-405)	--	543.9	0
L (I-405)	--	448.1	41.9
M (I-605)	--	21.6	0
Totals²		3,431.0	141.0

¹ The amount of direct effect has been adjusted to address the low level of precision and accuracy of the regional habitat data and allow for habitat types with small impacts to serve as a reasonable cap to direct effects under the Plan. See Section 4.3.1, "Effects on Natural Communities/Land Cover," for further explanation.

² Totals are slightly different from the sum of the individual projects as a result of some overlap of project footprints.

The improvement projects along the 13 discrete freeway segments represent the best forecast by OCTA on how the M2 construction funds will be utilized. It is possible that some adjustments/revisions to the freeway improvement projects may occur as a result of changes in the environmental setting, changes in traffic conditions, and/or other transportation planning factors. OCTA may address changes in project location and anticipated impacts through a Minor Amendment (see Section 8.5, "Amending the Plan"), provided that the revised freeway improvement project location is within the permit area, changes do not exceed the caps on impacts on habitat types, result in an increased level of take for Covered Species, or result in new environmental impacts that were not addressed in the Plan and the EIR/EIS. Changes that do not meet these criteria would necessitate a Major Amendment.

4.2.1.2 Indirect Effects

Covered freeway improvement projects may have effects on biological resources beyond the direct effects of the construction footprints and project duration, resulting in indirect effects during and after construction. Many ecological effects of transportation are subtle and gradual, making the extent and amount of indirect effects difficult to quantify (NRC 1997). Forman and Deblinger (2000) estimated that the maximum distance of ecological effects, including factors such as altered streams, habitat invasion by exotics, noise, and animal density, from a suburban freeway averaged about 1,000 feet, but they noted a high degree of variability in that average. However, for the purposes of this Plan, the Wildlife Agencies provided guidance that utilized a buffer of 300 feet around the direct

effect footprint to estimate the level of indirect effects. Although some indirect effects on Covered Species may extend beyond 300 feet from the edge of the roadway, it should be recognized that the proposed freeway improvement projects consist primarily of improvements along existing roadways; therefore, potential indirect effects will be limited to incremental increases of existing indirect effects. These incremental increases will be concentrated in the area closest to the edge of the roadway. Table 4-2 provides a summary of the amount of indirect effects from the freeway improvement projects.

Table 4-2. Freeway Improvement Projects—Indirect Effects

All Projects	Total Indirect Effect Footprint (acres)	Natural Habitat within Indirect Effect Footprint (acres)
Total	7,268.5	484.4

The primary types of indirect effects associated with freeway improvement projects will include those listed below.

Noise and Light Pollution. Construction equipment and activities may result in a temporary increase in noise and light pollution around project sites, while the increased traffic volume along improved freeways may be associated with noise and lighting effects that may extend beyond existing background levels. In North America, the abundance of at least 20 bird species previously categorized as common has declined more than 50% in the last 40 years. One likely contributor is the expansion and widening of paved roads and corresponding increases in the speed and volume of vehicles on those roads (Kociolek et al. 2011). Bird breeding success for a wide variety of species can be inversely correlated with proximity of the breeding site to roads. Light pollution may affect essential wildlife behavior, including movement through wildlife corridors, feedings, and reproduction patterns. Some artificial lighting structures attract migrating bird species, increasing the probability that they will be preyed upon or involved in collisions. They may also have their flight paths redirected, which may deplete their energy stores (Kociolek et al. 2011). Birds can use meaningful sound to assist with normal activities, such as communication, navigation, avoiding danger, or finding food against a background of noise. Excessive noise may cause disturbance (i.e., a detectable change in behavior) or damage (i.e., harm to health, reproduction, survivorship, habitat use, distribution, abundance, or genetic distribution) as a result of periodic flushing from the nest or roost sites, nest abandonment, egg infertility, or abandonment of territory.

Air Pollution. Important ecological effects are associated with chemical pollutants emitted into the atmosphere by motor vehicles. These emissions may become widely dispersed and alter air, water, and soil chemistry over large areas, thus affecting ecosystems through mechanisms as varied as exposure to tropospheric ozone and haze to acid deposition and nitrogen enrichment (NRC 1997). The combustion of fossil fuels used in transportation accelerates the process that causes increased concentrations of carbon dioxide in the atmosphere. Transportation is a close second to industry as the energy-use sector producing the most carbon dioxide emissions (NRC 1997). Besides carbon, an excess input of nitrogen can affect biodiversity and ecosystem function significantly because nitrogen is usually a limiting factor. Differences in the rate of nitrogen assimilation among species can eventually alter the mix and abundance of plants in the ecosystem to the point of affecting the communities that support rare species (NRC 1997, Weiss 1999). Besides its role in soil and water acidification or nutrient enrichment, nitrous oxide is an ozone-depleting substance and a long-lived greenhouse gas that has potential implications for global nitrogen cycling and future changes in

climate (NRC 1997). Road traffic can also mobilize and spread dust, which can block photosynthesis, respiration, and transpiration in plants or cause physical damage that can alter plant community structure (Trombulak and Frissell 2000).

Hydrology and Water Quality Effects. Nearby streams and wetlands may be affected by increased sedimentation or runoff during or after construction or by runoff of oil and grease from larger roads with more traffic (Angermeier et al. 2004). Roads directly change the hydrology of slopes and stream channels, resulting in surface-water habitats that are often detrimental to native biota (Trombulak and Frissell 2000). The covered freeway improvement projects will result in the conversion of undeveloped land to developed land cover types. This conversion increases the amount of impervious surfaces within the Plan Area. Impervious surfaces are materials of natural or anthropogenic sources that prevent the infiltration of water into soil. Impervious surfaces can affect the flow, sedimentation load, water temperature, and pollution composition of stormwater runoff. The proliferation of impervious surfaces fundamentally alters the timing of precipitation runoff, resulting in higher peak flows during storms and lower base flows or flooding that incises channels and adds sediment to bottom substrates (Angermeier et al. 2004). In addition, construction-related activities may result in contamination spills that affect water quality in nearby streams and wetlands. Covered Species relying on aquatic habitats are especially vulnerable to hydrological and water quality effects.

Introduction and Spread of Invasive Species. Construction activities related to freeway improvement projects present opportunities for the introduction and/or proliferation of invasive plant species in the Plan Area. Roads disperse exotic species through three mechanisms: providing habitat by altering conditions, making invasion more likely by stressing or removing native species, and allowing easier movement by wild or human vectors (Trombulak and Frissell 2000). Although roads may provide dispersal corridors for animals and plants, by providing linear strips of suitable habitat within an otherwise hostile landscape, they can also act as immigration corridors for exotic and invasive species worldwide (Holderegger and Di Giulio 2010). Construction equipment and personnel can serve as vectors for the transport of invasive species, especially plant seeds and propagules. Vegetation clearing at project sites allows invasive species to establish. These species are generally fast growing and thrive in disturbed habitats. Once established, they can spread quickly into natural areas and out-compete native species for resources.

Habitat Connectivity. Of all the indirect effects of roads, the barrier to movement, migration, and gene flow they present may have the greatest effect on vertebrates (Forman and Alexander 1998). Roads can increase the functional isolation of populations, which in turn can have genetic effects. In a recent review of the genetic effects of roads, 19 species-specific studies (on invertebrates, amphibians, and mammals) were identified, of which 14 reported negative effects on genetic diversity and five reported no effects (Holderegger and Di Giulio 2010). In all cases, freeway improvement projects are designed to improve existing freeway infrastructure, and therefore, wildlife movement and habitat connectivity/fragmentation effects have already occurred with original construction of these roadways. For the most part, these projects occur within urbanized areas where habitat connectivity is not an issue. There are a few instances in which the freeway improvement projects are located between blocks of natural habitat (e.g., SR-91 between the Chino Hills and Santa Ana Mountains and SR-57 through the Chino Hills) or adjacent to key habitat linkages. These areas, which are highlighted on Figure 4-1, show the freeway improvement project locations on top of the core and linkage areas. The potential for wildlife movement across freeways in these locations will require closer scrutiny of the existing structures (culverts, underpasses) that support wildlife movement.

Risk of Fire Ignition. Wildfires can be ignited along the edge of freeways by car fires, flares, sparks, discarded cigarette butts, and various other freeway sources/activities. The freeway improvement projects will expand existing freeways, resulting in greater traffic volumes along these existing routes. The risk of fire ignition will be slightly increased. This risk is greatest in situations where blocks of natural habitat are adjacent to freeways, as noted on Figure 4-1.

Vehicular Mortality. The addition of lanes and other road improvements will result in wider roadways and increases in traffic volumes that may contribute to slight increases in the existing level of vehicular mortality (road kill). Caltrans has been collecting information on road kill within Orange County since 1998. A summary of historical road kill (large mammals only) along freeway segments that are part of the Covered Activities is included in Table 4-3 and shown on Figure 4-2.

Table 4-3. Freeway Improvement Projects—Road Kill Data

Species	Along Freeway Segments That Are Part of Covered Freeway	
	Improvement Projects	Within Plan Area
Coyote	55	401
Deer	31	283
Bobcat	3	43
Mountain Lion	0	8
Total	89	735

¹ Road kill data collected by Caltrans between 1998 and 2012. Data entered into GIS by USFWS.

4.2.1.1 Cumulative and Growth-Inducing Effects

Covered freeway improvement projects will result in the expansion and improvement of existing freeway infrastructure. Therefore, the primary biological effects have already occurred with original construction of these roadways. In addition, although development and infrastructure improvements will continue within Orange County, about 70% of the remaining undeveloped open space in the county is protected. Therefore, the county is unlikely to experience major land use changes in the future. The cumulative effects of the project (i.e., project-related effects in combination with past, present, and future impacts) are likely to be limited across the Plan Area. The covered freeway improvement projects, as defined in the Regional Transportation Plan, are considered growth accommodating and do not represent a growth-inducing impact.

4.2.2 Covered Activities within Preserves

Some activities that are expected to occur as part of the Plan's conservation strategy to acquire and manage Preserves may adversely affect some Covered Species and natural communities. These effects are expected to be limited with respect to severity and generally temporary. Additionally, the overall conservation strategy implementation is expected to have a net benefit on all Covered Species and their habitats. However, because there is the potential for activities within the Preserves to result in take, these activities require coverage under this Plan.

Most activities associated with Preserve management and monitoring will not result in habitat loss or take of Covered Species. Therefore, the effects are assumed to be negligible and temporary and were not specifically identified in the quantitative effect estimates calculated for the Plan. New trail, firebreak, access road, or recreation and management facilities construction may result in habitat loss and more significant permanent effects on Covered Species. For purposes of this Plan, a conservative estimate and threshold of 13 acres was determined to be the maximum amount of habitat loss resulting from these types of activities within all Preserves to be acquired. The estimate of 13 acres represents approximately 1% of the overall natural habitat acreage anticipated to be acquired under this Plan (approximately 1,232 acres). A summary of effects resulting from the Covered Activities within the Preserves is included in Table 4-4.

Table 4-4. Overall Effects Resulting from Covered Activities within Preserves

Covered Activities within Preserves	Maximum Amount of Direct Effects on Natural Habitat
New Facilities, Firebreaks, and Trails within Preserves	13 acres

OCTA and Preserve Managers will track any activities resulting in more than 0.1 acre of new direct effects on natural habitat within the Preserves and record this information in a ledger that will be submitted to the Wildlife Agencies as part of the Plan’s annual report (see Section 8.4, “Annual Reporting Requirements”). In addition, any plans for new facilities, firebreaks, and/or trails will be listed within each individual Preserve RMP. A resource assessment shall be conducted during the siting of new facilities or trails and submitted to the Wildlife Agencies prior to construction. RMPs will be re-evaluated every 5 years by the Preserve Manager and Wildlife Agencies and updated as needed. Any updates to RMPs shall be reviewed and approved by the Wildlife Agencies. Some Preserves will most likely have a greater concentration of new facilities and trails than others, but OCTA will ensure that the overall cap of 13 acres is not exceeded. In addition, acreage may be added to the 13-acre cap by OCTA if degraded habitat within the Preserves is restored and converted to native habitat and approved by the Wildlife Agencies.

Preserve management and recreation will also increase human presence in natural areas. Increased exposure to humans may disturb Covered Species (e.g., humans may trample covered plant species). Additionally, increased human presence on Preserves may facilitate the spread of invasive nonnative plant and animal species and disease. Finally, covered Preserve management, monitoring, or restoration activities that require the use of off-road vehicles may result in vehicular effects on the Preserve (e.g., wildlife strikes, vegetation crushing, water quality issues, erosion of trails and roads, etc.).

All activities within Preserves will be designed to avoid or minimize take of Covered Species. The NCCP and ESA permits will cover the activities of OCTA and Preserve Manager personnel, their contractors, and lessees consistent with this Plan. An additional description of the types of effects associated with Preserve management and monitoring is provided below.

Management and Recreational Facilities. Management and recreational facilities built and maintained by the Preserve Managers to support Preserves could result in a limited amount of habitat removal. In many cases this removal may be permanent in nature. Management and

recreational facilities may require the construction of new trails or access roads, storage sheds, kiosks, or interpretive centers. These features, especially trails and access roads, can fragment otherwise intact landscapes and facilitate the invasion and spread of nonnative species. Facilities will be sited and constructed to avoid or minimize their effects on Covered Species and sensitive habitats. However, a limited amount of take may nevertheless occur.

Management Activities. Management activities may also disturb or inadvertently harm Covered Species. For example, fuel modification zones may be created and maintained around structures, or areas of defensible space may be required in particular areas of the Preserves to minimize the risk of wildfire and protect structures and adjacent lands. Creating and maintaining these fuel modification zones and areas of defensible space may have minor adverse effects on Covered Species and their habitats. However, they are considered permanent impacts.

Recreation. Allowing recreational activities on Preserves is expected to have some minor effects on Covered Species. Heavily used trails may result in some permanent indirect effects on wildlife habitat connectivity and habitat use. However, because the trails will be sited to avoid areas believed to be most heavily used by wildlife, and because the trails will be for daytime use only and wildlife species are most active at dawn and dusk or at night, disruptions to wildlife movement are not anticipated to be significant. Trails are often a source of invasion by nonnative plant species that are transported into the Preserve by trail users. As described in Chapter 7, “Management and Monitoring,” recreational uses will be limited to low-intensity activities such as hiking, wildlife observation, equestrian use, and non-motorized bicycling. Although some minor and temporary disturbance of wildlife is anticipated from recreational activities allowed within the Preserves, no take of Covered Species resulting from public use within Preserves is anticipated because such usage will be monitored and consistent with a Wildlife Agencies–approved RMP for each Preserve and the guidelines of this Plan. As such, the permits under NCCPA and ESA do not cover take by private individuals who are in non-compliance with these guidelines.

Habitat Enhancement and Restoration. Some habitat enhancement and restoration activities may occur within Preserves acquired under this Plan as part of ongoing Preserve management. These activities would result in the potential for temporary and adverse effects on Covered Species and their habitats. For example, invasive species control activities could temporarily disturb birds in the surrounding vegetation. Seed collection for use in habitat/species restoration is also authorized under this Plan. Despite these potential effects, these activities will, in the long-term, provide a net benefit to Covered Species and their habitats.

Species Surveys, Monitoring, and Research. Monitoring and research activities required by the Plan (see Chapter 7, “Management and Monitoring”) may also disturb wildlife. For example, to determine the presence of some Covered Species, individuals must be handled by a qualified biologist, as defined for each Covered Species in Table 7-2. Such handling constitutes a form of take (e.g., pursue, trap, capture, collect) under the ESA and requires authorization. All biologists conducting monitoring for Covered Species under the Plan (i.e., Monitoring Biologist, Preserve Manager staff members, or their consultants) will be covered for take of Covered Species associated with monitoring and research activities required by the Plan; however, biologists must possess a valid state-issued scientific collecting permit, if required, and appropriate skill levels and/or experience to work with Covered Species. See Chapter 7 for details regarding the certification biologists will need to conduct monitoring activities; such certification will minimize the potential take of individual Covered Species resulting from authorized monitoring and research activities. Research resulting in take of Covered Species that is conducted by other individuals (e.g., academic

scientists) will not be covered by the Plan because the nature and impacts of these future research projects cannot be predicted at this time, and these researchers are not bound by the terms of the permit.

Response to Changed Circumstances. Responses to Changed Circumstances covered by this Plan within the Preserves have the potential to affect Covered Species. Potential management actions following Changed Circumstances could include actions such as temporary erosion control features, more intensive weed control, and reseeded with native species following a fire; recontouring and replanting areas affected by flooding; temporary closure of trails or trail segments; and cleanup and restoration of an area affected by illegal dumping or a small toxic spill. With limitations on the activities that can be conducted in association with Changed Circumstances (described in more detail in Chapter 8.6, “Regulatory Assurances, Changed Circumstances, and Unforeseen Circumstances”), responses to Changed Circumstances are not anticipated to have a substantial negative impact on Covered Species. Rather, these responses are viewed as necessary to maintain the biological integrity of the Preserves.

4.3 Effects on Biological Resources

Implementation of Covered Activities may result in some incidental take of Covered Species and their habitat. To meet regulatory requirements and properly mitigate effects, the amount of take must be discussed and, if possible, quantified. Figure 3-1 shows the locations of the freeway improvement projects proposed for coverage under this Plan. The allowable amount of take associated with the freeway improvement projects was quantified by overlaying the direct and indirect effect footprints on natural communities, predicted species habitat, species occurrences data, and designated critical habitat. Effects resulting from Preserve implementation activities were estimated for natural communities and predicted species habitat.

Total allowable take of Covered Species habitat, as described and quantified in the Plan, represent the limit, or cap, on total take permitted under the Plan. Once these take levels are reached, no further take is permitted, pursuant to the NCCP and ESA permits. Total allowable take estimates are expected to over-predict actual effects resulting from Covered Activities. Therefore, take reported in this chapter represents a worst-case scenario for activities covered under the Plan. Regardless, OCTA will track take during Plan implementation to ensure that no Covered Activities are conducted that would result in the level of take authorized under the Plan and Permits to be exceeded.

As previously mentioned, the direct effects of freeway improvement projects are not broken out by temporary or permanent effects. Although effects from Covered Activities will be both permanent and temporary in nature, project footprints currently do not distinguish between these two types of effects. To facilitate the analysis, general project footprints were used to quantify direct effects calculations for covered freeway improvement projects. Resulting effect calculations were treated as permanent effects, most likely overestimating the actual extent of permanent effects on biological resources. Further, temporary effect areas associated with Covered Activities will be restored to pre-project conditions. Therefore, temporary effects resulting from Covered Activities will most likely be absorbed by conservative permanent effect estimates.

As Covered Activities are implemented, project-specific impacts will be more accurately quantified. The goal of the take analysis in this Plan is to identify practical and appropriate, yet conservative take assumptions to ensure that OCTA has full coverage for implementing Covered Activities throughout the Permit term. Because the take analysis is based on regional-level habitat mapping

and the tracking of impacts will be completed using project-specific field survey information, OCTA, in coordination with the Wildlife Agencies, made adjustments to the amount of allowable take for each individual habitat types to account for the precision and accuracy of the regional-level habitat mapping data (see Table 4-5). The adjustments were made to ensure that each habitat type had a reasonable cap (e.g., chaparral was adjusted from 0.3 acre to 5 acres). Some habitat types were adjusted an additional amount based on anecdotal review of the limitations of the regional habitat data (e.g., woodlands were adjusted from 0.1 acre to 10 acres). The revised estimates of take were applied throughout the conservation analysis in this document.

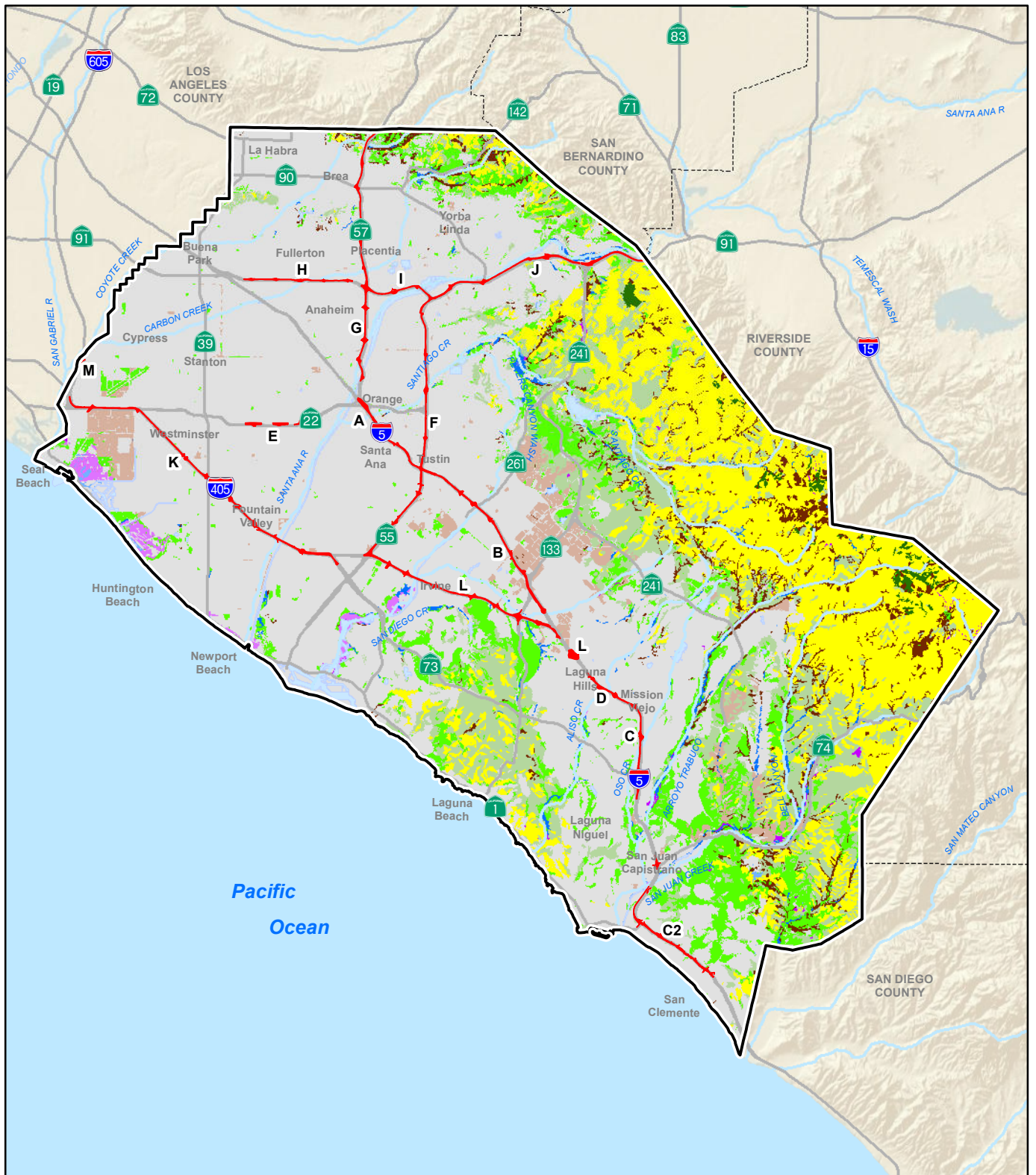
4.3.1 Effects on Natural Communities/Land Cover

To estimate effects resulting from implementation of Covered Activities over the course of the Permit term, the direct and indirect effect footprints were overlaid with the natural community information (see Section 2.4.1 for a description of the methods and data sources used to create the natural communities information used in this Plan). Potential effects on each natural community cover type are summarized in Table 4-5 and shown in Figure 4-3.













Table 4-5. Potential Effects on Natural Communities (acres)

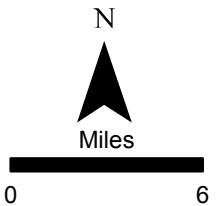
Natural Communities	Total in Plan Area	Covered Freeway Improvement Projects			Covered Activities in Preserves
		Direct (calculated) ¹	Direct (adjusted) ²	Indirect ³	Direct (estimated) ⁴
Chaparral	82,965	0.3	5.0	41.9	5.9
Coniferous Forest	1,930	--	0.0	--	--
Grassland	41,635	108.1	108.1	280.9	0.8
Riparian	4,457	2.0	5.0	57.0	0.2
Scrub	59,427	5.2	10.0	85.2	2.8
Water	2,696	--	0.4	0.1	--
Wet Meadows / Marsh	2,235	--	2.5	--	--
Woodland	13,995	0.1	10.0	19.3	3.3
Totals	209,340	115.7	141.0	484.4	13.0

¹ Direct effects resulting from freeway improvement projects include both permanent and temporary effects.
² The amount of direct effect for individual habitat types has been adjusted to address the low level of precision and accuracy of the regional habitat data and allow for habitat types with small impacts to serve as a reasonable cap to direct effects under the Plan.
³ Indirect effects have been estimated using a 300-foot buffer around direct effect areas.
⁴ Direct effects associated with Preserve implementation activities will be capped at no more than 13 acres of the natural habitat within the Preserves. The estimated amount of the effect on each individual natural community type is proportional to the overall distribution of habitat types within the Preserves.



Legend

- | | | |
|--|---|---|
|  Covered Freeway Improvement Projects |  Scrub |  Woodland |
|  Chaparral |  Coniferous Forest |  Water |
|  Grassland |  Barren |  Agriculture |
|  Wet Meadows/Marsh |  Developed | |
|  Riparian | | |



Potential Effects on Natural Communities

Figure 4-3

The data provided and assumptions made represent reasonable worst-case assumptions of future project effects. The actual effects may vary from those presented in Table 4-5. Through judicious siting, they would most likely be less than the estimated effects for sensitive habitat. As shown in Table 4-5, direct effects on sensitive natural communities are minimal. Grasslands are the most heavily affected natural land cover type because they are especially common in previously disturbed areas, including areas surrounding existing freeway infrastructure. However, most of the grassland impacts would be on highly degraded areas immediately adjacent to existing freeways. These areas have been mapped as grassland but provide less habitat value than typical grassland communities because they are exposed to a variety of indirect effects such as noise, light, pollution, and invasion by nonnative weedy species.

4.3.2 Effects on Covered Species

Freeway Improvement Projects

For all Covered Species, the assessment of effects associated with covered freeway improvement projects was based on the intersection of the direct and indirect footprints with the predicted species habitat models, known species occurrences, and designated critical habitat. Table 4-6 on the following page provides a summary of this analysis. Each of the factors used to evaluate effects on Covered Species has advantages and limitations for this analysis, as discussed below.

Predicted Species Habitat Models. Species models are important tools to utilize when evaluating species effects at a landscape scale, especially when it is not feasible to conduct comprehensive species surveys across the entire Plan Area. These models tend to be conservative (i.e., over-predict); the results generally overstate the actual effects on species. Not all of the predicted suitable habitat is likely to be occupied by the subject species.

The methods and assumptions used to develop the species models are included in Appendix C.3. The species models are based on biological and physical factors that have been mapped at a regional scale. The most important factor driving the species models is generally the natural communities mapping. Because the natural communities mapping (as described in Section 2.4.1) has not been field mapped and verified within the M2 project effect areas, the species models provide a rough effect assessment. The calculation of direct effects on predicted species habitat models has been modified to account for the adjustments to the direct effects on natural communities (see Table 4-5). This was done by determining the proportion of each species model by vegetation type and then adding the appropriate percentage of the habitat adjustments into the species model calculation. For example, the calculations used to adjust the direct effects for intermediate mariposa lily are shown in Table 4-7.

Table 4-6. Potential Effects on Covered Species

Species	Predicted Species Habitat or Critical Habitat Impacts (acres)				Current Known Occurrences ¹	
	Freeway Improvement Projects			Preserve Management	Freeway Improvement Projects	
	Direct (calc.)	Direct (adj.) ²	Indirect	Direct	Direct	Indirect ³
Plants						
Intermediate mariposa lily	0.4	3.9	28.1	3.3	0	0
Many-stemmed dudleya	6.2	11.1	83.7	8.2	0	0
Southern tarplant	7.3	9.2	35.3	0.1	0	0
Fish						
Arroyo chub	0.1	0.1	1.9	0.0	0	1/1
Reptiles						
Coast horned lizard	55.5	63.4	184.2	5.6	0	0
Orangethroat whiptail	42.6	45.1	110.7	0.5	0	2/2
Western pond turtle					1/2	1/7
Aquatic	0.9	3.1	16.5	0.1		
Upland	33.4	45.8	283.8	5.9		
Birds						
Cactus wren	5.2	9.7	85.2	2.7	0	2/3
Coastal California gnatcatcher					2/6	5/9
Very High		2.4	13.9	1.2		
High	1.7	3.5	53.1	0.8		
Moderate	2.0	2.7	24.2	1.4		
Low	1.3	1.7	4.8	1.1		
Total	5.0	10.3	96.0	4.5		
Critical Habitat	11.9		123.9	7.4		
Least Bell's vireo	2.0	4.9	55.2	0.1	4/21	10/14
Southwestern willow flycatcher	2.0	5.1	60.5	0.1	0	0
Mammals						
Bobcat	25.0	45.9	246.0	13.0	--	--
Mountain lion	5.5	20.9	123.0	10.7	--	--

¹ Includes only current known occurrences (since 1990).

² The calculation of direct effects on predicted species habitat models has been modified to account for adjustments to direct effects on vegetation communities (see example in Table 4-6).

³ If a known occurrence polygon touches both the direct and indirect footprints, it is counted as being only directly affected. If a known occurrence polygon touches only the indirect footprint area, than it is counted as being indirectly affected.

Table 4-7. Example of Adjustments to Predicted Species Habitat Models

Natural Communities	Total in Plan Area	Intermediate Mariposa Lily			
		Habitat in Species Model in Plan Area	Percent of Plan	Habitat Adjusted	Added to Species Model Effects
Chaparral	82,965	35,191	42.4%	4.7	2.0
Coniferous Forest	1,930				
Grassland	41,635	1,996	4.8%		
Riparian	4,457			3.0	
Scrub	59,427	18,436	31.0%	4.8	1.5
Water	2,696			0.4	
Wet Meadows/ Marsh	2,235			2.5	
Woodland	13,995			9.9	
Totals	209,340	55,623		25.3	3.5
Direct Effects Calculated:					0.4
Direct Effects Adjusted:					3.9

Known Species Occurrences. Effects were also assessed at the occurrence level using data from the CNDDDB and other databases (see Section 2.4.2.3). Because comprehensive field surveys have not been completed along the areas of the freeway improvement projects, the occurrence information helps to provide information regarding known occupied habitat, but it is biased toward those areas in which surveys have occurred.

The occurrence information is represented as polygons, with the size of the polygon based on a buffer created from the center point, which correlates to the degree of accuracy in which the known occurrence was mapped. In some instances (particularly plant populations), a definitive polygon shape was mapped. For the purposes of the effect analysis in this Plan, a known occurrence was considered affected if the polygon touched the direct and/or indirect effect footprint. If an individual occurrence polygon touched both the direct and indirect footprints, that occurrence was counted as being only directly affected. The amount of area of a known occurrence that overlapped with the impact footprints was not considered. The results of the known occurrence evaluation are presented as occurrences and number of individuals, not acres.

Designated Critical Habitat. Critical habitat is designated through rulemaking issued by USFWS and NOAA Fisheries for specific areas that have the physical and biological features essential to the conservation of listed species. Section 7 of the ESA prohibits federal agencies from taking actions that are likely to result in the destruction or adverse modification of designated critical habitat. Designated final critical habitat for coastal California gnatcatcher is found in the Plan Area. Critical habitat for southwestern willow flycatcher was finalized on January 3, 2013 (78 FR 344), but the species does not occur within the Plan Area. See Figure 2.7 for a map of gnatcatcher critical habitat within the Plan Area.

Covered Activities within Preserves

Direct effects on Covered Species associated with the Covered Activities within Preserves are expected to be minor. Prior to any direct effects within the Preserves, comprehensive surveys will be completed to identify and document the location of known individuals, including locations of recent (since 1990) known occurrences and occupied habitat within the Preserves. The types of new facilities that may be constructed within Preserves (kiosks, new trails, trail heads, maintenance facilities, etc.) will generally have the flexibility to be sited away from sensitive resources. The amount of direct effects on individual Covered Species habitat resulting from Preserve implementation is anticipated to include only 13 acres of total impact across all Preserves. Impacts on known occurrences will be largely avoided.

Covered Preserve management, monitoring, and restoration activities may also indirectly affect Covered Species. Overall, these Covered Activities will increase exposure of Covered Species to humans throughout the Preserves. Covered Preserve management, monitoring, or restoration activities that require the use of off-road vehicles may result in occasional wildlife disturbance or vehicular wildlife strikes and a small amount of vegetation crushing within Preserves.

Species-by-Species Effects Assessments

The following species-by-species sections provide a brief accounting of the direct and indirect effects on each of the Covered Species. A more detailed analysis comparing the effects from Covered Activities with the conservation achieved under the Plan is included in Chapter 6, "Conservation Analysis." Additional background information for each species is included in Appendix C, including descriptions of the methods and assumptions in the species models (Appendix C.3) and species accounts (Appendix C.2), which provide more detail about possible threats to each of the Covered Species.

4.3.2.1 Intermediate Mariposa Lily

Potential effects from covered freeway improvement projects associated with intermediate mariposa lily are included in Table 4-8 and shown on Figure 4-4.

Table 4-8. Potential Effects on Intermediate Mariposa Lily

Biometrics	Total within Plan Area	Direct Effects	Estimate of Indirect Effects
Predicted Species Habitat Model (acres)	55,623	3.9	28.1
Known Occurrences (occurrences/individuals)			
Current	329/23,966	0	0
Historic (pre-1990)	15/15	1/1	0
Critical Habitat (acres)	N/A	N/A	N/A

N/A = not applicable

Intermediate mariposa lily occurs on dry, rocky, open slopes in coastal sage scrub, chaparral, and grassland communities with elevations between 345 and 2,806 feet.

The covered freeway improvement projects potentially affecting this species include:

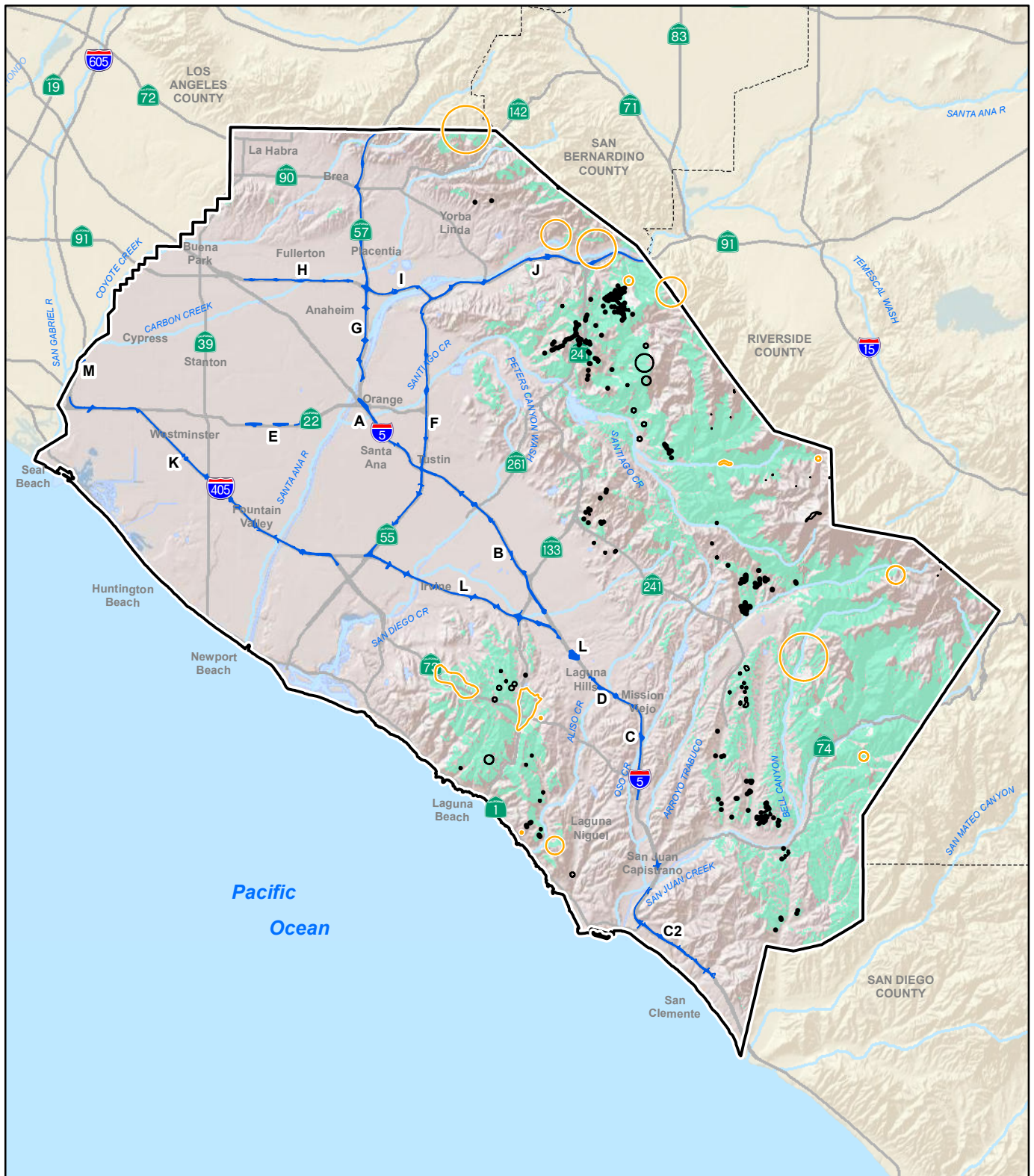
- Species model within direct footprint—Project J
- Species model within indirect footprint—Project J

The known occurrence within direct and indirect footprints is:

- Historic (pre-1990)—Project J

Indirect effects that could affect intermediate mariposa lily include:

- Introduction and spread of invasive species
- Increased human presence within Preserves

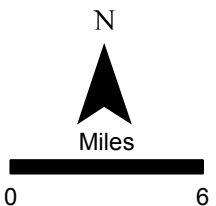


Legend

- Covered Freeway Improvement Projects
- Predicted Species Habitat
- Current Occurrence (1990 or later)
- Historic Occurrence (before 1990)

Sources:

Species Occurrences: Bonterra 2012, CNDDDB 2013, USFWS 2013, USFS 2013, Bonterra-Psomas/OCTA/CDFW 2015
 Species Model: ICF/TAIC 2013



Potential Effects on Intermediate Mariposa Lily
Calochortus weedii var. *intermedius*

Figure 4-4

4.3.2.2 Many-stemmed Dudleya

Potential effects from covered freeway improvement projects associated with many-stemmed dudleya are included in Table 4-9 and shown on Figure 4-5.

Table 4-9. Potential Effects on Many-stemmed Dudleya

Biometrics	Total within Plan Area	Direct Effects	Estimate of Indirect Effects
Predicted Species Habitat Model (acres)	91,237	11.1	83.7
Known Occurrences (occurrences/individuals)			
Current	225/58,948	0	0
Historic (pre-1990)	27/6,225	1/1	0
Critical Habitat (acres)	N/A	N/A	N/A

Many-stemmed dudleya occurs within open chaparral, coastal sage scrub, and grasslands, often on heavy clay soils with elevations from 49 to 2,592 feet.

The covered freeway improvement projects potentially affecting this species include:

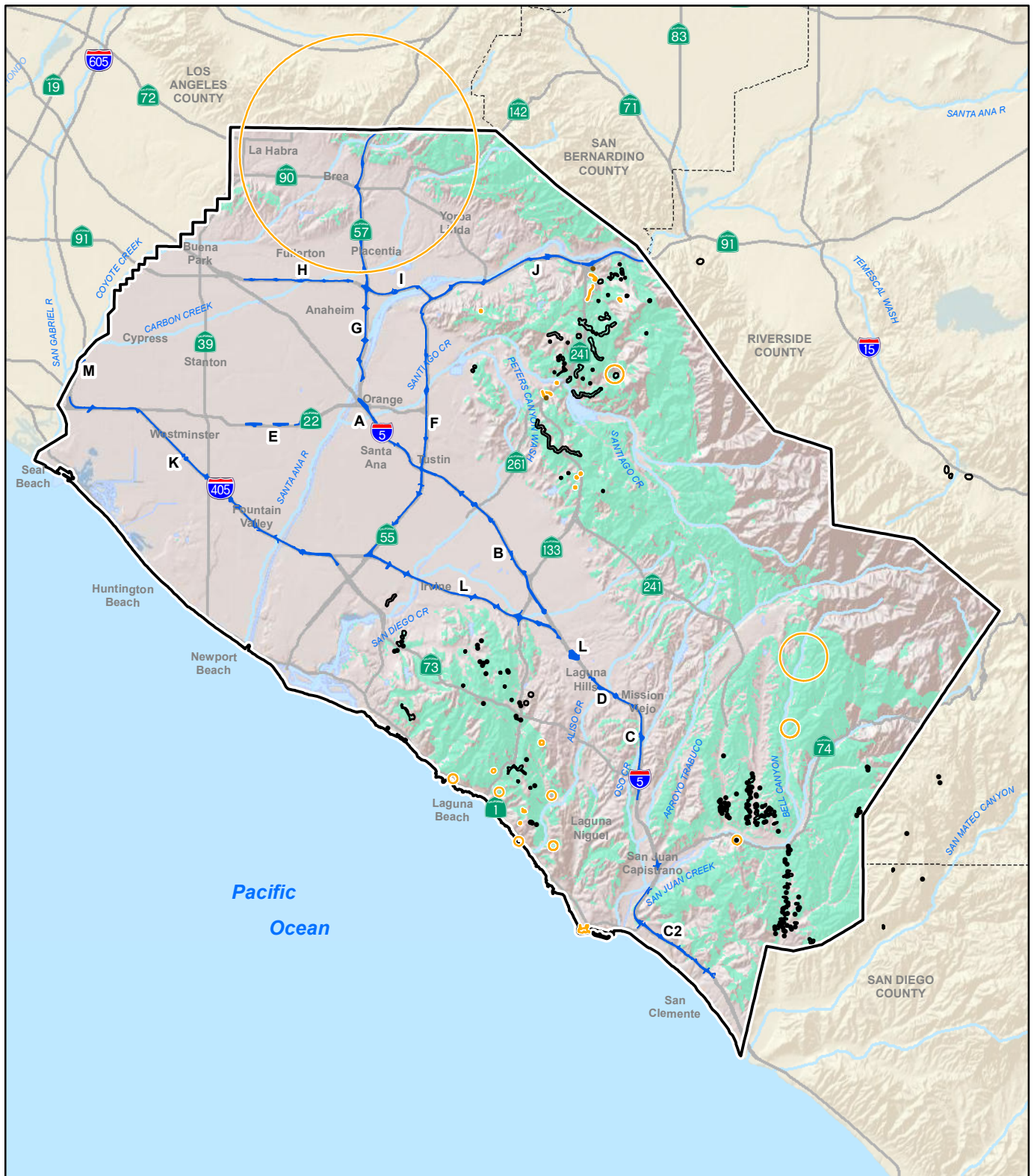
- Species model within direct footprint—Projects C, C2, G, J, and L
- Species model within indirect footprint—Projects C, C2, G, J, and L

The known occurrence within direct and indirect footprints is:

- Historic (pre-1990)—Project G

Indirect effects that could affect many-stemmed dudleya include:

- Introduction and spread of invasive species
- Increased human presence within Preserves

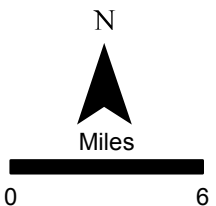


Legend

- Covered Freeway Improvement Projects
- Predicted Species Habitat
- Current Occurrence (1990 or later)
- Historic Occurrence (before 1990)

Sources:

Species Occurrences: Bonterra 2012, CNDDDB 2013, USFWS 2013, USFS 2013, Bonterra-Psomias/OCTA/CDFW 2015
 Species Model: ICF/TAIC 2013



Potential Effects on Many-Stemmed Dudleya
Dudleya multicaulis

Figure 4-5

4.3.2.3 Southern Tarplant

Potential effects from covered freeway improvement projects associated with southern tarplant are included in Table 4-10 and shown on Figure 4-6.

Table 4-10. Potential Effects on Southern Tarplant

Biometrics	Total within Plan Area	Direct Effects	Estimate of Indirect Effects
Predicted Species Habitat Model (acres)	5,963	9.2	35.3
Known Occurrences (occurrences/individuals)			
Current	42/63,448	0	0
Historic (pre-1990)	5/264	0	2/2
Critical Habitat (acres)	N/A	N/A	N/A

Southern tarplant occurs on the margins of marshes and swamps, in vernal mesic (saline) grasslands and vernal pools.

The covered freeway improvement projects potentially affecting this species include:

- Species model within direct footprint—Projects A, B, C2, D, F, G, I, J, and L
- Species model within indirect footprint—Projects A, B, C2, D, F, G, H, I, J, K, and L

The known occurrences within direct and indirect footprints are:

- Historic (pre-1990)—Projects K and L

Indirect effects that could affect southern tarplant include:

- Introduction and spread of invasive species
- Increased human presence within Preserves

4.3.2.4 Arroyo Chub

Potential effects from covered freeway improvement projects associated with arroyo chub are included in Table 4-11 and shown on Figure 4-7.

Table 4-11. Potential Effects on Arroyo Chub

Biometrics	Total within Plan Area	Direct Effects	Estimate of Indirect Effects
Predicted Species Habitat Model (acres)	69	0.1	1.9
Known Occurrences (occurrences/individuals)			
Current	51/345	0	1/1
Historic (pre-1990)	0	0	0
Critical Habitat (acres)	N/A	N/A	N/A

Arroyo chub occurs in slow-moving or backwater sections of warm to cool streams with substrates of sand or mud. The predicted species habitat model is limited to streamcourses in which known occurrences have been recorded and observed. This includes streamcourses in the San Juan Creek watershed and portions of the Santa Ana River. Species experts were contacted to provide input regarding the predicted species habitat model. New information regarding arroyo chub distribution is being produced but is not currently available for this document.

The covered freeway improvement projects potentially affecting this species include:

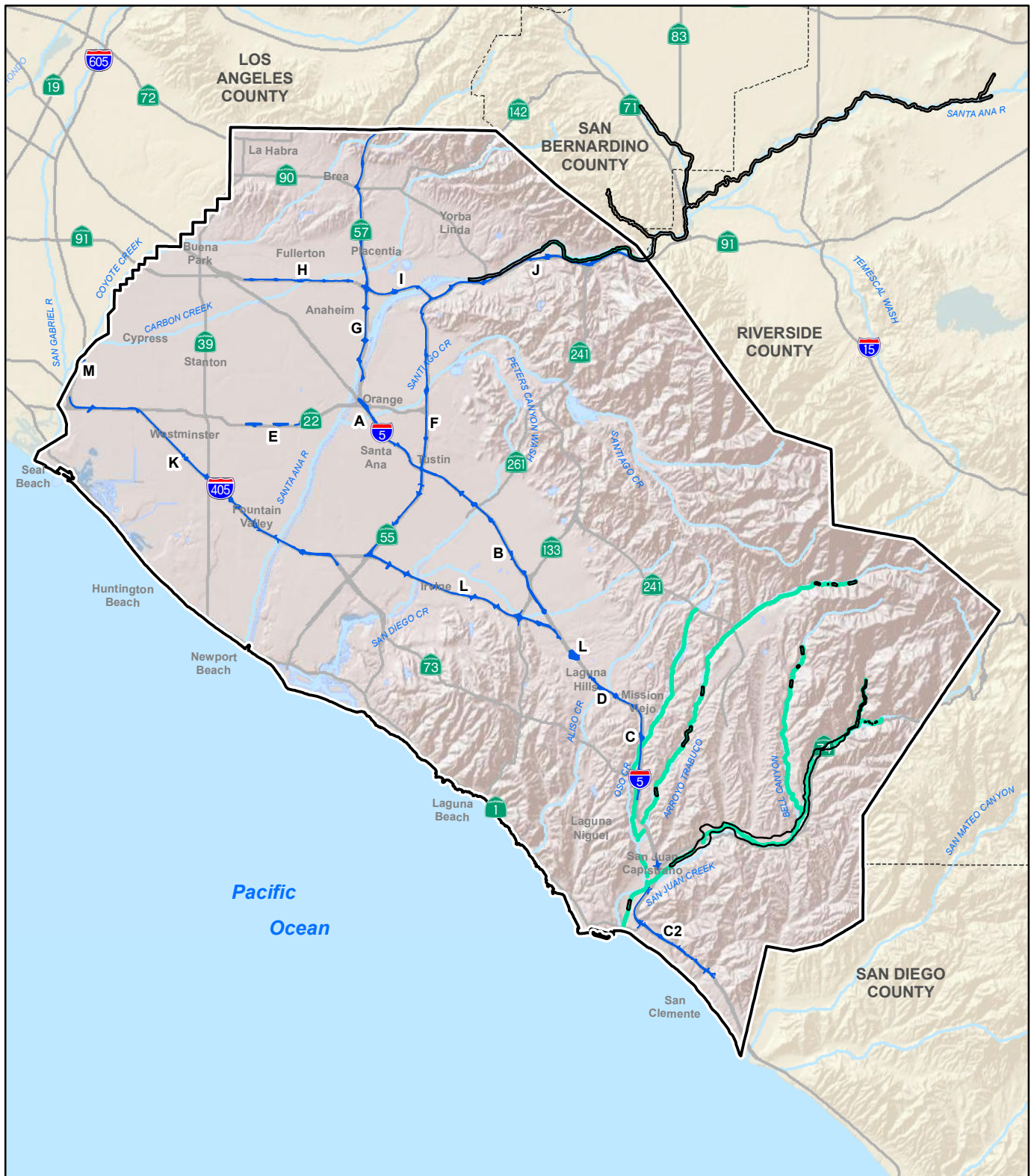
- Species model within direct footprint—Project C
- Species model within indirect footprint—Projects C and J

The known occurrence within indirect footprints only is:

- Current—Project J

Indirect effects that could affect arroyo chub include:

- Hydrology and water quality effects

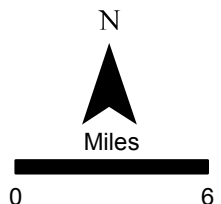


Legend

- Covered Freeway Improvement Projects
- Predicted Species Habitat
- Current Occurrence (1990 or later)

Sources:

Species Occurrences: Bonterra 2012, CNDDDB 2013, USFWS 2013, USFS 2013, Bonterra-Psomas/OCTA/CDFW 2015
 Species Model: ICF/TAIC 2015



Potential Effects on Arroyo Chub
Gila orcutti

Figure 4-7

4.3.2.5 Coast Horned Lizard

Potential effects from covered freeway improvement projects associated with coast horned lizard are included in Table 4-12 and shown on Figure 4-8.

Table 4-12. Potential Effects on Coast Horned Lizard

Biometrics	Total within Plan Area	Direct Effects	Estimate of Indirect Effects
Predicted Species Habitat Model (acres)	96,100	63.4	184.2
Known Occurrences (occurrences/individuals)			
Current	25/165	0	0
Historic (pre-1990)	18/39	3/3	1/1
Critical Habitat (acres)	N/A	N/A	N/A

Coast horned lizard generally prefers open habitats with loose, fine soil, which is found within a wide variety of vegetation types, including chaparral, coastal sage scrub, grassland, woodland, and coniferous forest.

The covered freeway improvement projects potentially affecting this species include:

- Species model within direct footprint—Projects A, C, C2, F, G, I, J, and L
- Species model within indirect footprint—Projects A, C, C2, D, F, G, H, I, J, K, and L

The known occurrences within direct and indirect footprints are:

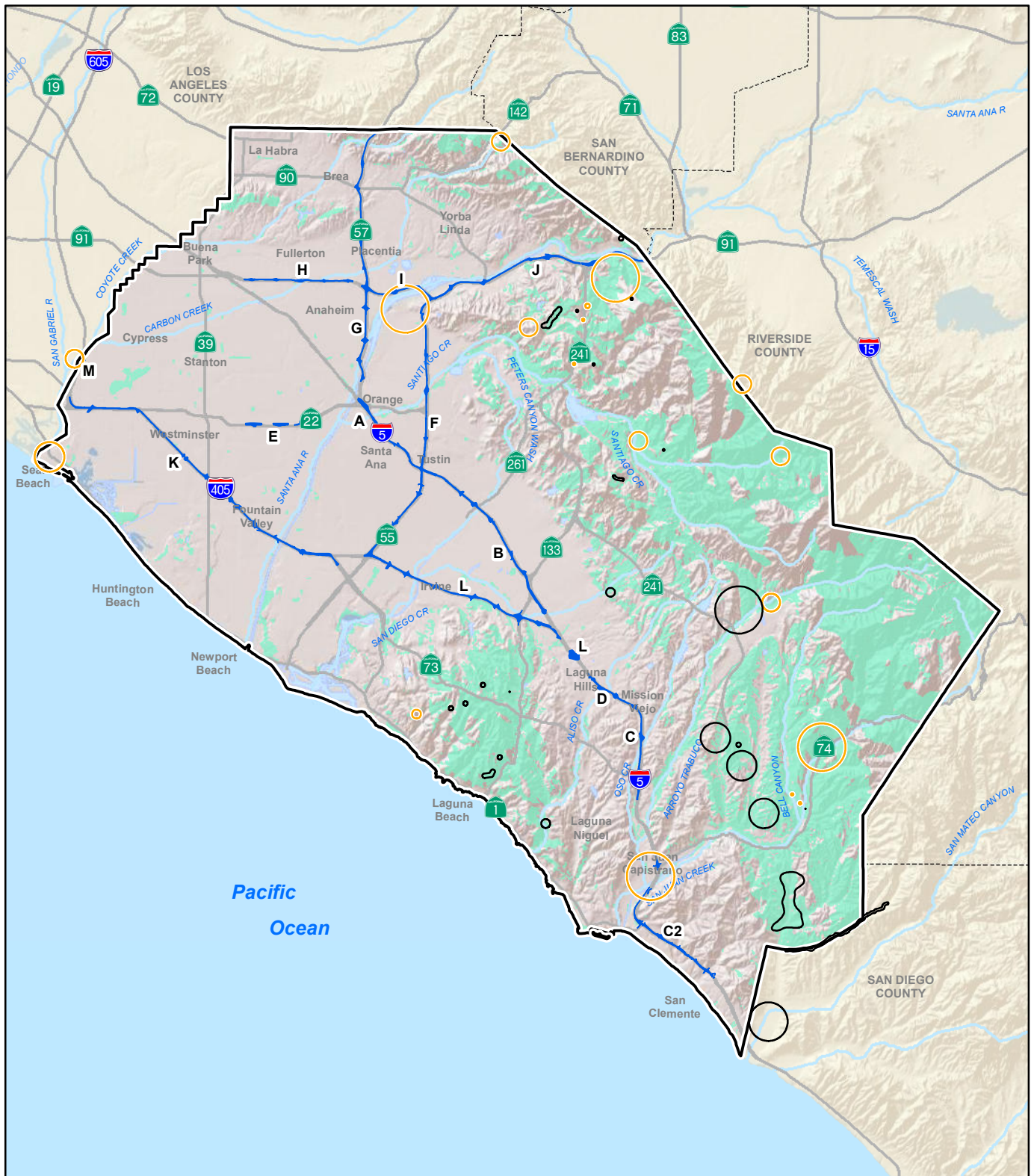
- Historic (pre-1990)—Projects C2, D, I, and J

The known occurrence within indirect footprints only is:

- Historic (pre-1990)—Project M

Indirect effects that could affect coast horned lizard include:

- Introduction and spread of invasive species (including Argentine ants)
- Increased human presence and associated activities within Preserves
- Increasing dispersal barriers by creating wider roadways

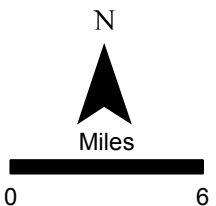


Legend

- Covered Freeway Improvement Projects
- Predicted Species Habitat
- Current Occurrence (1990 or later)
- Historic Occurrence (before 1990)

Sources:

Species Occurrences: Bonterra 2012, CNDDDB 2013, USFWS 2013, USFS 2013, Bonterra-Psomas/OCTA/CDWF 2015
 Species Model: ICF/TAIC 2013



Potential Effects on Coast Horned Lizard
Phrynosoma blainvillii

Figure 4-8

4.3.2.6 Orangethroat Whiptail

Potential effects from covered freeway improvement projects associated with orangethroat whiptail are included in Table 4-13 and shown on Figure 4-9.

Table 4-13. Potential Effects on Orangethroat Whiptail

Biometrics	Total within Plan Area	Direct Effects	Estimate of Indirect Effects
Predicted Species Habitat Model (acres)	23,469	45.1	110.7
Known Occurrences (occurrences/individuals)			
Current	40/182	0	2/2
Historic (pre-1990)	6/8	0	0
Critical Habitat (acres)	N/A	N/A	N/A

Orangethroat whiptail is known to occupy open, sparsely covered land, often with well-drained, loose soils and rocks. It is most strongly associated with coastal sage scrub, but oak woodland, moderately open riparian scrub, and chaparral communities also have significant value.

The covered freeway improvement projects potentially affecting this species include:

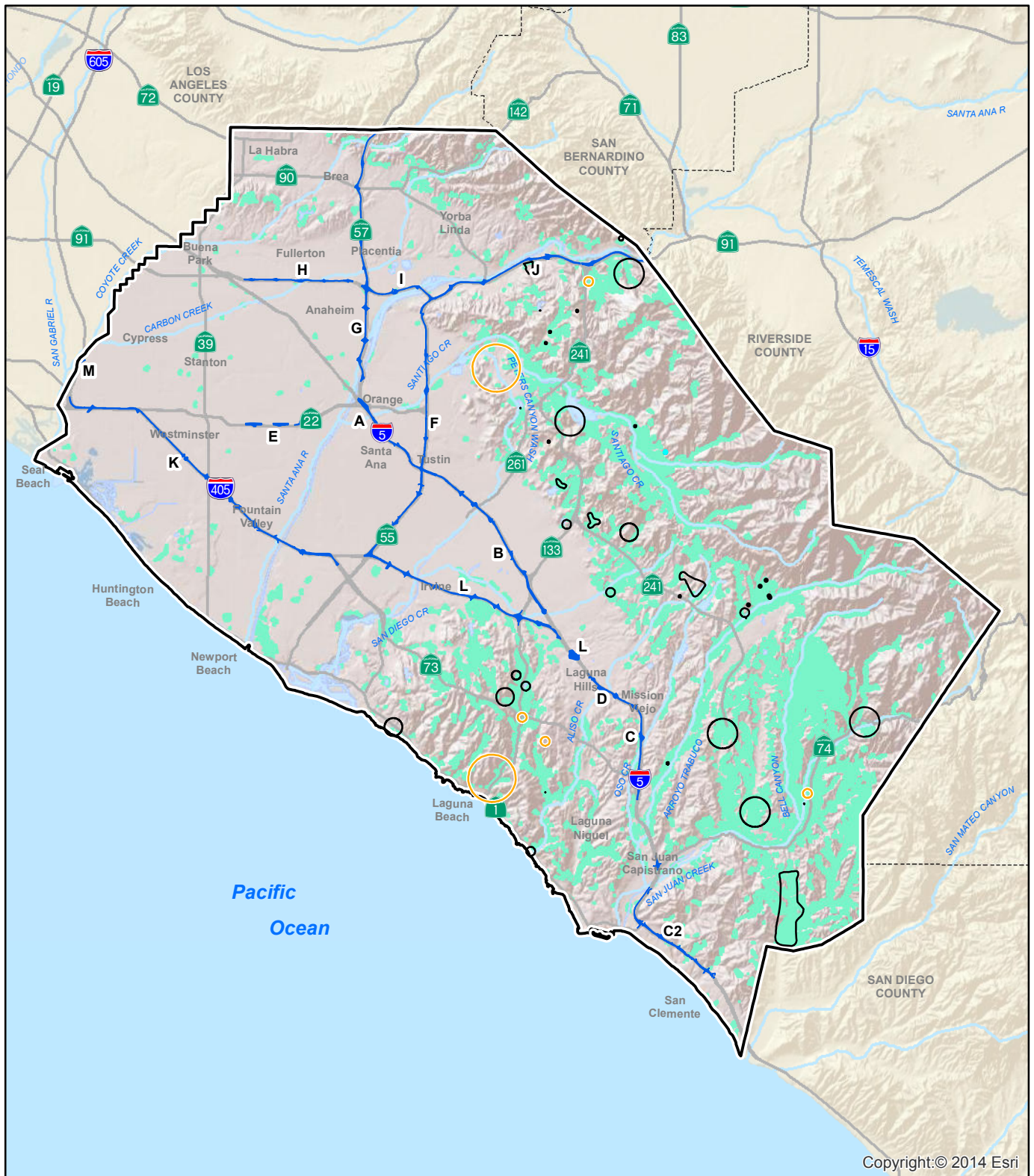
- Species model within direct footprint—Projects C, C2, D, G, I, J, and L
- Species model within indirect footprint—Projects C, C2, D, G, I, J, and L

The known occurrence within indirect footprints only is:

- Current—Project J

Indirect effects that could affect orangethroat whiptail include:

- Introduction and spread of invasive species (e.g., grasses that affect habitat cover)
- Increased human presence within Preserves
- Increasing dispersal barriers by creating wider roadways



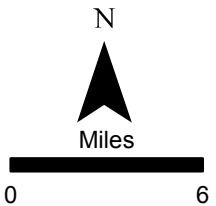
Copyright:© 2014 Esri

Legend

- Covered Freeway Improvement Projects
- Predicted Species Habitat
- Current Occurrence (1990 or later)
- Historic Occurrence (before 1990)

Sources:

Species Occurrences: Bonterra 2012, CNDDDB 2013, USFWS 2013, USFS 2013, Bonterra-Psomas/OCTA/CDFW 2015
 Species Model: ICF/TAIC 2013



Potential Effects on Orangethroat Whiptail
Aspidoscelis hyperythra

Figure 4-9

4.3.2.7 Western Pond Turtle

Potential effects from covered freeway improvement projects associated with western pond turtle are included in Table 4-14 and shown on Figure 4-10.

Table 4-14. Potential Effects on Western Pond Turtle

Biometrics	Total within Plan Area	Direct Effects	Estimate of Indirect Effects
Predicted Species Habitat Model (acres)			
Aquatic	5,963	3.1	16.5
Upland	90,120	45.8	283.8
Known Occurrences (occurrences/individuals)			
Current	12/54	1/2	1/7
Historic (pre-1990)	18/579	0	1/1
Critical Habitat (acres)	N/A	N/A	N/A

Western pond turtle is known to use both permanent and intermittent water sources, ranging from rivers and lakes to ponds, streams, and irrigation ditches.

The covered freeway improvement projects potentially affecting this species include:

- Species model within direct footprints:
 - Aquatic—Projects A, B, C, C2, D, E, F, G, H, I, J, K, and L
 - Upland—Projects B, C, C2, D, E, F, G, I, J, and L
- Species model within indirect footprints:
 - Aquatic—Projects A, B, C, C2, D, E, F, G, H, I, J, K, L, and M
 - Upland—Projects A, C, C2, D, F, G, I, J, L, and M

The known occurrence within direct and indirect footprints is:

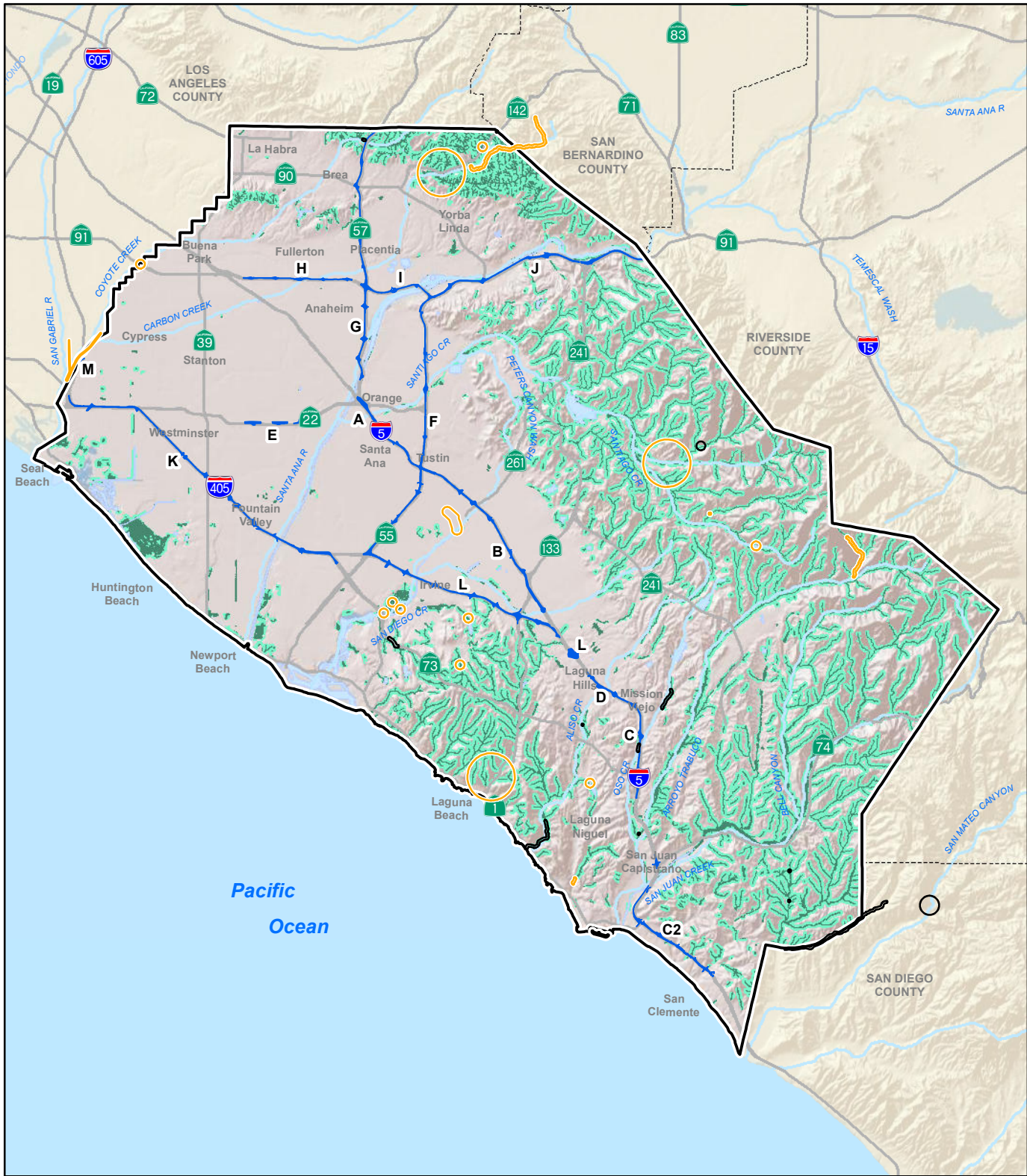
- Current—Project C

The known occurrences within indirect footprints only are:

- Current—Project G
- Historic (pre-1990)—Project M

Indirect effects that could affect western pond turtle include:

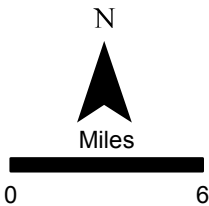
- Hydrology and water quality effects
- Increasing dispersal barriers by creating wider roadways



Legend

- Covered Freeway Improvement Projects
- Aquatic Habitat
- Upland Habitat
- Current Occurrence (1990 or later)
- Historic Occurrence (before 1990)

Sources:
 Species Occurrences: Bonterra 2012, CNDDB 2013, USFWS 2013, USFS 2013, Bonterra-Psomas/OCTA/CDFW 2015
 Species Model: ICF/TAIC 2013



Potential Effects on Western Pond Turtle
Emys marmorata

Figure 4-10

4.3.2.8 Cactus Wren

Potential effects from covered freeway improvement projects associated with cactus wren are included in Table 4-15 and shown on Figure 4-11.

Table 4-15. Potential Effects on Cactus Wren

Biometrics	Total within Plan Area	Direct Effects	Estimate of Indirect Effects
Predicted Species Habitat Model (acres)	55,651	9.7	85.2
Known Occurrences (occurrences/individuals)			
Current	80/558	0	2/3
Historic (pre-1990)	4/9	0	0
Critical Habitat (acres)	N/A	N/A	N/A

Cactus wren almost exclusively inhabits thickets of cholla and prickly pear below an elevation of 1,500 feet. These cactus thickets are too small to map at a regional scale, and the predicted species model highlights scrub habitat as a conservative estimate of potential habitat for cactus wren.

The covered freeway improvement projects potentially affecting this species include:

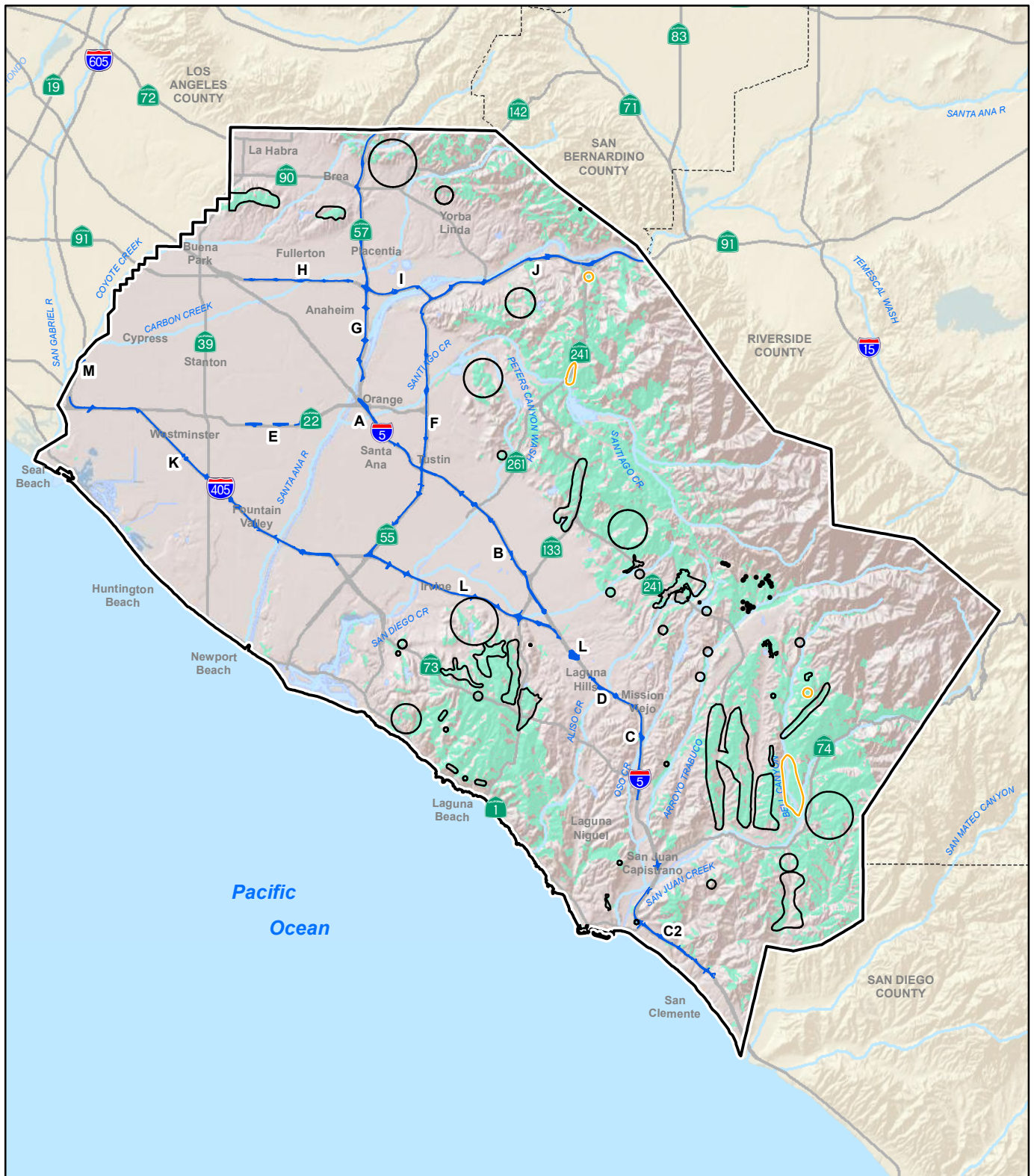
- Species model within direct footprint—Projects C, C2, G, and J
- Species model within indirect footprint—Projects C, C2, G, and J

The known occurrences within indirect footprints only are:

- Current—Projects C2 and L

Indirect effects that could affect cactus wren include:

- Noise and light pollution
- Introduction and spread of invasive species, such as annual grasses and forbs that reduce foraging habitat quality (e.g., loss of bare ground)
- Increasing dispersal barriers by creating wider roadways

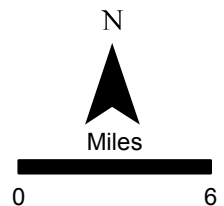


Legend

- Covered Freeway Improvement Projects
- Predicted Species Habitat
- Current Occurrence (1990 or later)
- Historic Occurrence (before 1990)

Sources:

Species Occurrences: Bonterra 2012, CNDDDB 2013, USFWS 2013, USFS 2013, Bonterra-Psomas/OCTA/CDWF 2015
 Species Model: ICF/TAIC 2013



Potential Effects on Cactus Wren
Campylorhynchus brunneicapillus

Figure 4-11

4.3.2.9 Coastal California Gnatcatcher

Potential effects from covered freeway improvement projects associated with coastal California gnatcatcher are included in Table 4-16 and shown on Figure 4-12.

Table 4-16. Potential Effects on Coastal California Gnatcatcher

Biometrics	Total within Plan Area	Direct Effects	Estimate of Indirect Effects
Predicted Species Habitat Model (acres)			
Very High	30,066	2.4	13.9
High	22,355	3.5	53.1
Moderate	8,430	2.7	24.2
Low	4,756	1.7	4.8
Total	65,608	10.3	96.0
Known Occurrences (occurrences/individuals)			
Current	1,828/3,419	2/6	5/9
Historic (pre-1990)	3/9	0	0
Critical Habitat (acres)	18,752	11.9	123.9

Coastal California gnatcatcher is dependent primarily on sage scrub habitat in the maritime and coastal climate zones of southern California. A gnatcatcher model has been developed to rank the relative value of modeled habitat based on the nesting habitat value to the gnatcatcher. The criteria for determining habitat value were patch size and shape, slope, and climate, all of which were shown to be correlated to use by the gnatcatcher (see Appendix C.3).

The covered freeway improvement projects potentially affecting this species include:

- Species model within direct footprints:
 - High—Projects C, C2, and J
 - Low—Projects G and J
 - Moderate—Project G
- Species model within indirect footprints:
 - Very High—Project J
 - Moderate—Projects G and J
 - High—Projects C, C2, and J
 - Low—Projects G and J

The known occurrences within direct and indirect footprints are:

- Current—Projects G and J

The known occurrence within indirect footprints only is:

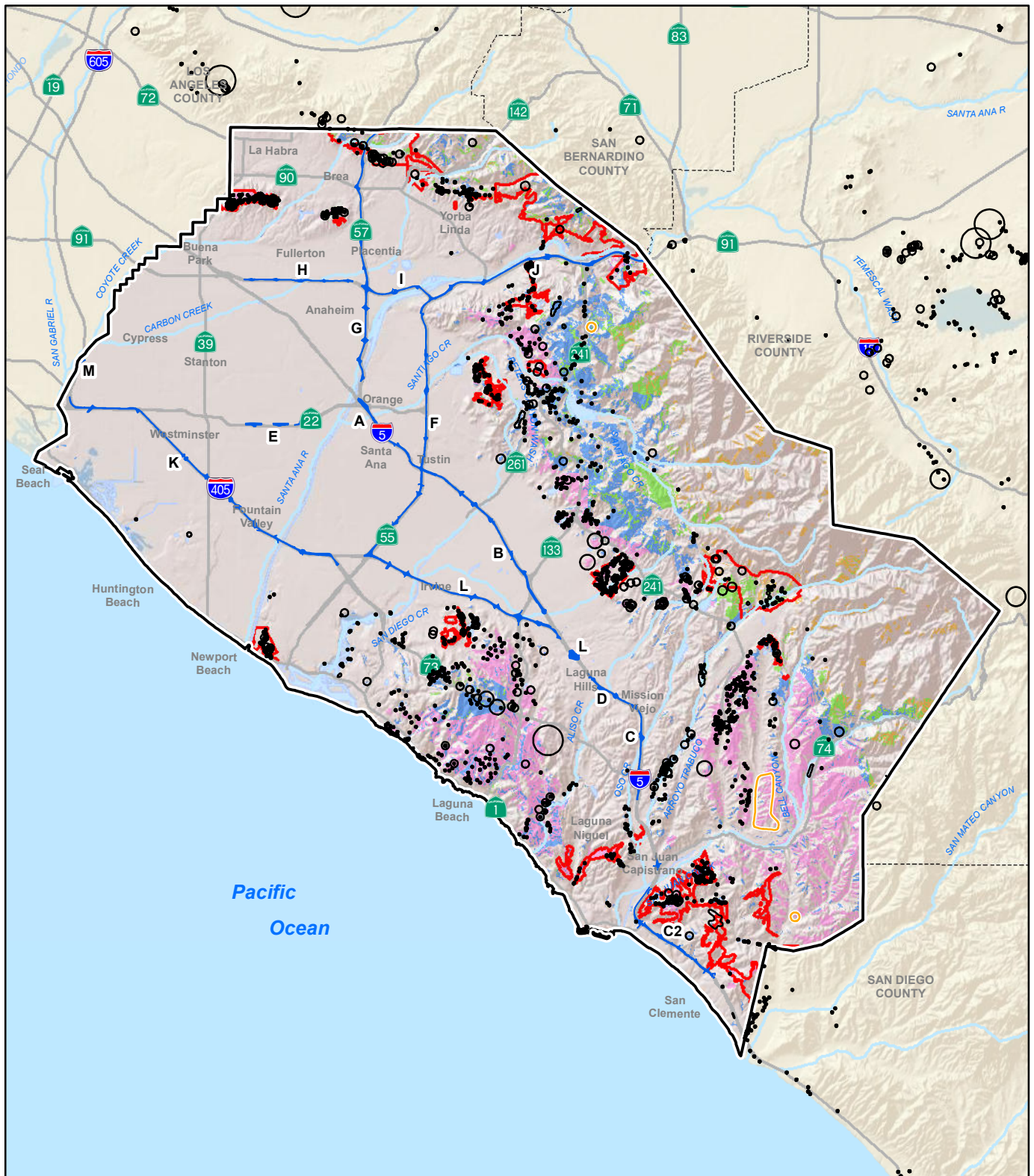
- Current—Project C2

Critical habitat within direct and indirect footprints includes:

- Critical habitat within direct footprint—Projects G and J
- Critical habitat within indirect footprint—Projects C2, G, and J

Indirect effects that could affect coastal California gnatcatcher include:

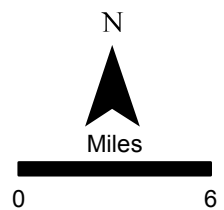
- Noise and light pollution
- Increased human presence within Preserves
- Increasing dispersal barriers by creating wider roadways



Legend

- Covered Freeway Improvement Projects
- Very High
- High
- Moderate
- Low
- Current Occurrence (1990 or later)
- Historic Occurrence (before 1990)
- Critical Habitat

Sources:
 Species Occurrences: Bonterra 2012, CNDDDB 2013, USFWS 2013, USFS 2013, Bonterra-Psomis/OCTA/CDFW 2015
 Species Model: ICF/TAIC 2015



Potential Effects on Coastal California Gnatcatcher
Poliptila californica californica

Figure 4-12



4.3.2.10 Least Bell’s Vireo

Potential effects from covered freeway improvement projects associated with least Bell’s vireo are included in Table 4-17 and shown on Figure 4-13.

Table 4-17. Potential Effects on Least Bell’s Vireo

Biometrics	Total within Plan Area	Direct Effects	Estimate of Indirect Effects
Predicted Species Habitat Model (acres)	4,466	4.9	55.2
Known Occurrences (occurrences/individuals)			
Current	413/874	4/21	10/14
Historic (pre-1990)	0	0	0
Critical Habitat (acres)	N/A	N/A	N/A

Least Bell’s vireo is typically associated with riparian habitat with dense cover up to an elevation of 2,000 feet.

The covered freeway improvement projects potentially affecting this species include:

- Species model within direct footprint—Projects D, G, J, and L
- Species model within indirect footprint—Projects C, D, F, G, J, and L

The known occurrence within direct and indirect footprints is:

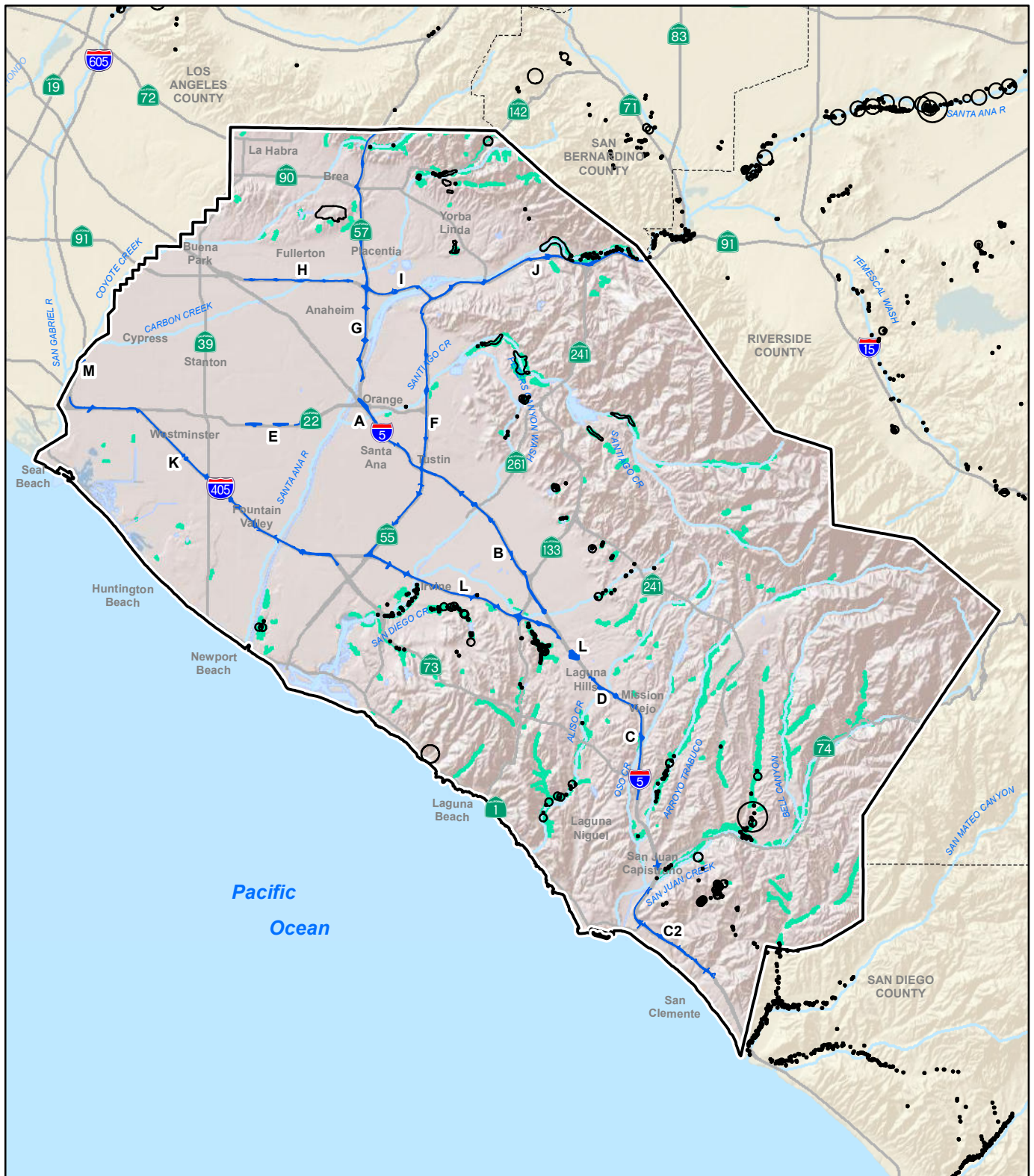
- Current—Project J

The known occurrence within indirect footprints only is:

- Current—Project L

Indirect effects that could affect least Bell’s vireo include:

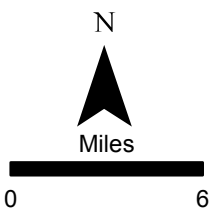
- Noise and light pollution
- Introduction and spread of invasive species (cowbirds, nonnative ants)
- Increased human presence within Preserves



Legend

- Covered Freeway Improvement Projects
- Predicted Species Habitat
- Current Occurrence (1990 or later)

Sources:
 Species Occurrences: Bonterra 2012, CNDDDB 2013, USFWS 2013, USFS 2013, Bonterra-Psomas/OCTA/CDFW 2015
 Species Model: ICF/TAIC 2013



Potential Effects on Least Bell's Vireo
Vireo bellii pusillus

Figure 4-13

4.3.2.11 Southwestern Willow Flycatcher

Potential effects from covered freeway improvement projects associated with southwestern willow flycatcher are included in Table 4-18 and shown on Figure 4-14.

Table 4-18. Potential Effects on Southwestern Willow Flycatcher

Biometrics	Total within Plan Area	Direct Effects	Estimate of Indirect Effects
Predicted Species Habitat Model (acres)	4,807	5.1	60.5
Known Occurrences (occurrences/individuals)			
Current	9/15	0	0
Historic (pre-1990)	0	0	0
Critical Habitat (acres)	N/A	N/A	N/A

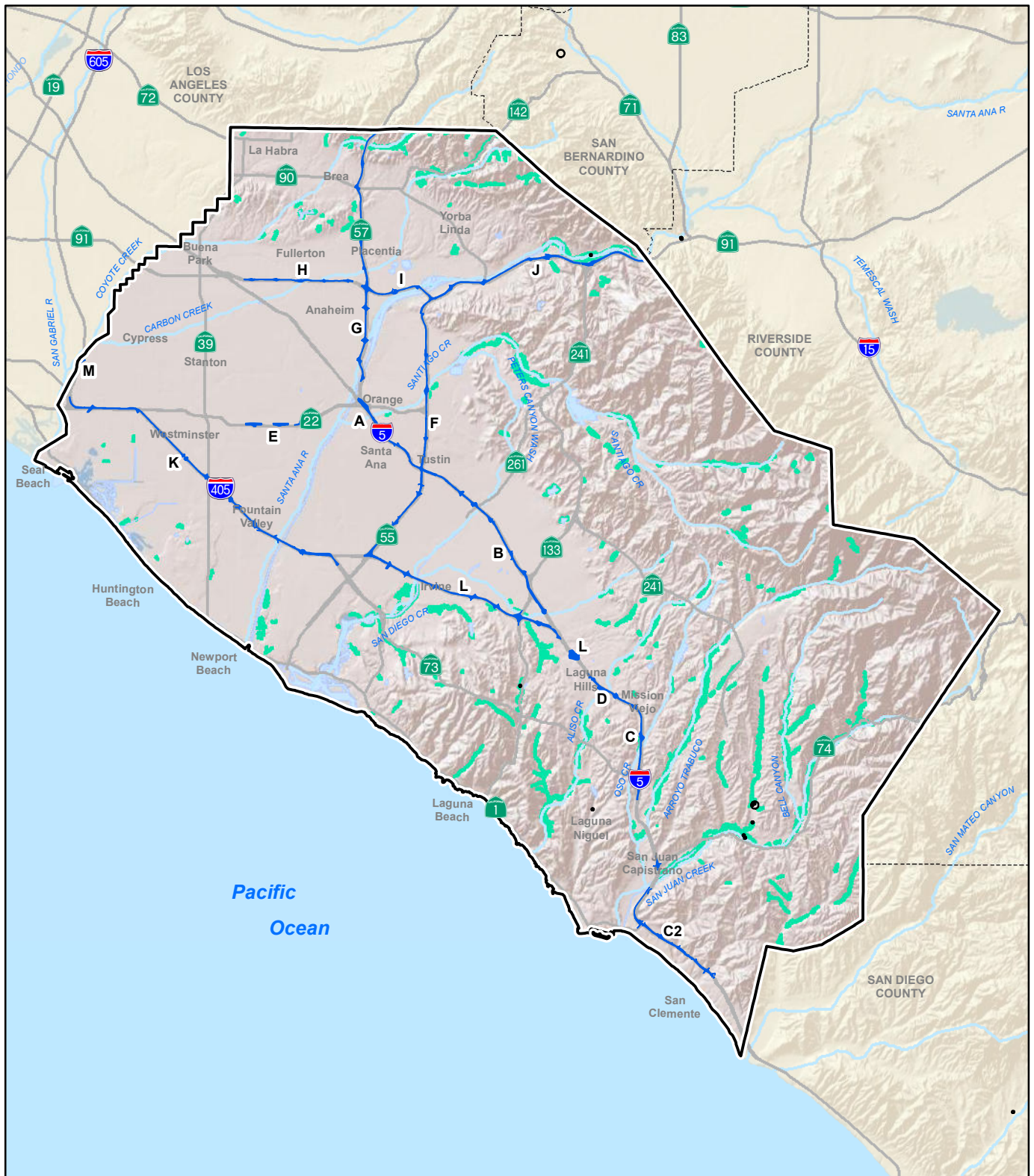
Southwestern willow flycatcher is typically associated with riparian habitat with dense cover. Critical habitat for southwestern willow flycatcher does not occur in the Plan Area.

The covered freeway improvement projects potentially affecting this species include:

- Species model within direct footprint—Projects, D, F, G, J, and L
- Species model within indirect footprint—Projects C, D, F, G, J, and L

Indirect effects that could affect southwestern willow flycatcher include:

- Noise and light pollution
- Introduction and spread of invasive species
- Increased human presence within Preserves

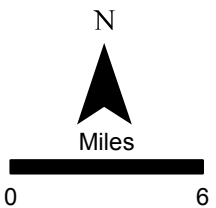


Legend

- Covered Freeway Improvement Projects
- Predicted Species Habitat
- Current Occurrence (1990 or later)

Sources:

Species Occurrences: Bonterra 2012, CNDDB 2013, USFWS 2013, USFS 2013, Bonterra-Psomas/OCTA/CDFW 2015
 Species Model: ICF/TAIC 2013



Potential Effects on Southwestern Willow Flycatcher
Empidonax traillii extimus

Figure 4-14

4.3.2.12 Bobcat

Potential effects from covered freeway improvement projects associated with bobcat are included in Table 4-19 and shown on Figure 4-15.

Table 4-19. Potential Effects on Bobcat

Biometrics	Total within Plan Area	Direct Effects	Estimate of Indirect Effects
Predicted Species Habitat Model (acres)	189,607	45.9	246.0
Known Occurrences (occurrences/individuals) ¹	N/A	N/A	N/A
Critical Habitat (acres)	N/A	N/A	N/A

¹ Occurrences of bobcat are not recorded in the CNDDDB or other regional databases.

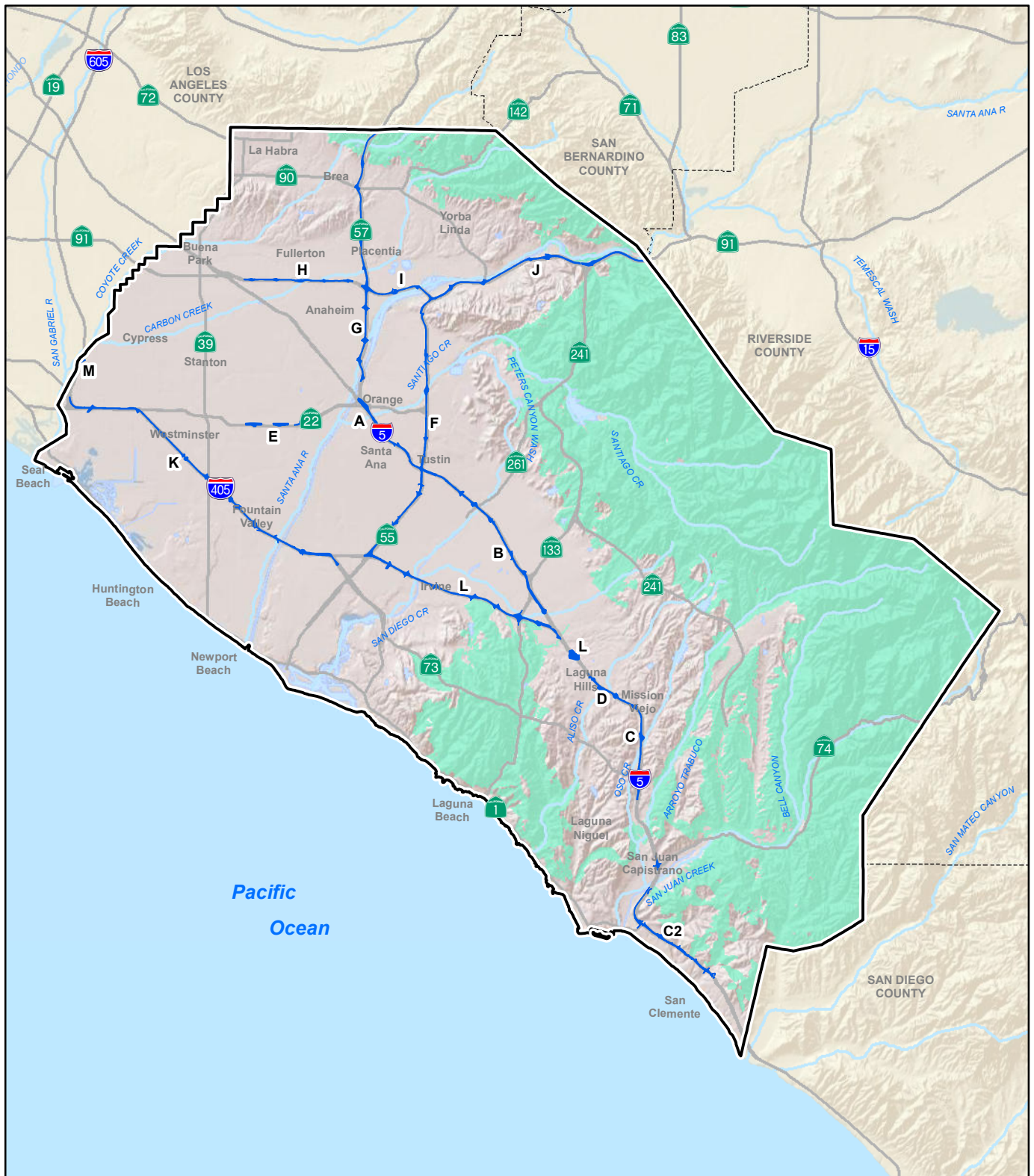
Bobcat is most closely associated with rocky and brushy areas near springs or other perennial water sources. The species occurs in any sizeable area of relatively undisturbed habitat (modeled using select Core Habitat Areas and all linkage areas developed as part of the CBI Orange County Conservation Assessment).

The covered freeway improvement projects potentially affecting this species include:

- Species model within direct footprints—Projects C2, G, J, and L
- Species model within indirect footprint—Projects C2, G, J, and L

Indirect effects that could affect bobcat include:

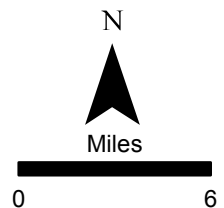
- Noise and light pollution
- Increased human presence within Preserves
- Increased movement barriers by widening roadways
- Increased traffic volume



Legend

- Covered Freeway Improvement Projects
- Predicted Species Habitat

Sources: Species Model: ICF/TAIC 2013



Potential Effects on Bobcat
Lynx rufus

Figure 4-15

4.3.2.13 Mountain Lion

Potential effects from covered freeway improvement projects associated with mountain lions are included in Table 4-20 and shown on Figure 4-16.

Table 4-20. Potential Effects on Mountain Lion

Biometrics	Total within Plan Area	Direct Effects	Estimate of Indirect Effects
Predicted Species Habitat Model (acres)	140,725	24.5	118.8
Known Occurrences (occurrences/individuals) ¹	N/A	N/A	N/A
Critical Habitat (acres)	N/A	N/A	N/A

¹ Occurrences of mountain lion are not recorded in the CNDDDB or other regional databases.

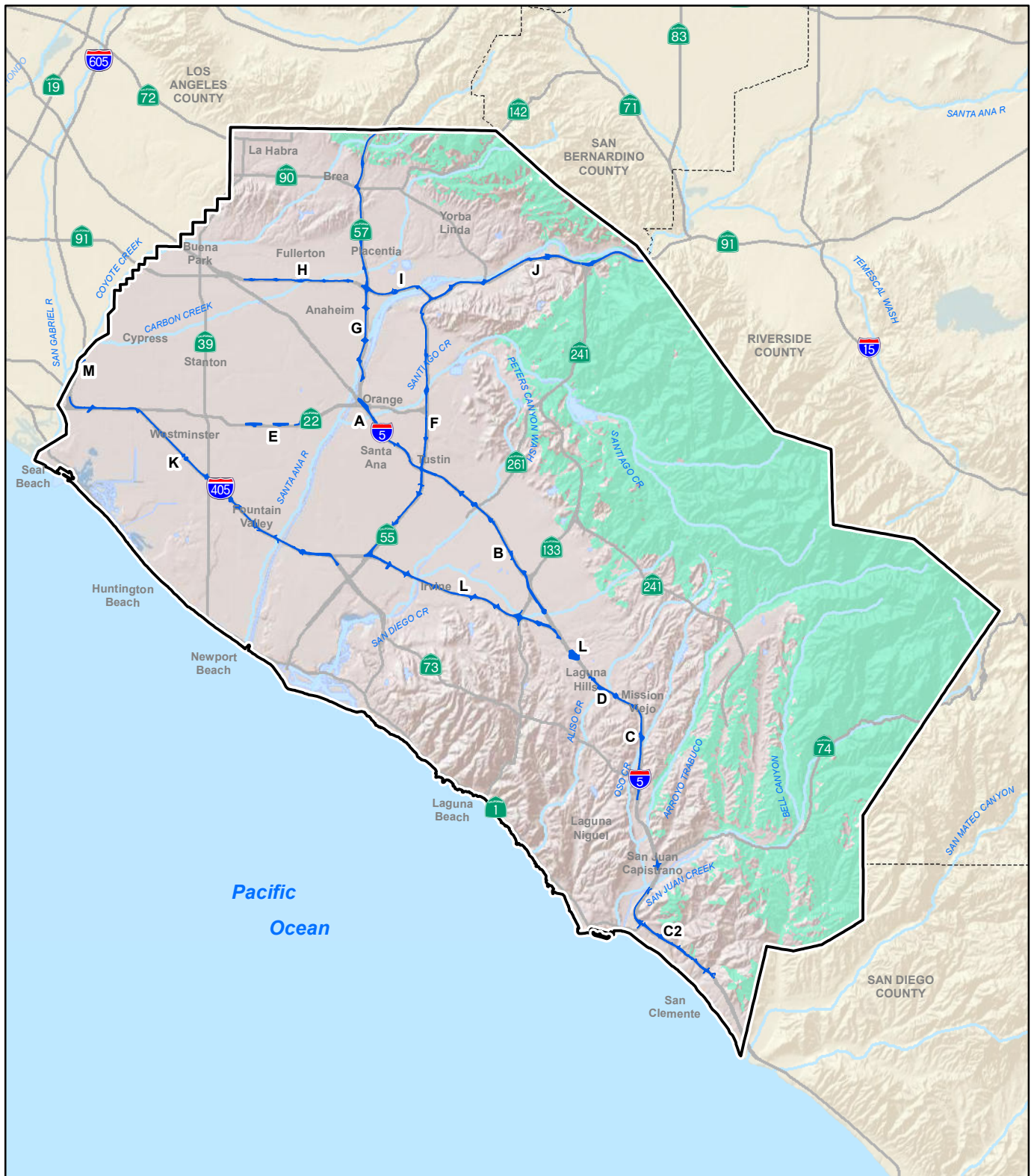
Mountain lion habitat is most closely associated with rocky areas, cliff ledges, and vegetated areas that provide cover. They occur in any sizeable area of relatively undisturbed scrub habitat (modeled using select Core Habitat Areas and all linkage areas developed as part of the CBI Orange County Conservation Assessment). Occurrences for mountain lion are not recorded in the CNDDDB or other species databases. However, radiotelemetry studies of mountain lion within Orange County have documented widespread distribution and use of habitat in Orange County. The predicted species habitat model shows the San Joaquin Hills as potential habitat although radiotelemetry data suggest this portion of the County is not currently being used by mountain lion.

The covered freeway improvement projects potentially affecting this species include:

- Species model within direct footprints—Projects G and J
- Species model within indirect footprints—Projects C2, G, and J

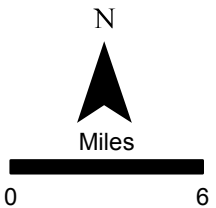
Indirect effects that could affect mountain lion include:

- Noise and light pollution
- Increased human presence within Preserves
- Increased movement barriers by widening roadways
- Increased traffic volume



Legend

- Covered Freeway Improvement Projects
- Predicted Species Habitat



Source: Species Model: ICF/TAIC 2013



Potential Effects on Mountain Lion
Puma concolor

Figure 4-16

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5.1 Introduction

The conservation strategy is designed to fulfill the requirements of the California NCCPA and federal ESA, and to streamline compliance with CEQA, NEPA, and other applicable environmental regulations. OCTA is not a general land use agency with the jurisdictional authority to establish a “stand-alone” Preserve system for the entire Plan Area, nor does OCTA affect development and conservation decisions subject to jurisdictions (various cities, County of Orange, etc.) having such land use authority. The Plan only authorizes habitat losses attributable to the Covered Activities. The Covered Activities extend over most of Orange County and across the Plan areas for other conservation planning efforts in Orange County. Therefore the Plan’s conservation strategy focuses on the protection and restoration of habitat that strengthens and enhances the regional conservation strategies of the other conservation plans. The lands acquired and/or restored as a result of Plan implementation include natural communities that are adjacent to other protected areas, provide stepping-stone linkages between already conserved lands, improve habitat function and quality within currently protected lands, and support additional high quality habitat for the Covered Species (e.g., designated critical habitat areas).

The primary elements and actions of the conservation strategy include:

1. **Preserve Acquisitions (Section 5.4).** OCTA acquired seven properties resulting in the protection of 1,232 acres of natural habitat (note that the total acreage of the seven properties is approximately 1,296 acres, but the amount of protected natural habitat credited to OCTA is less because portions of the properties are developed, include trails/maintenance roads, and the Saddle Creek South Preserve was acquired, in part, with funding from the National Fish and Wildlife Foundation and credits were adjusted accordingly). Each Preserve will be protected with a conservation easement, and sufficient funding will be set aside to ensure that the properties are properly monitored and managed in perpetuity. Public managed access will be provided on some of these properties, if that access is consistent with the Plan’s biological goals and objectives.
2. **Restoration Projects (Section 5.5).** OCTA has approved funding for 11 restoration projects to date totaling approximately 357 acres of restored habitats. The restoration projects occur throughout the Plan Area in core habitat areas and within key habitat linkages and riparian corridors. The restoration projects are on lands currently protected and will enhance habitat for Covered Species. OCTA has committed to funding additional restoration projects with the remaining restoration funds (approximately \$400,000 remains from the previous round of restoration project selection) and through future restoration project selection. The Plan identifies priorities for selecting future restoration projects and conservation actions that will contribute to meeting the biological goals and objectives of the Plan. The Plan identifies requirements for future restoration to ensure that the Plan provides conservation for all Covered Species.
3. **Avoidance and Minimization (Section 5.6).** The Plan includes measures to avoid and minimize take of Covered Species. These avoidance and minimization measures will be

implemented through a process to verify compliance of project design and construction of Covered Activities. Covered Activities will comply through avoidance and minimization of sensitive biological areas, adherence to species-specific protection measures and policies, compliance with procedures for protection of nesting birds, stormwater and water quality BMPs, wildfire protection techniques, and other standard avoidance and minimization measures and BMPs. Any costs associated with implementing these measures, as described in the Plan, will be funded through the individual project budgets and will not rely on funding under the M2 Environmental Mitigation Program. OCTA will have a Project Manager overseeing the activities undertaken by the Construction Lead (either Caltrans or OCTA). The OCTA Project Manager will be responsible for ensuring all avoidance and minimization measures are completed and documented by the Construction Lead and its contractors following the requirements as set forth by the Plan.

4. **Streambed Program (Section 5.7).** The Plan includes the Streambed Protection Mitigation Program (Streambed Program), which outlines the process for submittal of project-level Notification(s) of Lake or Streambed Alteration(s) (NLSA) and the issuance of individual LSAAs for the Covered Activities pursuant to California Fish and Game Code sections 1600–1616. The Streambed Program requires the evaluation of streambed avoidance options and specification of minimization measures prior to compensatory mitigation and will ensure adequate mitigation based on habitat and type of aquatic resource to address state regulatory obligations. For unavoidable permanent impacts on streambed and associated riparian habitat, OCTA will compensate at the pre-approved mitigation sites identified in Table E-1 of Appendix E, “Streambed Program Guidelines,” which are sites within the properties acquired for conservation under this Plan and the restoration projects approved for funding by OCTA, to achieve no-net-loss standards. Additionally, for temporary impacts on streambeds and associated riparian habitat, OCTA will ensure the impact site will be restored to its pre-project condition, when appropriate, to achieve no-net-loss standards. Restoration plans, as approved by CDFW, USFWS, and, if warranted, the USACE and State Water Resources Control Board, will be implemented at the sites. Additional mitigation is not expected to be needed to compensate for streambed and associated riparian habitat. Once the Covered Activities are evaluated and impact numbers are developed, OCTA will be able to determine if the compensatory mitigation proposed is adequate to satisfy the no-net-loss standards required. If the existing proposed mitigation is not adequate, OCTA will follow the same restoration and acquisition evaluation process to provide the additional mitigation necessary.
5. **Mitigation Approach (Section 5.8).** The conservation actions taken as part of this Plan provide upfront mitigation only for the Covered Activities. Once the Covered Activities are completed, there will be no remaining credits that can be used by OCTA as mitigation for other non-M2 projects. As the Plan is implemented, OCTA will be responsible for tracking impacts on natural resources resulting from Covered Activities to ensure that the amount of impacts that ultimately occur under the Plan stays below the amount of impacts estimated as part of this Plan.

5.2 Biological Targets

To guide the development of the conservation strategy and serve as a benchmark for the Plan conservation analysis, quantifiable targets have been developed to be consistent with the type and level of take estimated to occur from the Covered Activities (see Chapter 4, “Impact Assessment and Level of Take”) using the following formula:

$$\text{Plan Target} = (\text{Direct Effect} * 2.0) + (\text{Indirect Effect} * 0.5)$$

The targets represent an estimate of the amount of conservation to offset the direct and indirect effects from Covered Activities. It is anticipated these acreage targets will be greater than “mitigation-only” targets and address the broader goals of the M2 EMP. The targets (presented in Table 5-1) have been developed for natural communities and species habitat-based biological metrics (predicted species habitat models, designated critical habitat) used to evaluate individual species effects. Quantitative targets were not established for known occurrences, which are evaluated on a more qualitative and case-by-case basis.

Table 5-1. Plan Biological Targets

Biometric	Freeway Improvement Projects			Preserve Implementation ³	Plan Target ⁴
	Multiplier:	Direct Effects ¹	Indirect Effects ²		
		2.0	0.5	2.0	
Natural Communities (acres)					
Chaparral		5.0	41.9	5.9	42.8
Coniferous Forest		0.0	0.0	0.0	0.0
Grassland		108.1	280.9	0.8	358.3
Riparian		5.0	57.0	0.2	38.9
Scrub		10.0	85.2	2.8	68.2
Water		0.4	0.1	0.0	0.9
Wet Meadows/Marsh		2.5	0.0	0.0	5.0
Woodland		10.0	19.3	3.3	36.3
Totals		141.0	484.4	13.0	550.4
Predicted Species Habitat Models and Critical Habitat (acres)					
<i>Plants</i>					
Intermediate Mariposa Lily		3.9	28.1	3.3	28.5
Many-stemmed Dudleya		11.1	83.7	8.2	80.5
Southern Tarplant		9.2	35.3	0.1	36.2
<i>Fish</i>					
Arroyo Chub		0.1	1.9	0.0	1.1
<i>Reptiles</i>					
Coast Horned Lizard		63.4	184.2	5.6	230.2
Orangethroat Whiptail		45.1	110.7	0.5	146.7

Biometric	Freeway Improvement Projects		Preserve Implementation ³	Plan Target ⁴
	Direct Effects ¹	Indirect Effects ²		
Western Pond Turtle				
Aquatic	3.1	16.5	0.1	14.7
Upland	45.8	283.8	5.9	245.3
<i>Birds</i>				
Cactus Wren	9.7	85.2	2.7	67.4
Coastal California Gnatcatcher				
Very High	2.4	13.9	1.2	14.1
High	3.5	53.1	0.8	35.1
Moderate	2.7	24.2	1.4	20.3
Low	1.7	4.8	1.1	8.0
Total	10.3	96.0	4.5	77.5
Critical Habitat	53.9	182.7	6.5	212.1
Least Bell's Vireo	4.9	55.2	0.1	37.5
Southwestern Willow Flycatcher	5.1	60.5	0.1	40.6
<i>Mammals</i>				
Bobcat	45.9	246.0	13.0	240.8
Mountain Lion	24.5	118.8	10.7	129.7

¹ Estimated direct effects are based on a "planning-level" footprint. Actual effects are expected to be less through the implementation of avoidance and minimization measures. The amount of direct effects for individual habitat types and predicted species habitat models have been adjusted to address the low precision and accuracy of the regional habitat data and allowance for habitat types with small amount of impacts to serve as a reasonable cap to direct effects under the Plan. See Chapter 4.

² Indirect effects have been estimated using a 300-foot buffer around direct effect areas.

³ Direct effects associated with Preserve implementation activities (new trails, kiosks, maintenance facilities, etc.) have been estimated to be no more than 1% of natural habitat within Preserves. Because the location of the Preserve activity effects is not known at this time, a conservative estimate has been taken based on the proportion of the biometric within the Preserves. Actual effects are expected to be less through the implementation of avoidance and minimization measures.

⁴ Plan targets were calculated using the following formula: (direct effects * 2) + (indirect effects * 0.5).

5.3 Biological Goals and Objectives

The Plan also contains a broader set of biological goals and objectives at the landscape, natural community, and species level that describe how the conservation actions would occur within areas important for regional conservation purposes. Goals are broad and based on the conservation needs of the resources. Biological objectives describe in more detail the conservation or desired conditions to be achieved and have been designed to collectively achieve the biological goals. The biological goals and objectives indicate how the additional conservation of large blocks of habitat will benefit the biodiversity, natural communities, and habitat connectivity throughout key portions of the Plan Area, and provide for conservation and management of Covered Species. Biological goals for Covered Species are required by USFWS's *5-Point Policy* to be included in HCPs (65 FR 35242, June 1, 2000). The NCCPA (Section 2810) specifies the inclusion of conservation goals and objectives in the Planning Agreement. The biological goals and objectives are included below. An evaluation of

how the OCTA conservation strategy achieves each of these objectives is included in Chapter 6, “Conservation Analysis.” The Orange County Conservation Assessment prepared by CBI (CBI 2009) for the EOC has identified priority conservation areas within Orange County and has been used as a tool to guide and evaluate the conservation actions. The Preserve acquisitions and restoration projects funded by OCTA are the core of the M2 conservation effort and are used to satisfy many of the goals and objectives described below.

5.3.1 Landscape-Level Goals and Objectives

- **Landscape Goal 1:** Protect, manage, and enhance natural landscapes that result in conservation of areas large enough to support ecological integrity and sustainable populations of Covered Species, and are linked to each other and/or other areas of protected habitat in or adjacent to the Plan Area.
 - **Landscape Objective 1.1:** OCTA will conserve and manage natural landscapes within core and linkage areas contiguous with existing protected lands.
 - **Landscape Objective 1.2:** OCTA will fund and successfully implement restoration projects within the Plan Area to restore or enhance habitat that supports populations of Covered Species and natural landscapes.
- **Landscape Goal 2:** Protect and enhance natural and semi-natural landscapes important to maintain wildlife movement within the Plan Area.
 - **Landscape Objective 2.1:** OCTA will acquire, protect, and manage natural landscapes that secure wildlife movement corridors and provide landscape connectivity.
 - **Landscape Objective 2.2:** OCTA will restore or enhance habitat through restoration projects that improve habitat connectivity and wildlife movement through existing protected lands.
 - **Landscape Objective 2.3:** OCTA will set forth policies and procedures requiring the planning and execution of Covered Activities in a manner that maintains and, if feasible, enhances wildlife connectivity through existing structures. OCTA will provide monitoring, when and where appropriate, to demonstrate this objective has been met.
- **Landscape Goal 3:** OCTA will protect, enhance, and/or restore natural landscapes within a range of environmental gradients and contiguous to other protected areas to allow for shifting species distributions in response to catastrophic events (e.g., fire, prolonged drought) or changed circumstances (e.g., climate change).
 - **Landscape Objective 3.1:** OCTA will acquire and/or restore natural landscapes within elevation ranges (0–500, 500–1,000, 1,000–1,500, 1,500–2,000 feet). The conservation and restoration of Covered Species habitat in or contiguous with existing Preserve lands will benefit potential shifting species distributions in response to catastrophic events and changed circumstances.
- **Landscape Goal 4:** Protect and enhance habitat in geographically distinct areas across the Plan Area to conserve species by facilitating/promoting genetic exchange.
 - **Landscape Objective 4.1:** OCTA will acquire and/or restore natural landscapes within most of the major watersheds (Hydrologic Unit Code 8) and a majority of the core and linkage areas that are contributing to genetic exchange within these areas.

5.3.2 Natural Community-Level Goals and Objectives

- **Natural Community Goal 1:** Protect, manage, and enhance natural communities to promote native biodiversity.
 - **Natural Community Objective 1.1 (Chaparral):** OCTA will acquire and/or restore chaparral habitat to promote conservation of native biodiversity and connectivity that benefit Covered Species of the chaparral natural community.
 - **Natural Community Objective 1.2 (Grassland):** OCTA will acquire and/or restore grassland habitat to promote native biodiversity and connectivity that benefit Covered Species of the grassland natural community.
 - **Natural Community Objective 1.3 (Riparian):** OCTA will acquire and/or restore riparian habitat in multiple locations across the Plan Area. These actions will enhance and expand riparian communities in key locations for wildlife movement, provide potentially suitable live-in and dispersal habitat for some of the Covered Species, and promote native biodiversity and connectivity to benefit many of the Covered Species.
 - **Natural Community Objective 1.4 (Scrub):** OCTA will acquire and/or restore scrub habitat. These actions will enhance and expand scrub habitat in key locations for wildlife movement, provide potentially suitable nesting habitat for Covered Species, and promote native biodiversity and connectivity that benefit Covered Species of the scrub natural community.
 - **Natural Community Objective 1.5 (Woodland):** OCTA will acquire and/or restore woodland habitat. These actions will enhance and expand woodland habitat for foraging and cover by Covered Species, and will promote native biodiversity and connectivity that benefit Covered Species of the woodland natural community.
- **Natural Community Goal 2:** Maintain and enhance riparian and wetland function and values to benefit Covered Species and promote native biodiversity.
 - **Natural Community Objective 2.1:** OCTA will acquire, restore and/or enhance areas with aquatic resources (per CDFW jurisdiction). These conservation actions will protect riparian and wetlands functions and values by improving the condition and integrity of the physical streambed, aquatic and riparian habitat, and hydrology.
 - **Natural Community Objective 2.2:** OCTA will set forth policies and procedures to ensure Covered Activities result in no net loss of wetland habitat values and acreage in the Plan Area.

5.3.3 Species-Level Goals and Objectives

- **Species Goal 1:** Provide conservation of **intermediate mariposa lily** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.
 - **Species Objective 1.1:** OCTA will acquire Preserves with occurrences of intermediate mariposa lily. OCTA will ensure that appropriate management and monitoring actions are incorporated into the RMPs for each Preserve to support sustainable populations of intermediate mariposa lily.

- **Species Objective 1.2:** OCTA will establish policies and procedures that require OCTA to identify, track, mitigate, and report annually any unavoidable impacts on intermediate mariposa lily.
- **Species Goal 2:** Provide conservation of **many-stemmed dudleya** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.
 - **Species Objective 2.1:** OCTA will acquire a Preserve and/or implement a restoration project resulting in the protection, enhancement, and/or creation of a major population (i.e., 500 individuals) of many-stemmed dudleya.
 - **Species Objective 2.2:** OCTA will implement restoration projects where there are known occurrences of many-stemmed dudleya in the project vicinity. The restoration actions will improve and enhance potentially suitable habitat for many-stemmed dudleya.
 - **Species Objective 2.3:** OCTA will establish policies and procedures that require OCTA to identify, track, mitigate, and report annually any unavoidable impacts on many-stemmed dudleya.
- **Species Goal 3:** Provide conservation of **southern tarplant** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.
 - **Species Objective 3.1:** OCTA will implement a restoration project in the vicinity of known occurrences of southern tarplant. The restoration design plan includes elements (e.g., include southern tarplant seeds in the seed mix) to promote the expansion of southern tarplant as part of the restoration efforts.
 - **Species Objective 3.2:** OCTA will establish policies and procedures that require OCTA to identify, track, mitigate, and report annually any unavoidable impacts on southern tarplant.
- **Species Goal 4:** Provide conservation of **arroyo chub** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.
 - **Species Objective 4.1:** OCTA will restore and enhance riparian habitat in areas that potentially support arroyo chub and conserve natural habitat in the headwaters of a stream supporting arroyo chub to protect in-stream water quality.
 - **Species Objective 4.2:** OCTA will implement a restoration project focused on improving habitat conditions for arroyo chub, such as improving water quality, removing nonnative aquatic species or modifying check dams to allow passage, to support sustainable populations in occupied areas.
 - **Species Objective 4.3:** OCTA will establish policies and procedures to avoid and minimize impacts on arroyo chub and its habitat.
- **Species Goal 5:** Provide conservation of **coast horned lizard** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.
 - **Species Objective 5.1:** OCTA will acquire Preserves with natural habitat that includes areas with loose, fine soils with high sand fraction, open areas with limited overstory for basking, and other features known to support coast horned lizard and OCTA will ensure that appropriate management monitoring actions are incorporated into the RMPs for each Preserve that include suitable habitat for coast horned lizard.

- **Species Goal 6:** Provide conservation of **orangethroat whiptail** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.
 - **Species Objective 6.1:** OCTA will acquire Preserves that have documented occurrences of orangethroat whiptail. OCTA will ensure that appropriate management and monitoring actions are incorporated into the RMPs for each Preserve to protect and maintain habitat to support sustainable populations of orangethroat whiptail
- **Species Goal 7:** Provide conservation of **western pond turtle** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.
 - **Species Objective 7.1:** OCTA will acquire a Preserve(s) with the potential to expand western pond turtle populations, potentially via translocation. OCTA will enhance the riparian and streambed habitat within the Preserve(s) to create and/or improve permanent and intermittent water sources that could provide habitat for western pond turtle.
 - **Species Objective 7.2:** OCTA will implement a restoration project that will directly benefit known populations of western pond turtle by removing nonnative invasive plant species clogging the stream course, expanding ponds and open water, and exposing potential basking sites.
 - **Species Objective 7.3:** OCTA will establish policies and procedures to avoid and minimize impacts on western pond turtle and its habitat.
- **Species Goal 8:** Provide conservation of **cactus wren** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.
 - **Species Objective 8.1:** OCTA will protect and manage blocks of occupied cactus wren habitat to support sustainable populations and maintain habitat linkages between cactus wren populations within the Plan Area.
 - **Species Objective 8.2:** OCTA will implement restoration project(s) focused on creating cactus scrub habitat to expand habitat in areas of known cactus wren populations.
 - **Species Objective 8.3:** OCTA will establish policies and procedures to avoid and minimize impacts on cactus wren habitat, including cactus scrub.
- **Species Goal 9:** Provide conservation of **coastal California gnatcatcher** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.
 - **Species Objective 9.1:** OCTA will protect and manage blocks of occupied gnatcatcher nesting habitat to support sustainable populations and maintain habitat linkages between coastal California gnatcatcher populations within the Plan Area.
 - **Species Objective 9.2:** OCTA will restore and/or enhance coastal sage scrub habitat to expand coastal California gnatcatcher habitat.
 - **Species Objective 9.3:** OCTA will establish policies and procedures to avoid and minimize impacts on coastal California gnatcatcher habitat, including coastal sage scrub.
- **Species Goal 10:** Provide conservation of **least Bell's vireo** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.
 - **Species Objective 10.1:** OCTA will acquire a Preserve with the potential to enhance riparian habitat to expand least Bell's vireo habitat.

- **Species Objective 10.2:** OCTA will restore and/or enhance riparian habitat adjacent to occupied least Bell's vireo habitat.
- **Species Objective 10.3:** OCTA will restore and/or enhance riparian habitat in areas not currently occupied by least Bell's vireo to encourage future expansion of the species distribution within the Plan Area.
- **Species Objective 10.4:** OCTA will establish policies and procedures to avoid and minimize impacts on least Bell's vireo habitat, including riparian habitat.
- **Species Goal 11:** Provide conservation of **southwestern willow flycatcher** habitat within the Plan Area and minimize and mitigate impacts associated with Covered Activities.
 - **Species Objective 11.1:** OCTA will restore and/or enhance riparian habitat adjacent to suitable southwestern willow flycatcher habitat.
 - **Species Objective 11.2:** OCTA will establish policies and procedures to avoid and minimize impacts on southwestern willow flycatcher habitat, including riparian habitat.
- **Species Goal 12:** Provide conservation of **bobcat** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.
 - **Species Objective 12.1:** OCTA will protect and manage natural habitat that includes a combination of land cover types important for wildlife movement of mammals such as bobcat.
 - **Species Objective 12.2:** OCTA will implement a restoration project(s) designed to improve wildlife movement by mammals such as bobcat.
 - **Species Objective 12.3:** OCTA will restore or enhance habitat through restoration projects that improve habitat connectivity and wildlife movement for bobcat.
 - **Species Objective 12.4:** OCTA will establish policies and procedures to protect and maintain wildlife movement corridors.
- **Species Goal 13:** Provide conservation of **mountain lion** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.
 - **Species Objective 13.1:** OCTA will protect and manage natural habitat that includes a combination of land cover types important for wildlife movement of large mammals such as mountain lion.
 - **Species Objective 13.2:** OCTA will implement a restoration project(s) designed to improve wildlife movement by large mammals such as mountain lion.
 - **Species Objective 13.3:** OCTA will restore or enhance habitat through restoration projects that improve habitat connectivity and provide benefits to wildlife movement for mountain lion.
 - **Species Objective 13.4:** OCTA will establish policies and procedures to protect and maintain wildlife movement corridors.

5.4 Preserve Acquisitions

The acquisition of Preserve lands is the primary component of the Plan's conservation strategy. Properties have been acquired from willing sellers following the processes described below.

5.4.1 Selection of Preserves

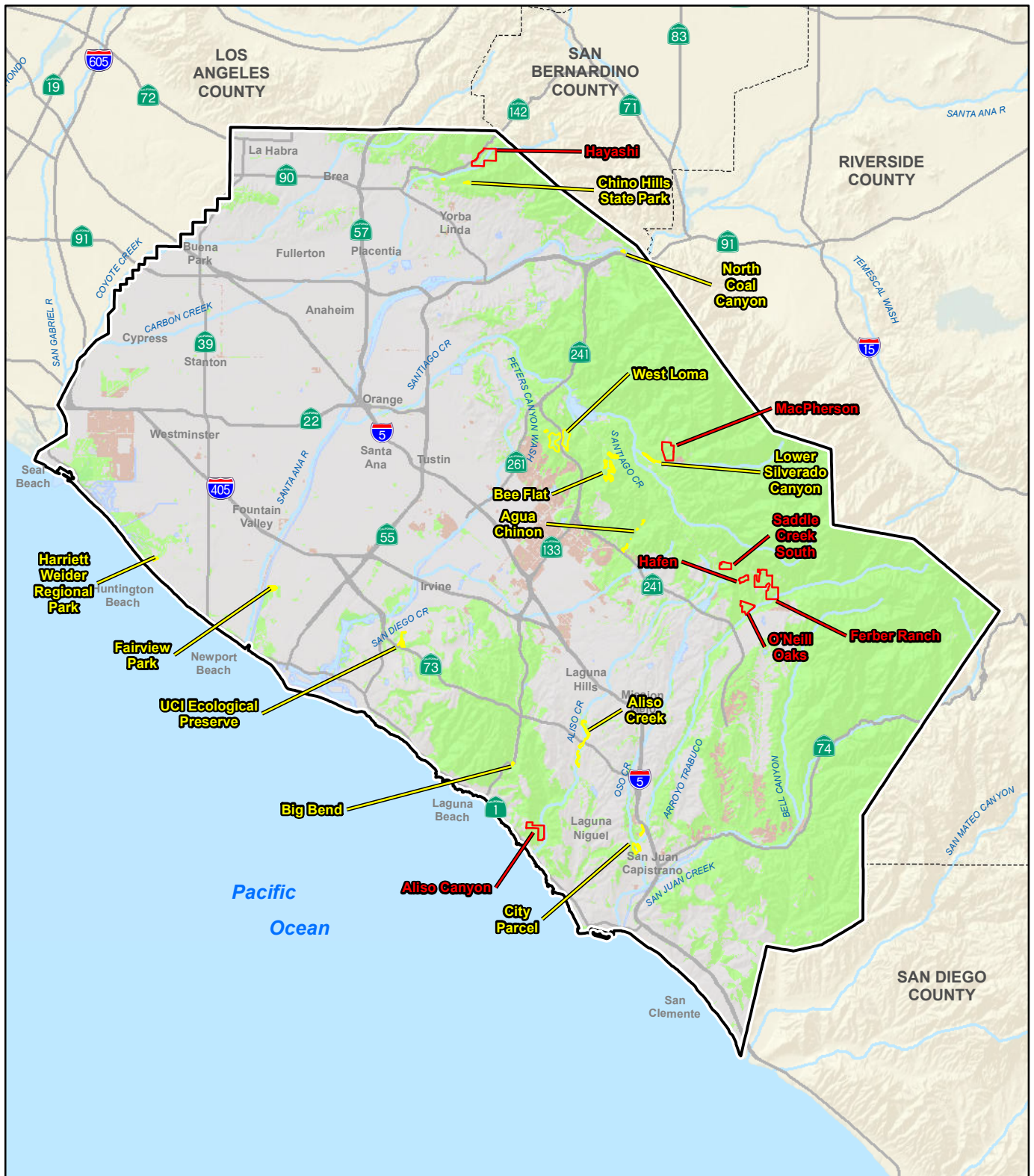
The selection of the Preserves was designed to meet the biological goals and objectives of the Plan while also contributing to the collective goals of the existing regional network of protected areas within the Plan Area. In August 2008, OCTA, Caltrans, CDFW, and USFWS began working together to develop criteria to assist in the evaluation of potential mitigation opportunities (including acquisitions). The acquisition, restoration, and management criteria were vetted by the EOC and were approved by the OCTA Board in fall 2008. These criteria were based on input from the resource agencies and EOC members. The criteria were initially used to provide guidance to property owners and conservation organizations as part of the solicitation of proposals to build an inventory of potential conservation sites. Using the property acquisition, restoration, and management criteria as a baseline, OCTA staff worked with Caltrans, CDFW, and USFWS to develop the Property Acquisition/Restoration/Management Criteria Matrices (property evaluation matrices). These matrices divided the acquisition, restoration, and management criteria into two categories: biological factors and non-biological factors.

Two matrices were developed to evaluate both the biological and non-biological factors. Criteria for biological factors were then sub-divided into two tiers. Tier I included primary biological values that align with freeway improvement project effects, conserve sensitive habitats, contain habitat for Covered Species, contribute to achieving the biological goals and objectives of the Plan, and contribute to achieving the collective goals of the regional network of protected lands. Tier II included the next level of biological values, including habitat diversity and quality of habitat. Non-biological factors included EOC and Board policy considerations that facilitated the decision-making process for properties under consideration. Factors such as timing and cooperation, management cost and constraints, funding, co-benefits, and support (at the community and governmental levels) were considered under this property evaluation matrix.

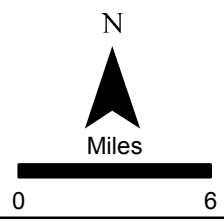
The complete set of criteria for property acquisitions is included in Appendix D. Together, these property evaluation matrices were intended to guide the involved parties in deciding whether or not to proceed with the acquisition of properties. In 2008, OCTA began soliciting proposals from the public, non-profits, local agencies, and willing seller landowners. Over 50 properties were evaluated and ranked by representatives of OCTA, EOC, and Wildlife Agencies. For those properties with the highest ranking, OCTA completed appraisals and entered into negotiations for acquisition.

5.4.2 Preserves

OCTA has selected and acquired seven Preserves that total approximately 1,300 acres (see Table 5-2). The locations of the Preserves across the Plan Area are shown on Figure 5-1 and the locations of the Preserves relative to adjoining protected open space are shown on Figure 6-4. The collection of Preserves in the Trabuco Canyon area has created a substantial block of conservation in an area that did not previously exist as protected open space. The Aliso Canyon, Hayashi, and MacPherson Preserves add to blocks of existing protected open space in Orange County. These Preserves provide for the protection of diverse habitats across the Plan Area.



- Legend**
- Plan Area
 - OCTA Acquired Preserves
 - OCTA Funded Restoration Projects
 - Natural Habitats
 - Agriculture
 - Developed



Sources: Preserves/Restoration Projects: OCTA 2015



Acquired Preserves and Restoration Projects

Figure 5-1

Table 5-2. Natural Habitat within Preserve Acquisitions

Preserves	Total Acres ¹	Acres of Natural Habitat
Aliso Canyon	151.1	146.9
Ferber Ranch	395.7	380.4
Hafen	48.0	47.9
Hayashi	298.8	293.6
O'Neill Oaks	116.1	112.4
MacPherson	203.5	200.0
Saddle Creek South ²	82.8	51.3
Total	1,296.0	1,232.5

¹ These acreages are approximate based on the best currently available survey data. Final acreages are not expected to vary significantly, but may be adjusted slightly in the future when more accurate data is available.

² Saddle Creek South Preserve was purchased, in part, with funding provided by the National Fish and Wildlife Foundation. OCTA receives a percentage of the available credits based on the percentage of the total cost of acquiring and managing the Preserve contributed by OCTA (75.36%).

For each of the seven Preserves, baseline biological surveys were completed that included detailed vegetation mapping and focused surveys of Covered Species. The baseline survey biological resources technical reports are included in Appendix C.6. The vegetation mapping from the baseline surveys was incorporated into a regional GIS database, and the predicted species habitat models were re-run to generate information that can be compared with Plan targets. Table 5-3 summarizes the biological data for each Preserve.

Table 5-3. Summary of Biological Resources within Acquired Preserves

Biometric	Preserves							Total
	Aliso Canyon	Ferber Ranch	Hafen	Hayashi	Mac-Pherson	O'Neill Oaks	Saddle Creek South ¹	
Natural Communities (acres)								
Chaparral	122.8	102.7	31.5	58.4	144.7	79.4	22.5	562.0
Coniferous Forest								0.0
Grassland	2.0	26.5		43.2	2.5			74.2
Riparian		3.0	2.1	3.4	9.8			18.3
Scrub	22.1	156.2	11.5	0.1	40.2	20.3	11.5	261.9
Water								0.0
Wet Meadows/ Marsh								0.0
Woodland		92.0	2.8	188.5	2.8	12.7	17.3	316.1
Totals	146.9	380.4	47.9	293.6	200.0	112.4	51.3	1,232.5

Biometric	Preserves							Total
	Aliso Canyon	Ferber Ranch	Hafen	Hayashi	Mac-Pherson	O'Neill Oaks	Saddle Creek South ¹	
Predicted Species Habitat Model and Critical Habitat (acres)								
<i>Plants</i>								
<i>Intermediate Mariposa Lily</i>								
Predicted Species Habitat	40.3	33.8	21.5		156.5	48.9	14.7	315.7
<i>Many-Stemmed Dudleya</i>								
Predicted Species Habitat	99.7	228.3	42.7	81.0	202.2	90.4	32.6	776.9
<i>Southern Tarplant</i>								
Predicted Species Habitat		9.3						9.3
<i>Fish</i>								
<i>Arroyo Chub</i>								
Predicted Species Habitat		0.1						0.1
<i>Reptiles</i>								
<i>Coast Horned Lizard</i>								
Predicted Species Habitat	85.7	79.5	42.8	0.7	199.1	97.3	24.7	529.8
<i>Orangethroat Whiptail</i>								
Predicted Species Habitat	2.1	30.2	0.5	13.7	0.4	4.4	0.8	52.1
<i>Western Pond Turtle</i>								
Predicted Species Habitat								
Aquatic	1.0	2.7	0.2	6.0				9.9
Upland	43.2	217.9	20.1	253.7	0.3	24.7	1.3	561.2
<i>Birds</i>								
<i>Cactus Wren</i>								
Predicted Species Habitat	22.1	156.1	11.5		40.2	20.3	4.5	254.7
<i>Coastal California Gnatcatcher</i>								
Predicted Species Habitat								
Very High	110.4							110.4
High	34.5				2.8	36.2		73.5
Moderate		83.5	11.3		23.2	13.9		131.9
Low		85.7			14.2		6.4	106.3
Critical Habitat		382.0	48.0			116.1	62.4	608.5
<i>Least Bell's Vireo</i>								
Predicted Species Habitat		3.0	2.1	3.4			0.2	8.7

Biometric	Preserves							Total
	Aliso Canyon	Ferber Ranch	Hafen	Hayashi	Mac-Pherson	O'Neill Oaks	Saddle Creek South ¹	
<i>Southwestern Willow Flycatcher</i>								
Predicted Species Habitat		3.0	2.1	3.4			0.2	8.7
<i>Mammals</i>								
<i>Bobcat</i>								
Predicted Species Habitat	146.9	380.4	47.9	293.6	200.0	112.4	51.3	1,232.5
<i>Mountain Lion</i>								
Predicted Species Habitat		353.9	47.9	250.4	197.5	112.4	51.2	1,013.3

¹ Saddle Creek South Preserve was purchased, in part, with funding provided by the National Fish and Wildlife Foundation. OCTA receives a percentage of the available credits based on the percentage of the total cost of acquiring and managing the Preserve contributed by OCTA (75.36%). Acres of natural communities conserved on Saddle Creek South are based on agreement with USFWS using previous vegetation mapping. Updated vegetation mapping (shown on Figure 5-8) will be used for ongoing Preserve management. Other land cover types (nonnative grasslands and ornamental) within the Saddle Creek South Preserve were not assigned conservation credits per agreement with USFWS.

The following sections provide an overview of each Preserve in terms of their biological resources and regional connectivity with other areas of protected open space.

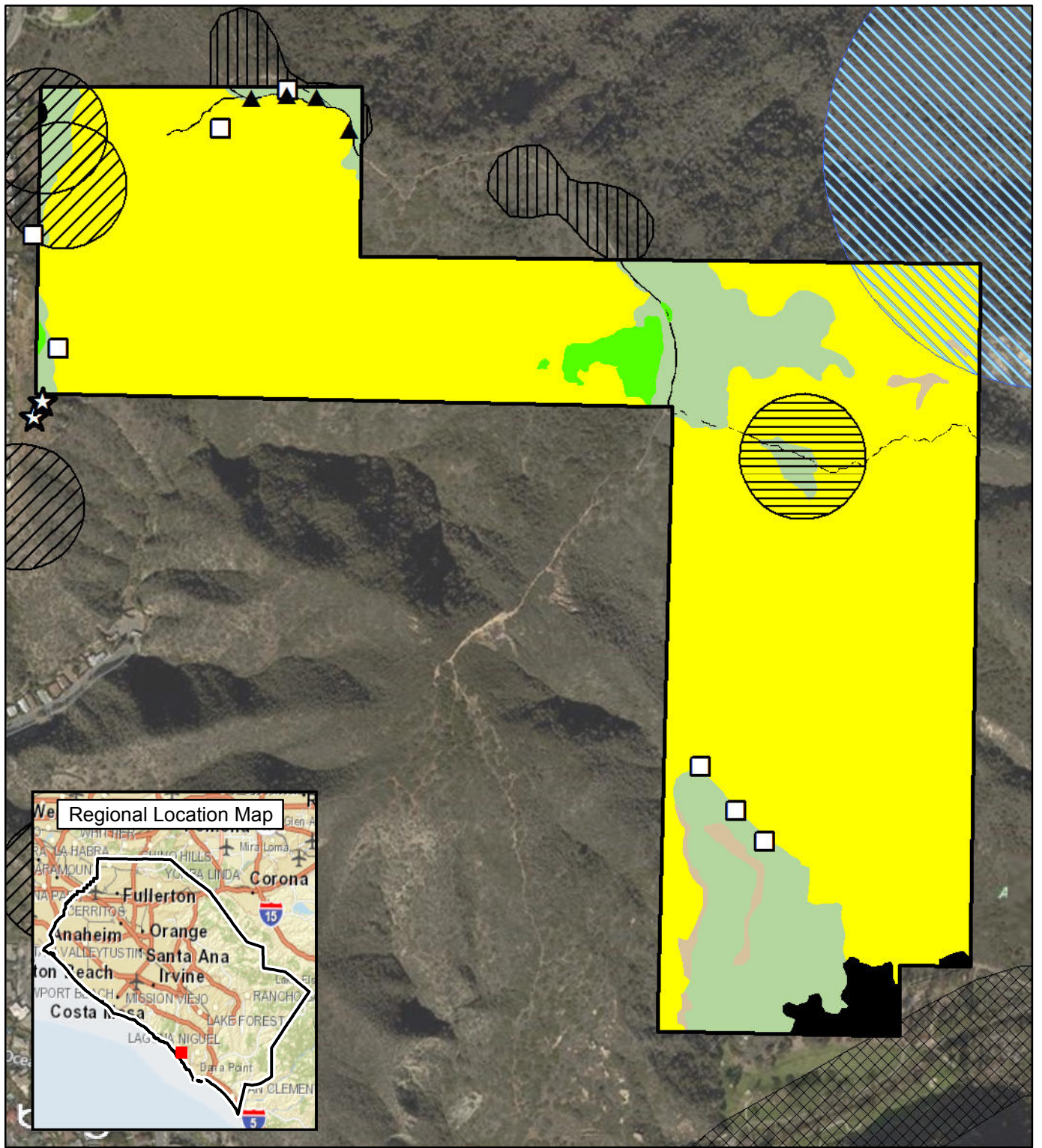
5.4.2.1 Aliso Canyon

The 151-acre Aliso Canyon Preserve is located east of Pacific Coast Highway in the southeast portion of the City of Laguna Beach. The northwestern edge of the property is adjacent to residential development along Barracuda Way and Loretta Drive, while the southeastern edge of the property is adjacent to The Ranch at Laguna Beach (hotel and golf course). The northern and eastern boundaries border the 4,500-acre Aliso and Wood Canyons Wilderness Park.



The Preserve can be accessed via trails from Moulton Meadows Park to the north and from the Aliso and Wood Canyon Wilderness Park’s “Mentally Sensitive Trail” to the northeast. Another trail spurs off the Mentally Sensitive Trail, continues south through the Aliso Canyon Preserve, and crosses onto City-owned lands to the south. The trails on the property are currently used by hikers and mountain bikers and are included on Orange County Parks’ trail maps, as well as in the trail network of the Laguna Beach General Plan Open Space/Conservation Element as “trails on private property”.

The Aliso Canyon Preserve was identified as a priority conservation area because of its diversity of habitat types it supports, including chaparral, scrub, and grassland and its proximity to other blocks of conserved open space. During the 2015 baseline surveys, Covered Species observed included coastal California gnatcatcher (immediately adjacent to Preserve), many-stemmed dudleya, and intermediate mariposa lily. Biological resources are shown on Figure 5-2.



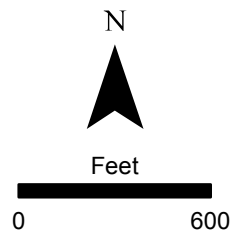
Legend

- Preserve Boundary
- Scrub
- Chaparral
- Grassland
- Barren
- Developed/Non-native

- Regional Species Sources**
- Coast Horned Lizard
 - Coastal California Gnatcatcher
 - Intermediate Mariposa Lily
 - Many-stemmed Dudleya
 - Southwestern Pond Turtle

- Baseline Surveys 2015**
- Coastal California Gnatcatcher
 - Intermediate Mariposa Lily
 - Many-stemmed Dudleya

Sources:
 Vegetation and Baseline Surveys: Bonterra-Psomas/OCTA/CDFW 2015;
 Regional Species: CNDDDB 2013, USFWS 2013, USFS 2013



Aliso Canyon Preserve Vegetation and Species Occurrences

Figure 5-2

Regional Significance and Connectivity. Aliso Canyon is within a priority conservation area of the San Joaquin Hills core habitat area (see Figure 6-1). A primary reason for selecting the Aliso Canyon Preserve for acquisition was its local and regional biological connectivity with conserved Orange County Parks open space that is a major component of the Central-Coastal NCCP/HCP Coastal Reserve. Figure 6-4 provides a regional perspective of how the Aliso Canyon Preserve contributes to and enhances the existing network of open space lands in this important coastal zone.

5.4.2.2 Ferber Ranch

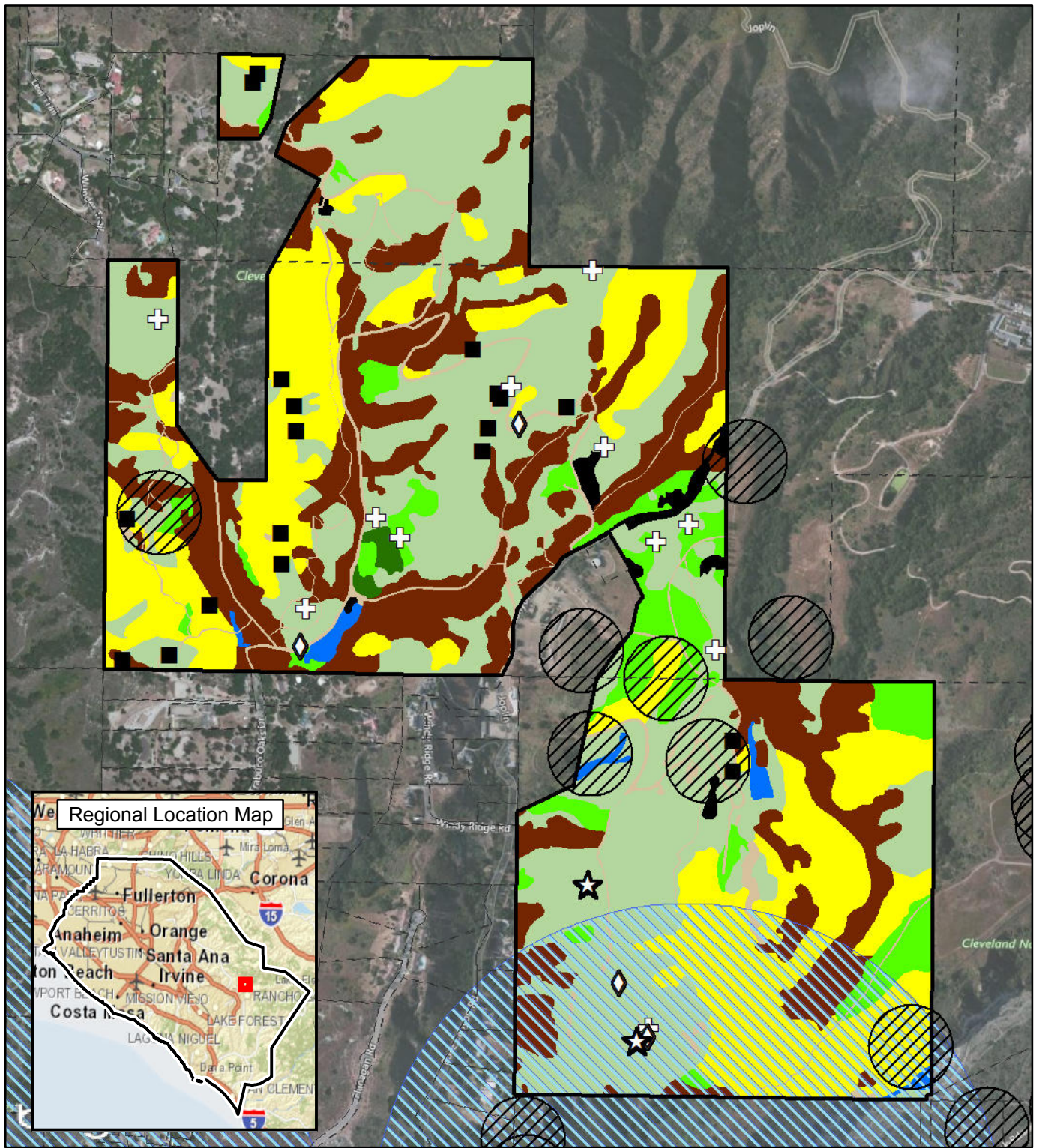
The 398.6-acre Ferber Ranch is located northwest of the City of Rancho Santa Margarita in Trabuco Canyon. The Preserve features rolling terrain with elevations ranging from 1,120–1,650 feet above msl. Hickey Creek drains the western side of the Preserve.

The Ferber Ranch Preserve was identified as a priority conservation area because of the diversity of habitat types it supports and its use as a wildlife movement corridor. The Preserve includes chaparral, scrub, woodland, riparian, and grassland habitat, with large patches of native grassland.



During the 2012 baseline surveys, Covered Species observed on site included coastal California gnatcatcher, cactus wren, orangethroat whiptail, bobcat, and intermediate mariposa lily. The Preserve is almost entirely within designated critical habitat for the coastal California gnatcatcher. Biological monitoring since the purchase of the Preserve has also documented use by mountain lion. Biological resources are shown on Figure 5-3.

Regional Significance and Connectivity. Ferber Ranch is located within a priority conservation area of the Northern Foothill and Santa Ana Mountains core habitat areas (see Figure 6-1). It is immediately adjacent to the CDFW-owned/managed, undesignated Hafen property to the west and near other open space lands, including the Cleveland National Forest to the north, Trabuco Creek and O'Neill Regional Park to the south, and the Joplin's Boys Ranch, which is maintained predominately as open space, to the northeast (see Figure 6-4). The Ferber Ranch Preserve is located within the Trabuco Canyon area of the Foothill/Trabuco Specific Plan. The Specific Plan has identified several important wildlife movement corridors on Ferber Ranch, which extend from Trabuco Creek to the Cleveland National Forest. Medium- and larger-sized mammals expected to be using these corridors include mule deer, mountain lion, bobcat, coyote, gray fox, badger, raccoon, and ring-tail. The Ferber Ranch Preserve is one of the larger landholdings within the Foothill/Trabuco Specific Plan and has a land use designation that would have allowed the construction of 188 dwelling units. The acquisition of Ferber Ranch as a Preserve will allow this core segment of the Trabuco Canyon area to be maintained as natural open space and ensure protection of Covered Species and preservation of wildlife movement in and through the area.



Legend

- | | |
|-------------------|----------------------|
| Preserve Boundary | Riparian |
| Scrub | Barren |
| Chaparral | Agriculture |
| Grassland | Developed/Non-native |
| Woodland | |

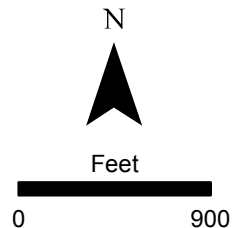
Regional Species Sources

- | |
|--------------------------------|
| Coast Horned Lizard |
| Coastal California Gnatcatcher |

Baseline Surveys 2012

- | |
|--------------------------------|
| Coastal California Gnatcatcher |
| Cactus Wren |
| Orangethroat Whiptail |
| Intermediate Mariposa Lily |

Sources:
 Vegetation and Baseline Surveys: Bonterra 2012
 Regional Species: CNDDB 2013, USFWS 2013, USFS 2013



Ferber Ranch Preserve Vegetation and Species Occurrences

Figure 5-3

5.4.2.3 Hafen

The Hafen Preserve is a 48-acre parcel located northwest of the City of Rancho Santa Margarita in Trabuco Canyon. The Preserve features rolling terrain with elevations ranging from 1,200–1,300 feet above msl. Residential development is located to the south and west with scattered residences to the immediate north. The Cleveland National Forest is located to the north and east of the Preserve.

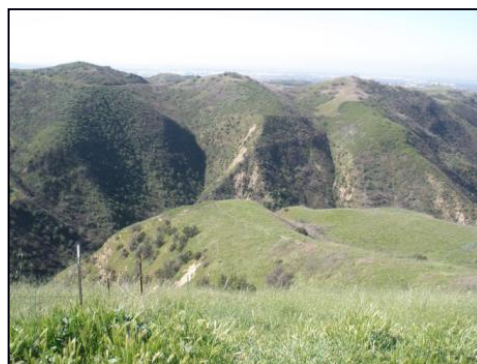


The Hafen Preserve was identified as a priority conservation area because of the diversity of habitat types found on the Preserve—including chaparral, coastal sage scrub, riparian, and woodlands. During the 2012 baseline surveys, Covered Species observed on site included cactus wren and intermediate mariposa lily. The Preserve is almost entirely within designated critical habitat for the coastal California gnatcatcher. Biological resources are shown on Figure 5-4.

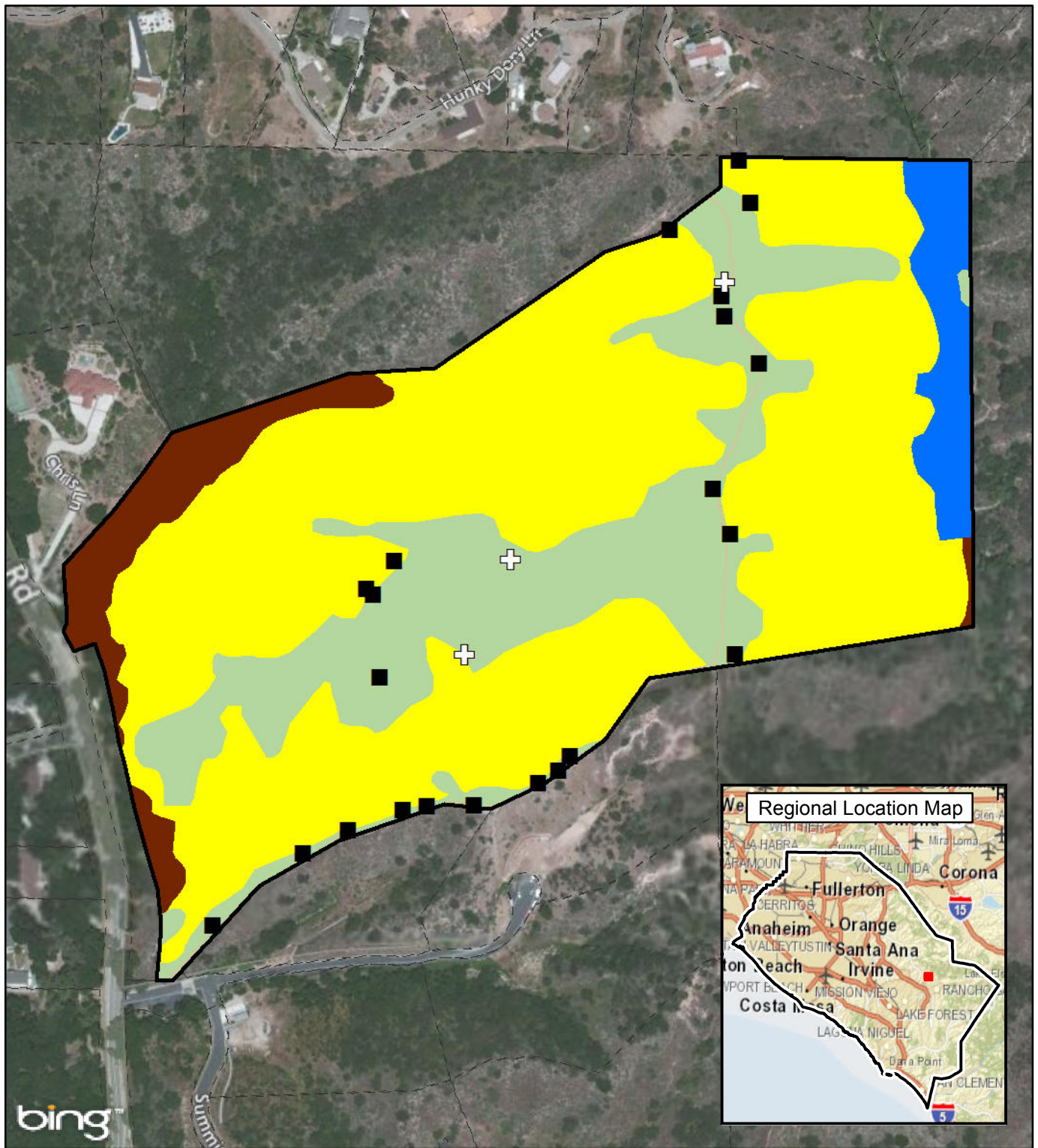
Regional Significance and Connectivity. The Hafen Preserve is located within a priority conservation area of the Northern Foothill core habitat area (see Figure 6-1). It is close to Ferber Ranch, with the State-owned and CDFW-managed Hafen Preserve between the two Preserves. It is located within the Trabuco Canyon area of the Foothill/Trabuco Specific Plan area. The Preserve provides a wildlife movement corridor that extends to the adjacent Live Oak Canyon Road and also provides connectivity to the Cleveland National Forest. According to the Foothill/Trabuco Specific Plan, large and medium sized mammals expected to be using the corridor include mule deer, mountain lions, bobcats, coyotes, gray foxes, badgers, raccoons, and ring-tail. The Preserve has a land use designation that would have allowed for the construction of up to nine dwelling units. However, OCTA's acquisition of this Preserve will allow this segment of the Trabuco Canyon area to be preserved as open space. This will maintain the natural open spaces values and ensure the protection of certain Covered Species and preservation of wildlife movement through the area.

5.4.2.4 Hayashi

The 299-acre Hayashi Preserve is located southeast of Carbon Canyon Road (SR-142) in the City of Brea, just northwest of the Chino Hills State Park. The Preserve is situated within the Chino Hills core habitat area, which forms the northeastern border of Orange County. The Preserve features rolling terrain with elevations ranging from 650–1,260 feet above msl and is defined by northeast–southwest trending hills on both sides of Soquel Canyon Creek.



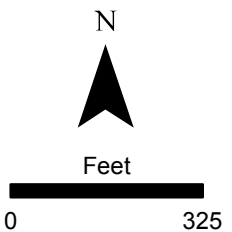
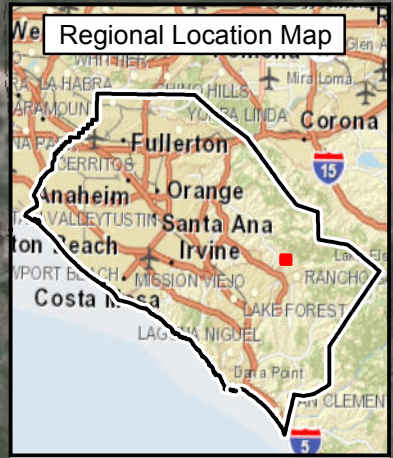
The Hayashi Preserve was identified as a priority conservation area due to high/very high landscape integrity and biodiversity. The Preserve supports chaparral, grassland, riparian, and woodland vegetation, including coast live oak woodland and California walnut woodland. Incidental observations of western pond turtle and bobcat have been reported on the Preserve by Chino Hills State Park staff. Biological resources are shown on Figure 5-5.



Legend

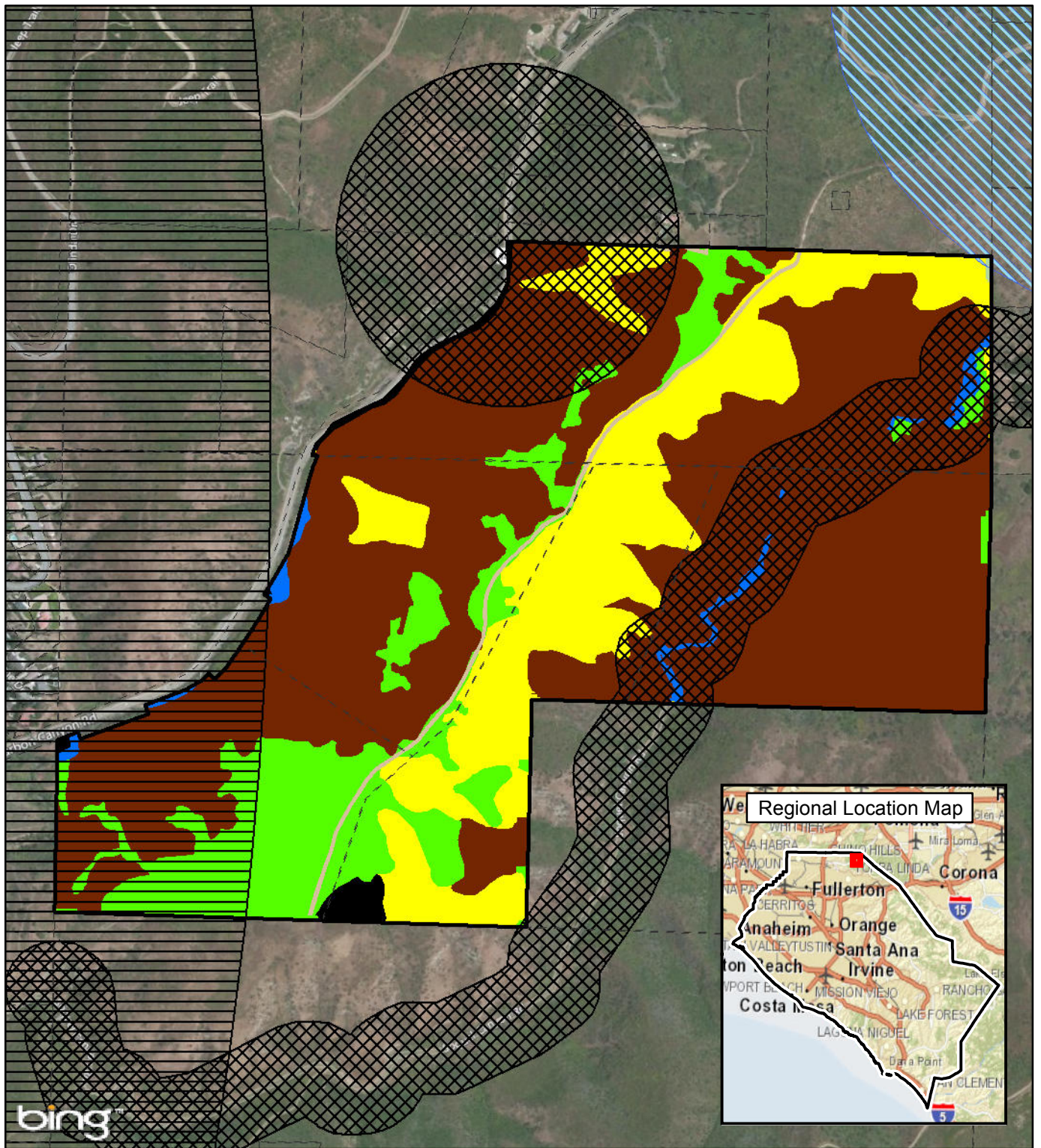
- | | |
|-------------------|------------------------------|
| Preserve Boundary | Baseline Surveys 2012 |
| Scrub | Cactus Wren |
| Chaparral | Intermediate Mariposa Lily |
| Woodland | |
| Riparian | |
| Barren | |

Sources:
 Vegetation and Baseline Surveys: Bonterra 2012
 Regional Species: CNDDB 2013, USFWS 2013, USFS 2013



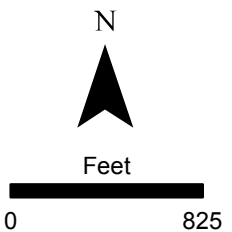
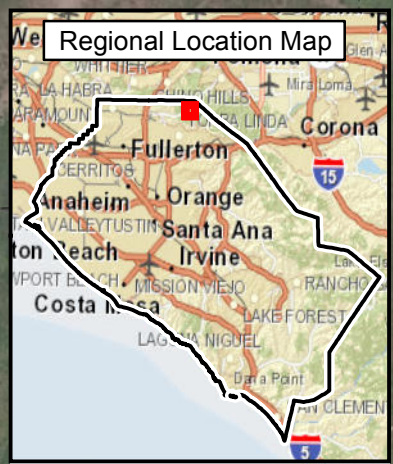
Hafen Preserve Vegetation and Species Occurrences

Figure 5-4



- Legend**
- | | | |
|-------------------|----------------------|---------------------------------|
| Preserve Boundary | Woodland | Regional Species Sources |
| Scrub | Riparian | Coast Horned Lizard |
| Chaparral | Barren | Many-Stemmed Dudleya |
| Grassland | Developed/Non-native | Southwestern Pond Turtle |

Sources:
 Vegetation and Baseline Surveys: Bonterra 2012
 Regional Species: CNDDDB 2013, USFWS 2013, USFS 2013



Hayashi Preserve Vegetation and Species Occurrences

Figure 5-5

Regional Significance and Connectivity. The Hayashi Preserve is within a priority conservation area of the Chino Hills core habitat area. It is immediately adjacent to the Chino Hills State Park along its southern boundary. The Preserve is located in the City of Brea and has a land use designation of Hillside Residential. Using the City's average slope range, approximately 15 dwelling units could be developed on the Hayashi Preserve. However, the acquisition of this Preserve will instead complement the open space of the 14,102-acre Chino Hills State Park. Preservation will contribute to the maintenance of the integrity of biological functions in the Chino Hills and protect wildlife migration and connectivity between the Puente Hills to the northwest and Santa Ana Mountains to the south. Acquisition of the Hayashi Preserve supports the preservation efforts of various entities that have long sought the conservation of open space resources in the Chino Hills.

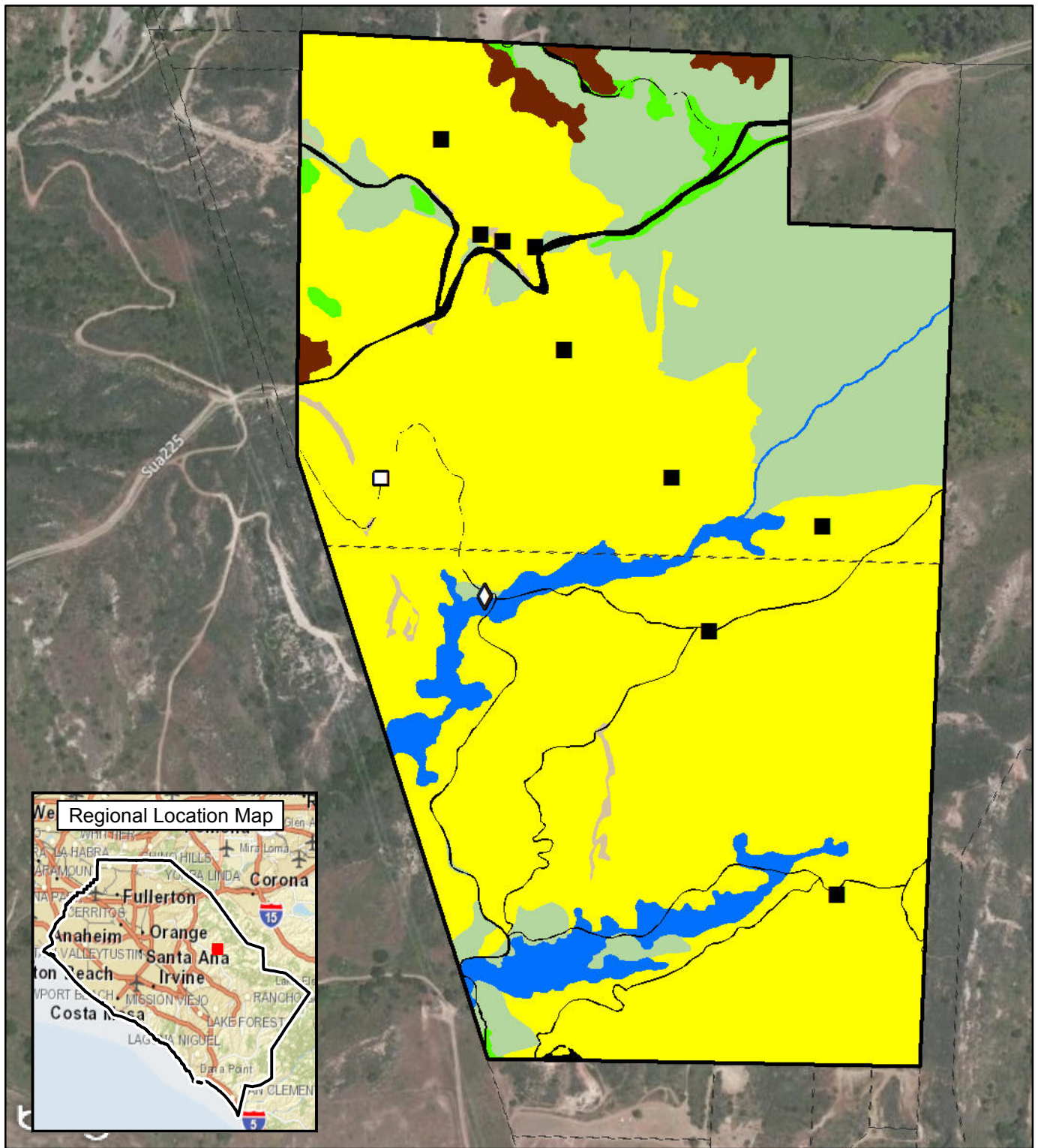
5.4.2.5 MacPherson

The MacPherson Preserve is an approximately 204-acre parcel located in the foothills of the Santa Ana Mountains within Silverado Canyon. Topography on the Preserve is hilly, with the main ridgelines oriented in a northeast to southwest direction. Elevations range from approximately 1,135 to 1,678 feet above msl. The Preserve is surrounded by open space with some adjacent low density residential development to the south. The Cleveland National Forest is located to the east with County-owned land to the west.



The MacPherson Preserve was identified as a priority conservation area in the Santa Ana Mountain core habitat area (see Figure 6-1) because it provides connectivity between lower- and higher-elevation open space lands within Orange County. The Preserve also supports a range of habitat types, including chaparral, grassland, riparian, scrub, and woodland. Covered Species observed on site included intermediate mariposa lily, coast horned lizard, and orangethroat whiptail. Biological resources are shown on Figure 5-6.

Regional Significance and Connectivity. The MacPherson Preserve was considered a high priority acquisition because of its local and regional proximity to Orange County Parks conserved open space lands, which border the Preserve on the west. In addition, the property is within the Cleveland National Forest administrative boundary. Cleveland National Forest land-holdings are to the north and east of the Preserve. Figure 6-4 provides a regional perspective of how the MacPherson Preserve is located within the network of open space lands.



Legend

- Preserve Boundary
- Scrub
- Chaparral
- Grassland
- Woodland
- Riparian
- Barren
- Developed/Non-native

Baseline Surveys 2015

- Coast Horned Lizard
- Orangethroat Whiptail
- Intermediate Mariposa Lily



Feet

0 570

Sources:
 Vegetation and Baseline Surveys: Bonterra-Psomas/OCTA/CDFW 2015
 Regional Species: CNDDB 2013, USFWS 2013, USFS 2013

Note: The entire MacPherson site is within a CNDDB 1951 Southwestern Pond Turtle siting. There are no other CNDDB mapped species locations within this preserve.



MacPherson Preserve Vegetation and Species Occurrences

Figure 5-6

5.4.2.6 O’Neill Oaks

The O’Neill Oaks Preserve is approximately 116 acres and is located northwest of the City of Rancho Santa Margarita in Trabuco Canyon. The Preserve features rolling terrain with elevations ranging from 920–1,250 feet above msl. Residential development is located to the south and east of the Preserve. The Cleveland National Forest is located approximately 1.5 miles north of the Preserve.

The O’Neill Oaks Preserve was identified as a priority conservation area because of the diversity of habitat types found on the Preserve—including chaparral, coastal sage scrub, riparian, and woodlands. The Preserve falls within designated critical habitat for the coastal California gnatcatcher. During the 2012 baseline surveys, Covered Species observed on site included the intermediate mariposa lily, orangethroat whiptail, cactus wren, coastal California gnatcatcher, and mountain lion. Biological resources are shown on Figure 5-7.



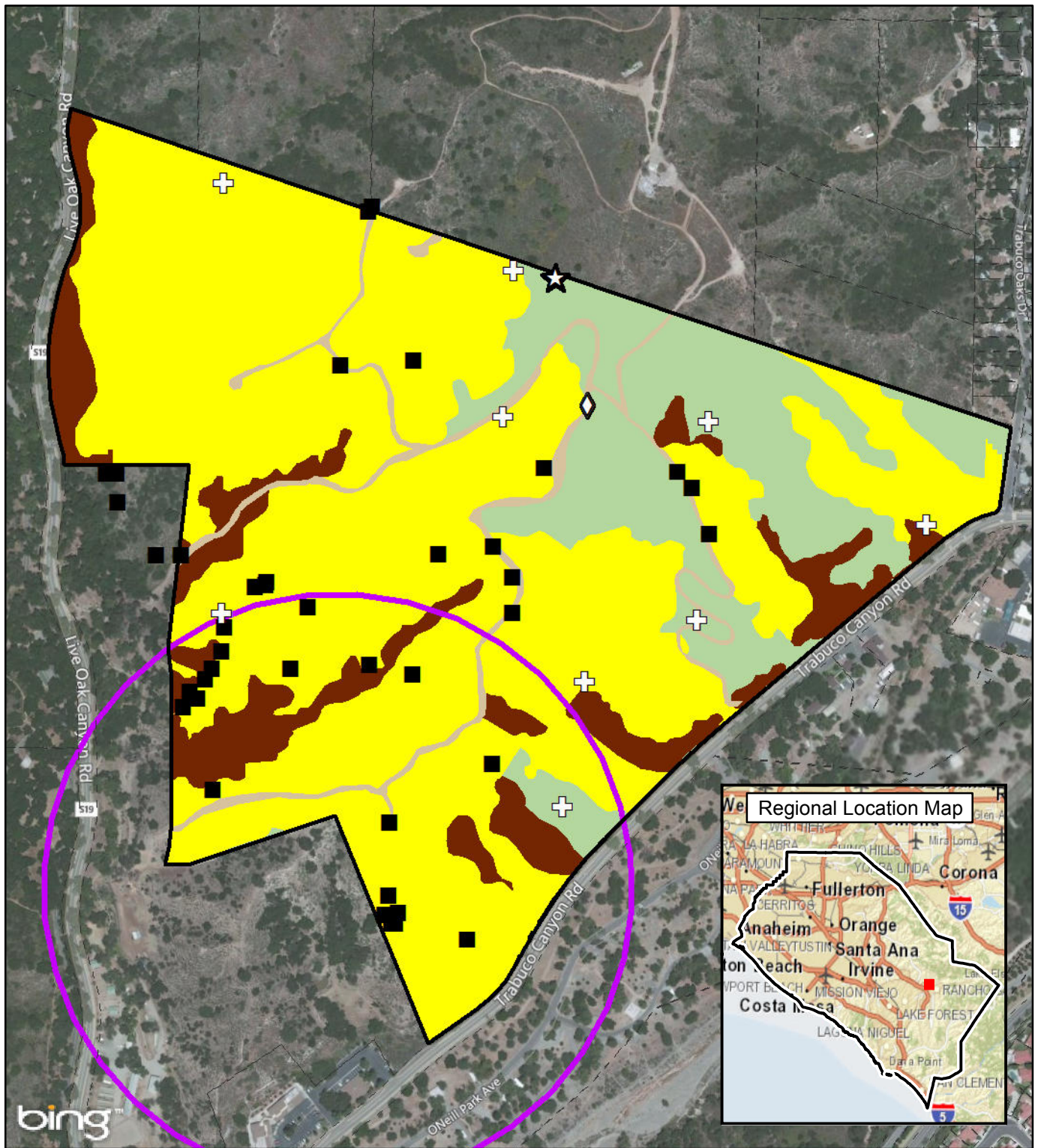
Regional Significance and Connectivity. The O’Neill Oaks Preserve is located in a priority conservation area of the Northern Foothills core habitat area (see Figure 6-1). O’Neill Regional Park borders it to the east and west (see Figure 6-4). The Preserve is within the Trabuco Canyon area of the Foothill/Trabuco Specific Plan area. The Specific Plan identifies a wildlife movement corridor along the western edge of the O’Neill Oaks Preserve. This wildlife movement corridor extends adjacent to Live Oak Canyon Road and provides connectivity to the Cleveland National Forest. The adjacency with O’Neill Regional Park provides a larger open space buffer adjacent to Trabuco Creek, which serves as an important wildlife movement corridor.

5.4.2.7 Saddle Creek South

The Saddle Creek South Preserve is an approximately 83-acre parcel located on the south side of Live Oak Canyon Road in the eastern portion of unincorporated Orange County, north of the City of Rancho Santa Margarita. The Preserve is at the western base of the Santa Ana Mountains and features low, east–west trending hills with elevations ranging from approximately 1,200 to 1,600 feet above msl.

The Saddle Creek South Preserve was identified as a priority conservation area in the Northern Foothills core habitat area and is within designated critical habitat for the coastal California gnatcatcher. The Saddle Creek South Preserve was purchased, in part, with funding provided by the National Fish and Wildlife Foundation. OCTA receives a percentage of the available credits based on the percentage of the total cost of acquiring and managing the Preserve contributed by OCTA (75.36%). Habitat types found on the Preserve include chaparral, coastal sage scrub, grassland, and woodlands. During the 2012 baseline surveys, Covered Species observed on site included the intermediate mariposa lily and cactus wren. Biological resources are shown on Figure 5-8.





Legend

- Preserve Boundary
- Scrub
- Chaparral
- Woodland
- Barren
- Developed/Non-native

Regional Species Sources

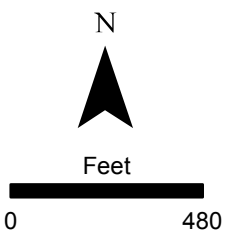
- Orangethroat whiptail
- Note: The CNDDB San Diego coast horned lizard occurrence (1990) covers the entire property.

Baseline Surveys 2012

- Coastal California Gnatcatcher
- Cactus Wren
- Intermediate Mariposa Lily
- Orangethroat Whiptail

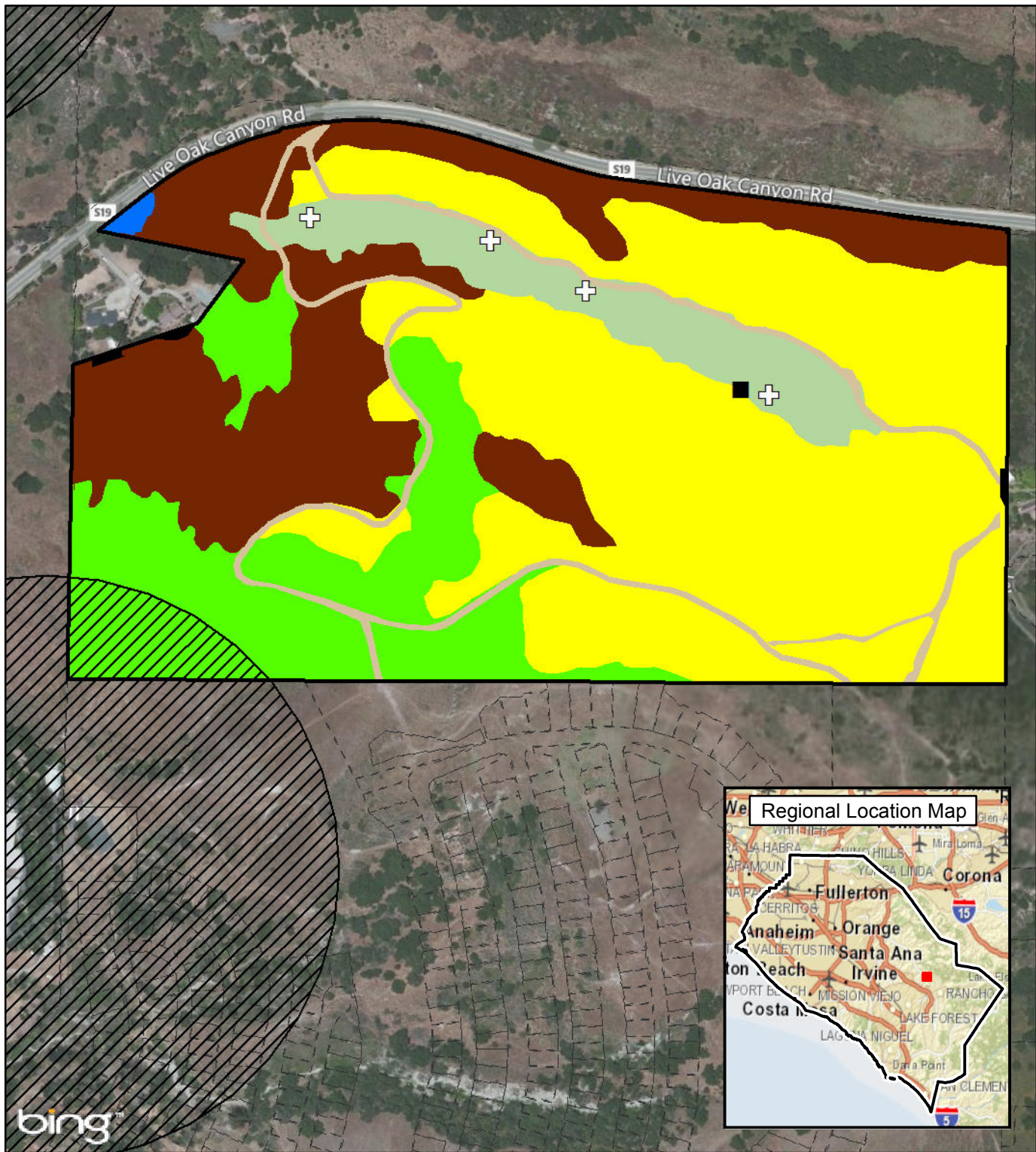
Sources:

Vegetation and Baseline Surveys: Bonterra 2012
 Regional Species: CNDDB 2013, USFWS 2013, USFS 2013



O'Neill Oaks Preserve Vegetation and Species Occurrences

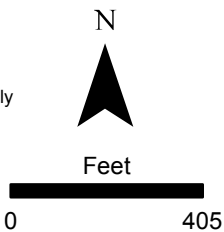
Figure 5-7



- Legend**
- Preserve Boundary
 - Woodland
 - Riparian
 - Chaparral
 - Grassland
 - Barren
 - Developed/Non-native

- Regional Species Sources**
- Coastal California Gnatcatcher

- Baseline Surveys 2012**
- Cactus Wren
 - Intermediate Mariposa Lily



Sources:
 Vegetation and Baseline Surveys: Bonterra 2012
 Regional Species: CNDDDB 2013, USFWS 2013, USFS 2013



Saddle Creek South Preserve Vegetation and Species Occurrences

Figure 5-8

Regional Significance and Connectivity. The Saddle Creek South Preserve is located within a priority conservation area of the Northern Foothills core habitat area (see Figure 6-1). It is immediately adjacent to the Live Oak Preserve Area along its western boundary and Saddle Creek North Preserve to the north (see Figure 6-4). Further, Saddle Creek South lies between the Cleveland National Forest and Live Oak Canyon, and its preservation protects wildlife movement between these two areas. The Preserve has relatively large blocks of intact habitat with high biodiversity and habitat suitable for coastal California gnatcatcher occupancy and movement. Conserving a portion of the Northern Foothills core habitat with the acquisition of the Saddle Creek South Preserve helps minimize interior fragmentation and maintain connectivity to the Santa Ana Mountains.

5.5 Restoration Projects

In addition to the Preserve acquisitions, a key component of the Plan conservation strategy is the funding of restoration projects throughout the Plan Area. The implementation of restoration projects provides greater flexibility for focused and directed conservation actions within particular locations and for habitats supporting Covered Species.

5.5.1 Selection of Restoration Projects

OCTA, through the direction and oversight of the EOC, solicited proposals for restoration projects and evaluated each one using a process that selected those that best met Plan goals. Initially, the EOC established restoration funding guidelines in 2010, which outlined the requirements for a restoration project—including success criteria, species protection, restoration site preparation, maintenance, monitoring, status reporting, and documentation. In 2012, these guidelines were updated with recommendations made by CDFW, USFWS, and USACE. This information was provided to entities interested in implementing restoration projects. There have been two rounds of funding for restoration projects. The first round took place in Fiscal Year 2009/2010 and the second in Fiscal Year 2011/2012.

A total of 25 restoration proposals were evaluated and considered for the first round of funding, and a total of 40 were considered for the second round (19 new proposals plus 21 from Round 1). The selection process was similar for both rounds and used a consistent set of biological and non-biological evaluation criteria (see Appendix D, “Evaluation Criteria for Selection of Preserves and Restoration Projects”). In conjunction with Caltrans, USFWS, CDFW, and USACE (M2 acquisition and restoration evaluation team), all restoration proposals were evaluated based on biological merits. The evaluation resulted in projects being assigned to one of the following groups:

- **Group 1:** Highest potential to support similar vegetative communities lost to covered freeway improvement projects (including consideration of impacts on watersheds), restores habitat for species that are considered sensitive under the CNDDDB and/or has high potential for the restoration of wetlands and waters of the U.S. with high functions and values, has high potential net benefit in ecological value for target species, and provides high habitat connectivity/contiguity opportunities.
- **Group 2:** Good potential to support similar vegetative communities lost to freeway projects (including the consideration of impacts on watersheds), restores habitat for species that are considered sensitive under the CNDDDB and/or has good potential for the restoration of

wetlands and waters of the U.S. with high functions and values, has good potential net benefit in ecological value for target species, and provides good connectivity/contiguity opportunities.

- **Group 3:** Lower potential to support similar vegetative communities lost to freeway projects (including the consideration of impacts on watersheds), fewer species that are considered sensitive under the CNDDDB and/or has less potential for the restoration of wetlands and waters of the U.S. with high functions and values, has lower potential net benefit in ecological value for target species, and offers fewer connectivity/contiguity opportunities.
- **Group 4:** Very low potential to support vegetative communities lost to freeway projects (including the consideration of impacts on watersheds), very few species that are considered sensitive under the CNDDDB and/or has very low potential for the restoration of wetlands and waters of the U.S. with high functions and values, has very low potential net benefit in ecological value for target species, and offers very low connectivity/contiguity opportunities.

Through discussions with the evaluation team, it was decided that restoration proposals within the first two hierarchical groups possessed the necessary biological value to contribute to the obligations of the Plan. The restoration projects that were selected focused both on habitats that can be tied back to effects resulting from the covered freeway projects and had benefits to watersheds that were considered to address the needs of the RWQCBs (Santa Ana and San Diego) and the USACE.

In September 2010, the OCTA Board authorized contracts with five restoration project sponsors for Round 1. In May 2012, the OCTA Board approved funding for six additional restoration projects for Round 2. The Round 1 and Round 2 restoration projects are shown on Figure 5-1 and listed in Table 5-4. Acreage estimations were provided to the Board for approval based on conceptual restoration design plans provided by the project sponsors for each of the restoration projects. As the project sponsors develop and refine their restoration plans these numbers are also revised and refined. The numbers in this table depict the acreage estimation amount as of fall 2013. Some of the restoration plans for Round 2 are still being finalized and approved by the Wildlife Agencies and Regulatory Agencies. Therefore, many of the numbers presented in this table are still estimates and may vary slightly in the final restoration plans.

Table 5-4. Round 1 and Round 2 Restoration Projects

Round	Project	Sponsor	Description
1	Agua Chinon/ Bee Flat Canyon	Irvine Ranch Conservancy	90.1 acres of restoration consisting of chaparral, grassland, coastal sage scrub, elderberry scrub, oak woodland, and riparian (mulefat scrub/elderberry shrubland)
	Big Bend	Laguna Canyon Foundation	3.7 acres of restoration consisting of coastal sage scrub and riparian woodland to enhance wildlife connectivity
	City Parcel	City of San Juan Capistrano	53 acres of restoration consisting of riparian and coastal sage scrub within Trabuco Creek Wildlife Linkage
	Fairview Park	City of Costa Mesa	23 acres of restoration consisting of wetlands, grasslands, coastal sage scrub, and riparian
	UC Irvine Ecological Preserve	Nature Reserve of Orange County	8.5 acres of restoration consisting of cactus scrub

Round	Project	Sponsor	Description
2	Aliso Creek	Laguna Canyon Foundation	55 acres of restoration consisting of riparian and transitional habitat
	Chino Hills State Park	Chino Hills State Park	13.5 acres of riparian restoration and 6 acres of cactus scrub restoration
	Harriett Weider Regional Park	Bolsa Chica Conservancy	8.2 acres of restoration consisting of grassland, coastal sage scrub, and riparian habitat
	Lower Silverado Canyon	Irvine Ranch Conservancy	28.4 acres of restoration consisting of riparian and coastal sage scrub habitat
	North Coal Canyon	California Department of Parks and Recreation	5.5 acres of restoration consisting of coastal sage scrub habitat within a key wildlife connectivity linkage area
	West Loma	Irvine Ranch Conservancy	62.47 acres of restoration consisting of grassland, coastal sage scrub, and riparian habitat

5.5.2 Contribution of Restoration Projects to Plan Obligations

The restoration projects approved for funding by OCTA provide substantial biological value and were selected in large part for how these projects provide partial mitigation for impacts resulting from the covered freeway improvement projects. OCTA received letters from the Wildlife Agencies that provided assurances that restoration projects can contribute to the Plan obligations as long as OCTA can demonstrate that:

1. The restored habitat meets final success criteria identified in final restoration plans approved by the Wildlife Agencies. The Wildlife Agencies will be responsible for the review and approval of restoration projects to sign off that the success criteria has been met.
2. The restored habitat is conserved through a conservation easement, deed restriction, or other mechanism approved by the Wildlife Agencies.
3. The restoration site will be managed in-perpetuity in a manner that maintains the biological values of the restoration site.

In terms of items #2 and #3, all of the 11 restoration projects approved for funding to date occur on public or quasi-public lands that are being managed for long-term biological value. A more detailed description of the status of conservation easements and long-term management associated with each individual restoration project is provided below.

In terms of item #1, OCTA has entered into contracts with the entities managing the restoration efforts, which include the success criteria identified in the final restoration plans as part of the contracts. For the purposes of this Plan and conservation analysis, it is assumed that the restoration projects will be successful in meeting the final success criteria. However, OCTA will receive credit for restoration projects only after the Wildlife Agencies sign off that the restoration projects have achieved their success criteria. If projects are not successful in meeting their success criteria, OCTA will address each situation on a case-by-case basis in coordination with the entity implementing the restoration project and the Wildlife Agencies.

The following assumptions were used in determining how much each restoration project contributes to the Plan obligations in terms of biological factors (natural communities, predicted species models):

- **Natural Communities:** 1:1 acres for natural communities
- **Predicted Species Models:** Restoration for certain habitat types are recognized as also improving and enhancing potential habitat for Covered Species based on:
 - **Coastal sage scrub**—Coastal California gnatcatcher (the value rating of Very High, High, Moderate, Low was determined based on the location of the restoration project in relation to factors that influence the model—slope, patch size, elevation)
 - **Coastal cactus scrub**—Cactus wren and coastal California gnatcatcher
 - **Scrub habitat**—Reptiles (coastal horned lizard and orangethroat whiptail)
 - **Riparian restoration**—Least Bells’ vireo, southwestern willow flycatcher, and western pond turtle (upland 80% and aquatic 20%)
 - **Riparian restoration within specific watersheds**—Arroyo chub
 - **Wet Meadow/Marsh** – Western pond turtle (aquatic 100%)
 - **Known potential for Covered Plants at restoration location**—Covered Plants

Table 5-5 provides a summary of how each restoration project contributes to the Plan obligations in terms of habitat types and predicted species habitat.

Table 5-5. Summary of Biological Resources within Restoration Projects

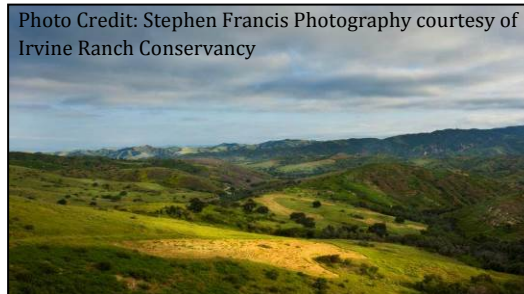
Biometric	<u>2011/2012 M2 Funded Restoration Projects</u>					<u>2009/2010 M2 Funded Restoration Projects</u>						Total
	Aliso Creek	Chino Hills State Park	Harriett Weider Regional Park	Lower Silverado Canyon	North Coal Canyon	West Loma	Aqua Chinon / Bee Flat Canyon	Big Bend	City Parcel	Fairview Park	UC Irvine Ecological Reserve	
Natural Communities (acres)												
Chaparral							4.0					4.0
Coniferous Forest												
Grassland			3.8			34.2	35.4			5.0		78.4
Riparian	55.0	13.5	0.5	20.6		2.2	2.1	0.5	13.0	3.0		110.6
Scrub		6.0	3.9	7.8	5.5	26.1	30.8	3.2	40.0	9.0	8.5	140.7
Water										1.0		1.0
Wet Meadows/Marsh										5.0		5.0
Woodland							17.8					17.8
Totals	55.0	19.5	8.2	28.4	5.5	62.5	90.1	3.7	53.0	23.0	8.5	357.5
Species – Predicted Species Habitat												
<i>Plants</i>												
<i>Intermediate Mariposa Lily</i>												
<i>Many-stemmed Dudleya</i>												
<i>Southern Tarplant</i>			8.2							23.0		31.2
<i>Fish</i>												
<i>Arroyo Chub</i>									13.0			13.0

Biometric	<u>2011/2012 M2 Funded Restoration Projects</u>					<u>2009/2010 M2 Funded Restoration Projects</u>						Total
	Aliso Creek	Chino Hills State Park	Harriett Weider Regional Park	Lower Silverado Canyon	North Coal Canyon	West Loma	Aqua Chinon / Bee Flat Canyon	Big Bend	City Parcel	Fairview Park	UC Irvine Ecological Reserve	
Reptiles												
<i>Coast Horned Lizard</i>		6.0	3.9	7.8	5.5	26.1	30.8	3.2	40.0	9.0	8.5	140.8
<i>Orangethroat Whiptail</i>		6.0	3.9	7.8	5.5	26.1	30.8	3.2	40.0	9.0	8.5	140.8
<i>Western Pond Turtle – Aquatic</i>	11.0	2.7	0.1	4.1		0.4	0.4	0.1	2.6	0.6		22.1
<i>Western Pond Turtle – Upland</i>	44.0	10.8	0.4	16.5		1.8	1.7	0.4	10.4	2.4		88.3
Birds												
<i>Cactus Wren</i>		6.0									8.5	14.5
<i>Coastal Cal. Gnatcatcher – Very High</i>							11.1	3.2				14.3
<i>Coastal Cal. Gnatcatcher – High</i>		6.0	3.9	17.6	5.5	49.0	19.7		40.0	9.0	8.5	126.5
<i>Coastal Cal. Gnatcatcher – Moderate</i>												
<i>Coastal Cal. Gnatcatcher – Low</i>												
<i>Least Bell's Vireo</i>	55.0	13.5	0.5	20.6		2.2	2.1	0.5	13.0	3.0		110.4
<i>Southwestern Willow Flycatcher</i>	55.0	13.5	0.5	20.6		2.2	2.1	0.5	13.0	3.0		110.4
Mammals												
<i>Bobcat</i>	55.0	13.5		28.4	5.5	62.5	90.1	3.7	53.0			311.7
<i>Mountain Lion</i>		13.5		28.4	5.5	28.3	54.7					130.4

5.5.3 Restoration Projects

5.5.3.1 Agua Chinon/Bee Flat

The Irvine Ranch Conservancy (IRC) proposed to restore 90.1 acres in the San Diego Creek watershed, within the sub-watersheds of Bee Flat Canyon and Agua Chinon. The sites include disturbed coastal sage scrub, grassland, and chaparral, as well as woodland and riparian habitat. The OCTA-funded restoration project will add to the other ongoing restoration projects in the same watershed that are being funded by other entities. The project site is within the Central-Coastal NCCP/HCP Central Reserve system, but the restoration proposed for this project is above and beyond the requirements of the Central-Coastal NCCP/HCP.



The long-term goal of the restoration is to facilitate habitat restoration and enhancement for the purpose of increasing landscape-scale ecosystem resilience and resistance to disturbance, primarily from catastrophic wildfire and invasive species. Sub-watershed-wide weed targets also will be controlled. The restoration success criteria include the reduction of nonnative cover of grasslands to native cover.

Long-Term Management. The sub-watersheds to be restored are owned in fee by the County of Orange. The Orange County Parks Department is responsible for their long-term stewardship subject to the terms and conditions of the Central-Coastal NCCP/HCP. In addition, the lands are deed restricted for open space and conservation purposes as the result of the recent transfer of land from the Irvine Company to the County of Orange. IRC works under contract with the County of Orange under the supervision of Orange County Parks and has existing formal permission to conduct restoration projects here.

Regional Significance and Connectivity. Located in unincorporated Orange County, the land is publicly owned, permanently protected, and within the plan area of the Central-Coastal NCCP/HCP.

5.5.3.2 Big Bend

This restoration project is located in the City of Laguna Beach. Since its purchase by the City a decade ago, the site has been used as an informal trailhead to access the 20,000-acre South Coast Wilderness System. The project site has been degraded by invasive species and human activity. Over the past 10 years, the City of Laguna Beach has worked with the Laguna Canyon Foundation (LCF) to preserve more than 250 acres adjacent to the proposed restoration area, which is now under City ownership and managed by Orange County Parks. This restoration site, however, is not part of the Central-Coastal NCCP/HCP Coastal Reserve.



The project will restore 3.2 acres of disturbed coastal sage scrub and approximately 0.5 acre of riparian habitat to benefit local species and increase the wildlife corridor's local and regional effectiveness. The restoration plan calls for the removal of invasive nonnative species and debris, planting of native species, and the maintenance/improvement of flood conveyance patterns across the site to enhance water quality for this important coastal watershed (the San Juan watershed).

Long-Term Management. The City of Laguna Beach currently owns the property and will be obligated to manage it to perpetuate the benefits of the restoration project. It is anticipated that it will be incorporated into the Orange County Parks management agreement mentioned above.. A deed restriction is expected to be recorded for the property to ensure long-term land use consistent with the project's restoration and mitigation intent.

Regional Significance and Connectivity. The restoration project is located within the Laguna Creek watershed in one of the key wildlife corridors that links Aliso and Wood Canyons Wilderness Park to the Laguna Coast Wilderness Park. Big Bend is at the juncture of several high-frequency wildlife trails used by deer and bobcat. It is located within the Central-Coastal NCCP/HCP Plan Area but has not been added to the Reserve system.

5.5.3.3 City Parcel

The City Parcel (2C Ranch Trabuco Canyon) is located within the San Juan Creek (Trabuco Creek) watershed in the City of San Juan Capistrano. This project is restoring 13 acres of riparian and 40 acres of coastal sage scrub habitats.

The primary aim of the restoration will be the removal and control of invasive, nonnative plants across the entire restoration area, followed by the planting of native riparian and upland species. This will establish a more diverse habitat structure that is conducive to supporting an array of native plants and wildlife. CNDDDB occurrence records for coastal California gnatcatcher, least Bell's vireo, and southwestern willow flycatcher intersect with the restoration site. The project site is not within the Plan Area of the Central-Coastal NCCP/HCP or the Orange County Southern Subregion HCP but within the City's designated Northwest Open Space. This open space area provides an important connection between these two landscape-level planning areas.



Long-Term Management. The City of San Juan Capistrano owns and manages the entire property of this restoration site as part of the Northwest Open Space. The City recorded a Declaration of Covenants and Restrictions in the fall of 2013. This Declaration will ensure long-term land use consistent with the project's restoration and habitat management intent.

Regional Significance and Connectivity. This project will strengthen the Trabuco Creek Wildlife Linkage, which provides vital connections between the Central-Coastal NCCP/HCP and Orange County Southern Subregion HCP reserve systems. The natural riparian zone along Trabuco Creek is unchannelized and historically known to support arroyo chub. The upland area extends uphill from Trabuco Creek to the Colinas ridgeline, where it connects to the Salt Creek Open Space Corridor, which is a permanent wilderness preserve and key wildlife corridor.

5.5.3.4 Fairview Park

The City of Costa Mesa will be responsible for restoring 23 acres of native grassland, coastal sage scrub, wet meadow/marsh, and riparian habitats within the northwest portion of this public park. The purpose is to create native habitat for riparian birds and animals by increasing native plant diversity within 10 feet of the constructed wetlands and stream channels. The project includes the creation of wetland ponds and a water delivery irrigation system to establish and support the native habitat. This restoration site is within the Santa Ana River watershed. The project site is within the Plan Area of the Central-Coastal NCCP/HCP but is not part of the Reserve. There was a previous mitigation project at this location (for the Santa Ana River Mainstem Project [SARP] Lower Santa Ana River Reach 2 Channel Excavation) (USFWS 2003), but the restoration project approved for funding by OCTA is above and beyond the requirements of the previous project.



Occurrences of the coastal California gnatcatcher have been observed at the restoration site. In addition, successful revegetation efforts for southern tarplant have been implemented at the restoration site (Nerhus pers. comm.).

Long-Term Management. The City of Costa Mesa will maintain the restored wetlands and riparian habitat project site in-perpetuity. Improvements and restoration are guided by the Fairview Park Master Plan approved by the Costa Mesa City Council in 1998. A conservation easement was recorded in 2008 for the Orange County Public Works in favor of the Orange County Flood Control District that currently protects the site.

Regional Significance and Connectivity. The undeveloped part of the Park west of Placentia Avenue is a part of the lower Santa Ana River ecosystem, and the City's Master Plan calls for the restoration and protection of that sensitive area. The restoration will provide increased connectivity with the County's 90-acre Talbert Nature Preserve to the south.

5.5.3.5 University of California Irvine Ecological Preserve

NCC has been responsible for the planning and implementation (completed in November 2011) of the restoration and enhancement of 8.5 acres of cactus scrub in a mosaic of native grassland at the University of California (UC) Irvine Ecological Preserve, located in the San Joaquin Hills. The goal of the project is to increase breeding habitat for coastal California gnatcatcher and cactus wren. Even at the early stages of establishment, both cactus wrens and coastal California gnatcatchers were observed using the restoration area. Coastal California gnatcatchers were observed moving through the restoration site in pairs and family groups, foraging in native shrubs that were at the site prior to restoration and in native forbs that have developed since the



restoration began. With respect to cactus wrens, the southern half of the restoration site was used by a family group. Cactus wrens were observed foraging in the restoration site and a juvenile cactus wren was observed calling from planted prickly pear cactus clumps (Land IQ 2013). The project site is within the Central-Coastal NCCP/HCP Coastal Reserve, but the proposed restoration is above and beyond the requirements of the Central-Coastal NCCP/HCP.

Long-Term Management. The Preserve is managed by the UC Irvine Office of Natural Resources, for the School of Biological Science. It is designated for conservation and habitat management by UC Irvine's long-range development plan and pursuant to the Central-Coastal NCCP/HCP.

Regional Significance and Connectivity. The Preserve is enrolled in the Central-Coastal NCCP/HCP and is part of the Coastal Reserve System. It is a critical site for maintaining California gnatcatchers and cactus wren populations, and serves as a source of dispersing individuals for other areas in the Plan Area.

5.5.3.6 Aliso Creek

LCF is undertaking the restoration of 55 acres of riparian habitat along Aliso Creek, in the City of Laguna Niguel. The project includes removing nonnative invasive plants and planting willow and mulefat scrub and transitional riparian-upland habitats. It will add to other restoration projects in the same watershed being funded by other entities. The site is in the San Juan watershed and within the boundaries of the Aliso and Wood Canyons Wilderness Park, but outside of the Central-Coastal NCCP/HCP Reserve boundaries.



The restoration of riparian habitat along Aliso Creek will benefit Covered Species such as the least Bell's vireo, southwestern willow flycatcher, western pond turtle, and bobcat. Known occurrences of least Bell's vireo, southwestern willow flycatcher, and western pond turtle have been recorded at this restoration site. The restoration plan includes specific actions to benefit and improve western pond turtle habitat.

Long-Term Management. Orange County Parks owns and manages this land as part of Aliso and Wood Canyons Wilderness Park, in conjunction with the Aliso and Wood Canyon RMP.

Regional Significance and Connectivity. Aliso Creek runs for 19 miles from the Santa Ana Mountains to the Pacific Ocean, connecting several large public open space Preserves. The riparian corridor is a key wildlife movement corridor, so the restoration will improve overall connectivity of habitat for wildlife. Aliso Creek supports regionally significant populations of key species including those covered by the Plan (e.g., least Bell's vireo, western pond turtle).

5.5.3.7 Chino Hills State Park

Chino Hills State Park is composed of 14,102 acres in the hills of Santa Ana Canyon, with portions of the park found in Orange, Riverside, and San Bernardino Counties. Ranging from 430 to 1,781 feet above msl, the park straddles the north end of the Santa Ana Mountains and the southeast portion of the Puente-Chino Hills, which together form the northern end of the Peninsular Ranges in southern California. The proposed restoration site is outside the Central-Coastal NCCP/HCP Plan Area.



This project is located near the City of Brea and Yorba Linda and will enhance and restore up to 13.5 acres of riparian and 6.0 acres of cactus scrub in Telegraph Canyon.

The cactus scrub restoration will provide breeding and foraging habitat for cactus wren and coastal California gnatcatcher. The riparian enhancement project will provide breeding and foraging habitat for least Bell's vireo and other riparian species. A CNDDDB occurrence for coastal California gnatcatcher intersects the project location.

Long-Term Management. The property is owned in fee title and is permanently conserved by the California Department of Parks and Recreation. The park is managed according to the Chino Hills State Park General Plan (California Department of Parks and Recreation 1999).

Regional Significance and Connectivity. The Park is a critical link in the Puente-Chino Hills biological corridor. Telegraph Canyon in the interior of the Park connects the core habitat zone to Water and Brush Canyons, which provides a linkage to CDFW-owned and managed Coal Canyon Ecological Reserve and the Santa Ana Mountains to the south.

5.5.3.8 Harriett Weider Regional Park

The Bolsa Chica Conservancy is restoring 8.2 acres of grassland, coastal sage scrub, and riparian habitat in the Santa Ana watershed. Harriett Weider Regional Park is to be established as a mixed-use passive park, with sections restored to native habitat. The proposed restoration site within the Plan Area for the Central-Coastal NCCP/HCP but is not part of the Reserve.



The Conservancy has successfully re-introduced southern tarplant to a site near the new interpretive center north of the Park and will be including tarplant seed in the restoration plant palette.

Long-Term Management. The Bolsa Chica Conservancy, in partnership with Orange County Parks, will be the long-term management entity. The County currently holds title to approximately 30% of the land designated for the Harriett Weider Regional Park. Signal Landmark, Thomas Oil & Gas, and the City of Huntington Beach hold title to the remaining parcels. The portion of the land that is privately owned will be conveyed to the County through an Irrevocable Offer of Dedication. However, the entire restored area would be maintained/managed by the Bolsa Chica Conservancy

on behalf of Orange County Parks. The restoration project is consistent with the General Development Plan that the County of Orange adopted in 1997. The Bolsa Chica Conservancy is working with Orange County Parks (on behalf of the County of Orange) to determine what type of protection instrument will be needed in order to protect the restoration site in-perpetuity.

Regional Significance and Connectivity. This project complements ongoing restoration at the adjacent CDFW-owned and managed Bolsa Chica Ecological Reserve and supports expansion of habitat for the cactus wren and California gnatcatcher, particularly nesting birds that have recently moved into the north end of the adjacent Bolsa Chica wetlands. Connectivity with the Shipley Nature Center to the north and the Bolsa Chica Ecological Reserve to the northwest will also be enhanced by this project. In addition, this project enhances an existing wildlife corridor in Huntington Beach situated between Central Park and the ocean and removes nonnative vegetation and restores native vegetation that will improve habitat quality for wildlife and enhance adjacent wetlands and upland habitat.

5.5.3.9 Lower Silverado Canyon

The IRC will implement both active and passive restoration of 20.6 acres of riparian habitat and 7.8 acres of coastal sage scrub along Silverado Creek, a tributary to Santiago Creek (total of 28.4 acres). The project location is within the Santa Ana watershed. The degraded habitat being restored lies within a landscape mosaic containing patches of intact habitat. Restoring degraded patches within the mosaic will improve continuity to further benefit habitat quality of both restored and intact components. The project site is within the Plan Area for the Central-Coastal NCCP/HCP but it is not currently part of the Reserve. However, the land will remain as conserved open space due to the recordation of conservation easements dedicated to The Nature Conservancy.



Photo Credit: Melanie Schlotterbeck, Friends of Harbors, Beaches and Parks

Long-Term Management. The project site is owned in fee by the County of Orange, and Orange County Parks is responsible for its long-term stewardship. IRC works under contract to the County of Orange under the supervision of Orange County Parks to manage this area and has existing formal permission to conduct restoration projects here. Broad management of the site, consistent with the terms of the Conservation Easement Deed, is guided by the Resource Plan for the 2009 SilMod Conservation Easement Property. The Integrated Adaptive Management Framework for the North Irvine Ranch Wildlands (Noss 2011) is the umbrella management framework that applies to all management units in the North Irvine Ranch regardless of ownership or mechanism of land protection. This document is a broad scale strategic plan to guide managers in identifying priorities and improving management results over time. The project site is subject to, and protected by, the permanent Silmod Conservation Easement Deed recorded in 2002 in favor of The Nature Conservancy. In addition, the lands are deed restricted for open space and conservation purposes under the wilderness park designation as the result of the transfer of land from the Irvine Company to the County of Orange.

Regional Significance and Connectivity. To the west, the restoration site connects to Santiago Canyon in the Irvine Ranch Open Space via a 4-foot culvert under Black Star Canyon Road. Additional vegetative cover will be planted around this culvert to enhance wildlife movement under the road. To the northeast, the property connects to Cleveland National Forest. Restoration in

Silverado Canyon will improve connectivity with the national forest for wildlife such as mountain lions that travel long distances and utilize habitat both in the foothills and the Santa Ana Mountains. A functioning, connected landscape mosaic of restored and remnant habitat will increase available nesting habitat for several Covered Species, including least Bell's vireo, southwestern willow flycatcher, and coastal California gnatcatcher.

5.5.3.10 North Coal Canyon

The property owned by California State Parks at Coal Canyon, within Chino Hills State Park is a vital link between the surrounding Puente-Chino Hills to the north and the Cleveland National Forest and the Santa Ana Mountains on the south. The proposed restoration project will enhance and restore coastal sage scrub/Riversidian alluvial fan sage scrub on the north side of SR-91. The project site is outside the Central-Coastal NCCP/HCP Plan Area.

The restoration site is in the Santa Ana watershed, within 200 feet of the current river channel. The project is expected to improve wildlife movement under SR-91 by making habitat north of SR-91 more attractive to wildlife, and will complete the restoration of the entire Coal Canyon parcel by connecting three other restoration projects being funded by other entities.

Long-Term Management. The property is permanently conserved by California Department of Parks and Recreation with deed restrictions on the parcel. The Park is managed according to the Chino Hills State Park General Plan (California Department of Parks and Recreation 1999).

Regional Significance and Connectivity. The parcel was acquired by California State Parks to improve connectivity from the Puente-Chino Hills in the north to the Cleveland National Forest, 2 miles south of the park boundary, across SR-91. This bio-corridor is the only remaining link that allows dispersal of wildlife and genetic material between the park and the more diverse Santa Ana Mountains. Coal Canyon provides habitat for the movement of Covered Species such as mountain lion and bobcat along Brush and Water canyons to the interior of the park's core habitat zone, and also provides high quality habitat for coastal California gnatcatcher as well as foraging habitat for the least Bell's vireo.



Photo Credit: Melanie Schlotterbeck, Friends of Harbors, Beaches and Parks

5.5.3.11 West Loma

IRC will undertake restoration of 62.47 acres of grassland, coastal sage scrub, and riparian habitat and realign existing wildlife fencing at the West Loma site. The restoration site is in the Santa Ana watershed. The degraded habitat being restored lies within a landscape mosaic containing patches of intact habitat. Restoring degraded patches within the mosaic will improve contiguity to further benefit habitat quality of both restored and intact components. The project also includes fence realignment around a key wildlife corridor in the vicinity of the 241 toll road. With fencing improvement



Photo Credit: Melanie Schlotterbeck, Friends of Harbors, Beaches and Parks

and nearby restored habitat, the crossing is expected to become more attractive to wildlife and improves connectivity, effectively increasing the area of available riparian and upland habitat for wildlife. This project also capitalizes on a large-scale restoration project that is currently taking place within the same watershed. The project site intersects with CNDDDB occurrence records for many-stemmed dudleya, orangethroat whiptail, and coastal California gnatcatcher. A portion of the project site is within the Central-Coastal NCCP/HCP Reserve, but the proposed restoration is above and beyond the requirements of the Central-Coastal NCCP/HCP.

Long-Term Management. IRC works under contract with the County of Orange under the supervision of Orange County Parks and has existing formal permission to conduct restoration projects here. A portion of the land is under conservation easement held by The Nature Conservancy, and the other portion is deed restricted exclusively for open space by the County of Orange and is dedicated as part of the reserve lands in the Central-Coastal NCCP/HCP. Orange County Parks is responsible for long-term stewardship subject to the terms and conditions of the Orange County Central-Coastal NCCP/HCP and the East Orange Conservation Easement, as well as the management plans developed under these agreements.

Regional Significance and Connectivity. A functioning, connected landscape mosaic of restored and remnant habitat will have the potential to benefit Covered Species, including least Bell's vireo, cactus wren, coastal California gnatcatcher, bobcat, and mountain lion, as well as several raptor species. In particular, the western ridge of the sub-watershed abruptly drops several hundred feet, providing updrafts frequently used by foraging raptors.

5.6 Avoidance and Minimization

The Plan includes measures to minimize take of Covered Species. Avoidance and minimization of effects on Covered Species and their habitats will be implemented through a process that verifies that construction activities undertaken as part of Covered Activities adhere to a set of protection measures. These measures include avoidance and minimization of sensitive biological areas, species-specific protection measures and policies, procedures for complying with nesting bird protections, stormwater and water quality BMPs, and wildfire protection techniques

The avoidance and minimization measures are requirements that will be evaluated and implemented on a project-by-project basis for each Covered Activity. For each individual covered freeway improvement project, OCTA and Caltrans will establish cooperative agreements that define the responsibilities and oversight of each organization. OCTA will be responsible for preparing project-specific environmental documents, meeting Caltrans' standard CEQA/NEPA requirements, in which avoidance and minimization measures will be identified. Under the M2 program, either OCTA or Caltrans will function as the Construction Lead. Under the normal design, bid, build process, Caltrans is anticipated to be the Construction Lead. In certain instances, OCTA may be the Construction Lead for select M2 freeway improvement projects. However, it is anticipated Caltrans will be the Construction Lead for the majority of the M2 freeway improvement projects. Whichever entity functions as the Construction Lead, that entity will take the responsibility for implementation of avoidance and minimization measures. Any costs associated with implementing avoidance and minimization measures, as described in this section, will be funded through the individual project budgets and will not rely on funding under the M2 Environmental Mitigation Program (see Section 8.3, "Plan Funding").

OCTA will have a Project Manager overseeing the activities undertaken by the Construction Lead. The OCTA Project Manager will be responsible for ensuring all avoidance and minimization measures are completed and documented by the Construction Lead and its contractors following the requirements as set forth by the Plan. Prior to construction of freeway improvement projects, the Construction Lead will submit a project-specific “Biological Resources Avoidance and Minimization Plan” to the Wildlife Agencies for review and approval. This plan will address compliance with each of the policies described below, including potential impacts on the identified resources, specific measures that will be implemented to comply with the policies, and appropriate reporting. If sufficient information on potential impacts and appropriate measures are incorporated into the project-specific CEQA/NEPA document or Natural Environment Study, the Construction Lead may reference the appropriate sections of these documents in their concurrence request to the Wildlife Agencies without preparing a separate plan.

5.6.1 Avoidance and Minimization of Sensitive Biological Resources

Prior to final design, OCTA will complete project-specific biological surveys to identify biologically sensitive areas within each Covered Activity footprint. These surveys are typically completed as part of the preparation of the project environmental compliance documentation (CEQA/NEPA). The biological surveys will include, at a minimum, an initial field survey to map natural communities and determine if potential habitat of Covered Species exists within the project area. These biological surveys will produce a report consistent (Natural Environment Study) with Caltrans standard requirements and will be conducted during the Planning Development phase of each of the projects. Based on the results of the field surveys, the Construction Lead will identify and implement appropriate adjustments to project design and scheduling to avoid and minimize effects on biological resources while taking into consideration the degree of sensitivity of biological resources within the project area. Habitat types with a higher degree of sensitivity, such as rare/limited vegetation types (e.g., native grasslands, California walnut, cactus scrub) and riparian/wetland features, will be avoided to the maximum extent possible. Given the nature of the freeway improvement projects, there will be limited opportunities to change project footprints; however, temporary staging, access roads, and other flexible project impact components will be located with consideration of biologically sensitive areas.

Standard BMPs that will be implemented to avoid and minimize impacts on biological resources will include, but not be limited to:

- **Delineation of Environmentally Sensitive Areas.** Prior to clearing or construction, highly visible barriers (such as orange construction fencing) will be installed around areas adjacent to the project footprint to designate environmentally sensitive areas to be protected. No project activity of any type will be permitted within these environmentally sensitive areas. In addition, heavy equipment, including motor vehicles, will not be allowed to operate within the environmentally sensitive areas. All construction equipment will be operated in a manner so as to prevent accidental damage to environmentally sensitive areas. No structure of any kind, or incidental storage of equipment or supplies, will be allowed within these protected zones. Silt fence barriers will be installed at the environmentally sensitive area boundary to prevent accidental deposition of fill material in areas where vegetation is immediately adjacent to planned grading activities.

- **Restoration of Temporary Impacts.** Areas of natural habitat that are temporarily affected by construction activities will be restored to a natural condition. The restoration effort will emulate surrounding vegetation characteristics and/or return to previous conditions. For freeway construction projects, revegetation plans will be part of the project design following Caltrans' landscape architecture guidelines and requirements. Restoration plans will be reviewed and approved by the Wildlife Agencies.
- **Invasive Species Control.** Invasive species will be removed from the project work area and controlled during construction. The use of known invasive plant species (i.e., plant species listed in California Invasive Plant Council's [Cal-IPC's] California Invasive Plant Inventory with a High or Moderate rating) will be prohibited for construction, revegetation, and landscaping activities. Project measures will be included to ensure invasive plant material is not spread from the project site to other areas by disposal off site or by tracking seed on equipment, clothing, and shoes. Equipment/material imported from an area of invasive plants must be identified and measures implemented to prevent importation and spreading of nonnative plant material within the project site. All construction equipment will be cleaned with water to remove dirt, seeds, vegetative material, or other debris that could contain or hold seeds of noxious weeds before arriving to and leaving the project site. Eradication strategies (i.e., weed abatement programs) will be employed should an invasion occur during construction.
- **Trash Control.** To avoid attracting predators of Covered Species and other sensitive species, the project site will be kept as clean of debris as possible. All food-related trash items will be enclosed in sealed containers and regularly removed from the site(s).
- **Onsite Training.** When in or near natural habitat areas, all personnel involved in the onsite project construction will be required to participate in a preconstruction training program to understand the avoidance and minimization obligations on the project.
- **Construction Monitoring.** A qualified biologist will monitor construction activities when necessary, as determined during the project-specific environmental review, for the duration of the project to ensure that practicable measures are being employed to avoid and minimize incidental disturbance of habitat and Covered Species inside and outside the project footprint. Opportunities to further avoid and minimize impacts on Covered Species will be explored.

5.6.2 Species-Specific Protection Measures and Policies

Covered freeway improvement projects will primarily affect low value habitats and impacts will be mitigated in advance through implementation of the Conservation Strategy (i.e., Preserve acquisitions and restoration projects). Therefore, OCTA is not required to complete focused species surveys for Covered Species unless there are additional avoidance and minimization measures that are warranted because there is the potential for that species to be present in the area of impact (as determined in the project-level biological report). These situations will need to be addressed in the following circumstances:

- **Aquatic Species.** If the project area includes aquatic resources, such as rivers, creeks, and riparian areas, specific avoidance and minimization measures will be employed to address dewatering and water diversions to maintain fish passage. This will also include an assessment of potential effects on arroyo chub and southwestern pond turtle. See Section 5.6.2.1, "Aquatic Resources and Species Policy."

- **Covered Plants.** If a Covered Activity has potential effects on a covered plant species, OCTA will evaluate effects based on project-specific field surveys. Mitigation of effects will be accomplished using credits determined through field surveys of Preserves and actions taken to enhance, restore, and create populations of covered plant species as part of restoration projects approved for funding by OCTA. See Section 5.6.2.2, “Covered Plant Species Policy.”
- **Wildlife Crossing.** If it is determined that an existing structure (culvert, underpass) is functioning as an important wildlife crossing and is potentially affected by a covered freeway improvement project, additional surveys and design requirements will be implemented following Caltrans standards. See Section 5.6.2.3, “Wildlife Crossing Policy.”

5.6.2.1 Aquatic Resources and Species Policy

Construction activities in aquatic resources, such as rivers, creeks, and riparian areas, will be restricted during the rainy season (October 15 through June 1) or will be conducted when the resource is dry and/or lacks flowing or standing water. Construction activities in human-made features cannot be restricted to a given season because they are often managed, and, therefore, water may be present regardless of the season. In the event that construction work-window restrictions cannot be followed, or in the case of human-made features, additional avoidance and minimization measures are required.

As part of the additional specific avoidance and minimization measures, dewatering and water diversion will be implemented as described below, and additional BMPs to reduce potential water-quality-related indirect impacts on special aquatic resources will be implemented as determined through consultation with USACE, CDFW’s Lake and Streambed Alteration Program, and RWQCB. The additional BMPs may include the placement of additional straw wattles, silt fencing, or protective barriers as necessary.

Dewatering/Water Diversion

Construction activities in special aquatic resources will be restricted to the dry season (June 1 through October 15) when possible. However, open or flowing water may be present during construction. If construction occurs where there is open or flowing water, a strategy that is approved by the resource agencies (e.g., USACE, CDFW’s Lake and Streambed Alteration Program, and RWQCB), such as the creation of cofferdams, will be used to dewater or divert water from the work area. If cofferdams are constructed, implementation of the following cofferdam or water diversion measures is recommended to avoid and lessen aquatic resources impacts during construction:

- The cofferdams, filter fabric, and corrugated steel pipe are to be removed from the creek bed after completion of the project.
- The timing of work within all channelized waters is to be coordinated with the regulatory agencies.
- The cofferdam is to be placed upstream of the work area to direct base flows through an appropriately sized diversion pipe. The diversion pipe will extend through the contractor's work area, where possible, and outlet through a sandbag dam at the downstream end.

- Sediment catch basins immediately below the construction site are to be constructed when performing in-channel construction to prevent silt- and sediment-laden water from entering the mainstream flow. Accumulated sediments will be periodically removed from the catch basins.

Arroyo Chub

The Construction Lead will retain a qualified biologist during any project that could impact potential arroyo chub habitat to determine if arroyo chub might be present and subject to potential injury or mortality from construction activities. The minimum qualifications for the fish biologist are described in Table 7-2. The biologist will conduct preconstruction surveys of the project area to determine whether such species are present or likely to be present near the project site. When arroyo chub are present and could be affected by construction activities, the project biologist will identify appropriate methods to capture, handle, exclude, and relocate those individuals. All fish exclusion activities will adhere to accepted NOAA Fisheries Service and CDFW protocols.

Western Pond Turtle

If potential western pond turtle habitat occurs within or adjacent to the construction area, coordination and approval by the Wildlife Agencies is required in order to determine a specific Western Pond Turtle Avoidance and Minimization Plan. This plan will be prepared by the Construction Lead and describe: (1) the methodology for pre-construction surveys based on the planned start of construction (i.e., within or outside of the season when western pond turtles are active); (2) structures that will be installed around the construction impact area to exclude turtles; (3) methodology for relocation of western pond turtles outside of the construction impact area; (4) identification of a relocation site at a nearby location in the same watershed as the covered freeway improvement project; (5) biological monitoring requirements during construction; and (6) avoidance measures to be implemented during construction to avoid and minimize impacts on the western pond turtle. Current required protocols include the following measures:

- **Western Pond Turtle Pre-construction Surveys.** Two weeks prior to ground-disturbing activities (including placement of heavy equipment) in or near aquatic habitats, the Construction Lead will ensure that a pre-construction survey is conducted for western pond turtles as described in the Western Pond Turtle Avoidance and Minimization Plan. The pre-construction surveys will be conducted by a Wildlife Agency-approved/qualified Biologist (i.e., one with pond turtle trapping/handling experience and holding a CDFW Scientific Collecting Permit to carry out these activities) to determine their presence or absence within the construction footprint. The pre-construction survey will include a trapping effort of four consecutive days prior to construction with traps checked daily; the trapping effort will be consistent with USGS trapping protocols. If nonnative species are captured during the trapping effort, they will be removed. The trapping effort will be combined with a visual survey; the Wildlife Agency-approved/qualified Biologist will walk the impact area to search for any potential breeding areas and existing nests. To the extent possible, pre-construction surveys will be conducted under weather conditions when western pond turtles are expected to be active. If construction begins under conditions that would not be conducive to western pond turtle activity, pre-construction surveys may be conducted more than two weeks prior or would use alternative methodology to detect aestivating turtles as described in the Western Pond Turtle Avoidance and Minimization Plan and approved by the Wildlife Agencies.

A report documenting the pre-construction survey results and measures that will be required during construction as described in the Western Pond Turtle Avoidance and Minimization Plan will be provided to Caltrans/OCTA/Wildlife Agencies prior to commencing construction or within two weeks of completion of field surveys, whichever is earlier. If western pond turtles are found within the construction footprint, the occupied habitat and appropriate buffer, as determined by a qualified Biologist, will be avoided to the maximum extent practicable.

- **Western Pond Turtle Exclusion and Relocation.** If western pond turtles are present in the biological survey area during pre-construction surveys, exclusion and relocation of western pond turtles as described in the Western Pond Turtle Avoidance and Minimization Plan and approved by the Wildlife Agencies will be implemented. The Plan will provide for the erection of turtle barriers/exclusion fencing and surveys of the construction area to capture and relocate turtles from within the project work area. Turtles will be relocated to nearby suitable habitat a minimum of 300 feet downstream from the work area or another appropriate nearby location within the watershed; relocation areas will be described in the Western Pond Turtle Avoidance and Minimization Plan and will be approved by the Wildlife Agencies prior to relocation of turtles. Alternatively, if recommended/approved by the Wildlife Agencies in the Western Pond Turtle Avoidance and Minimization Plan, the turtles may be captured and temporarily held.

Pre-construction surveys will be conducted using a combination of visual, seine, and trap methods to determine the population structure and status. A minimum of two trapping periods, each consisting of four days and three nights, will be conducted during period of peak pond turtle activity (i.e., April to August). Additionally, immediately prior to initiation of construction, the Wildlife Agency-approved Biologist will visually survey the work area and will relocate any western pond turtles to the relocation site as approved by the Wildlife Agencies in the Western Pond Turtle Avoidance and Minimization Plan.

- **Biological Monitoring in Western Pond Turtle Occupied Habitat.** Biological Monitoring will occur as described in the Western Pond Turtle Avoidance and Minimization Plan. In areas where western pond turtle occurrence is assumed, a Biological Monitor will be present on site during vegetation clearing regardless of the outcome of pre-construction surveys and during other construction activities as described in the Plan. If a pond turtle is observed in the impact area (i.e., it was not captured during pre-construction trapping or enters into the construction area following trapping), the Biological Monitor will have the authority to stop construction activities that could harm the turtle until it can be captured and relocated out of the impact area. The Biological Monitor will contact the Construction Lead and the Wildlife Agencies immediately to notify them of the observation. The pre-construction survey methodology will be repeated to capture and relocate the western turtle out of the impact area. If the western pond turtle has not been captured after four days of trapping, the Construction Lead will contact the Wildlife Agencies to determine whether trapping will be extended or for authorization to continue construction activities.

Exclusionary fencing will be used to ensure western pond turtles are kept out of the construction area as described in the Western Pond Turtle Avoidance and Minimization Plan. Exclusionary fencing will be maintained throughout the duration of construction. The integrity of the exclusion fencing will be checked daily by the Biological Monitor throughout construction. Additionally, the Biological Monitor will check the work area every morning before construction may begin to ensure that no turtles are within the exclusion area. Any western pond turtle found will be relocated immediately to the relocation area approved in the Western Pond Turtle Avoidance and Minimization Plan. If pond turtles are relocated during the pre-construction

survey effort or during biological monitoring, the Biological Monitor will conduct follow-up visits to the relocation site to monitor the effectiveness of pond turtle relocation.

- **Avoidance and Minimization of Western Pond Turtle Habitat.** Construction will avoid work in ponded or flowing water within 1,500 feet of known turtle locations unless alternative avoidance and minimization measures described in the Western Pond Turtle Avoidance and Minimization Plan are approved by the Wildlife Agencies.

5.6.2.2 Covered Plant Species Policy

The covered plant species (intermediate mariposa lily, many-stemmed dudleya, southern tarplant) are narrow endemics that are known only from California (or in the case of southern tarplant, also Baja California). Narrow endemic species are considered to have highly restrictive habitat requirements, localized soil requirements, or other ecological factors that limit their distribution. Due to variability in reproduction and survival that is influenced by physical disturbance as well as seasonal, climatic, and biotic factors, the status and distribution of their populations are particularly difficult to assess and predict using regional data sources. To ensure any actual impacts on covered plant species are properly addressed, OCTA will implement a Covered Plant Species Policy that will involve the evaluation of impacts based on project-specific field surveys. The policy will also set forth mitigation of impacts using credits determined through field surveys of Preserves and actions taken to enhance, restore, and create populations of covered plant species as part of restoration projects approved for funding by OCTA. This policy will require OCTA to maintain a ledger-type accounting system to track credits and debits.

The Covered Plant Species Policy will be implemented based on the following:

- **Credits:** To the extent that conservation actions undertaken by OCTA as part of the Plan result in the preservation, enhancement, and creation of populations of covered plant species, OCTA will receive credits.
 - **Preserves:** To quantify the population size of covered plant species on the Preserves, OCTA will complete baseline surveys that will include focused rare plant surveys conducted by a qualified biologist (Table 7-2) during the appropriate seasonal window. Because the Preserves will be managed in perpetuity and will have conservation easements in place, each conserved individual will be counted as credits in the accounting system. OCTA has completed baseline surveys for all of the Preserves (see Appendix C.6). The results of the covered plant species surveys for these Preserves are included in Table 5-6.

OCTA can receive additional credits if additional or enhanced populations of covered plant species are identified during subsequent surveys within the Preserves (by qualified OCTA staff or other qualified biologists) as part of periodic monitoring or other field efforts. OCTA will provide documentation to the Wildlife Agencies (during submission of the Annual Report) for review and approval to receive additional credits. OCTA will keep track of the date of each observation and make sure surveys are not double-counting previous observations.

Table 5-6. Covered Plant Species Populations within Preserves

Preserve	Credits		
	Intermediate Mariposa Lily ²	Many-stemmed Dudleya	Southern Tarplant
Aliso Canyon	151	60	--
Ferber Ranch	69	--	--
Hafen	74	--	--
Hayashi	--	--	--
MacPherson	18	--	--
O'Neill Oaks	283	--	--
Saddle Creek South ¹	2	--	--
Total	597	60	0

¹ Saddle Creek South Preserve was purchased, in part, with funding provided by the National Fish and Wildlife Foundation. OCTA receives a percentage of the available credits based on the percentage of the total cost of acquiring and managing the Preserve contributed by OCTA (75.36%).

² The intermediate mariposa lily locations are scattered throughout the Preserves. The Plan estimates that the 428 individuals in the Preserves occur in 77 occurrences.

- **Restoration Projects:** Populations of the covered plant species may be restored, enhanced, or established as part of the restoration projects approved for funding and implemented under this Plan. Existing populations of covered plant species at restoration project locations may be enhanced by active or passive methods. Passive methods may include actions such as saving and replacing topsoil to preserve the seed bank, or using fencing and signage to exclude disturbances. Restoring or enhancing the quality of habitat that supports these covered plant species, and controlling nonnative competitive plant species, would also indirectly enhance populations by creating favorable conditions for their survival. Any covered plant populations will also be indirectly preserved through conservation easements and/or deed restrictions and actions of the Restoration Project Sponsors and Land Management Entities. Further, focused restoration projects may employ more active methods, such as the creation of new populations of the covered plant species, using appropriate methods determined in consultation with a qualified biologist (e.g., including seed in the restoration plant palette, planting bulbs or corms, collecting seed, or propagating plants in a nursery). Specific considerations related to active restoration of covered plant species is included in Appendix C.2, “Covered Species Accounts.”

OCTA will be able to provide the Wildlife Agencies with information and documentation of how the restoration projects benefit covered plant species to receive credits. The amount of conservation credit will be determined on a case-by-case basis at the discretion of the Wildlife Agencies. Of the 11 restoration projects approved for funding to date, the following restoration projects have the potential to result in credits for covered plant species:

- **Many-stemmed Dudleya.** OCTA has approved for funding two restoration projects, West Loma and Big Bend, in which many-stemmed dudleya has been mapped in the vicinity of both projects. This plant is capable of self-fertilization and remains dormant as an underground corm in dry months (June–November). The restoration actions have the potential to improve the potential for many-stemmed dudleya to establish. Rare plants will be documented (during project implementation and monitoring) at these

restoration project sites to determine if populations of many-stemmed dudleya establish within the sites.

- **Southern Tarplant.** OCTA has approved for funding the Harriet Weider Regional Park project in which southern tarplant has been mapped in the immediate project vicinity. The restoration project sponsor has agreed to include specific measures as part of the restoration project design plan to achieve the establishment of southern tarplant. Southern tarplant seeds have been harvested from mature plants near the restoration site, and they will be included in the restoration seed mix. OCTA will ensure the restoration project sponsor conducts focused surveys for southern tarplant as part of their monitoring efforts to quantify the population established through the restoration process. In addition, southern tarplant has established at the Fairview Park restoration project site where it occurs naturally.
- **Debits:** Impacts on covered plant species resulting from Covered Activities will be tracked and quantified as debits in the accounting system. As described in Section 5.6.1, “Avoidance and Minimization of Sensitive Biological Resources,” OCTA will complete project-specific biological surveys prior to construction to assess the potential of Covered Species within the project area. If there is the potential for covered plant species to occur, OCTA will complete focused rare plant surveys during the appropriate seasonal window to identify the distribution of covered plant species within the project area. The Construction Lead will identify adjustments to the project design to avoid and minimize impacts on the covered plant species populations to the maximum extent practical. If impacts are unavoidable, the Construction Lead will mitigate impacts based on the following options:
 - **Mitigation Ratio.** The population of affected plants will be determined through field surveys by counting the number of plants or by calculating an estimate by multiplying the area affected by an observed density of plants (e.g., number of plants/square foot). The amount of debits required will be calculated using a 3:1 mitigation ratio. OCTA must have sufficient number of credits available before being able to use this option of take coverage (i.e., no negative balance is permitted). If OCTA does not have enough credits, it will have the option to coordinate with the Wildlife Agencies to implement a focused restoration project and/or acquire a Preserve (using EMP revenue) to achieve appropriate mitigation.
 - **Biological Superior Alternative.** If determined to be appropriate from a biological perspective, OCTA has the option to prepare project-specific restoration plans to implement salvage efforts to minimize effects and conserve covered plant species. Plant salvage operations may involve the saving of topsoil and/or seeds and bulbs within the affected area. The Construction Lead will then attempt to identify an appropriate location to replace the topsoil and seed to reintroduce the affected covered plant. The salvage and restoration plans must be reviewed and approved by the Wildlife Agencies, and successful establishment of covered plant species must be accomplished before receiving credit(s).
- **Cap on Impacts:** Cumulative impacts on covered plant species from Covered Activities using the approach described above will be capped at 500 individuals of each plant species. This will ensure that the Plan does not authorize impacts on as-yet-unknown important populations that may be in the construction footprint of freeway improvement projects. Impacts on more than 500 individuals may be authorized through a minor amendment to the Plan if the Wildlife Agencies agree that the mitigation approach described above provides a biological benefit that is greater than the anticipated impacts. The relative biological benefit of impacts and

conservation/restoration will depend not only on the number of individuals impacted or conserved, but also on factors such as long-term sustainability of the occurrence, importance for maintaining connectivity and contiguity between other occurrences in the area, and other factors that may make the occurrence in question biologically valuable or unique.

5.6.2.3 Wildlife Crossing Policy

As part of the project-specific biological surveys completed prior to final design, OCTA will ensure the project area is evaluated by a qualified biologist (Table 7-2) to determine if existing structures function as important wildlife movement crossings. Covered freeway improvement projects located within or between blocks of natural habitat or adjacent to key habitat linkages (see Figure 4-1) will be the primary focus for this assessment. OCTA will coordinate with the Wildlife Agencies and other entities (i.e., USGS) that are addressing wildlife movement in the Plan Area to take advantage of expert knowledge, existing data, and other sources of information to the degree appropriate. Assessments will be based on current methods and guidance to determine if any existing structures (culverts, underpass, pipes) function as wildlife crossings. The current set of Wildlife Agency-approved methods are in the *Caltrans Wildlife Crossing Guidance Manual* (Caltrans 2009), which is provided as Appendix G. If a proposed project could substantially alter the function of a potentially important wildlife crossing, then OCTA will evaluate the existing data and information. If OCTA, in collaboration with the Wildlife Agencies, determines that the existing data and information is not available and/or adequate to assess the functionality of the crossing, additional wildlife movement monitoring and surveys (e.g., using motion-activated cameras, track plates, etc. before and after project construction) may be required and would be used to determine what wildlife functional groups (large, medium, small mammals; amphibian/riparian reptiles; upland reptiles) utilize the crossing and to the extent of each group's use. If it is determined in collaboration with Wildlife Agencies that an existing structure functions as an important wildlife crossing and is proposed to be altered by the project in a manner that would have the potential to adversely affect wildlife movement, the Construction Lead will be required to implement appropriate design features to ensure that the wildlife crossing maintains or improves functionality after the freeway construction improvements are completed. Design elements and/or project options may include, but not limited to, steps to maintain the Openness Indices (OI) of existing culverts, protect suitable habitat on either side of the roadway, minimize human activity, reduce noise and lighting, provide funneling/fencing, improve internal habitat, and incorporate ledges or other appropriate structural features. If modifications are warranted, a technical report summarizing the results and recommendations will be prepared and provided to the Wildlife Agencies for approval prior to final design. This information will be included in the Plan's Annual Report.

5.6.3 Nesting Birds Policy

OCTA will implement a Nesting Birds Policy to conform to existing regulations and procedures for protection of nesting birds. Migratory native bird species are protected by international treaty under the MBTA of 1918 (50 CFR 10.13). Sections 3503, 3503.5, and 3513 of the California Fish and Game Code make it unlawful to: take, possess, or needlessly destroy the nest or eggs of any bird (3503); take, possess or destroy any birds in the orders of Falconiformes or Strigiformes (birds-of-prey) and the nest and eggs of any such bird (3503.5); and take or possess any migratory nongame bird, or any part thereof, as designated in the MBTA. Under state law, take means to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill (Fish and Game Code Section

86), and includes take of eggs and/or young resulting from disturbances that cause abandonment of active nests.

Proposed project activities (including, but not limited to, staging and disturbances to native and nonnative vegetation, structures, and substrates) should occur outside of the avian breeding season, which generally runs from March 1 to September 15 (as early as January 1 for some birds) to avoid disturbance to breeding birds or destruction of the nest or eggs. Depending on the avian species present, a qualified biologist may determine that a change in the breeding season dates is warranted.

If the Construction Lead determines that avoidance of the avian breeding season is not feasible, at least 2 weeks prior to the initiation of project activities, a qualified biologist (Table 7-2) with experience in conducting breeding bird surveys will conduct weekly bird surveys to detect presence/absence of native bird species occurring in suitable nesting habitat that is to be directly or indirectly disturbed and (as access to adjacent areas allows) any other such habitat within an appropriate buffer distance of the disturbance area. Generally the buffer distance should be 300 feet (500 feet for raptors); however, because the covered freeway improvement projects will generally occur along noisy freeways, a buffer distance as low as 100 feet for non-raptors could be appropriate. If a narrow buffer distance is warranted, the Construction Lead will have a qualified biologist identify the appropriate buffer distances for raptors and non-raptors and notify Wildlife Agencies. The surveys should continue on a weekly basis with the last survey being conducted no more than 3 days prior to the initiation of project activities. If a native or nesting bird species is found, the Construction Lead will do one of the following to avoid and minimize impacts on native birds and the nest or eggs of any birds:

- a. Implement default 300-foot minimum avoidance buffers for all birds and 500-foot minimum avoidance buffers for all raptor species. The breeding habitat/nest site will be fenced and/or flagged in all directions, and this area will not be disturbed until the nest becomes inactive, the young have fledged, the young are no longer being fed by the parents, the young have left the area, and the young will no longer be impacted by the project.
- b. If a narrower buffer distance is determined appropriate by the qualified biologist, the Construction Lead will develop a project-specific Nesting Bird Management Plan. The site-specific nest protection plan will be developed collaboratively with Wildlife Agencies and submitted to the Wildlife Agencies, although the Wildlife Agencies will not be responsible for approving the narrower buffer distance and the Nesting Bird Management Plan. The Plan should include detailed methodologies and definitions to enable a qualified avian biologist to monitor and implement nest-specific buffers based on topography, vegetation, species, and individual bird behavior. This Nesting Bird Management Plan will be supported by a Nest Log that tracks each nest and its outcome. The Nest Log will be submitted to the Wildlife Agencies at the end of each week.
- c. The Construction Lead may propose an alternative plan for avoidance and nesting birds for Wildlife Agencies' review and approval.

Flagging, stakes, and/or construction fencing should be used to demarcate the inside boundary of the buffer between the project activities and the nest. The Construction Lead personnel, including all contractors working on site, should be instructed on the sensitivity of the area. The Construction Lead will document the results of the recommended protective measures described above to

demonstrate compliance with applicable state and federal laws pertaining to the protection of native birds.

The biological monitor will be present on site during all grubbing and clearing of vegetation to ensure that these activities remain within the project footprint (i.e., outside the demarcated buffer) and that the flagging/stakes/fencing is being maintained, and to minimize the likelihood that active nests are abandoned or fail due to project activities. The biological monitor will send weekly monitoring reports to the OCTA NCCP Administrator during the grubbing and clearing of vegetation and will notify the OCTA NCCP Administrator immediately if project activities take, possess, or needlessly destroy the nest or eggs of any bird as well as birds-of-prey and their nest or eggs. Within 48 hours of damage to an active nest or eggs or observed death or injury of birds protected under state law or the MBTA (which includes, but not is limited to, the birds on the Covered Species list), OCTA will notify the Wildlife Agencies.

5.6.4 Stormwater and Water Quality Best Management Practices

Potential effects of Covered Activities on water quality and sedimentation can impact Covered Species (arroyo chub, western pond turtle) dependent upon natural hydrological processes. The Construction Lead will identify structural and nonstructural BMPs to control sediment and non-stormwater discharges from the site to protect water quality. Actions to prevent sediment from entering watercourses during and after construction may include, but are not limited to, the following BMPs: silt fencing, fiber rolls, gravel bag berms, sand bag barriers, tracking controls, stockpile management, dry season scheduling, proper material delivery and storage, solid waste management, concrete waste management, preservation of existing vegetation, temporary soil stabilization, dust and erosion control, soil binders, and straw mulch. No site personnel will discard solid or liquid materials into jurisdictional water features or any ESA lands. Temporary, construction-related BMPs may include, but will not be limited to, the following:

- **Silt Fence.** A silt fence is made of a filter fabric that has been entrenched, attached to supporting poles, and sometimes backed by a plastic or wire mesh for support. The silt fence detains sediment-laden water, promoting sedimentation behind the fence.
- **Fiber Rolls.** A fiber roll consists of straw, coir, or other biodegradable materials bound into a tight tubular roll and wrapped by netting, which can be photodegradable or natural. Fiber rolls with plastic netting that poses a wildlife entanglement hazard will not be used. Fiber rolls used for erosion control will be certified as free of noxious weed seed. When fiber rolls are placed at the toe and on the face of slopes along contours, they intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide removal of sediment from the runoff. By interrupting the length of a slope, fiber rolls can also reduce sheet and rill erosion until vegetation is established.
- **Gravel Bag Berms.** A series of gravel-filled bags are placed on a level contour to intercept sheet flows. Gravel bags pond sheet flow runoff, allowing sediment to settle out and release runoff slowly as sheet flow, preventing erosion.
- **Preservation of Existing Vegetation.** Careful planned preservation of existing vegetation minimizes the potential removal or injury to existing trees, vines, shrubs, and grasses that protect soil from erosion.

- **Stockpile Management.** Stockpile management procedures and practices are designed to reduce or eliminate air and stormwater pollution from stockpiles of soil, paving materials such as Portland cement concrete rubble, asphalt concrete, asphalt concrete rubble, aggregate base, aggregate sub base or pre-mixed aggregate, asphalt minder (so called “cold mix” asphalt), and pressure-treated wood.
- **Vehicle and Equipment Maintenance.** Contamination of stormwater resulting from vehicle and equipment maintenance can be prevented or reduced by running a “dry and clean site.” The best option would be to perform maintenance activities at an offsite facility. If this option is not available then work should be performed in designated areas only, while providing cover for materials stored outside, checking for leaks and spills, and containing and cleaning up spills immediately. Employees and subcontractors must be trained in proper procedures.

In addition, permanent treatment BMPs will be included in the project design as part of the upgrading and installation of storm drain system facilities and storm drain controls associated with the project. Permanent BMPs would be implemented for the protection of water quality using Caltrans-approved techniques and would be designed to meet RWQCB and NPDES permit requirements. The probable selection of permanent treatment BMPs includes infiltration devices (infiltration trenches), biofiltration swales, and biofiltration strips. Infiltration trenches are basins or trenches that store runoff and allow it to infiltrate into the ground, thus preventing pollutants in the captured runoff from reaching surface waters. Biofiltration strips are vegetated land areas, over which stormwater flows as sheet flow. Biofiltration swales are vegetated channels, typically configured as trapezoidal or v-shaped channels that receive and convey stormwater flows while meeting water quality criteria and other flow criteria. Pollutants are removed by filtration through the vegetation, sedimentation, adsorption to soil particles, and infiltration through the soil. Strips and swales are effective at trapping litter, total suspended sediment, and particulate metals. Biofiltration strips and swales would be considered wherever site conditions and climate allow vegetation to be established and where flow velocities will not cause scour. The intent of the BMPs implemented for the covered freeway improvement projects would be to reduce pollutants in stormwater discharge to the maximum extent practicable (MEP).

Implementation of the covered freeway improvement projects will conform to the Caltrans State Storm Water Management Plan (SWMP) (Caltrans 2003) and will provide guidance for compliance with the NPDES Permit requirement for discharge. As part of the Project Delivery Stormwater Management Program described in the SWMP, selected Construction Site, Design Pollution Prevention, and Treatment BMPs would be incorporated into the proposed project. Compliance with the standard requirements of the SWMP for potential short-term (during construction) and long-term (post construction) impacts would avoid or minimize potential substantial impacts on water quality and stormwater runoff. Conformance with the SWMP will include the following:

- Covered freeway improvement projects will comply with the provisions of the Caltrans Statewide NPDES Permit (Order No. 2012-0011-DWQ, NPDES No. CAS00003) and the NPDES General Permit, WDRs for Discharges of Storm Water Runoff Associated with Construction Activities (Order No. 2009-0009-DWQ, NPDES No. CAS000002), and any subsequent permit in effect at the time of construction.
- A Storm Water Pollution Prevention Plan (SWPPP) will be prepared and implemented to address all construction-related activities, equipment, and materials that have the potential to affect water quality. The SWPPP will identify the sources of pollutants that may affect the quality of stormwater and include the Construction Site BMPs to control pollutants, such as sediment

control, catch basin inlet protection, construction materials management, and non-stormwater BMPs. All Construction Site BMPs will follow the latest edition of the *Storm Water Quality Handbooks, Project Planning and Design Guide* (Caltrans 2007) to control and minimize the impacts of construction and construction-related activities, material, and pollutants on the watershed. These include, but are not limited to temporary sediment control, temporary soil stabilization, scheduling, waste management, materials handling, and other non-stormwater BMPs.

- Caltrans-approved treatment BMPs will be implemented to the MEP consistent with the requirements of the NPDES Permit, Statewide Storm Water Permit, and WDRs for Caltrans Properties, Facilities, and Activities (Order No. 2012-0011-DWQ, NPDES No. CAS000003). Treatment BMPs will include, for example, biofiltration strips/swales, infiltration basins, detention devices, dry weather flow diversion, Gross Solids Removal Devices (GSRDs), media filters, and wet basins. Final determination regarding the selection of treatment BMPs will occur during the design phase.
- Design Pollution Prevention BMPs will be implemented, such as preservation of existing vegetation, slope/surface protection systems (permanent soil stabilization), concentrated flow conveyance systems such as ditches, berms, dikes and swales, oversize drains, flared end sections, and outlet protection/velocity dissipation devices.
- Construction site dewatering must conform to the General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (*de minimus*) Threat to Water Quality (Order No R8-2009-0003, National Pollutant Discharge Elimination System No. CAG998001), and any subsequent updates to this permit at the time of construction. Dewatering BMPs must be used to control sediments and pollutants, and the discharges must comply with the WDRs issued by the Santa Ana RWQCB.

5.6.5 Wildfire Protection Techniques

Wildfires can be ignited along the edge of freeways from car fires, flares, sparks, discarded cigarettes, and various other freeway sources/activities. To minimize the potential for wildfires, as appropriate, the OCTA NCCP Administrator and environmental planning staff will work with the Construction Lead to design freeway improvement projects in a manner to adequately maintain a safe distance between the road edge and flammable natural habitat. The project design could include additional pavement, gravel shoulders, mowed edges, the extension of metal beam guardrails, and/or manufactured mats as necessary. This design requirement may often be in conflict with other avoidance and minimization requirements to reduce effects on natural lands areas. However, the detrimental effects of frequent and major wildfires is substantially higher than the small degree of additional impact area that is associated with maintaining an adequate degree of road hardening along the interface of freeways and natural lands. The Plan recognizes the need for wildfire protection along the freeway edges and provides coverage for the incremental effects on natural habitat and Covered Species habitat.

5.7 Streambed Program

The Streambed Program provides guidance to protect and compensate for impacts on streambed areas and wetland/riparian habitats under the jurisdiction of CDFW pursuant to Sections 1600–

1616 of the Fish and Game Code. This section provides a brief summary of the program; full details of the Streambed Program are attached as Appendix E, which should be referred to when a Section 1602 Lake or Streambed Alteration Agreement is required for a Covered Activity under this Plan. The Streambed Program requires the evaluation of streambed avoidance options and specification of minimization measures prior to compensatory mitigation and will ensure adequate mitigation based upon habitat and type of aquatic resource (see Table E-2 in Appendix E) to address state regulatory obligations. To offset unavoidable impacts on streambed and wetland/riparian habitats, thereby achieving an overall no-net-loss of streambed functions and values, compensatory mitigation will be provided according to a Habitat Restoration Plan (HRP) and/or Habitat Mitigation and Monitoring Plan (HMMP) as approved by the Wildlife Agencies and Regulatory Agencies (if warranted). The mitigation plans may be implemented in advance of impacts, if possible, to offset temporal loss.

Wetlands, jurisdictional waters, and riparian areas are regulated at the state and/or federal level. Activities that may affect jurisdictional wetlands and/or waters of the U.S. will continue to be regulated under Sections 401 and 404 of the CWA by the State Water Board and USACE. Under Sections 1600–1616 of the Fish and Game Code, CDFW regulates activities that would alter streams, rivers, or lakes, or the bed, banks, or channels thereof. CDFW jurisdiction includes adjacent riparian habitats affected by watercourse alterations. The State Water Board and RWQCB regulate activities involving waters of the state and all waters of the U.S., as mandated by both the federal CWA and the California Porter-Cologne Water Quality Control Act.

5.8 Plan Mitigation Approach

Through the EAP, OCTA was able to bond against future M2 revenues to implement conservation actions (Preserve acquisitions and restoration projects) to provide upfront and comprehensive mitigation for effects on Covered Species and their habitats. As described in Sections 5.4 and 5.5, the identification and selection of Preserve acquisitions and restoration projects was spearheaded by the EOC. The goal of the EOC was to identify conservation actions that result in protection and enhancement of habitats that mitigate for potential species effects associated with the M2 funded freeway improvement projects.

By providing upfront mitigation, OCTA will be able to achieve streamlined review and approval of Covered Activities. OCTA will implement simplified procedures for tracking impacts and mitigation, as described in Section 5.8.1. The conservation actions taken as part of the Plan can be used as mitigation only for the Covered Activities. Once the Covered Activities are completed, there will be no remaining credits that can be used by OCTA as mitigation for other projects.

Note: Mitigation requirements associated with state and federal wetland regulations will be addressed under separate permitting structure with the USACE, State Water Resources Control Board, and CDFW (described above in the Section 5.7, “Streambed Program,” and Appendix E). For unavoidable permanent impacts on streambed and associated riparian habitat, OCTA/Caltrans will compensate at the pre-approved mitigation sites identified in Appendix E, which are sites within the properties acquired for conservation under this Plan and the M2 restoration projects approved for funding, to achieve no-net-loss standards. If no-net-loss standards are unable to be accomplished for impacts on CDFW jurisdictional streambeds at these mitigation sites, additional compensatory mitigation may be required. Additionally, for temporary impacts on streambeds and associated riparian habitat, the Construction Lead will restore the impact site to its pre-project condition, when

appropriate, to achieve no-net-loss standards. Restoration plans, as approved by CDFW, USFWS, and, if warranted, the USACE and State Water Resources Control Board, will be implemented at the sites.

5.8.1 Tracking Impacts

As the Plan is implemented, OCTA will be responsible for tracking impacts on natural resources resulting from Covered Activities to ensure that the amount of impacts that ultimately occur under the Plan stays below the amount of impacts estimated during Plan development. OCTA will track impacts for the following areas:

1. Habitat types resulting from freeway improvement projects
2. Covered plant species resulting from Covered Activities
3. Habitat types resulting from Covered Activities within Preserves

5.8.1.1 Tracking Impacts on Habitat Types Resulting from Freeway Improvement Projects

OCTA will track the amount of impacts on individual natural habitat types resulting from covered freeway improvement projects to ensure the amount of impacts stays within an approved set of caps for each habitat type (see Table 5-7). As described in Section 4.3, “Effects on Biological Resources,” caps for individual habitat types have been established based on (1) the estimate of effects developed using the “planning-level” footprints, (2) adjustments that account for the precision and accuracy of the regional-level habitat mapping used to calculate effects for the Plan, and (3) allowance for habitat types with small amounts of impacts. OCTA will track impacts on habitat types and not track impacts on Covered Species habitats and/or occurrences, with the exception of covered plant species (see Section 5.8.1.2). If impacts stay below the established caps, it is assumed that Covered Species and their habitats will be protected and conserved to the degree required under the Plan.

The process to track habitat type impacts will include the following steps:

1. Biological field surveys will be completed as part of project-specific environmental compliance (CEQA/NEPA). This will involve vegetation mapping based on field surveys typically using detailed vegetation categories. The detailed vegetation categories will need to be cross-walked to the broad habitat types listed in Table 5-7.
2. Grasslands anticipated to be impacted by the freeway improvement projects are in most cases maintained and comprised of nonnative grass species. Due to the largely compromised value of this habitat type, an additional assessment will be made as part of the project-level environmental document review process to determine if impacts to nonnative grassland should be counted against the Plan’s allotted impact caps. If it can be shown that the nonnative grassland areas meet all of the following criteria, impacts to nonnative grassland will **not** be counted:
 - a) The nonnative grassland is within the median or interchanges (between on and off-ramps and the freeway or contained within clover leaf) OR within the narrow (i.e., less than 100 feet) strips between the freeway and adjacent development or ornamental landscaping;

- b) The nonnative grassland regularly maintained; and
- c) The nonnative grassland does not provide live-in habitat or located within a significant dispersal corridor for Covered Species.

This determination will be made on a project by project basis using project-specific biological surveys which will be further assessed in collaboration with OCTA and the Wildlife Agencies. The final impact acreages will be included in the NCCP/HCP Annual Report and tracking spreadsheet.

3. Based on the project-specific biological surveys, avoidance and minimization measures will be incorporated into project design and project schedule per requirements outlined above in Section 5.6.1, "Avoidance and Minimization of Sensitive Biological Resources," and Section 5.6.2, "Species-Specific Protection Measures and Policies."
4. For each individual freeway improvement project, OCTA will complete a quantification of impacts (both permanent and temporary) on each habitat type by overlaying the impact footprint with the vegetation mapping. Temporary impacts, which will require revegetation to previous conditions per restoration plans reviewed and approved by the Wildlife Agencies, are still included in this impact tracking because the impacts estimate in the Plan included both permanent and temporary impacts.
5. OCTA will keep an accounting of the Plan-to-date impacts on habitat types for all freeway improvement projects included under the Plan to ensure impacts stay within the caps listed in Table 5-7. A template for tracking impacts for habitat types is included in Appendix F, "Impact Tracking Template." If impacts on a specific habitat type exceed the caps, OCTA will coordinate with the Wildlife Agencies to process a major amendment to the Plan to adjust the cap on that specific habitat type. Adjustment can be made based on an analysis of conservation achieved under the Plan and if excess credits warrant the caps on a specific habitat to be increased (see Section 8.5.4, "Major Amendments").

Table 5-7. Caps for Impacts on Habitat Types Resulting from Covered Freeway Improvement Projects

Habitat Types	Estimated Direct Effects ¹ (acres)	Individual Habitat Type Impact Caps ² (acres)
Chaparral	0.3	5.0
Coniferous Forest	--	--
Grassland	108.1	108.1
Riparian	2.0	5.0
Scrub	5.2	10.0
Water	--	0.4
Wet Meadows/Marsh	--	2.5
Woodland	0.1	10.0
Totals	115.7	141.0

¹ Direct effects resulting from freeway improvement projects have been estimated using "planning-level" footprints that include both permanent and temporary effects. The footprints were overlaid with regional habitat mapping.

² Individual habitat type impact caps have been adjusted to address the low precision and accuracy of the regional habitat data and allowance for habitat types with small amount of impacts.

5.8.1.2 Tracking Impacts on Covered Plant Species Resulting from Covered Activities

Per requirements outlined in Section 5.6.2.2, “Covered Plant Species Policy,” OCTA will be responsible for maintaining a ledger-type accounting system to track credits and debits for covered plant species conservation and impacts. The ledger will keep track of credits resulting from the Plan conservation actions (Preserve acquisitions, restoration projects). In addition, OCTA will track impacts on covered plant species based on project-specific biological surveys. If impacts are unavoidable, OCTA will mitigate impacts by deducting credits based on a 3:1 mitigation ratio. A template for the covered plant species tracking is included in Appendix F.

5.8.1.3 Tracking Impacts on Habitat Types Resulting from Covered Activities within Preserves

The Plan establishes that no more than 13 acres (approximately 1%) of the natural habitat within the acquired Preserves will be impacted by Preserve management activities that will result in new impacts on habitat. The 13 acres of anticipated impacts within the Preserves may be concentrated within a few of the Preserves or they may be spread evenly throughout each of the Preserves. The specific location of anticipated impacts will be determined through the development of each Preserve’s RMP, in coordination with the Wildlife Agencies. Potential impacts include activities such as construction of new trails, access roads, recreation facilities, and maintenance structures. OCTA and Preserve Managers will track any activities resulting in more than 0.1 acre of new direct effects on natural habitat within the Preserves and record this information in a ledger that will be submitted to the Wildlife Agencies as part of the Plan’s annual report. In addition, any plans for new facilities, fire breaks, and/or trails will be listed within each individual Preserve’s RMP, which will be reviewed and approved by the Wildlife Agencies, and updated every 5 years, as warranted.

OCTA will ensure that the overall cap across all Preserves is not exceeded. If degraded habitat and/or existing developed areas (e.g., roads and trails) within the Preserves are restored and converted to native habitat, OCTA will also be able use credits from these activities, subject to review and approval by the Wildlife Agencies, to offset impacts on within the Preserves. OCTA will track impacts and credits within the Preserves for each of the individual habitat types, but will be held to a cap only for the overall amount of natural habitat impacted. A template for the tracking of impacts resulting from Preserve-management activities is included in Appendix F.

5.8.2 Maintaining Rough Proportionality

Under the NCCPA, conservation measures in an approved NCCP must be roughly proportional in time and extent to the impact on habitat or Covered Species authorized under the plan. Similarly, the USFWS *HCP Policy Handbook* provides that mitigation for project impacts should generally occur prior to or concurrent with the impacts.

Implementation of conservation measures roughly proportional in time and extent to impacts on natural communities and Covered Species will be measured as follows: (1) for habitat acquired, the date of recordation of a conservation easement or other approved site protection mechanism; and (2) for restoration projects, the date on which the restoration projects have met their success criteria. For the purpose of maintaining rough proportionality, OCTA will ensure that a minimum 2:1 mitigation ratio for direct impacts will be maintained for each vegetation community, with the exception of grassland, which will be maintained at a minimum 1:1 ratio. Thus, for each acre of

chaparral, riparian vegetation, scrub, and woodland that is directly impacted, at least two acres will have been conserved or restored before the impacts take place. For each acre of grassland that is directly impacted, at least one acre will have been conserved or restored before the impacts take place. If OCTA has not conserved or restored enough grassland habitat acreage to offset grassland impacts, it can offset grassland impacts with “out-of-kind” habitat at a 2:1 ratio. Compliance with the requirement to maintain rough proportionality will be monitored by OCTA and will be reported on an annual basis as part of the Annual Report.

Because OCTA has accelerated the implementation of conservation actions (Preserve acquisitions and restoration projects) through the EAP, it is expected that most or all of the conservation actions under the Plan will be completed (i.e., conservation easements recorded for OCTA Preserves and restoration projects signed off as meeting their success criteria) within 10 years after permit issuance. This will be prior to when a substantial percentage of the impacts from Covered Activities occur. To ensure that rough proportionality will be maintained during the first few years of the Plan, OCTA will either record a conservation easement for at least one Preserve or be able to demonstrate that one or more restoration projects have received Wildlife Agency sign-off as meeting their success criteria within 2 years of permit issuance.

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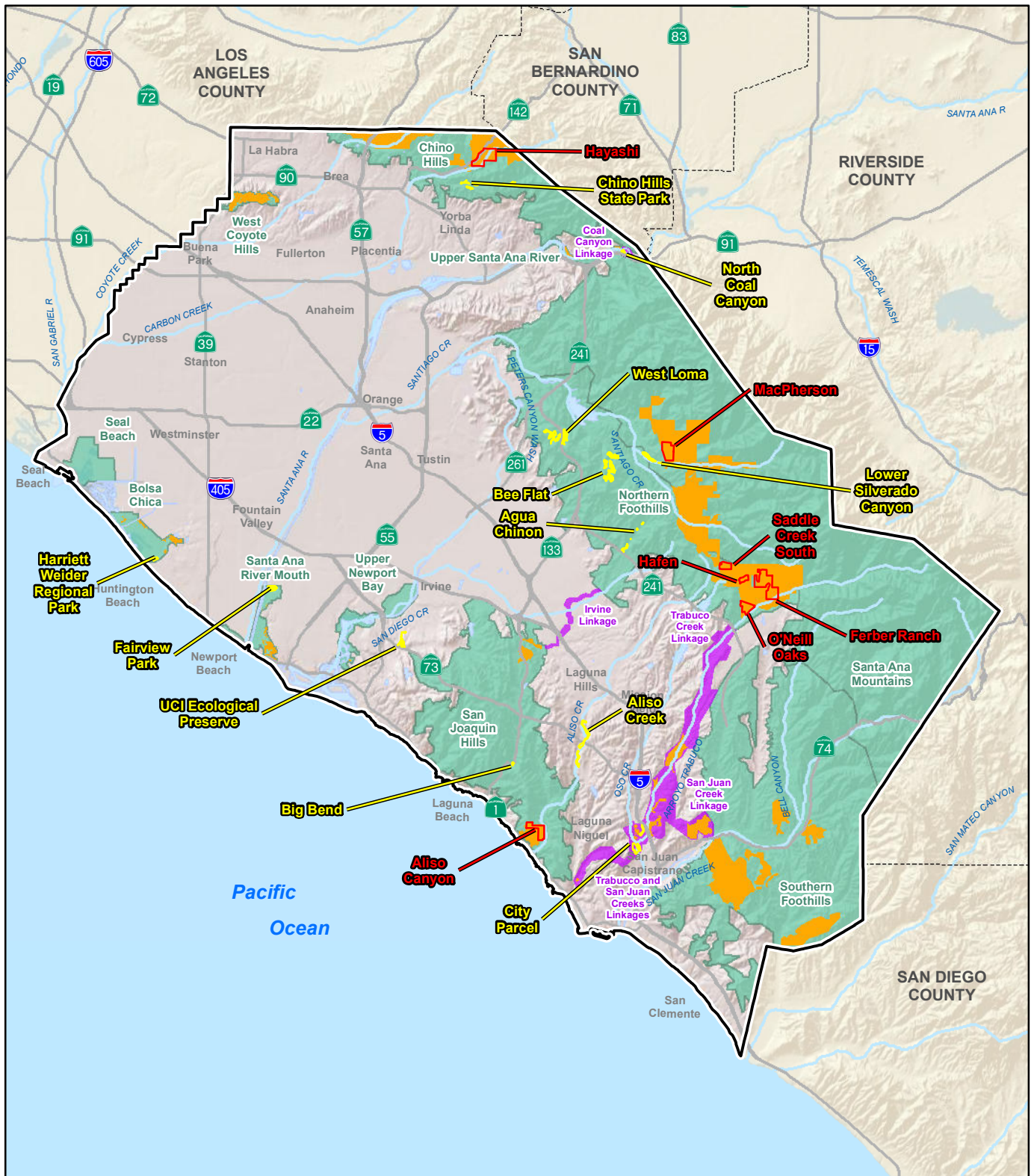
6.1 Introduction

This section includes a conservation analysis to determine if the conservation strategy (Preserve acquisitions, restoration projects, and avoidance and minimization measures) results in the conservation and management of the Covered Species and their habitats. The conservation analysis evaluates how, at a landscape and natural community level, the acquisitions of Preserve areas and implementation of habitat restoration projects are able to achieve the biological goals and objectives for broader conservation of natural communities, ecological functions, habitat connectivity, and local biodiversity. The species-level conservation analysis further considers acquisition and restoration elements of the conservation strategy as well as the Plan’s avoidance and minimization measures to determine if the biological goals and objectives are achieved for Covered Species. The conservation analysis is organized hierarchically according to the landscape, natural community, and species-level biological goals and objectives, and links the analysis of the objectives to criteria identified in the NCCPA and USFWS’s coverage determinations for Covered Species.

6.2 Landscape-Level Conservation Analysis

The landscape-level conservation analysis evaluates how the landscape-level goals and objectives have been accomplished through implementation of the Plan conservation strategy. The Orange County Conservation Assessment prepared by CBI (CBI 2009) for the EOC has identified priority conservation areas within Orange County and has been used as a tool to guide and evaluate the Preserve acquisitions and restoration projects (see Section 2.4.3, “Landscape Level Conservation Assessment” and Appendix C.5, “CBI Conservation Assessment Summary”). To assist in the landscape conservation analysis, the following figures show the relationship of the OCTA Preserves and OCTA restoration projects relative to areas important for regional conservation, currently protected lands, and other environmental factors.

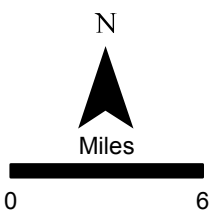
- Figure 6-1, “OCTA NCCP/HCP Preserves and Restoration Projects Relative to Core, Linkage, and Priority Conservation Areas”
- Figure 6-2a,b, “OCTA NCCP/HCP Preserves Relative to Positional Priority Areas”
- Figure 6-3, “OCTA NCCP/HCP Preserves and Restoration Projects Relative to Protected Lands”
- Figure 6-4a,b, “OCTA NCCP/HCP Preserves and Adjacent Protected Lands”
- Figure 6-5, “OCTA NCCP/HCP Preserves and Restoration Projects Relative to Elevation Ranges”
- Figure 6-6, “OCTA NCCP/HCP Preserves and Restoration Projects Relative to Watersheds”



Legend

- OCTA Acquired Preserves
- OCTA Funded Restoration Projects
- Core Habitat Area
- Linkage
- Priority Conservation Areas

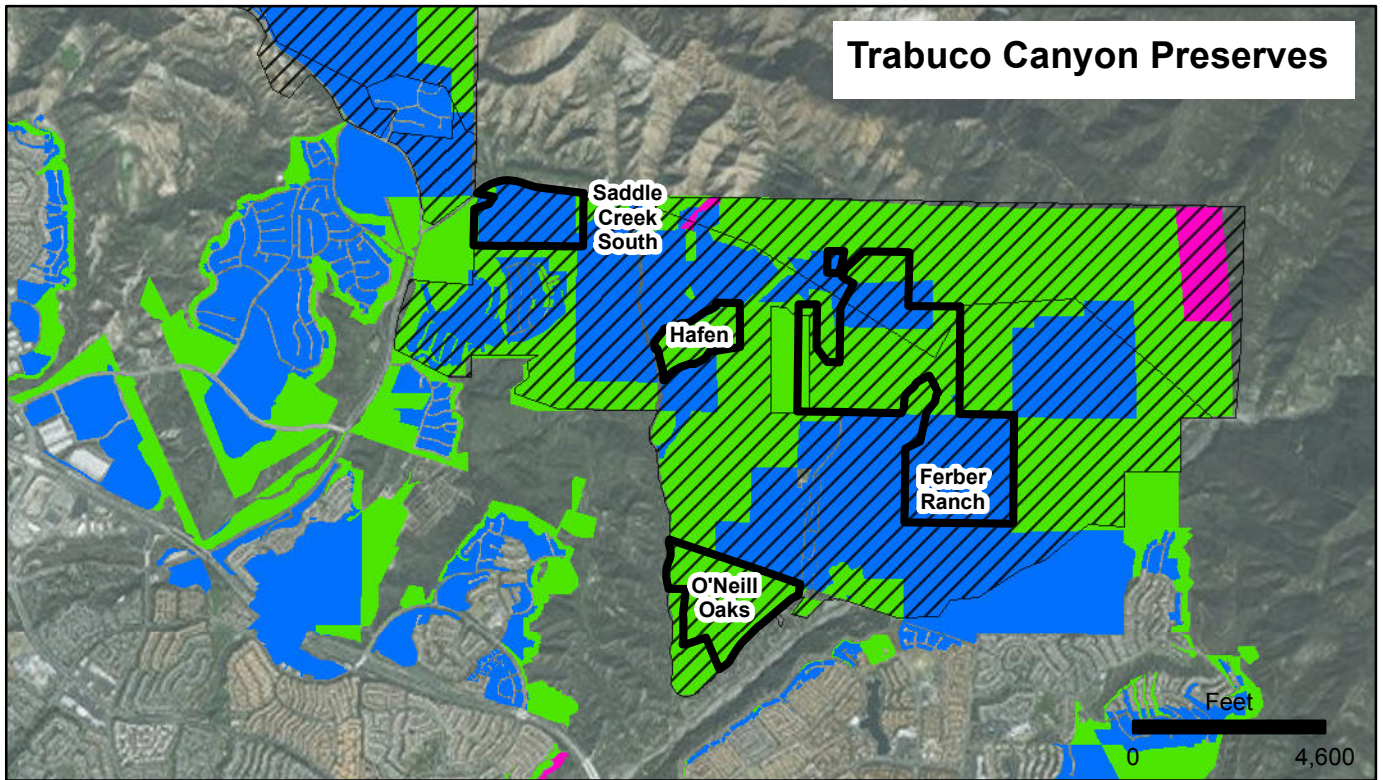
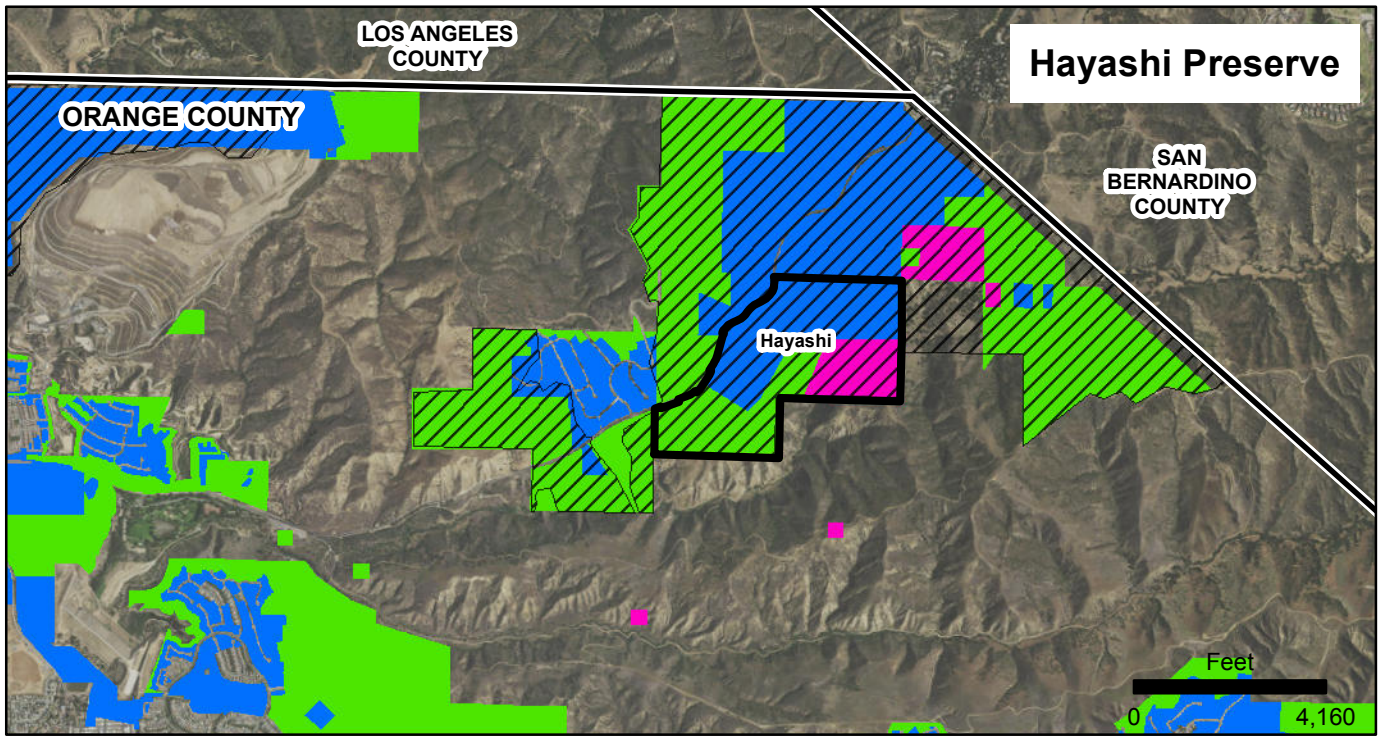
Sources:
 Preserves/Restoration Projects: OCTA 2015
 Core, Linkage, and Priority Conservation Areas: CBI 2009



OCTA NCCP/HCP Preserves and Restoration Projects Relative to Core, Linkage, and Priority Conservation Areas

Figure 6-1





Legend

- Plan Area
- Priority Conservation Areas
- Preserve Boundary

Positional Priority Levels

- High Priority
- Moderate Priority
- Low Priority

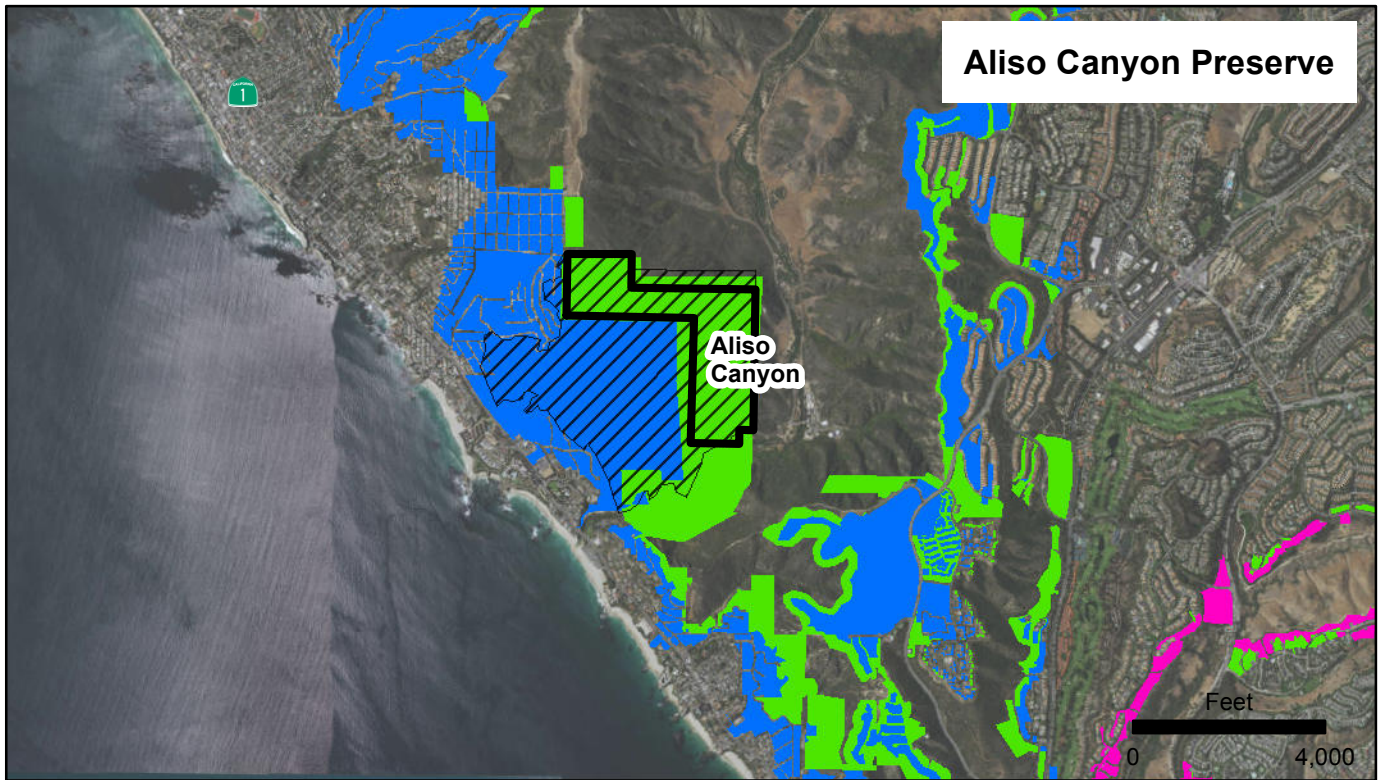
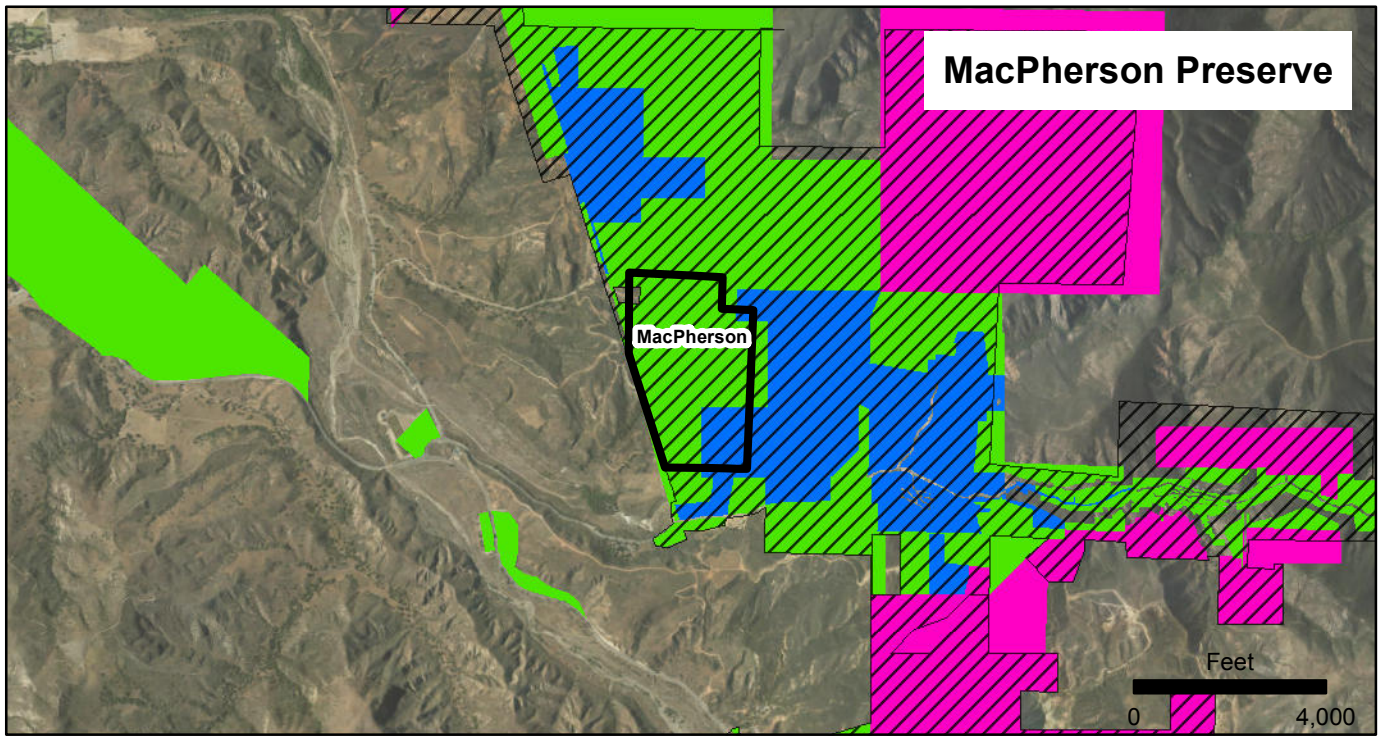
Source: Positional Priority Levels: CBI 2009

Note: Positional priority levels have not been adjusted based on updates to protected lands.




OCTA NCCP/HCP Preserves Relative to Positional Priority Levels – Hayashi and Trabuco Canyon Preserves

Figure 6-2a



Legend

- | | |
|---|---|
|  Priority Conservation Areas | Positional Priority Levels |
|  OCTA Acquired Preserves |  High Priority |
| |  Moderate Priority |
| |  Low Priority |

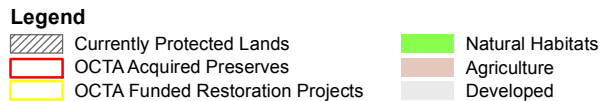
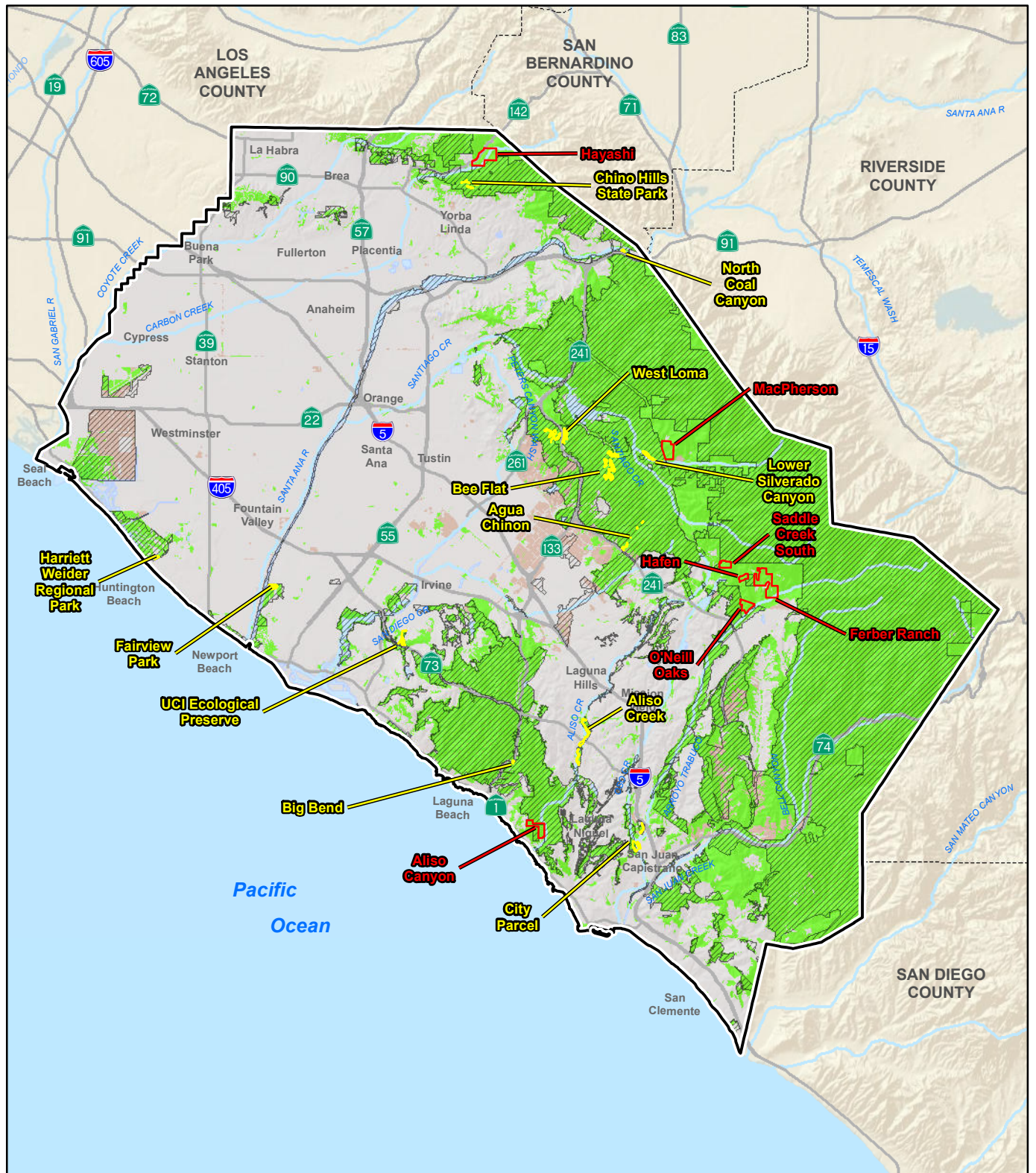
Source: Positional Priority Levels: CBI 2009

Note: Positional priority levels have not been adjusted based on updates to protected lands.

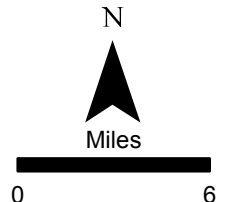


OCTA NCCP/HCP Preserves Relative to Positional Priority Levels – Aliso Canyon and MacPherson Preserves

Figure 6-2b



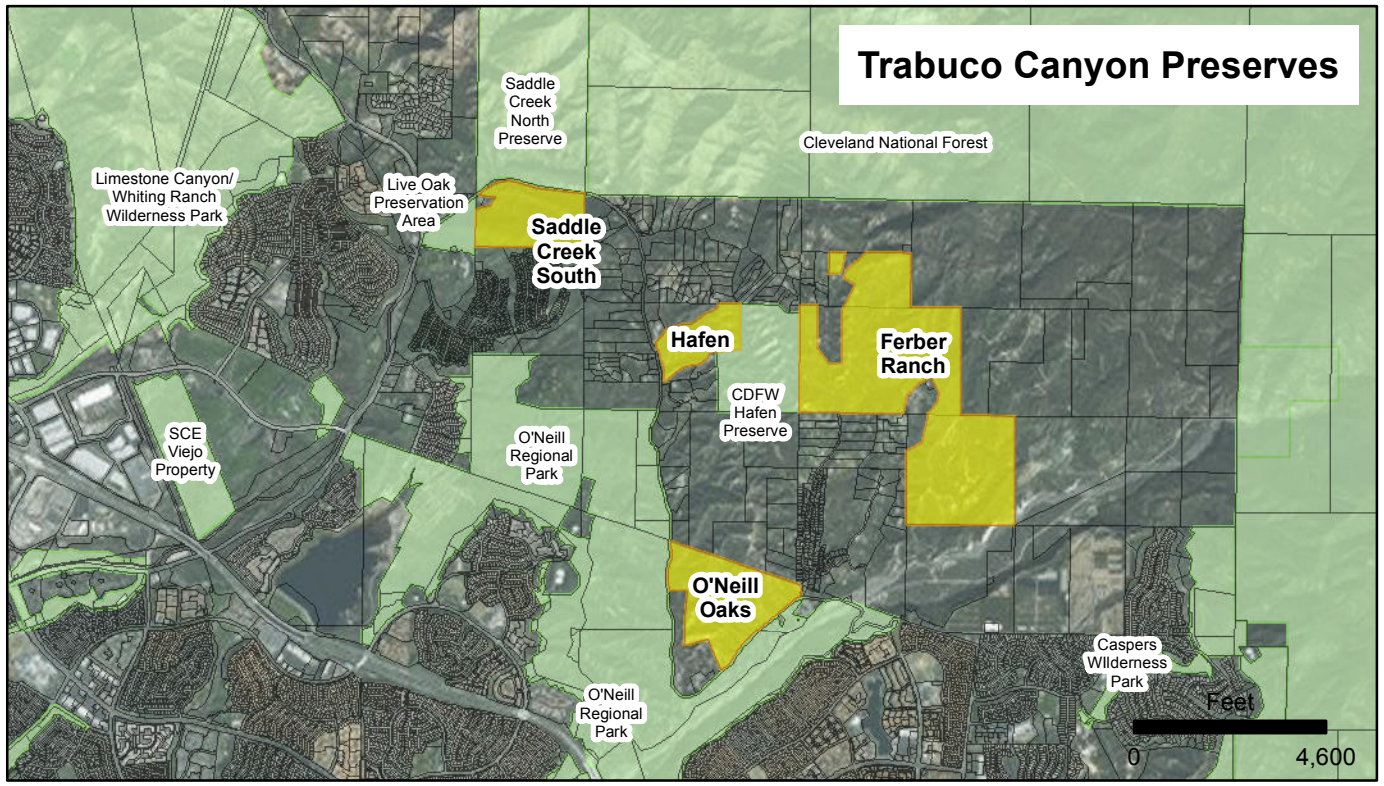
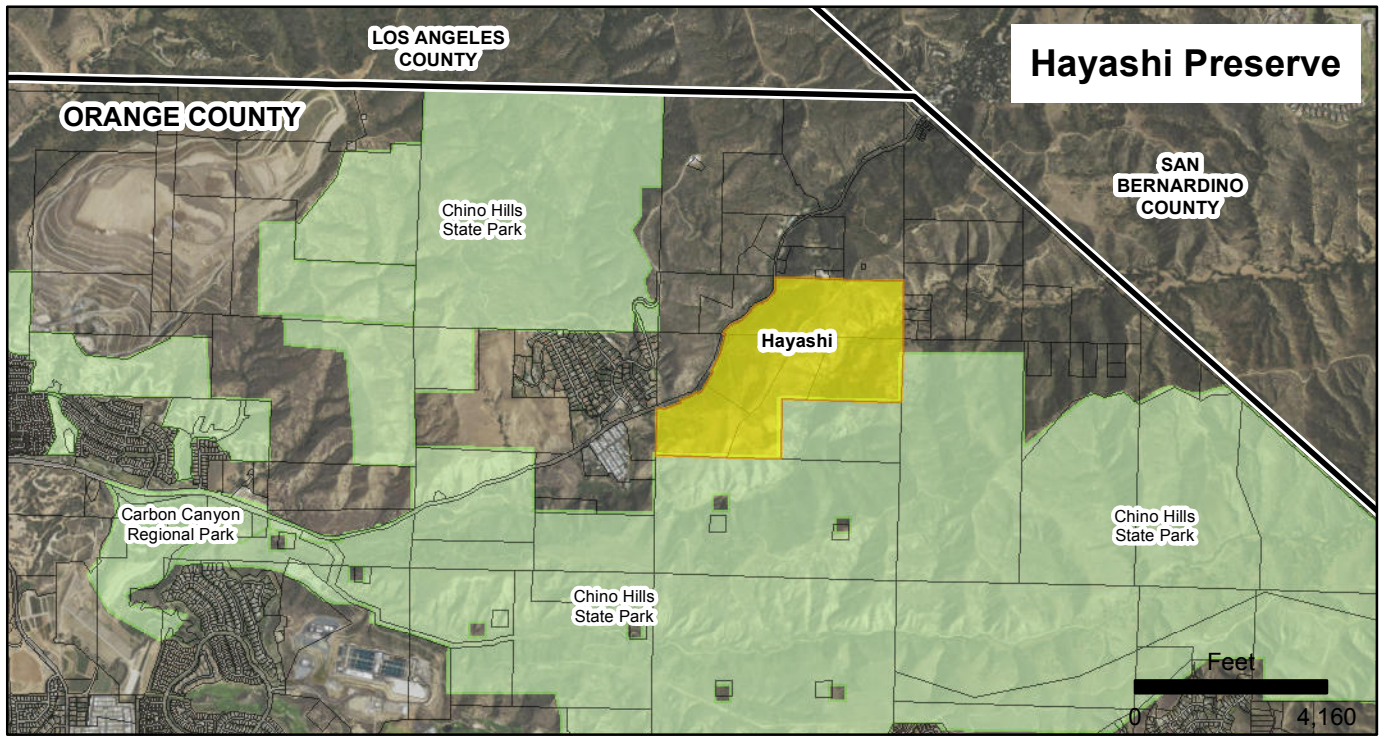
Sources:
 Preserves/Restoration Projects: OCTA 2015
 Protected Areas: CBI 2009, ICF/TAIC/OCTA 2015



**OCTA NCCP/HCP Preserves and Restoration Projects
 Relative to Protected Lands**

Figure 6-3





Legend

- OCTA Acquired Preserves
- Currently Protected Lands

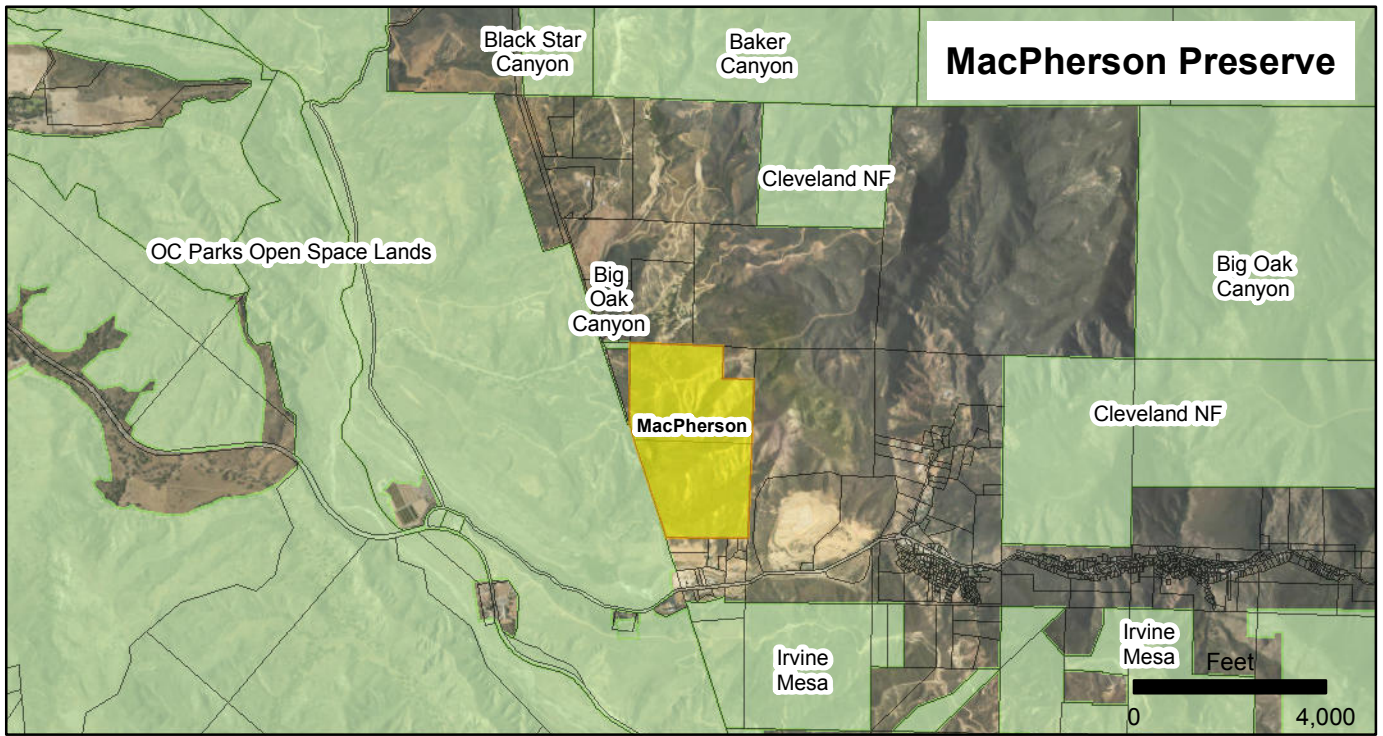


Sources:
 Preserves: OCTA 2015
 Protected Areas: CBI 2009, ICF/TAIC/OCTA 2015



OCTA NCCP/HCP Preserves and Adjacent Protected Lands – Hayashi and Trabuco Canyon Preserves

Figure 6-4a



Legend

- OCTA Acquired Preserves
- Currently Protected Lands
- City of Laguna Beach Community Park

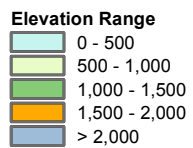
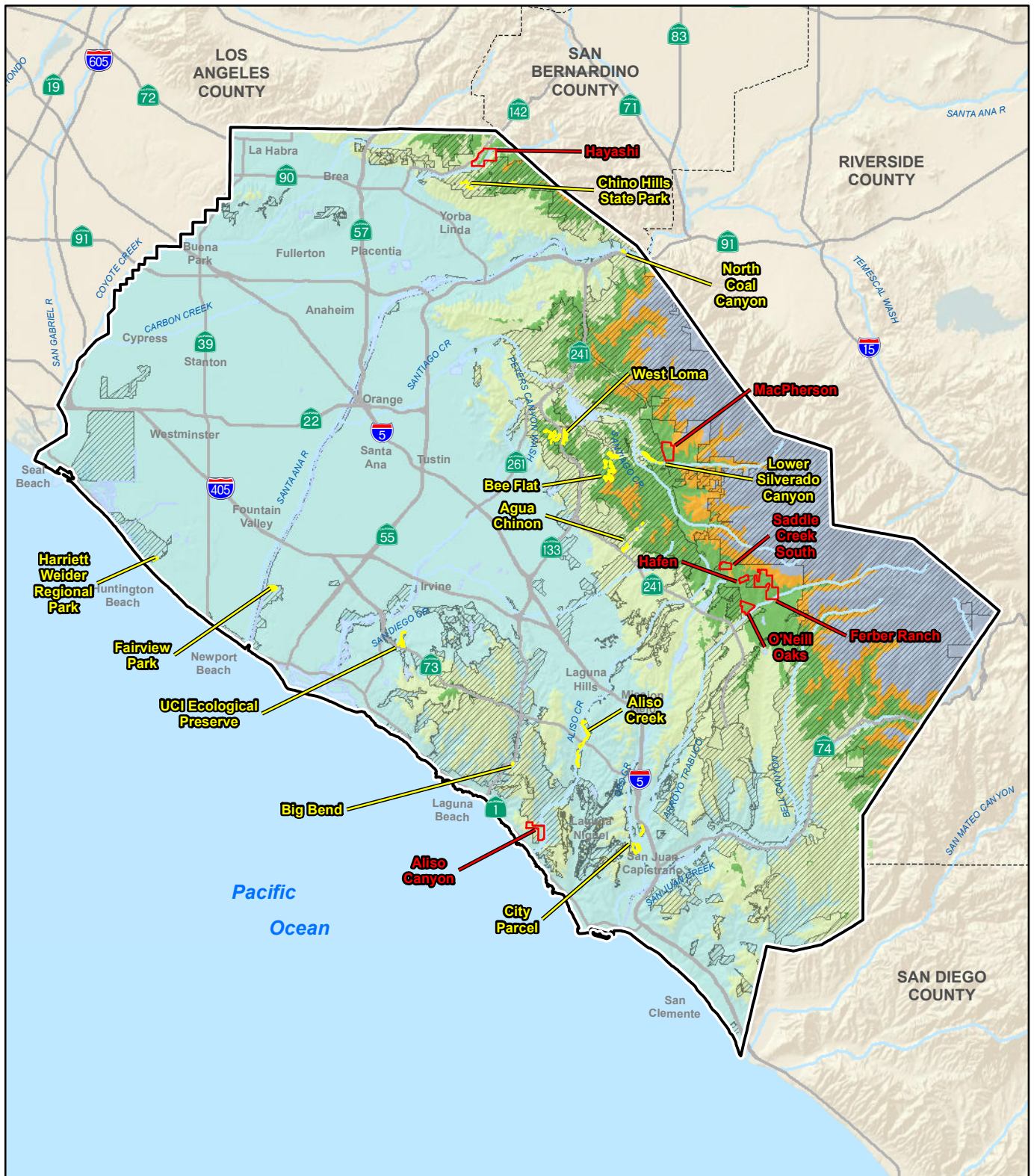


Sources:
 Preserves: OCTA 2015
 Protected Areas: CBI 2009, ICF/TAIC/OCTA 2015

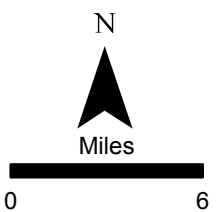


OCTA NCCP/HCP Preserves and Adjacent Protected Lands – Aliso Canyon and MacPherson Preserves

Figure 6-4b



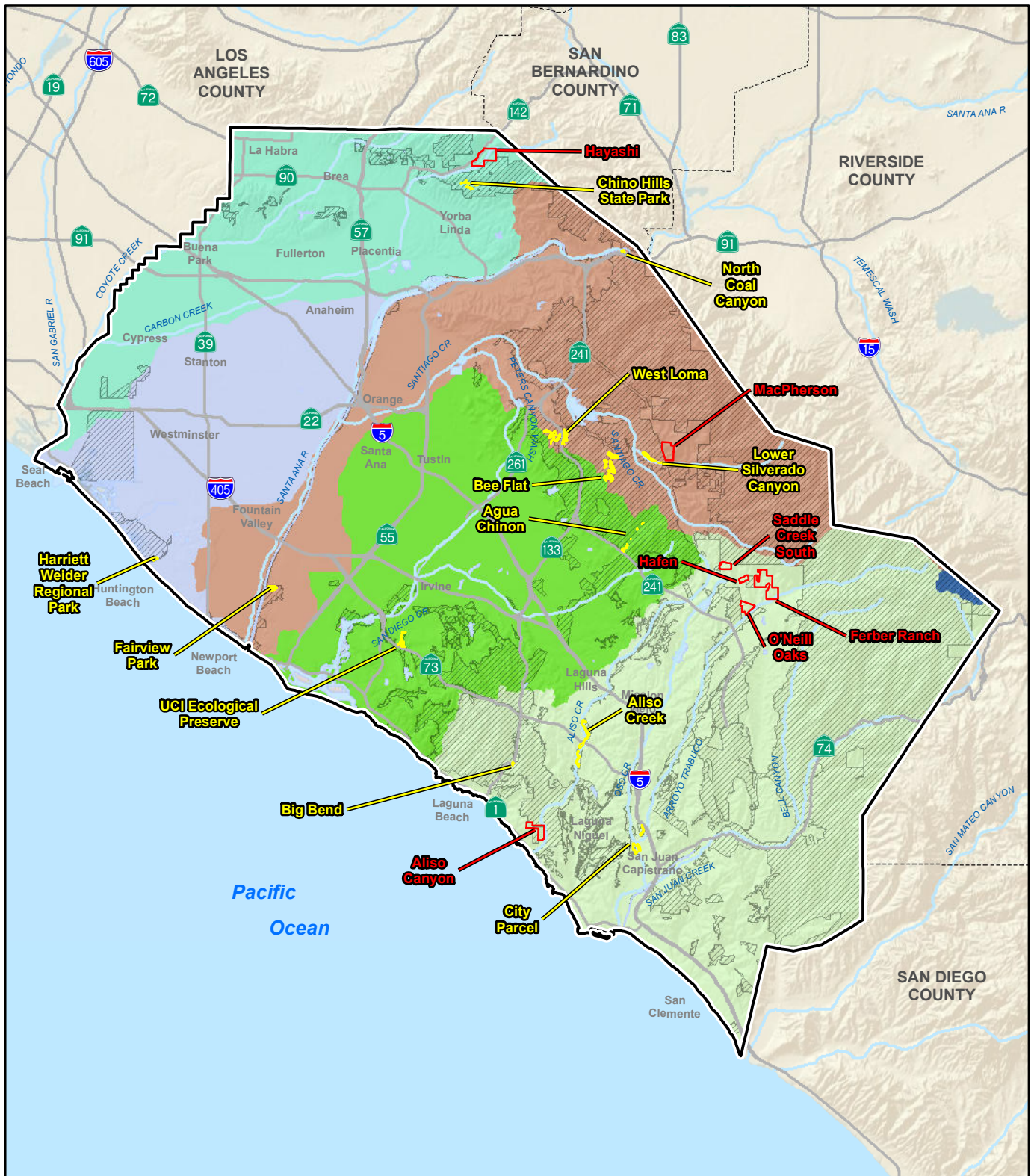
Sources:
 Preserves/Restoration Projects: OCTA 2015
 Protected Lands: CBI 2009, ICF/TAIC/OCTA 2015



**OCTA NCCP/HCP Preserves and Restoration Projects
 Relative to Elevation Ranges**

Figure 6-5





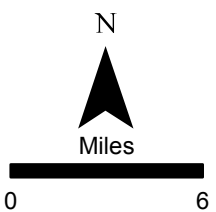
Legend

- OCTA Acquired Preserves
- OCTA Funded Restoration Projects
- Currently Protected Lands

HUC 8 Watershed

- Aliso-San Onofre
- Newport Bay
- San Gabriel
- San Jacinto
- Santa Ana
- Seal Beach

Sources:
 Preserves/Restoration Projects: OCTA 2015
 Protected Lands: CBI 2009, ICF/TAIC/OCTA 2015



**OCTA NCCP/HCP Preserves and Restoration Projects
 Relative to Watersheds**

Figure 6-6

Landscape Goal 1: Protect, manage, and enhance natural landscapes that result in conservation of areas large enough to support ecological integrity and sustainable populations of Covered Species, and are linked to each other and/or other areas of protected habitat in or adjacent to the Plan Area.

Landscape Objective 1.1: OCTA will conserve and manage natural landscape within core and linkage areas contiguous with existing protected lands.

Conservation Analysis: OCTA acquired seven Preserves—Aliso Canyon, Ferber Ranch, Hafen, Hayashi, MacPherson, O’Neill Oaks, and Saddle Creek South Preserves—totaling 1,232.5 acres of natural habitat. In all instances, the seven Preserves are located within priority conservation areas as identified in the CBI Conservation Assessment of Orange County (Figure 6-1). The priority conservation areas are defined as “those currently unprotected lands for which acquisition would be a ‘no regrets’ decision, based on their contribution to the regional reserve system” (CBI 2009). These Preserves add to the protection of large blocks of natural open space in areas important for regional conservation.

The Hayashi Preserve is located at the north end of the County within the Chino Hills core habitat area, which forms the northeastern border of Orange County (Figure 6-1). The Chino Hills core habitat area is particularly important in providing habitat for large-area dependent species such as bobcat and other large mammals. This core habitat area also supports a number of under-protected vegetation communities, including one of the few California walnut woodland habitat areas in Orange County and core populations of Covered Species. The preservation and management of the Hayashi property helps to achieve key conservation objectives for this core habitat area that include, but are not limited to, minimization of internal fragmentation, maintaining connectivity to the Puente Hills and Santa Ana Mountains, and maintaining the integrity of Chino Hills State Park (CBI 2009).

The MacPherson Preserve is located at the central portion of the County within the Santa Ana Mountains core habitat area (Figure 6-1). The Santa Ana Mountain core habitat area constitutes the largest block of high integrity habitat and functions as the ‘backbone’ of the regional reserve system. It is notable for its high landscape integrity, large size, connectivity to other cover habitat areas, and suite of mid- to high elevation habitats and species. This core habitat area is large enough to support intact ecosystem processes and has the ability to function as both a refugium and source area for key species in the event of large-scale disturbances or climate change. The preservation and management of the MacPherson property helps to achieve key conservation objectives for this core habitat area that include, but are not limited to, minimization of internal fragmentation by acquiring or otherwise conserving unprotected parcels in the central portion of the core (CBI 2009).

The four Preserves in the Trabuco Canyon area—Ferber Ranch, Hafen, O’Neill Oaks, and Saddle Creek South Preserves—are located primarily in the Northern Foothills core habitat area. The Northern Foothills is a medium-sized core that is contiguous with the larger Santa Ana Mountain core habitat area to the east. Because of this contiguity, the area is able to support large-area dependent species such as bobcat and mountain lion. It also supports high biodiversity, including sensitive habitat and core populations of coastal California gnatcatchers, cactus wren, and other Covered Species. The preservation

and management of the south County Preserves helps to achieve key conservation objectives for the Northern Foothills core habitat area that includes, but are not limited to, minimization of internal fragmentation and maintaining connectivity to the Santa Ana Mountains (CBI 2009).

The Aliso Canyon Preserve is located near the coast within the San Joaquin core habitat area (Figure 6-1). The San Joaquin core habitat area is a medium-sized block of habitat on the immediate coast. This core supports high quality, relatively intact habitat, but is bisected by two major roads (SR-73 and SR-133), and is largely isolated from other sizeable core habitat areas. The San Joaquin Hills support a number of sensitive vegetation communities, endemic species, and core populations of cactus wren, coastal California gnatcatchers, many-stemmed dudleya, and other Covered Species. An estimated 84% of this core is currently protected, primarily within the Coastal Subarea Reserve of the Nature Reserve of Orange County (CBI 2009). The Aliso Canyon Preserve is immediately adjacent to the 4,500-acre Aliso and Wood Canyons Wilderness Park and adds to the preservation of an important block of protected habitat near the coast.

Each Preserve borders or is in close proximity to existing protected lands. Figure 6-2 shows the positional priority levels for each Preserve as identified in the CBI (2009) Conservation Assessment of Orange County. Positional priority levels are based on (1) position (i.e., interior versus edge) of the parcel within a reserve element and (2) proximity of the parcel to protected open space. The methods and ranking system used to define positional priority level is explained in detail in Appendix C.5, "CBI Conservation Assessment Summary". The Aliso Canyon, Ferber Ranch, Hafen, Hayashi, MacPherson, and O'Neill Oaks Preserves all have mostly moderate or high positional priority levels. Even though the Saddle Creek South Preserve is close to the Saddle Creek North Preserve and Cleveland National Forest, it was calculated as having a low positional priority level because Live Oak Canyon Road separates it from the Saddle Creek North Preserve and Cleveland National Forest to the north. Figures 6-3 and 6-4 show the proximity of the Preserves relative to existing protected lands and demonstrate how the acquisition of these Preserves enhances the biological function and values of these other protected lands in the Plan Area that were conserved by other regional planning efforts.

The strategic location of these Preserves, the total acreage, and the commitment to long-term management contribute to achieving this objective. This objective will be considered achieved when OCTA records conservation easements for these Preserves.

This objective supports CDFW's NCCPA Findings Section 2820a, findings 3, 4A, 4B, 4C, and 4E.

Landscape Objective 1.2: OCTA will fund and successfully implement restoration projects within the Plan Area to restore or enhance habitat that supports populations of Covered Species and the ecological integrity of natural landscapes.

Conservation Analysis: OCTA has approved funding for 11 restoration projects to date, totaling an estimated 357.4 acres of restored habitats throughout the Plan Area (Figure 6-1). Each restoration project is located on lands currently protected or in the process of being protected through a conservation easement or an equivalent long-term protection mechanism approved by the Wildlife Agencies. The location of the restoration

projects are within core habitat areas and/or key habitat linkages and riparian corridors. (see Section 5.5.3, “Restoration Projects”). A summary of the restoration projects, their landscape location in areas important for regional conservation, and Covered Species potentially benefitted by the restoration actions is included in Table 6-1.

This objective will be considered achieved when all 11 restoration projects have met their project-specific success criteria.

This objective supports CDFW’s NCCPA Findings Section 2820a, findings 4A and 4E.

Landscape Goal 2: Protect and enhance natural and semi-natural landscapes important to maintain wildlife movement within the Plan Area.

Landscape Objective 2.1: OCTA will acquire, protect, and manage natural landscapes that secure wildlife movement corridors and provide landscape connectivity.

Conservation Analysis: OCTA has acquired four Preserves—Ferber Ranch, Hafen, O’Neill Oaks, and Saddle Creek South—totaling 592.0 acres of conserved natural open space in the Trabuco Canyon area. The more recently acquired MacPherson Preserve (200.0 acres) is within the Silverado Canyon. These five Preserves provide a significant addition to the protection of open space in this region of the Plan Area. The addition of this protection helps provide habitat connectivity between O’Neill Regional Park, Cleveland National Forest, the Central-Coastal NCCP/HCP Central Reserve, and the Orange County Southern Subregion HCP Reserve (Figures 6-3 and 6-4). In addition, OCTA has acquired the Hayashi Preserve in the Chino Hills area, which provides 293.6 acres of natural habitat in a location that provides connectivity between the Puente Hills to the northwest and Santa Ana Mountains to the south (Figures 6-3 and 6-4). All six Preserves are a part of a 40-mile stretch of nearly continuous wildlife habitat within Orange County that spans from the northern boundary of Marine Corps Base (MCB) Camp Pendleton, into the Cleveland National Forest through the Santa Ana Mountains and Southern and Northern Foothills core areas, across the Coal Canyon linkage at SR-91 and the Santa Ana River, through the Chino Hills core area and Chino Hills State Park. The strategic location of these six Preserves protects habitat that provides opportunities for movement of native wildlife species, including Covered Species. Management of the Preserves will include activities and actions specific to sustaining effective wildlife movement, specifically installation of wildlife friendly fencing, managed public access to control recreational trail use to a balanced degree, and monitoring (with cameras) that will inform adaptive management decisions.

Specific observations and examples of wildlife movement identified on the Preserves to date include:

- Ferber Ranch – Incidental observations of mountain lion have been reported on Ferber Ranch for many years. Multiple observations have been recorded on wildlife movement cameras to date (see image).



Table 6-1. OCTA NCCP/HCP Restoration Projects – Landscape Location and Covered Species Benefitted

Project	Sponsor	Description	Location	Covered Species Potentially Benefitted
Agua Chinon/ Bee Flat Canyon	Irvine Ranch Conservancy	90.1 acres of restoration consisting of chaparral, grassland, coastal sage scrub, elderberry scrub, oak woodland, and riparian	Northern Foothills core habitat area	Coast horned lizard, orangethroat whiptail, western pond turtle, coastal California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, bobcat, mountain lion
Big Bend	Laguna Canyon Foundation	3.7 acres of restoration consisting of coastal sage scrub and riparian woodland to enhance wildlife connectivity	San Joaquin Hills core habitat area	Coast horned lizard, orangethroat whiptail, western pond turtle, coastal California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, bobcat
City Parcel	City of San Juan Capistrano	53 acres of restoration consisting of riparian and coastal sage scrub	Trabuco and San Juan Creek linkage area	Arroyo chub, coast horned lizard, orangethroat whiptail, western pond turtle, coastal California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, bobcat
Fairview Park	City of Costa Mesa	23 acres of restoration consisting of wetlands, grasslands, coastal sage scrub, and riparian	Santa Ana River Mouth core habitat area	Southern tarplant, coast horned lizard, orangethroat whiptail, western pond turtle, coastal California gnatcatcher, least Bell's vireo, southwestern willow flycatcher
UC Irvine Ecological Preserve	Nature Reserve of Orange County	8.5 acres of restoration consisting of cactus scrub	UC Irvine Ecological Preserve	Coast horned lizard, orangethroat whiptail, cactus wren, coastal California gnatcatcher
Aliso Creek	Laguna Canyon Foundation	55 acres of restoration consisting of riparian and transitional habitat	Aliso Creek riparian corridor	Western pond turtle, least Bell's vireo, southwestern willow flycatcher, bobcat
Chino Hills State Park	Chino Hills State Park	13.5 acres of riparian restoration and 6.0 acres of cactus scrub restoration	Chino Hills core habitat area	Coast horned lizard, orangethroat whiptail, western pond turtle, coastal California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, bobcat, mountain lion
Harriett Weider Regional Park	Bolsa Chica Conservancy	8.2 acres of restoration consisting of grassland, coastal sage scrub, and riparian habitat	Bolsa Chica core habitat area	Southern tarplant, coast horned lizard, orangethroat whiptail, western pond turtle, coastal California gnatcatcher, least Bell's vireo, southwestern willow flycatcher
Lower Silverado Canyon	Irvine Ranch Conservancy	28.4 acres of restoration consisting of riparian and coastal sage scrub habitat	Santa Ana Mountains core habitat area	Coast horned lizard, orangethroat whiptail, western pond turtle, coastal California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, bobcat, mountain lion
North Coal Canyon	California Dept of Parks and Recreation	5.5 acres of restoration consisting of coastal sage scrub habitat within a key wildlife connectivity linkage area	Coal Canyon linkage area	Coast horned lizard, orangethroat whiptail, coastal California gnatcatcher, bobcat, mountain lion
West Loma	Irvine Ranch Conservancy	62.47 acres of restoration consisting of grassland, coastal sage scrub, and riparian habitat	Northern Foothills core habitat area	Coast horned lizard, orangethroat whiptail, western pond turtle, coastal California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, bobcat, mountain lion

- O'Neill Oaks - Incidental observations of mountain lion and bobcat have been reported on O'Neill Oaks by Orange County Parks staff. Observations have been recorded on wildlife movement cameras as well.
- Hayashi – Bobcat were observed by OCTA and State Park staff during site visits.

This objective will be considered achieved when OCTA records conservation easements for these five Preserves.

This objective supports CDFW's NCCPA Findings Section 2820a, findings 4B and 4E.

Landscape Objective 2.2: OCTA will restore or enhance habitat through restoration projects that improves habitat connectivity and wildlife movement through existing protected lands.

Conservation Analysis: Of the 11 restoration projects OCTA has approved funding for to date, 5 (totaling 179.7 acres of restored habitat) are located in areas highly important for habitat connectivity and wildlife movement and/or include specific design features (e.g., improve directional fencing to wildlife crossings) to promote wildlife movement (Figure 6-1). These five restoration projects include the North Coal Canyon, West Loma, Big Bend, Aliso Creek, and City Parcel. A brief summary of the conditions at each of these restoration sites is presented below, with an explanation of how these restoration projects will enhance wildlife movement through existing protected lands.

- North Coal Canyon – This restoration project is located within the Coal Canyon linkage area (Figure 6-1). The Coal Canyon linkage is an existing freeway underpass being restored specifically for maintaining wildlife connectivity across SR-91 between the Santa Ana Mountains and Chino Hills core habitat areas. This underpass is critical to maintaining movement of wide-ranging species between these two core habitat areas. This wildlife linkage is currently protected and will benefit from improved vegetation cover. The California Department of Parks and Recreation (Chino Hills State Park) has completed/initiated coastal sage scrub restoration on other parts of the project area, and this 5.5-acre project will complete restoration on the entire 32-acre parcel on the north side of the freeway. Restoring the entire parcel will improve the viability of the connection for wildlife movement as well as provide additional high quality habitat for resident species. Occupation of the project area by coastal California gnatcatcher will be monitored. Due to its proximity to the Santa Ana River it is possible that portions of the project site may also be used for foraging by least Bell's vireo. This wildlife linkage connects intact habitat on the south side of SR-91 to the riparian corridor of the Santa Ana River and north into the main portion of Chino Hills State Park, up Aliso Canyon and Telegraph Canyon, moving west with connections all the way to the City of Whittier.
- West Loma – This restoration project is located in the Northern Foothills core habitat area (Figure 6-1). The project site is bisected by the 241 toll road. The project involves the restoration of degraded habitat that lies within a landscape mosaic containing patches of intact habitat. Restoring degraded patches within the mosaic will improve contiguity to further benefit habitat quality of both restored and intact components. The project also includes fence realignment around a key wildlife corridor in the vicinity of the 241 toll road. With fencing improvements and nearby restored habitat, the crossing is expected to become more attractive to wildlife and

will improve connectivity, effectively increasing the area of available riparian and upland habitat for wildlife.

- **Big Bend** – This restoration project is located in the San Joaquin Hills core habitat area (Figure 6-1). It is within the Laguna Creek watershed in one of the key wildlife corridors that links Aliso and Wood Canyons Wilderness Park to the Laguna Coast Wilderness Park. Big Bend is at the juncture of several high-frequency wildlife trails used by deer and bobcat. The site has been used as an informal trailhead and had been degraded by invasive species and human activity. Over the past 10 years, the City of Laguna Beach has worked with the Laguna Canyon Foundation to preserve more than 250 acres adjacent to the proposed restoration area, which is now under City ownership and County wilderness park management. The project will restore approximately 3 acres of disturbed coastal sage scrub and more than a 0.5 acre of riparian habitat to high quality habitat that will benefit local species and increase the wildlife corridor’s local and regional effectiveness.
- **Aliso Creek** – This restoration project is located along Aliso Creek in Laguna Niguel (Figure 6-1). Aliso Creek runs for 19 miles from the Santa Ana Mountains to the Pacific Ocean, connecting several large public open space preserves. The riparian corridor is a key movement area for wildlife. Covered Species occur upstream and downstream of the restoration project site (e.g., least Bell’s vireo, western pond turtle). Restoration of riparian habitat will improve overall connectivity of habitat for wildlife, improve in-stream water quality, and expand the potential for Covered Species to utilize this stretch of Aliso Creek.
- **City Parcel** – This restoration project is located in the Trabuco and San Juan Creeks linkage (Figure 6-1). The primary aim of the restoration will be the removal and control of invasive, nonnative plant species across the restoration area. This project will strengthen the Trabuco and San Juan Creek Wildlife Linkage, which provides vital connections between the Central-Coastal NCCP/HCP and Orange County Southern Subregion HCP Reserve systems. The upland area extends uphill from the Trabuco Creek to the Colinas ridgeline, where it connects to the Salt Creek Open Space Corridor, which is a permanent wilderness preserve and key wildlife corridor.

This objective will be considered achieved when these five restoration projects have met their specific success criteria.

This objective supports CDFW’s NCCPA Findings Section 2820a, finding 4E.

Landscape Objective 2.3: OCTA will set forth policies and procedures requiring the planning and execution of covered freeway improvement projects in a manner that maintains and, if feasible, enhances wildlife connectivity through existing structures. OCTA will provide monitoring, when and where appropriate, to demonstrate this objective has been met.

Conservation Analysis: The Plan includes the Wildlife Crossing Policy (see Section 5.6.2.3) as part of the avoidance and minimization measures. This policy requires that covered freeway improvement projects be evaluated during pre-project surveys to determine if existing structures function as important wildlife movement crossings. Covered freeway improvement projects located between blocks of natural habitat or adjacent to key habitat linkages will require closer scrutiny (see Figure 4-1). OCTA will

require that appropriate design features are implemented to ensure that the wildlife crossing continues to function after the freeway construction improvements are completed. OCTA will provide a technical report summarizing design recommendations for review and approval by the Wildlife Agencies prior to final design. This technical report will set forth appropriate monitoring requirements of the wildlife crossing using guidance outlined in the *Caltrans Wildlife Crossing Guidance Manual*.

The implementation of the Wildlife Crossing Policy will maintain or enhance opportunities for movement of native wildlife species, including Covered Species, and contribute to achieving this objective. This objective will be considered achieved through implementation of this policy.

This objective supports CDFW’s NCCPA Findings Section 2820a, finding 4E.

Landscape Goal 3: OCTA will protect, enhance, and/or restore natural landscapes with high habitat diversity across a range of environmental gradients and contiguous to other protected areas to allow for shifting species distributions in response to catastrophic events (e.g., fire, prolonged drought) or changed circumstances (e.g., climate change).

Landscape Objective 3.1: OCTA will acquire and/or restore natural landscapes within elevation ranges (0–500; 500–1,000; 1,000–1,500; 1,500–2,000 feet). The conservation and restoration of Covered Species habitat in or contiguous with existing Preserve lands will benefit potential shifting species distributions in response to catastrophic events and changed circumstances.

Conservation Analysis: OCTA has acquired seven Preserves and approved funding of 11 restoration projects that occur throughout the Plan Area across a range of environmental gradients. Preserves and restoration projects occur from coastal areas to inland foothills, and are distributed across the Plan Area, north to south, and east to west. The location and distribution of the Preserve and restoration projects captures a range of environmental gradients, including a range of climatic conditions (temperature and rainfall), and elevation gradients (which are a surrogate for gradients of climate, geology, and topography). Inclusion of a range of environmental gradients protects a greater diversity of environmental conditions and greater species diversity, and provides opportunities for species to adapt to changed circumstances including climate change by dispersing along environmental gradients.

The elevation range of the OCTA acquired Preserves and restoration projects approved for funding is shown in Figure 6-5, included in detail in Table 6-2, and summarized in the following table.

Elevation Range	Total Acres in Plan Area	Currently Protected in Plan Area	OCTA Preserves	OCTA Restoration Projects
0–500 feet	297,846	35,519	66.3	156.7
500–1,000 feet	106,367	50,660	244.5	83.7
1,000–1,500 feet	42,446	29,033	864.5	92.7
1,500–2,000 feet	18,012	15,138	57.2	24.3
Over 2,000 feet	46,805	44,388		
Total	511,476	174,738	1,232.5	357.4

Table 6-2. OCTA NCCP/HCP Conservation Across Environmental Gradients (acres)

Environmental Gradient	Plan Area		Acquired Preserves							Restoration Projects										Total	
	Total Plan Area	Currently Protected in Plan Area	Aliso Canyon	Ferber Ranch	Hafen	Hayashi	MacPherson	O'Neill Oaks	Saddle Creek South	Round 1					Round 2						
										Agua Chinon / Bee Flat	Big Bend	City Parcel	Fairview Park	UCI Ecological Reserve	Aliso Creek	Chino Hills State Park	H. Weider Regional Park	Lower Silverado Canyon	North Coal Canyon		West Loma
<i>Elevation Ranges</i>																					
0-500 feet	297,846	35,519	66.3								3.7	52.8	23.0	8.5	55.0		8.2		5.5		223.0
500-1,000 feet	106,367	50,660	80.6			157.4		6.5		26.3		0.2			19.5			16.1		21.6	328.2
1,000-1,500 feet	42,446	29,033		356.0	47.9	136.2	174.1	105.9	44.4	39.5								12.3		40.9	957.2
1,500-2,000 feet	18,012	15,138		24.4			25.9		6.9	24.3											81.5
Over 2,000 feet	46,805	44,388																			-
Totals	511,476	174,738	146.9	380.4	47.9	293.6	200.0	112.4	51.3	90.1	3.7	53.0	23.0	8.5	55.0	19.5	8.2	28.4	5.5	62.5	1,589.9
<i>Watersheds (HUC8)</i>																					
Aliso - San Onofre	168,170	85,755	146.9	380.4	47.9			112.4	51.3		3.7	53.0			55.0						850.6
Newport Bay	100,990	19,754								6.8				8.5						0.4	15.7
San Gabriel	71,615	6,583				293.6									19.5						313.1
San Jacinto	910	904																			-
Santa Ana	113,560	56,026					200.0			83.3		23.0						28.4	5.5	62.1	402.3
Seal Beach	56,232	5,717														8.2					8.2
Totals	511,476	174,738	146.9	380.4	47.9	293.6	200.0	112.4	51.3	90.1	3.7	53.0	23.0	8.5	55.0	19.5	8.2	28.4	5.5	62.5	1,589.9
<i>Core and Linkage Areas</i>																					
<i>Cores:</i>																					
Chino Hills	14,508	7,196				293.6									19.5						313.1
Northern Foothills	27,803	19,510		300.9	47.9			112.4	51.3	90.1								6.7		62.5	671.8
North Coast	4,156	3,660										23.0				8.2					31.2
San Joaquin Hills	23,812	17,180	146.9								3.7										150.6
Santa Ana Mountains	86,003	75,406		79.5			200.0											21.7			301.2
Southern Foothills	47,949	33,019																			-
Upper Santa Ana River	647	357																		1.1	1.1
West Coyote Hills	649	109																			-
<i>Linkages:</i>																					
1:Coal Canyon	94	40																		4.4	4.4
2:Irvine	276	180																			-
4/6:Trabuco-San Juan Creek	7,834	3,350										53.0									53.0
<i>Outside Core and Linkages:</i>	297,745	14,730												8.5	55.0						63.5
Totals	511,476	174,738	146.9	380.4	47.9	293.6	200.0	112.4	51.3	90.1	3.7	53.0	23.0	8.5	55.0	19.5	8.2	28.4	5.5	62.5	1,589.9

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Portions of the Plan Area at higher elevations (over 2,000 feet) already have a high percentage of protected lands since most of these lands are part of the Cleveland National Forest.

This objective will be considered achieved when OCTA records conservation easements for these seven Preserves and when these 11 restoration projects have met their specific success criteria.

This objective supports CDFW’s NCCPA Findings Section 2820a, finding 4D.

Landscape Goal 4: Protect and enhance habitat in geographically distinct areas across the Plan Area to conserve species by facilitating/promoting genetic exchange.

Landscape Objective 4.1: OCTA will acquire and/or restore natural landscapes within most of the major watersheds (HUC8) and a majority of the core and linkage areas that are contributing to genetic exchange within these areas.

Conservation Analysis: OCTA has acquired seven Preserves and approved funding for 11 restoration projects that occur throughout the Plan Area in many geographically distinct areas. Preserves and restoration projects occur from coastal areas to inland foothills and are distributed across the Plan Area, north to south, and east to west. OCTA has acquired Preserves and approved restoration projects for funding within five of the six watersheds within the Plan Area (Figure 6-6). The watersheds in which the OCTA Preserves and restoration projects approved for funding occur within are provided in detail in Table 6-2 and summarized in the following table.

Watersheds (HUC8)	Total Acres in Plan Area	Currently Protected in Plan Area	OCTA Preserves	OCTA Restoration Projects
Aliso – San Onofre	168,170	85,755	738.9	111.7
Newport Bay	100,990	19,754	-	15.7
San Gabriel	71,615	6,583	293.6	19.5
San Jacinto	910	904	-	-
Santa Ana	113,560	56,026	200.0	202.3
Seal Beach	56,232	5,717	-	8.2
Total	511,476	74,738	1,232.5	357.4

In addition, OCTA has acquired Preserves and/or approved for funding restoration projects in 9 of the 12 core and linkage areas (Figure 6-1).

This objective will be considered achieved when OCTA records conservation easements for the seven Preserves and when the 11 restoration projects have met their specific success criteria.

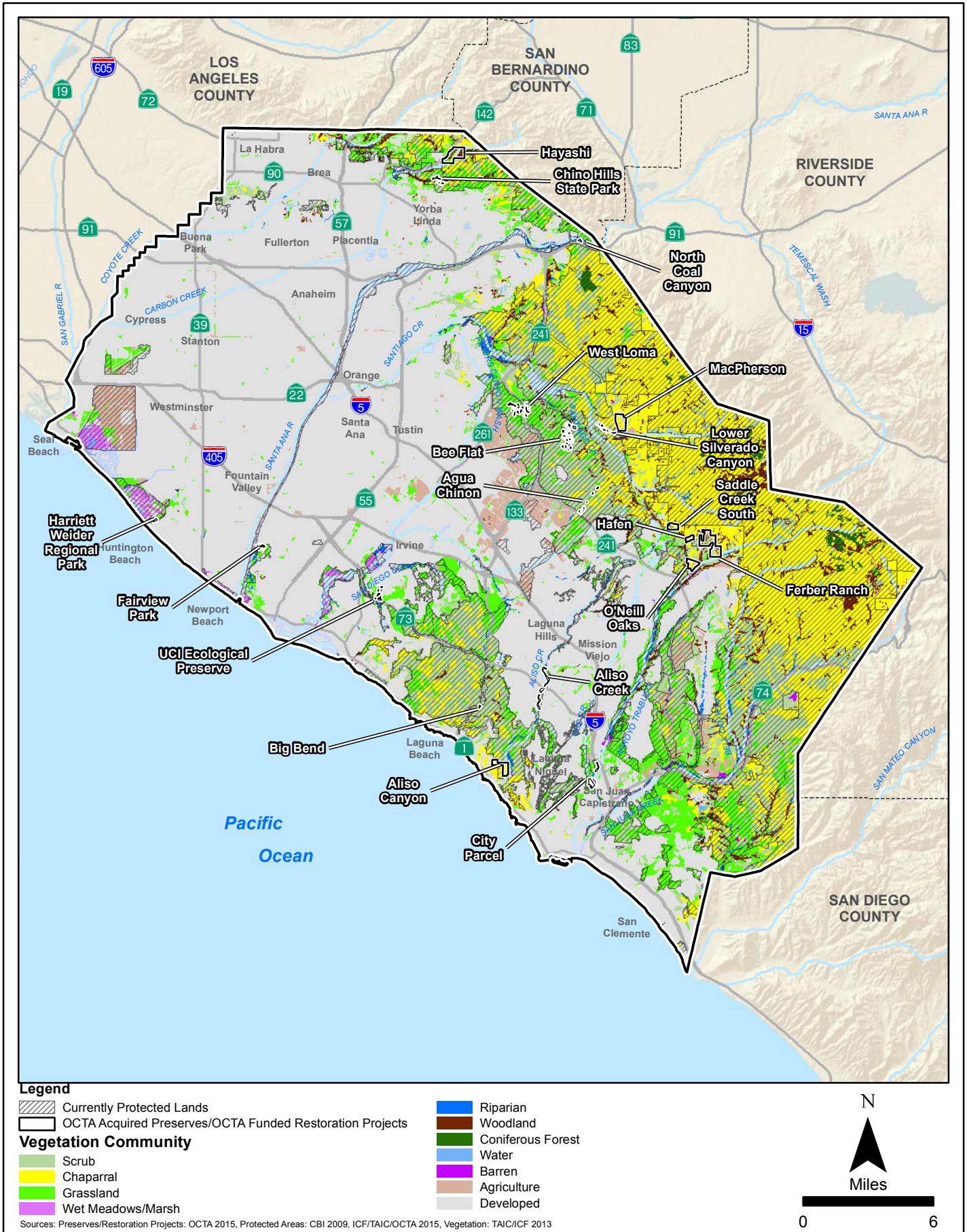
This objective supports CDFW’s NCCPA Findings Section 2820a, finding 4A.

6.3 Natural Communities Conservation Analysis

The natural communities' conservation analysis evaluates how the natural communities-level goals and objectives have been accomplished through implementation of the Plan conservation strategy. The primary data source used to evaluate natural communities across the Plan Area was the USFS EVeg dataset (see Section 2.4.1, "Natural Communities" and Appendix C.1, "Natural Communities Profiles"). Goals and objectives have been established using the major natural community categories of chaparral, grassland, riparian, scrub, and woodland. For the Coniferous Forest category, no goals and objectives were established because the covered freeway improvement projects will not affect this habitat type and 99.9% of the Coniferous Forest is currently protected. Goals and objectives for the wetlands/wet meadows/marsh communities are addressed based on mapping completed as part of the aquatic resources permitting program being undertaken by OCTA.

To assist in the natural communities' conservation analysis, Figure 6-7 shows (at a Plan Area scale) the major vegetation communities that are currently protected and where OCTA Preserves and OCTA restoration projects are located. Preserve-level vegetation mapping was completed as part of baseline biological surveys for the OCTA Preserves (Appendix C.6). This vegetation mapping was completed using field surveys following *A Manual of California Vegetation* 2nd Edition classification system (Sawyer et al. 2009). Maps showing the detailed vegetation mapping at the Preserves are included in Appendix C.6, "Baseline Biological Survey Technical Reports". The preserve-level vegetation data was cross-walked into the EVeg classification scheme and integrated into the vegetation GIS database. Maps showing the cross-walked vegetation mapping for the Preserves are included in Section 5.4.2, "Preserves."

Biological targets were developed for each major natural community based on the type and level of take estimated to occur from the Covered Activities. The targets represent an estimate of the amount of conservation to offset the direct and indirect effects from Covered Activities. Table 6-3 provides a summary of the total natural communities in the Plan Area, the amount currently protected, the amount protected as a result of the OCTA acquisition of Preserves, the amount restored/enhanced through OCTA restoration projects, and a comparison with targets. All natural community types are substantially above their targets except for grasslands. The negative conservation balance for grasslands is, however, offset based on the following considerations: (a) direct and indirect effects on grasslands will generally occur for small patches of disturbed, predominantly nonnative grasslands along freeway edges that have low biological value; (b) conservation of grassland is occurring within large, intact areas of protected natural habitat that have a high biological value; (c) Preserve acquisitions include large patches of native grasslands; and (d) the Plan results in conservation of other sensitive habitats, including scrub, riparian, and woodlands, that exceed Plan targets.



**OCTA NCCP/HCP Preserves and Restoration Projects
Relative to Natural Communities**

Figure 6-7



Table 6-3. Natural Communities Conservation Analysis Summary

Natural Communities	Total within Plan Area	Currently Protected	Plan Targets ¹	Conservation Actions		Conservation Above or Below Target
				Preserve Acquisitions	Restoration Projects	
Chaparral	82,965	70,857	42.8	562.0	4.0	523.2
Coniferous Forest	1,930	1,927	0.0	0.0	0.0	0.0
Grasslands	41,635	22,790	358.3	74.2	78.4	-205.7
Riparian	4,457	3,184	38.9	18.3	110.4	89.8
Scrub	59,427	46,448	68.2	261.9	140.8	334.5
Water	2,696	1,152	0.9	0.0	1.0	0.1
Wet Meadows/Marsh	2,235	2,001	5.0	0.0	5.0	0.0
Woodland	13,995	10,367	36.3	316.1	17.8	297.6
Totals	209,340	158,726	550.4	1,232.5	357.4	1,039.5

¹ Targets were calculated using the following formula: (direct effects * 2) + (indirect effects * 0.5).

The following analysis evaluates how the natural communities-level goals and objectives have been accomplished through implementation of the Plan conservation strategy and result in conservation actions in areas important for regional conservation purposes.

Natural Community Goal 1: Protect, manage, and enhance natural communities to promote native biodiversity.

Natural Community Objective 1.1 (Chaparral): OCTA will acquire and/or restore chaparral habitat to promote conservation of native biodiversity and connectivity that benefit Covered Species of this natural community.

Conservation Analysis: OCTA acquired seven Preserves that include a total of 562.0 acres of chaparral habitat. Each of the Preserves includes chaparral habitat. A majority of the Aliso Canyon (84%), Hafen (66%), MacPherson (72%) and O'Neill Oaks (71%) Preserves are covered with chaparral habitat. In addition, the Agua Chinon/Bee Flat Canyon restoration project includes 4.0 acres of chaparral habitat restoration and/or enhancement. Most of these Preserves and restoration project are located within a 40-mile stretch of nearly continuous wildlife habitat within Orange County that spans from MCB Camp Pendleton in the south to Chino Hills State Park in the north and therefore protect and enhance habitat connectivity of this natural community. The conservation and restoration of chaparral habitat will benefit the chaparral natural community and native biodiversity as well as the following Covered Species: intermediate mariposa lily, many-stemmed dudleya, coast horned lizard, orangethroat whiptail, bobcat, and mountain lion.

This objective will be considered achieved when OCTA records conservation easements for the seven Preserves and when the Agua Chinon/Bee Flat Canyon restoration project has met its success criteria.

This objective supports CDFW's NCCPA Findings Section 2820a, findings 4A, 4B, 4C, and 4E.

Natural Community Objective 1.2 (Grassland): OCTA will acquire and/or restore grassland habitat to promote native biodiversity and connectivity that benefit Covered Species of this natural community.

Conservation Analysis: Of the seven Preserves, Ferber Ranch and Hayashi Preserves support the largest patches of grassland habitat. These two Preserves support a combined total of 69.7 acres of grassland. Native grassland has been mapped on both Preserves with large patches of high quality native grassland habitat (totaling 17.1 acres) occurring on the Ferber Ranch property. OCTA will ensure that appropriate management actions (e.g., additional weed abatement, access control) are implemented for this vegetation community and included in the Ferber Ranch and Hayashi RMPs. Implementation of these actions will help protect and enhance the native grassland patches in both Preserves. In addition, OCTA has approved funding for four restoration projects—Harriet Weider Regional Park, West Loma, Fairview Park, and Agua Chinon/Bee Flat Canyon—that include restoration of grassland habitats totaling 78.4 acres.

Ferber Ranch, Hayashi, and the restoration projects are located within core habitat areas and adjacent to or within largely intact block of protected lands and therefore further protect and enhance habitat connectivity of this natural community. The conservation and restoration of additional grassland habitat in the Plan Area will enhance native biodiversity and benefit the species that rely on this natural community for live-in and dispersal habitat, including the following Covered Species: intermediate mariposa lily, many-stemmed dudleya, southern tarplant, coast horned lizard, orangethroat whiptail, and bobcat.

This objective will be considered achieved when OCTA records conservation easements for the Ferber Ranch and Hayashi Preserves and when the Harriet Weider Regional Park, West Loma, Fairview Park, and Agua Chinon/Bee Flat Canyon restoration projects have met their specific success criteria.

This objective supports CDFW's NCCPA Findings Section 2820a, findings 4A, 4B, 4C, and 4E.

Natural Community Objective 1.3 (Riparian): OCTA will acquire and/or restore riparian habitat in multiple locations across the Plan Area. These actions will enhance and expand riparian communities in key locations for wildlife movement, provide potentially suitable live-in and dispersal habitat for some of the Covered Species, and promote native biodiversity and connectivity to benefit many of the Covered Species.

Conservation Analysis: OCTA has acquired four Preserves—Ferber Ranch, Hafen, Hayashi, and MacPherson—that have a total of 18.3 acres of riparian habitat. On the Hayashi Preserve, OCTA has undertaken steps to remove grazing (using fencing) to allow the riparian habitat to passively recover and expand. In addition, 9 of the 11 restoration

projects OCTA has approved for funding to date include riparian habitat restoration that totals 110.4 acres. These include Aliso Creek, Chino Hills State Park, Harriett Weider Regional Park, Lower Silverado Canyon, West Loma, City Parcel, Fairview Park, Agua Chinon/Bee Flat Canyon, and Big Bend. These riparian restoration projects occur within areas important for regional conservation, including large-sized restoration projects along Aliso Creek and Lower Silverado Canyon. These Preserves and restoration projects occur within core habitat areas and linkage areas, and adjacent/within currently protected lands. Therefore, they protect and enhance the habitat connectivity of this natural community. Conservation of riparian habitat will potentially benefit Covered Species that rely on healthy streambed ecosystems (arroyo chub, western pond turtle), riparian nesting birds (least Bell's vireo, southwestern willow flycatcher), and mammals using riparian habitat for movement cover (bobcat, mountain lion).

This objective will be considered achieved when OCTA records conservation easements for the Ferber Ranch, Hafen, Hayashi, and MacPherson Preserves and when the Aliso Creek, Chino Hills State Park, Harriett Weider Regional Park, Lower Silverado Canyon, West Loma, City Parcel, Fairview Park, Agua Chinon/Bee Flat Canyon, and Big Bend restoration projects have met their specific success criteria.

This objective supports CDFW's NCCPA Findings Section 2820a, findings 4A, 4B, 4C, and 4E.

Natural Community Objective 1.4 (Scrub): OCTA will acquire and/or restore scrub habitat. These actions will enhance and expand scrub habitat in key locations for wildlife movement, provide suitable nesting habitat for Covered Species, and promote native biodiversity and connectivity that benefit Covered Species of this natural community.

Conservation Analysis: OCTA has acquired six Preserves—Aliso Canyon, Ferber Ranch, Hafen, MacPherson, O'Neill Oaks, and Saddle Creek South—that have a total of 261.9 acres of scrub habitat. These Preserves support nesting populations of coastal California gnatcatcher and cactus wren and add to the protection of an important block of scrub habitat between the Southern Orange HCP and Central-Coastal NCCP/HCP Reserves. In addition, OCTA has approved funding for two restoration projects—UC Irvine Ecological Reserve and Chino Hills State Park—that include 14.4 acres of cactus scrub habitat in locations known to support cactus wren and eight restoration projects that included coastal sage scrub restoration. These projects include Harriett Weider Regional Park, Lower Silverado Canyon, North Coal Canyon, West Loma, City Parcel, Fairview Park, Agua Chinon/Bee Flat Canyon, and Big Bend. Together they include 126.3 acres of coastal sage scrub habitat that will enhance and expand habitat for the coastal California gnatcatcher. This amounts to a total of 402.6 acres of scrub habitat that has been acquired and/or will be restored. These Preserves and restoration projects occur within core habitat areas and linkage areas, and are adjacent to or within currently protected lands, and they, therefore, protect and enhance habitat connectivity of this natural community. The conservation and restoration of scrub habitat will benefit the scrub natural community and native biodiversity as well as the following Covered Species: intermediate mariposa lily, many-stemmed dudleya, coast horned lizard, orangethroat whiptail, cactus wren, California gnatcatcher, bobcat, and mountain lion.

This objective will be considered achieved when OCTA records conservation easements for these six Preserves and when these nine restoration projects have met their specific success criteria.

This objective supports CDFW's NCCPA Findings Section 2820a, findings 4A, 4B, 4C, and 4E.

Natural Community Objective 1.5 (Woodland): OCTA will acquire and/or restore woodland habitat. These actions will enhance and expand woodland habitat for foraging and cover by Covered Species, and will promote native biodiversity and connectivity that benefit Covered Species of this natural community.

Conservation Analysis: OCTA has acquired six Preserves that include a total of 316.1 acres of woodland habitat. A majority of the Hayashi Preserve (64%) is covered with woodland habitat, including 11.6 acres of coast live oak woodland and 174.4 acres of California walnut woodland. The California walnut woodland is a habitat type considered of special concern by the state and noted as under-protected in the Orange County Conservation Assessment (CBI 2009). In addition, the Agua Chinon/Bee Flat Canyon restoration project includes 17.8 acres of woodland habitat restoration and/or enhancement. These Preserves and restoration projects are located within a 40-mile stretch of nearly continuous wildlife habitat within Orange County that spans from MCB Camp Pendleton in the south to Chino Hills State Park in the north, and they, therefore, protect and enhance habitat connectivity of this natural community. The conservation and restoration of woodland habitat will benefit the woodland natural community and native biodiversity as well as the following Covered Species: coast horned lizard and orangethroat whiptail. A wide range of species use woodlands for reproduction, foraging, shelter, and dispersal, including bobcat and mountain lion. Bats also have the potential to use tree cavities and bark crevices in woodland habitat for night roosting.

This objective will be considered achieved when OCTA records conservation easements for these six Preserves and when the Agua Chinon/Bee Flat Canyon restoration project has met its success criteria.

This objective supports CDFW's NCCPA Findings Section 2820a, findings 4A, 4B, 4C, and 4E.

Natural Community Goal 2: Maintain and enhance riparian and wetland function and values to benefit Covered Species and promote native biodiversity.

Natural Community Objective 2.1: OCTA will acquire, restore, and/or enhance areas with aquatic resources (per CDFW jurisdiction). These conservation actions will protect riparian and wetlands functions and values by improving the condition and integrity of the physical streambed, aquatic and riparian habitat, and hydrology.

Conservation Analysis: For all of the Preserves that OCTA has acquired, jurisdictional delineations have been completed to identify and map the extent of aquatic resources within the Preserves. In addition, jurisdictional delineations have been completed for six of the OCTA restoration projects containing waters of the United States. A total of 88.4 acres of aquatic resources (per CDFW jurisdiction) occurs within the Preserves and approximately 101.5 acres of aquatic resources will be restored, enhanced, and/or rehabilitated through the restoration projects. The conservation actions protect and

enhance riparian and wetland functions and values to a degree sufficient to mitigate any unavoidable impacts on aquatic resources resulting from Covered Activities (see Natural Community Objective 2.2).

This objective will be considered achieved when OCTA records conservation easements for all seven Preserves, and when the nine restoration projects with an aquatic resource restoration component have met their specific success criteria.

This objective supports CDFW's NCCPA Findings Section 2820a, finding 4A.

Natural Community Objective 2.2: OCTA will set forth policies and procedures to ensure Covered Activities result in no net loss of wetland habitat value and acreage in the Plan Area.

Conservation Analysis: The Plan sets forth the Streambed Program (Section 5.7 and Appendix E) designed to protect and compensate for unavoidable impacts on streambed areas and riparian/wetland habitats under jurisdiction of CDFW. Table E-2 in Appendix E shows that impacts will be mitigated using mitigation ratios depending on the type and quality of resources affected. OCTA will track impacts and mitigation of aquatic resources by habitat type and acreage using a Mitigation Ledger and provide a summary in an annual report.

The establishment and implementation of the policies and procedures in the Streambed Program will achieve this objective.

This objective supports CDFW's NCCPA Findings Section 2820a, finding 3.

6.4 Species-Level Conservation Analysis

6.4.1 Intermediate Mariposa Lily

Calochortus weedii var. *intermedius*

Legal Status:	Federal:	None
	State:	None
	Forest Service:	Sensitive Species

CNDDDB Rank (2010): T2 /S2.2

CNPS List (2013): 1B.2

Recovery Plan: n/a



Background: Intermediate mariposa lily is a perennial in the Liliaceae family that occurs on dry, rocky, open slopes in coastal sage scrub, chaparral, and grassland communities between 105 and 855 meters (350 to 2,800 feet). It blooms from May to July. This California endemic is threatened by development, road construction, fuel modification, frequent fires, competition from nonnative plants, and collecting by horticulturalists (CNPS 2013). See Appendix C.2, “Covered Species Accounts,” for more information on species life history, habitat requirements, distribution, core areas, habitat linkages, and trends.

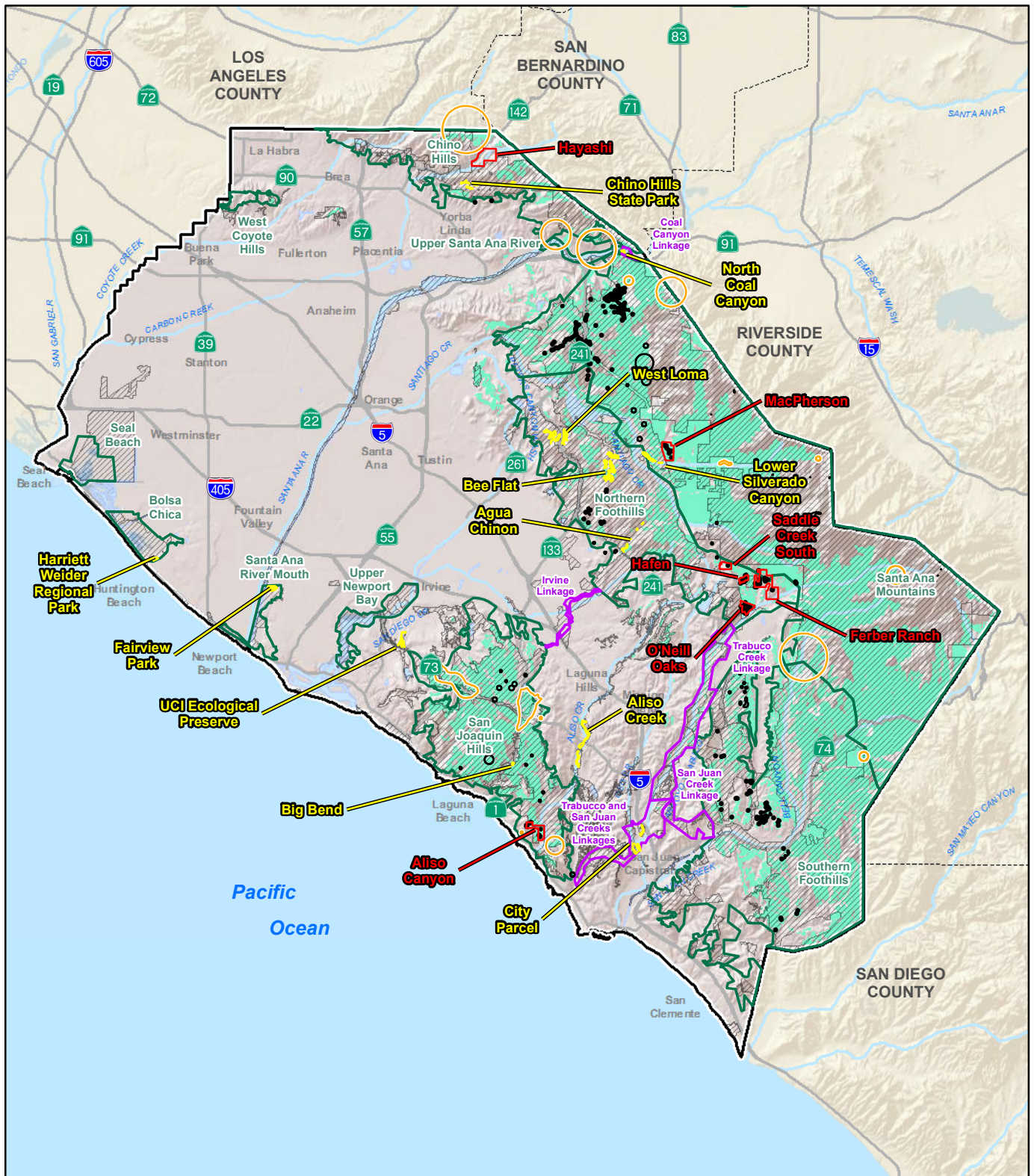
There is a total of 55,623 acres of predicted suitable habitat for intermediate mariposa lily in the Plan Area. Over 84% of the predicted habitat is currently protected (see Table 6-4 and Figure 6-8). Blocks of unprotected intermediate mariposa lily suitable habitat occur in the Santa Ana Mountains, Northern Foothills, Southern Foothills, San Joaquin Hills, and Chino Hills core habitat areas.

Species Goal 1: Provide conservation of **intermediate mariposa lily** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.

Species Objective 1.1: OCTA will acquire Preserves with occurrences of intermediate mariposa lily. OCTA will ensure that appropriate management and monitoring actions are incorporated into the RMPs for each Preserve to support sustainable populations of intermediate mariposa lily.

Conservation Analysis: OCTA completed baseline biological surveys for the seven Preserves and during these surveys, intermediate mariposa lily was detected at six of the seven Preserves—Aliso Canyon, Ferber Ranch, Hafen, MacPherson, O’Neill Oaks, and Saddle Creek South—with a total of 93 identified locations and total population of 597 plants. OCTA will include appropriate management actions to protect and enhance these locations and any future locations found in the Preserves as part of the Preserve RMPs, such as adjustments to vegetation management actions to avoid known occurrences, access control and limiting trail use in areas adjacent of known occurrences, and evaluation of the potential for translocation and replanting if appropriate.

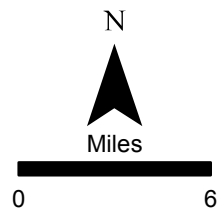
The Plan will indirectly benefit existing conservation lands that support the majority of intermediate mariposa lily populations in the Plan Area by expanding the habitat protection in the Northern Foothills, Santa Ana Mountains, and Chino Hills core habitat



- Legend**
- Currently Protected Lands
 - OCTA Acquired Preserves
 - OCTA Funded Restoration Projects
 - Core Habitat Areas
 - Linkage
 - Predicted Habitat

- Species Occurrences**
- Current Occurrence (1990 or later)
 - Historic Occurrence (before 1990)

Sources:
 Species Occurrences Sources: Bonterra 2012, CNDDb 2013, USFWS 2013, USFS 2013, Bonterra-Psomas/OCTA/CDFW 2015
 Protected Lands: CBI 20009, ICF/TAIC/OCTA 2015
 Species Model: ICF/TAIC 2013
 Core and Linkage Areas: CBI 2009



**Intermediate Mariposa Lily
 Predicted Habitat and Species Occurrences with Protected Lands**

Figure 6-8

Table 6-4. Conservation Analysis Summary: Intermediate Mariposa Lily

	Predicted Species Habitat Model (acres)	Current Known Occurrences (occurrences/individuals)	Critical Habitat (acres)
Total in Plan Area	55,623	329/23,966	n/a
Currently Protected in Plan Area	47,065	189/18,035	n/a
Percentage Protected in Plan Area	84.6%	57.4%/75.3%	n/a
Estimated Effects from Covered Activities:			
Freeway Improvement Project Direct Effects ¹	3.9	0	--
Freeway Improvement Project Indirect Effects	28.1	0	--
Preserve Management Direct Effects	3.3	--	--
Targets²	28.5	--	n/a
Conservation (to date):			
Preserve Acquisitions	315.7	93/597	--
Restoration Projects	0.0	0	--
Total Conservation:	315.7	93/597	--
Conservation Above or Below Target	287.2	--	n/a
Protected in Plan Area After OCTA Acquisitions	47,381	282/18,632	n/a
Percentage Protected After OCTA Acquisitions	85.2%	85.7%/77.7%	n/a

¹ Estimated direct effects are based on a “planning-level” footprint and adjusted to account for low precision and accuracy of regional vegetation data. Actual effects will most likely be less through the implementation of avoidance and minimization measures.

² Targets were calculated using the following formula: (direct effects * 2) + (indirect effects * 0.5). Targets include a conservative estimate of the amount of conservation required to offset the direct and indirect effects from Covered Activities.

Relevant Avoidance and Minimization Measures: The following checked measures are relevant to the protection, avoidance, and minimization of direct and indirect effects on this species:

<input checked="" type="checkbox"/>	Avoidance and Minimization of Sensitive Biological Areas	<input type="checkbox"/>	Wetland and Riparian Streambed Protection Program
<input type="checkbox"/>	Aquatic Resources and Species Policy	<input type="checkbox"/>	Nesting Birds Policy
<input checked="" type="checkbox"/>	Covered Plant Species Policy	<input checked="" type="checkbox"/>	Wildfire Protection Techniques
<input type="checkbox"/>	Wildlife Crossing Policy	<input type="checkbox"/>	Stormwater and Water Quality BMPs

conservation areas (see Figure 6-8 and Appendix C.7 for locations of intermediate mariposa lily on IRC managed lands). There are 102 occurrences of intermediate mariposa lily recorded within 5 miles of the Trabuco Canyon Preserves. The Plan will benefit the intermediate mariposa lily by protecting habitat connectivity, supporting populations of pollinators, providing opportunities for dispersal of pollinators and seeds, and maintaining genetic exchange between populations.

This objective will be considered achieved when OCTA records conservation easements for six Preserves and implements species monitoring and management according to the RMPs for these Preserves.

Species Objective 1.2: OCTA will establish policies and procedures that require OCTA to identify, track, mitigate, and report annually any unavoidable impacts on intermediate mariposa lily.

Conservation Analysis: There are no known occurrences of intermediate mariposa lily in the area of direct or indirect effects for covered freeway improvement projects; however, project-specific surveys have the potential to detect this species within the Permit Area. The Plan includes the Covered Plant Species Policy (see 5.6.2.2), which sets forth policies and procedures for OCTA to evaluate impacts based on project-specific field surveys and to mitigate the impacts (at a 3:1 ratio) using credits results from the Plan conservation actions. Credits are determined through field surveys of Preserves and/or restoration actions to enhance, restore, and create populations of covered plant species as part of restoration projects approved for funding by OCTA. OCTA will maintain a ledger-type accounting system to track credits and debits related to covered plant species and report status as part of the Plan's annual report.

This objective will be considered achieved when OCTA signs the Implementing Agreement and adopts and implements the Plan, including the implementation of the Covered Plant Species Policy.

Rationale for Coverage:

The conservation actions and avoidance and minimization measures of the Plan are expected to achieve the biological goals and objectives for this species by conserving and managing known locations within the OCTA acquired Preserves, tracking and mitigating impacts through implementation of the Covered Plant Species Policy, and monitoring and managing the species. Implementation of the conservation actions will exceed the Plan target of 28.5 acres by 287.2 acres.

There are no documented occurrences of intermediate mariposa lily within the direct or indirect effects footprints for the covered freeway improvement projects. However, there is the potential for intermediate mariposa lily to occur within the Permit Area. As part of the Covered Plant Species Policy, OCTA will ensure project-specific surveys will be conducted prior to construction of covered freeway improvement projects. There are only 3.9 acres of predicted suitable habitat for intermediate mariposa lily estimated to be directly affected by the covered freeway improvement projects; however, 28.1 acres of intermediate mariposa lily predicted habitat is within 300 feet of these projects, which could be indirectly affected by an incremental increase in factors such as increased nitrogen deposition, dust, and other pollutants. In addition, up to 3.3 acres of intermediate mariposa lily habitat could be impacted by Preserve management activities. There are a total of 55,623 acres of predicted suitable habitat and at least 23,966 individuals within the Plan Area. Therefore, if intermediate mariposa lily occurs within the potential impact area, it is likely that the individuals would represent a small fraction of the total Plan Area population. Furthermore, the predicted suitable habitat in the area of direct impact for covered freeway improvement projects is adjacent to major freeways and not high quality.

The conservation of 315.7 acres of intermediate mariposa lily predicted suitable habitat is within areas of high quality habitat, including at least 597 intermediate mariposa lilies within the six of the seven Preserves. Each of these Preserves has been documented as having healthy populations of intermediate mariposa lily. Protection of these populations will help maintain populations in perpetuity and will maintain landscape-level connectivity with adjacent lands of protected open space. The biological benefits to intermediate mariposa lily from the conservation and management

of these Preserves will be substantially greater than the loss of up to 7.2 acres of intermediate mariposa lily predicted habitat and indirect effects on 28.1 acres of predicted habitat.

In summary, the conservation actions under the Plan will provide for the conservation and management of intermediate mariposa lily and will ensure that the impacts from Covered Activities are minimized and mitigated to the maximum extent practicable. As such, the Plan has been developed to meet the requirements of NCCPA sections 2820(a) and 2821, and ESA section 10(a) for the issuance of permits for intermediate mariposa lily.

6.4.2 Many-stemmed Dudleya

Dudleya multicaulis

Legal Status:	Federal:	None
	State:	None
	Forest Service:	Sensitive Species

CNDDDB Rank (2010):	G2/S2
CNPS List (2013):	1B.2
Recovery Plan:	n/a



Background: Many-stemmed dudleya is a perennial, deciduous succulent in the Crassulaceae family that is endemic to southern California. This plant is capable of self-fertilization and remains dormant as an underground corm in the dry months (June–November). Habitat includes areas within open chaparral, coastal sage scrub, and valley and foothill grasslands, often on heavy, clay soils from 15 to 790 meters (2,592 feet) (CNPS 2013). Dudleyas have the ability to tolerate long periods of drought, and population size varies considerably from year to year both in number of seedlings produced and number of mature plants leafing out. Many-stemmed dudleya blooms from April through July. See Appendix C.2, “Covered Species Accounts,” for more information on species life history, habitat requirements, distribution, core areas, habitat linkages, and trends.

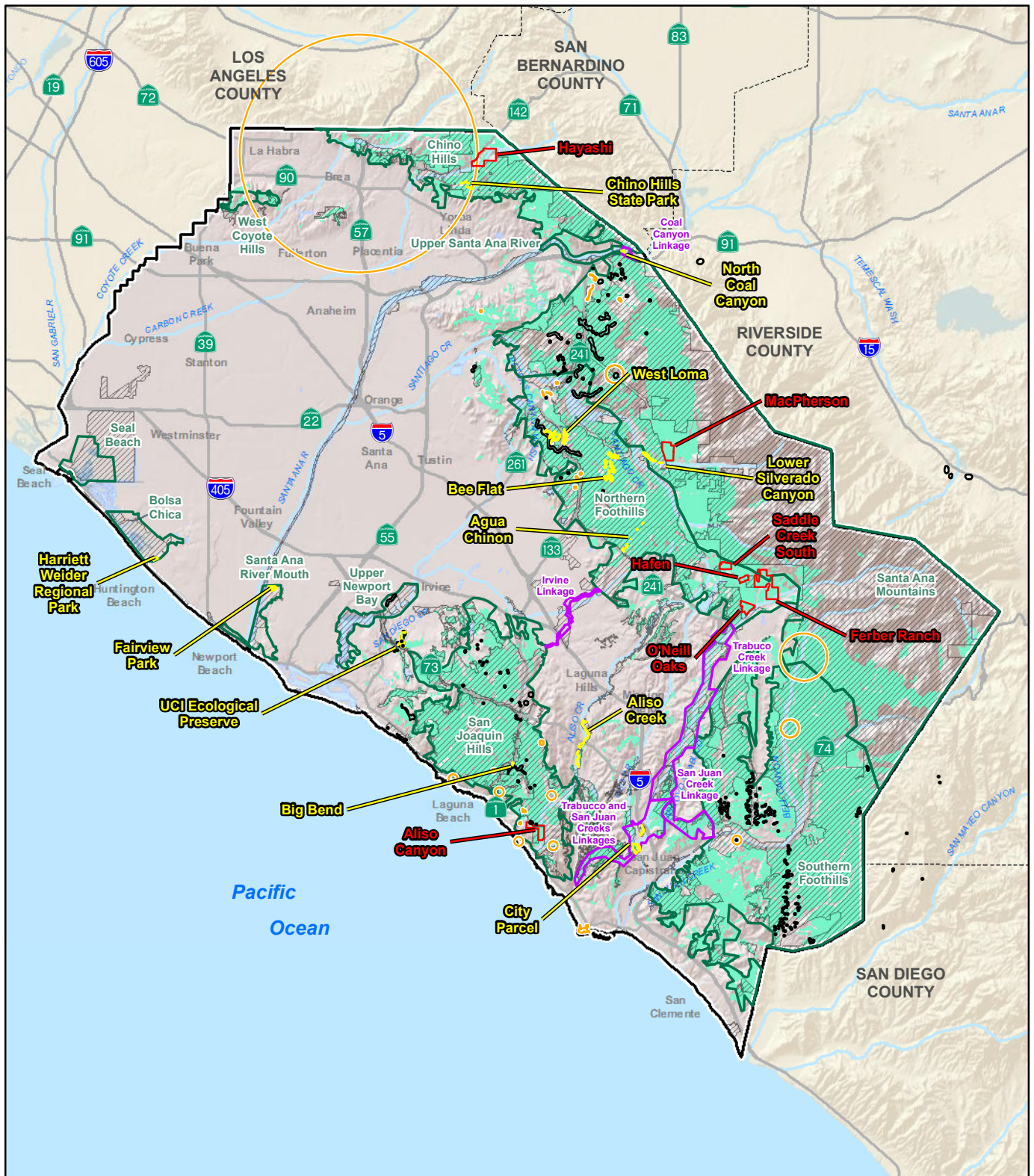
There is a total of 91,237 acres of predicted suitable habitat for many-stemmed dudleya in the Plan Area. Over 74% of the predicted habitat is currently protected (see Table 6-5 and Figure 6-9). Areas of unprotected many-stemmed dudleya suitable habitat occur across the Plan Area including within the Santa Ana Mountains, Upper Santa Ana River, Northern Foothills, Southern Foothills, San Joaquin Hills, Chino Hills, West Coyote Hills, and Upper Newport Bay core habitat areas.

Species Goal 2: Protect and enhance sustainable populations of **many-stemmed dudleya** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.




Species Objective 2.1: OCTA will acquire a Preserve and/or implement a restoration project resulting in the protection, enhancement, and/or creation of a major population (i.e., 500 individuals) of many-stemmed dudleya.



Conservation Analysis: To ensure that the Plan provides conservation and management for many-stemmed dudleya, OCTA will protect, enhance, and/or establish a major population (i.e., 500 individuals) of many-stemmed dudleya. This threshold can be accomplished through the protection, enhancement, and/or establishment of many-stemmed dudleya populations at multiple locations or at a single location.




During baseline biological surveys of the Aliso Canyon Preserve, four occurrences with a total of 60 individuals were detected (Psomas 2015). All of these occurrences are in disturbed mixed sage scrub immediately adjacent to an existing trail used by hikers and mountain bikers. OCTA will implement appropriate management actions to protect and enhance these occupied areas of the Preserve and for any future locations found in the other Preserves. Management activities, such as fencing, weed control, and erosion BMPs



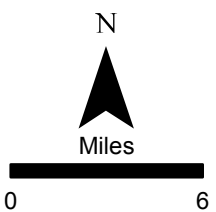
Legend

-  Currently Protected Lands
-  OCTA Acquired Preserves
-  OCTA Funded Restoration Projects

-  Core Habitat Areas
-  Linkage

-  Predicted Habitat
- Species Occurrences**
-  Current Occurrence (1990 or later)
-  Historic Occurrence (before 1990)

Sources:
 Species Occurrences Sources: Bonterra 2012, CNDBB 2013, USFWS 2013, USFS 2013, Bonterra-Psomas/OCTA/CDFW 2015
 Protected Lands: CBI 2009, ICF/TAIC/OCTA 2015
 Species Model: ICF/TAIC 2013
 Core and Linkage Areas: CBI 2009



**Many-Stemmed Dudleya
 Predicted Habitat and Species Occurrences with Protected Lands**

Figure 6-9

Table 6-5. Conservation Analysis Summary: Many-stemmed Dudleya

	Predicted Species Habitat Model (acres)	Current Known Occurrences (occurrences/individuals)	Critical Habitat (acres)
Total in Plan Area	91,237	225/58,948	n/a
Currently Protected in Plan Area	67,788	189/44,097	n/a
Percentage Protected in Plan Area	74.3%	84.0%/74.8%	n/a
Estimated Effects from Covered Activities:			
Freeway Improvement Project Direct Effects ¹	11.1	0	--
Freeway Improvement Project Indirect Effects	83.7	0	--
Preserve Management Direct Effects	8.2	--	--
Targets²	80.5	--	n/a
Conservation (to date):			
Preserve Acquisitions	776.9	4/60	--
Restoration Projects	0.0	2/2	--
Total Conservation:	776.9	6/62	--
Conservation Above or Below Target	696.4		n/a
Protected in Plan Area After OCTA Acquisitions	68,565	193/44,157	--
Percentage Protected After OCTA Acquisitions	75.2%	85.8%/74.9%	--

¹ Estimated direct effects are based on a “planning-level” footprint and adjusted to account for low precision and accuracy of regional vegetation data. Actual effects will most likely be less through the implementation of avoidance and minimization measures.

² Targets were calculated using the following formula: (direct effects * 2) + (indirect effects * 0.5). Targets include a conservative estimate of the amount of conservation required to offset the direct and indirect effects from Covered Activities.

Relevant Avoidance and Minimization Measures: The following checked measures are relevant to the protection, avoidance, and minimization of direct and indirect effects on this species:

<input checked="" type="checkbox"/> Avoidance and Minimization of Sensitive Biological Areas	<input type="checkbox"/> Wetland and Riparian Streambed Protection Program
<input type="checkbox"/> Aquatic Resources and Species Policy	<input type="checkbox"/> Nesting Birds Policy
<input checked="" type="checkbox"/> Covered Plant Species Policy	<input checked="" type="checkbox"/> Wildfire Protection Techniques
<input type="checkbox"/> Wildlife Crossing Policy	<input type="checkbox"/> Stormwater and Water Quality BMPs

along the trail are examples of actions that may be included in the Aliso Canyon Preserve RMP. Similar management actions will be included in the other RMPs if many-stemmed dudleya is detected on other Preserves based on site-specific criteria. If public access is documented as degrading many-stemmed dudleya or its habitat, then access also may be re-routed to avoid occupied areas. To facilitate further establishment of this species, the Aliso Canyon RMP will include a conservation measure to evaluate the potential translocation of some individuals, if appropriate, to more protected areas in the Preserve. As noted in the baseline survey technical report (see Appendix C.6), the Aliso Canyon Preserve supports suitable habitat (e.g., heavy clay soils) in areas without authorized

public access; however, these areas are currently degraded and would require active restoration.

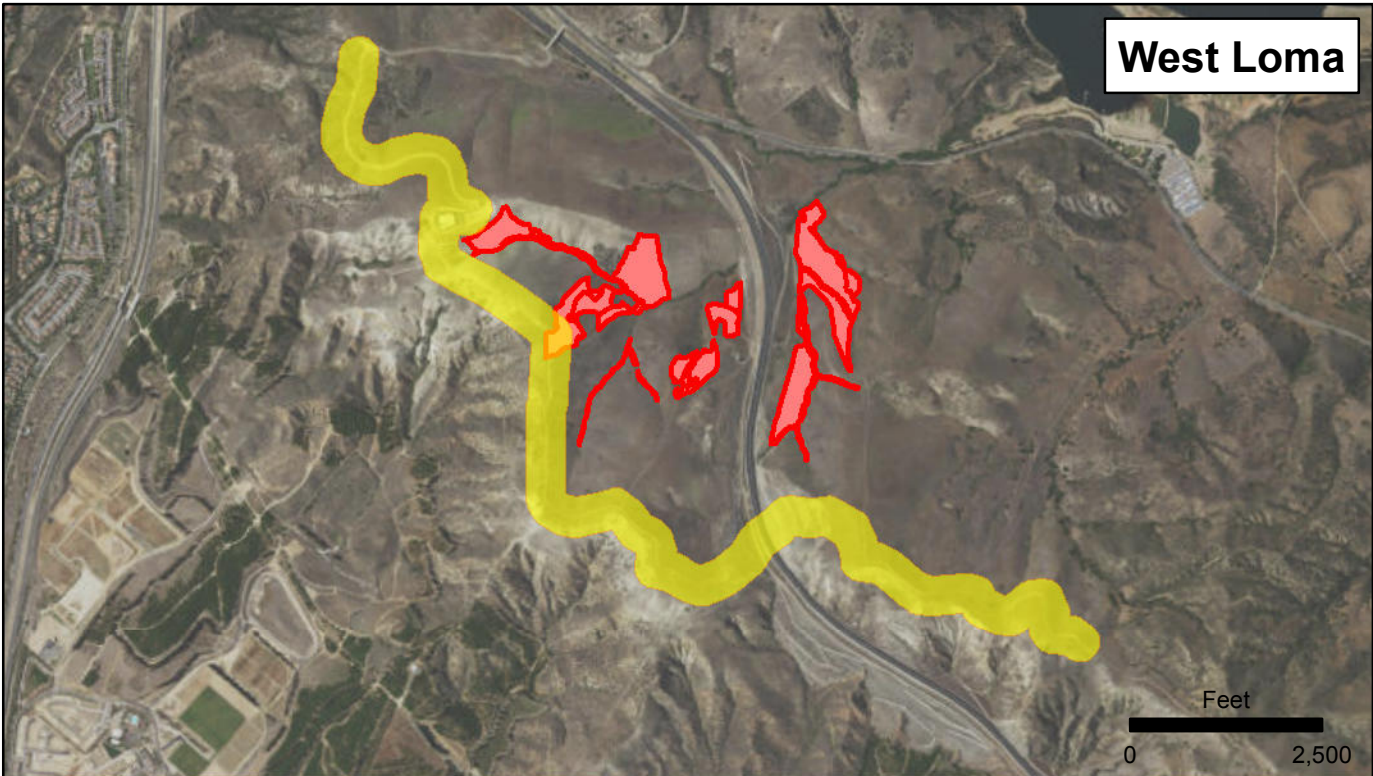
Ongoing Preserve management may improve habitat suitability (e.g., reduction of invasive species) that results in the expansion of the existing population on Aliso Canyon Preserve and/or establishment/detection of new populations on the other OCTA Preserves. Also, future non-drought conditions may result in the detection of new occurrences at Aliso Canyon. If a minimum of 500 individuals are eventually identified on the Preserves or within the approved restoration projects (see Species Objective 2.2) within 10 years from Plan adoption, then this objective will be considered complete. If this objective cannot be met within the first 10 years as described, OCTA will select and oversee implementation of a restoration project designed to establish or expand a population of many-stemmed dudleya. This restoration project will be within an area of protected open space and will result in an increase of a current population or establishment of a new population such that a minimum of 500 individuals is achieved to receive coverage under the Plan. If the restoration project is able to result in the increase and/or establishment of more than 500 individuals, the count above 500 will be available to OCTA to use as mitigation credits under the Covered Plant Species Policy. The restoration project will preferably occur where historic or current occurrences of many-stemmed dudleya have been documented. Generally, it is recommended that restoration efforts for this species be accomplished by active site preparation (to control nonnative, invasive plants), sowing seeds rather than transplanting plants, and installation of herbivory exclusion devices. The design of the restoration project will take into consideration factors influencing the long-term viability of a many-stemmed dudleya population, including methods and ability for long-term weed control. Other restoration projects specifically designed to enhance and establish populations of many-stemmed dudleya have been successfully implemented in the Plan Area in the upper Newport Bay and in the Big Canyon areas (Dodero pers. comm.).

This objective will be considered achieved when a major population (i.e., 500 individuals) of many-stemmed dudleya individuals are managed and monitored in-perpetuity on the OCTA Preserves or have been established on conserved lands through an OCTA-funded restoration project(s). This includes both currently and future funded restoration projects.

Species Objective 2.2: OCTA will implement restoration projects where there are known occurrences of many-stemmed dudleya in the project vicinity. The restoration actions will improve and enhance potentially suitable habitat for many-stemmed dudleya.

Conservation Analysis: OCTA has approved funding for two restoration projects, West Loma and Big Bend, in which occurrences of many-stemmed dudleya have been documented within the CNDDDB as overlapping or within 50 feet of these projects (Figure 6-10). The restoration actions are anticipated to improve the potential for many-stemmed dudleya to become established in these areas.

This objective will be considered achieved when the West Loma and Big Bend restoration projects met their specific success criteria.



- Legend**
- Restoration Property
 - Many-Stemmed Dudleya

Sources:
 Restoration Properties: OCTA 2015
 Species: CNDDB 2013, USFWS 2013, USFS 2013



**Many-Stemmed Dudleya Occurrences in Vicinity of
 Big Bend and West Loma Restoration Projects**

Figure 6-10

Species Objective 2.3: OCTA will establish policies and procedures that require OCTA to identify, track, mitigate, and report annually any unavoidable impacts on many-stemmed dudleya.

Conservation Analysis: There are no known occurrences of many-stemmed dudleya in the area of direct or indirect effects for covered freeway improvement projects; however, project-specific surveys have the potential to detect this species within the Permit Area. The Plan includes the Covered Plant Species Policy (see Section 5.6.2.2), which sets forth policies and procedures requiring OCTA to evaluate impacts based on project-specific field surveys of the freeway improvement projects and to mitigate any impacts (at a 3:1 ratio) using credits determined through field surveys of Preserves and actions taken to enhance, restore, and create populations of covered plant species as part of restoration projects approved for funding by OCTA. OCTA will maintain a ledger-type accounting system to track credits and debits related to covered plant species and report status as part of the Plan's annual report.

This objective will be considered achieved when OCTA signs the Implementing Agreement and adopts and implements the Plan, including the implementation of the Covered Plant Species Policy.

Rationale for Coverage:

The conservation actions and avoidance and minimization measures of the Plan are expected to achieve the biological goals and objectives for this species by restoring and enhancing habitat, establishing or expanding populations within protected open space, tracking and mitigating impacts, implementing the Covered Plant Species Policy, and monitoring and managing the species. Implementation of the conservation actions will exceed the Plan target of 80.5 acres by 696.4 acres.

There are no documented occurrences of many-stemmed dudleya in the direct or indirect effects footprints for the covered freeway improvement projects. However, there is the potential for many-stemmed dudleya to occur within the Permit Area. As part of the Covered Plant Species Policy, OCTA will ensure project-specific surveys will be conducted prior to construction of freeway improvement projects. There are only 11.1 acres of predicted suitable habitat for many-stemmed dudleya estimated to be directly affected by the freeway improvement projects and 83.7 acres of many-stemmed dudleya habitat within 300 feet of these projects that could be indirectly affected by an incremental increase in factors such as increased nitrogen deposition, dust, and other pollutants. In addition, up to 8.2 acres of many-stemmed dudleya predicted suitable habitat could be impacted by Preserve management activities. There are a total of 91,237 acres of predicted suitable habitat within the Plan Area and at least 59,225 individuals. Therefore, if this species occurs within the potential impact area, it is likely that the individuals would represent a small fraction of the total population within the Plan Area. The predicted suitable habitat in the area of direct impact for covered freeway improvement projects is adjacent to major freeways and not high quality, while the habitat that will be enhanced and restored is expected to be of much higher quality and well-connected to adjacent large blocks of protected habitat.

All seven preserves include a combined 776.9 acres of predicted suitable habitat for many-stemmed dudleya. Based on recent baseline surveys, four occurrences with approximately 60 individuals were identified on the Aliso Canyon Preserve. The RMP for this Preserve will include species-specific management directives including habitat protection and enhancement to benefit this species. The

Aliso Canyon Preserve is adjacent to the Aliso and Woods Canyon Wilderness Park, which is also occupied by many-stemmed dudleya. Protection of the Aliso Canyon Reserve and in-perpetuity management of occupied habitat contributes to/enhances landscape connectivity for this species within the Central-Coastal NCCP/HCP Coastal Reserve. In addition, the conservation of 394.0 acres of predicted suitable habitat for many-stemmed dudleya occurring within the four Preserves in the Trabuco Canyon area will help maintain potential landscape-level connectivity between the many-stemmed dudleya populations in the Central-Coastal NCCP/HCP Central Reserve to the north and in the Orange County Southern Subregion HCP Reserve to the south (Figure 6-9 and Appendix C.7). The biological benefits to many-stemmed dudleya from the conservation and management of these Preserves will be substantially greater than the potential direct loss of up to 19.3 acres of many-stemmed dudleya habitat and indirect effects on 83.7 acres of habitat.

In summary, the conservation actions under the Plan will provide for the conservation and management of many-stemmed dudleya and will ensure that the impacts from Covered Activities are minimized and mitigated to the maximum extent practicable. As such, the Plan has been developed to meet the requirements under NCCPA sections 2820(a) and 2821, and ESA section 10(a) for the issuance of permits for many-stemmed dudleya.

6.4.3 Southern Tarplant

Centromadia parryi ssp. *australis*

Legal Status:	Federal:	None
	State:	None
	Forest Service:	None
	CNDDDB Rank (2010):	G4T2/S2.1
	CNPS List (2013):	1B.1
	Recovery Plan:	n/a



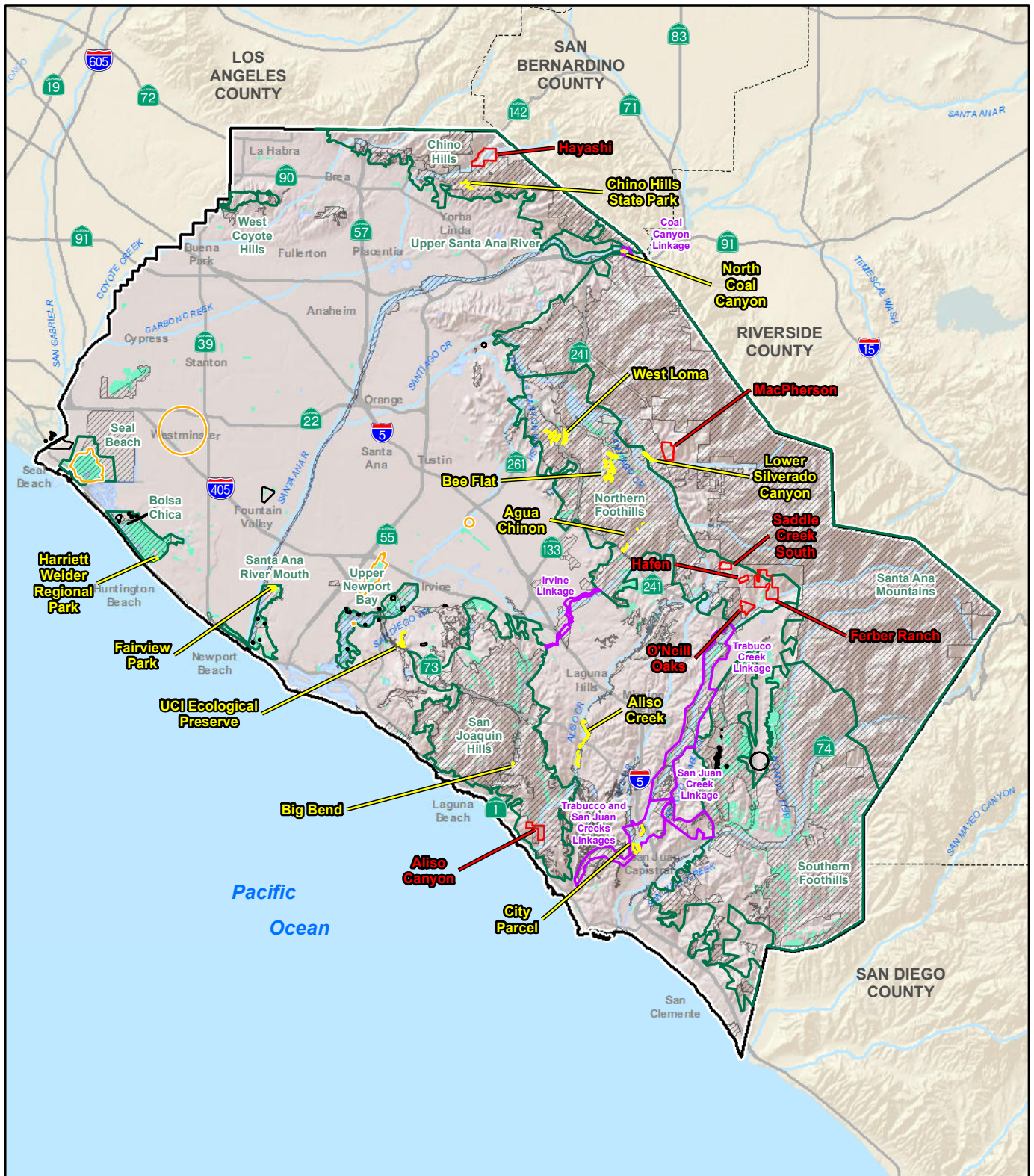
Background: Southern tarplant (previously under the scientific name of *Hemizonia parryi* ssp. *australis*) is an annual herb in the Asteraceae family that is known from both California and Baja California. Southern tarplant is known to occur at the margins of marshes and swamps, in vernal mesic (saline) valley and foothills grasslands, and vernal pools below 425 meters (1,394 feet). Population fragmentation is a serious problem, and this plant continues to be threatened by urbanization, vehicles, development, foot traffic, grazing, habitat disturbance, and competition from nonnative plants (CNPS 2013). See Appendix C.2, “Covered Species Accounts,” for more information on species life history, habitat requirements, distribution, core areas, habitat linkages, and trends.

There is a total of 5,963 acres of predicted suitable habitat for southern tarplant in the Plan Area. Over 62% of the predicted habitat is currently protected (see Table 6-6 and Figure 6-11). Areas of unprotected southern tarplant suitable habitat occur across the Plan Area including within the Northern Foothills, Southern Foothills, San Joaquin Hills, Upper Newport Bay, Santa Ana River mouth, Seal Beach, and Bolsa Chica core habitat areas.

Species Goal 3: Provide conservation of **southern tarplant** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.

Species Objective 3.1: OCTA will implement a restoration project in the vicinity of known occurrences of southern tarplant. The restoration design plan includes elements to promote the expansion of southern tarplant as part of the restoration efforts.

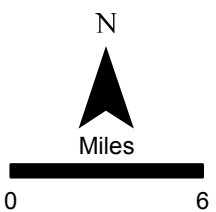
Conservation Analysis: OCTA has approved funding for the Harriet Weider Regional Park restoration project; southern tarplant has been mapped in the project vicinity (Nerhus pers. comm.). The restoration project sponsor has agreed to include specific measures as part of the restoration project design plan to achieve the establishment of southern tarplant. Southern tarplant seeds have been harvested from mature plants near the restoration site and will be included in the restoration seed mix. OCTA will ensure that focused surveys are conducted for southern tarplant as part of their monitoring efforts to quantify the population established through the restoration process.



Legend

- Currently Protected Lands
- OCTA Acquired Preserves
- OCTA Funded Restoration Projects
- Core Habitat Areas
- Linkage
- Predicted Habitat
- Species Occurrences**
- Current Occurrence (1990 or later)
- Historic Occurrence (before 1990)

Sources:
 Species Occurrences Sources: Bonterra 2012, CNDDb 2013, USFWS 2013, USFS 2013, Bonterra-Psomas/OCTA/CDFW 2015
 Protected Lands: CBI 2009, ICF/TAIC/OCTA 2015
 Species Model: ICF/TAIC 2013
 Core and Linkage Areas: CBI 2009



Southern Tarplant
Predicted Habitat and Species Occurrences with Protected Lands

Figure 6-11

Table 6-6. Conservation Analysis Summary: Southern Tarplant

	Predicted Species Habitat Model (acres)	Current Known Occurrences (occurrences/individuals)	Critical Habitat (acres)
Total in Plan Area	5,963	42/63,448	n/a
Currently Protected in Plan Area	3,708	32/55,864	n/a
Percentage Protected in Plan Area	62.2%	76.2%/88.0%	n/a
Estimated Effects from Covered Activities:			
Freeway Improvement Project Direct Effects ¹	9.2	0	--
Freeway Improvement Project Indirect Effects	35.3	0	--
Preserve Management Direct Effects	0.1		
Targets²	36.2		n/a
Conservation (to date):			
Preserve Acquisitions	9.3	0	--
Restoration Projects	31.2	pending	--
Total Conservation:	40.5		--
Conservation Above or Below Target	4.3		n/a
Protected in Plan Area After OCTA Acquisitions	3,717	32/55,864	
Percentage Protected After OCTA Acquisitions	62.3%	76.2%/88.0%	

¹ Estimated direct effects are based on a "planning-level" footprint and adjusted to account for low precision and accuracy of regional vegetation data. Actual effects will most likely be less through the implementation of avoidance and minimization measures.

² Targets were calculated using the following formula: (direct effects * 2) + (indirect effects * 0.5). Targets include a conservative estimate of the amount of conservation required to offset the direct and indirect effects from Covered Activities.

Relevant Avoidance and Minimization Measures: The following checked measures are relevant to the protection, avoidance, and minimization of direct and indirect effects on this species:

<input checked="" type="checkbox"/> Avoidance and Minimization of Sensitive Biological Areas	<input type="checkbox"/> Wetland and Riparian Streambed Protection Program
<input type="checkbox"/> Aquatic Resources and Species Policy	<input type="checkbox"/> Nesting Birds Policy
<input checked="" type="checkbox"/> Covered Plant Species Policy	<input checked="" type="checkbox"/> Wildfire Protection Techniques
<input type="checkbox"/> Wildlife Crossing Policy	<input type="checkbox"/> Stormwater and Water Quality BMPs

In addition to the Harriet Weider Regional Park restoration project, southern tarplant has been documented in the vicinity of the Fairview Park restoration project. Natural recruitment of southern tarplant has been documented during monitoring of this restoration project by Endemic Environmental Services, Inc. on May 17, 2013 (see image from monitoring report). While the Fairview Park restoration project did not include active measures to promote the expansion of southern tarplant, general enhancement and reduction of nonnative species associated with this restoration project have improved



and allowed for the recruitment of southern tarplant that occurs naturally at this location.

OCTA completed baseline biological surveys of the seven acquired Preserves. As part of the baseline surveys, suitable habitat was noted only on the Hayashi Preserve, but no individuals were observed during the surveys. Southern tarplant has also been observed in Chino Hills State Park immediately south of the Hayashi Preserve. The proximity and comparable conditions suggest Hayashi would be a suitable location for translocation of southern tarplant.

This objective will be considered achieved when the Harriet Weider Regional Park restoration project meets its project-specific success criteria.

Species Objective 3.2: OCTA will establish policies and procedures that require OCTA to identify, track, mitigate, and report annually any unavoidable impacts on southern tarplant.

Conservation Analysis: There are no known occurrences of southern tarplant in the area of direct or indirect effects for covered freeway improvement projects; however, project-specific surveys have the potential to detect this species within the Permit Area. The Plan includes the Covered Plant Species Policy (see Section 5.6.2.2), which sets forth policies and procedures for OCTA to evaluate impacts based on project-specific field surveys and to mitigate any impacts (at a 3:1 ratio) using credits determined through field surveys of Preserves and actions taken to enhance, restore, and create populations of covered plant species as part of restoration projects approved for funding by OCTA. OCTA will maintain a ledger-type accounting system to track credits and debits and report status as part of the Plan's annual report.

This objective will be considered achieved when OCTA signs the Implementing Agreement and adopts and implements the Plan, including the implementation of the Covered Plant Species Policy.

Rationale for Coverage:

The conservation actions and avoidance and minimization measures of the Plan are expected to achieve the biological goals and objectives for this species by acquiring Preserves with potentially suitable habitat for southern tarplant, restoring habitat in the vicinity of known southern tarplant occurrences (including locally collected southern tarplant seeds in restoration project seed mix), tracking and mitigating impacts, implementing the Covered Plant Species Policy, and monitoring and managing the species. Implementation of the conservation actions will exceed the Plan target of 36.2 acres by 4.3 acres.

There are no documented occurrences of southern tarplant within the area of direct or indirect effects. However, there is the potential for southern tarplant to occur within the Permit Area. As part of the Covered Plant Species Policy, OCTA will ensure project-specific surveys will be conducted prior to construction of Covered Activities. There are only 9.2 acres of predicted suitable habitat for southern tarplant estimated to be directly affected by the covered freeway improvement projects and 35.3 acres of southern tarplant habitat within 300 feet of these projects that could be indirectly affected by an incremental increase in factors such as increased nitrogen deposition, dust, and other pollutants. In addition, up to 0.1 acre of southern tarplant predicted suitable habitat could be impacted by Preserve management activities. There are a total of 5,963 acres of predicted suitable habitat within the Plan Area and at least 63,448 individuals. Therefore, if this species occurs within

the potential impact area, it is likely that the individuals would represent a small fraction of the total population within the Plan Area. The predicted suitable habitat in the area of direct impact for covered freeway improvement projects is adjacent to major freeways and is not expected to be of high quality, while the habitat that will be enhanced and restored, including at Harriet Weider Regional Park where southern tarplant will be seeded, is expected to be of much higher quality and well-connected to adjacent large blocks of protected habitat.

In summary, the conservation actions under the Plan will provide for the conservation and management of southern tarplant and will ensure that the impacts from Covered Activities are minimized and mitigated to the maximum extent practicable. As such, the Plan has been developed to meet the requirements under NCCPA sections 2820(a) and 2821, and ESA section 10(a) for the issuance of permits for southern tarplant.

6.4.4 Arroyo Chub

Gila orcutti

Legal Status:	Federal:	None
	State:	CDFW Species of Special Concern
	Forest Service:	Sensitive
	Recovery Plan:	None



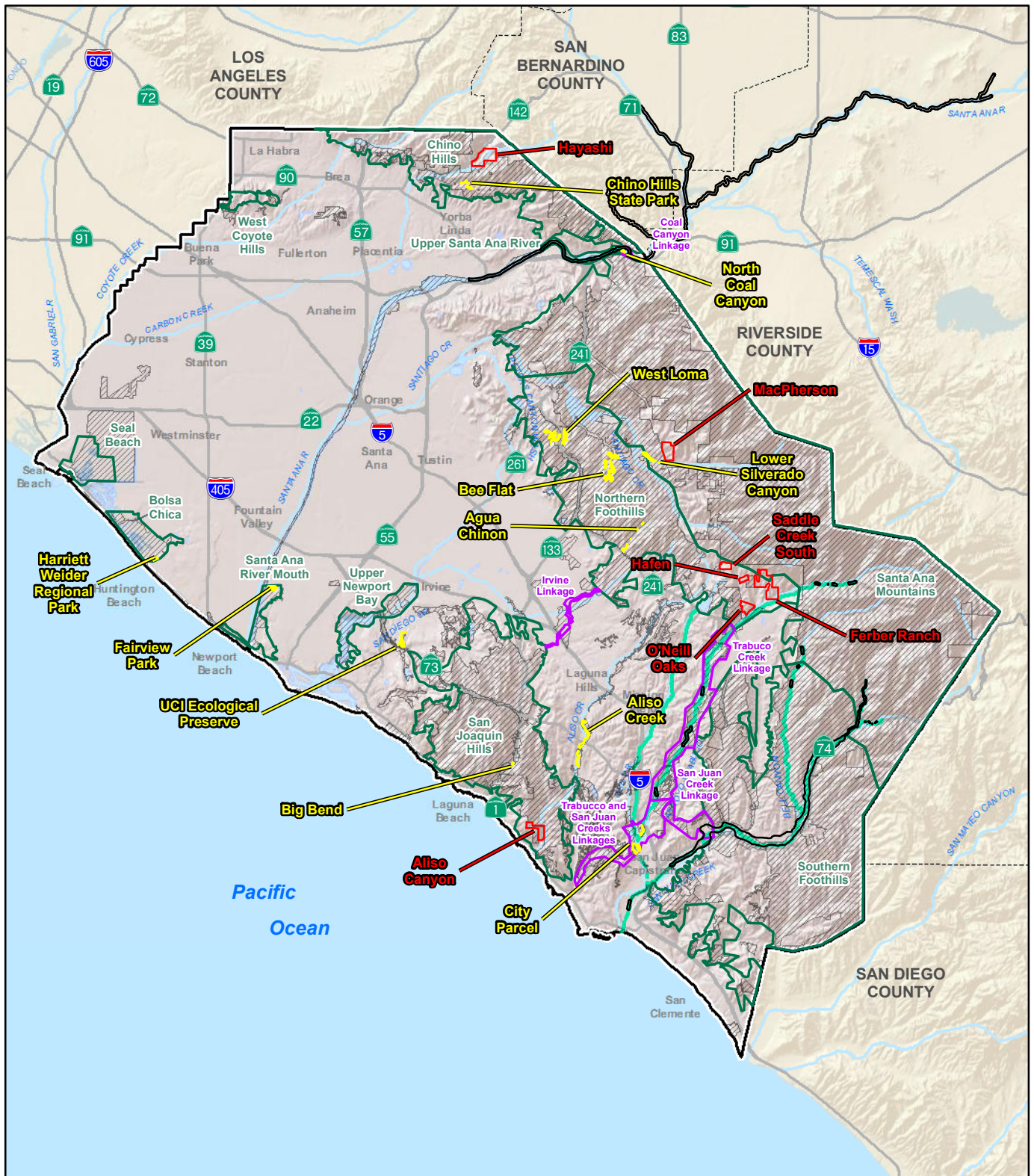
Background: The arroyo chub is a small, chunky minnow in the Cyprinidae family. The historic range of the arroyo chub includes the Los Angeles, San Gabriel, San Luis Rey, San Dieguito, Santa Ana, and Santa Margarita rivers and also Malibu and San Juan Creeks. One of the largest remaining natural populations occurs in Orange County in the San Juan and Trabuco creeks. The arroyo chub has a very restricted range in southern California, and southern Orange County populations in San Juan and Trabuco Creeks are among the largest remaining natural habitats for the species. Preferred habitat is slow moving or backwater sections of warm to cool streams with substrates of sand or mud and depth greater than 40 centimeters (16 inches). Threats include water quality issues, predation, competition from nonnative species, and degradation of streams and habitat loss due to stream modifications, check dams, or channelization that fragments and reduces the populations. See Appendix C.2, “Covered Species Accounts,” for more information on species life history, habitat requirements, distribution, core areas, habitat linkages, and trends.

There is a total of 69 acres of predicted suitable habitat for arroyo chub in the Plan Area. Over 72% of the predicted habitat is currently protected (see Table 6-7 and Figure 6-12). Areas of unprotected arroyo chub suitable habitat occur in the Northern Foothills, Southern Foothills, Santa Ana Mountains, and Upper Santa Ana River core habitat areas.

Species Goal 4: Provide conservation of **arroyo chub** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.

Species Objective 4.1: OCTA will restore and enhance riparian habitat in areas that potentially support arroyo chub and conserve natural habitat in the headwaters of a stream supporting arroyo chub to protect in-stream water quality.

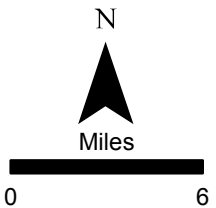
Conservation Analysis: OCTA completed baseline biological surveys of all seven OCTA acquired Preserves. There is habitat with a limited potential to support the species on the Hayashi Preserve in Carbon Canyon Creek, but this area is isolated from known populations. There is no potentially suitable habitat on any of the other six Preserves. The City Parcel restoration project results in 13.0 acres of riparian restoration along lower reaches of Trabuco Creek. This restoration effort includes removal of nonnative plant species, removal of debris and trash, and planting of native plant species. These restoration activities will contribute to the improvement of the natural hydrological functions and water quality for this important coastal stream course and will improve Trabuco Creek as potential habitat for arroyo chub. In addition, OCTA has acquired the Ferber Ranch, Hafen, and O’Neill Oaks Preserves, which are located in headwaters of Trabuco Creek. The protection of 546.5 acres of natural habitat in this location contributes to the protection of water quality, sedimentation, and hydrological processes important for arroyo chub habitat downstream in Trabuco Creek.



Legend

- Currently Protected Lands
- OCTA Acquired Preserves
- OCTA Funded Restoration Projects
- Core Habitat Areas
- Linkage
- Predicted Habitat
- Current Occurrence (1990 or later)

Sources:
 Species Occurrences Sources: Bonterra 2012, CNDDDB 2013, USFWS 2013, USFS 2013, Bonterra-Psomas/OCTA/CDFW 2015
 Protected Lands: CBI 2009, ICF/TAIC/OCTA 2015
 Species Model: ICF/TAIC 2015
 Core and Linkage Areas: CBI 2009



**Arroyo Chub
 Predicted Habitat and Species Occurrences with Protected Lands**

Figure 6-12

Table 6-7. Conservation Analysis Summary: Arroyo Chub

	Predicted Species Habitat Model (acres)	Current Known Occurrences (occurrences/individuals)	Critical Habitat (acres)
Total in Plan Area	69	51/345	n/a
Currently Protected in Plan Area	50	51/345	n/a
Percentage Protected in Plan Area	72.5%	100%/100%	n/a
Estimated Effects from Covered Activities:			
Freeway Improvement Project Direct Effects ¹	0.1	0	--
Freeway Improvement Project Indirect Effects	1.9	1/1	--
Preserve Management Direct Effects	0.0	--	--
Targets²	1.1	--	n/a
Conservation (to date):			
Preserve Acquisitions	0.1	0	--
Restoration Projects	13.0	1/1	--
Total Conservation:	13.1	1/1	--
Conservation Above or Below Target	12.0	--	n/a
Protected in Plan Area After OCTA Acquisitions	50.1	51/345	
Percentage Protected After OCTA Acquisitions	72.6%	100%/100%	

¹ Estimated direct effects are based on a “planning-level” footprint and adjusted to account for low precision and accuracy of regional vegetation data. Actual effects will most likely be less through the implementation of avoidance and minimization measures.

² Targets were calculated using the following formula: (direct effects * 2) + (indirect effects * 0.5). Targets include a conservative estimate of the amount of conservation required to offset the direct and indirect effects from Covered Activities.

Relevant Avoidance and Minimization Measures: The following checked measures are relevant to the protection, avoidance, and minimization of direct and indirect effects on this species:

<input checked="" type="checkbox"/>	Avoidance and Minimization of Sensitive Biological Areas	<input checked="" type="checkbox"/>	Wetland and Riparian Streambed Protection Program
<input checked="" type="checkbox"/>	Aquatic Resources and Species Policy	<input type="checkbox"/>	Nesting Birds Policy
<input type="checkbox"/>	Covered Plant Species Policy	<input checked="" type="checkbox"/>	Wildfire Protection Techniques
<input checked="" type="checkbox"/>	Wildlife Crossing Policy	<input checked="" type="checkbox"/>	Stormwater and Water Quality BMPs

These conservation actions provide a positive but marginal benefit for conservation of arroyo chub. The overriding threat to arroyo chub is competition and predation by nonnative species. To provide for a level of conservation required for coverage of arroyo chub under the NCCPA and federal incidental take permit, OCTA will implement a future restoration project focused on improving habitat conditions for arroyo chub (see Species Objective 4.2).

This objective will be considered achieved when OCTA records conservation easements for the Ferber Ranch, Hafen, and O’Neill Oaks Preserves, and the City Parcel restoration project has met its specific success criteria.

Species Objective 4.2: OCTA will implement a restoration project focused on improving habitat conditions for arroyo chub, such as improving water quality, removing nonnative aquatic species, or modifying check dams to allow passage, to support sustainable populations in occupied areas.

Conservation Analysis: To provide for conservation of arroyo chub, OCTA will fund a future restoration project that will achieve a direct benefit to an existing population of arroyo chub. This restoration project could include actions to improve water quality in a subwatershed known to have arroyo chub (e.g., in Bell Canyon), removal or modification of check dams to facilitate fish passage (e.g., along San Juan Creek in USFS lands), and/or a focused nonnative fish removal within a select tributary (e.g., fish trapping of source populations of nonnatives in Oso Creek). A recent study analyzed the arroyo chub population structure and genetic diversity across the species' native range (Benjamin et al. 2016). Arroyo chub were sampled from six watersheds in southern California, including the San Juan watershed that is located within the Plan Area. The study determined that individuals sampled in the six watersheds represent genetically distinct populations. Altered fluvial processes and impediments to movement have fragmented the remaining range in southern California such that populations function independently of each other and are at risk due to their small size. Although the San Juan Creek population shows a relatively high genetic diversity, the size of the population has significantly declined. Benjamin et al. (2016) concluded that conservation of this population is important to the recovery of arroyo chub because it may become a source population for future reintroduction efforts in other suitable watersheds, which would be essential to securing genetic stability for the arroyo chub across its native range. Since 2011, arroyo chub has been documented as successfully breeding within two stream reaches in Bell Canyon (subwatershed of the San Juan watershed) (Gibson pers. comm.). Due to variation in annual rainfall between 2011 and 2015, these two reaches have expanded and contracted in size. The driest year within the survey time period was 2014, when the two reaches supporting arroyo chub were reduced to only 330 and 500 feet but still had successfully breeding arroyo chub. Arroyo chub is also known to occur in Trabuco Creek near the O'Neill Regional Park (Barabe pers. comm.). Once OCTA identifies a potential restoration project that is designed to improve habitat conditions for arroyo chub, it will coordinate closely with the Wildlife Agencies and EOC to evaluate and approve this restoration project as meeting this objective.

This objective will be considered achieved when a future restoration project designed to improve habitat conditions for arroyo chub has met its project-specific success criteria.

Species Objective 4.3: OCTA will establish policies and procedures to avoid and minimize impacts on arroyo chub and its habitat.

Conservation Analysis: The Plan includes the Aquatic Resources and Species Policy that outlines appropriate avoidance and minimization measures for construction activities in aquatic resources, such as rivers, creeks, and riparian areas. The Construction Lead will retain a qualified biologist during any project that could impact potential arroyo chub habitat to determine if arroyo chub might be present and subject to potential injury or mortality from construction activities. When arroyo chub are present, the project biologist will identify appropriate methods to capture, handle, exclude, and relocate those individuals. All fish exclusion and salvage activities will adhere to accepted NOAA Fisheries Service and CDFW protocols. Other policies that will provide for the protection

of arroyo chub include the Avoidance and Minimization of Sensitive Biological Areas, Wildlife Crossing Policy, Stormwater and Water Quality BMPs, Wildfire Protection Techniques, and Wetland and Riparian Streambed Protection Program.

The implementation of the Aquatic Resources and Species Policy will protect and minimize impacts on arroyo chub. This objective will be considered achieved through implementation of this policy.

Rationale for Coverage:

The conservation actions and avoidance and minimization measures of the Plan are expected to achieve the biological goals and objectives for this species by restoring riparian habitat along Trabuco Creek, protecting habitat in the Trabuco headwaters, and implementing a future restoration project that will be focused on improving habitat conditions for arroyo chub. In addition OCTA will participate in a regional arroyo chub management plan. Implementation of the conservation actions will exceed the Plan target of 1.1 acre by 12.0 acres.

There are no documented occurrences of arroyo chub within the area of direct effects. One known occurrence has been documented within the area of indirect effects (Project J along the Santa Ana River). Additionally, 0.1 acre of predicted suitable habitat occurs within the area of direct effects associated with the covered freeway improvement projects; therefore, the potential for direct effects from these projects is expected to be very low. There is only 1.9 acre of arroyo chub habitat that is within 300 feet of the Permit Area out of 69 acres of habitat mapped within the Plan Area. The occurrence within the area of potential indirect effects is the population within the Santa Ana River. This population will not be directly impacted, and appropriate measures will be taken to ensure that it is not impacted by erosion and siltation from project construction. Therefore, potential impacts on this species from the project would be limited to factors such as dust, lighting, and noise, which are expected to be minimal. As part of the Wildlife Crossing Policy, OCTA will evaluate any culverts or drainages that would be affected by the covered freeway improvement projects to ensure that fish passage is maintained. Impacts will be partially offset through the restoration of 13.0 acres of arroyo chub habitat in Trabuco Creek and conservation of the Preserves adjacent to Trabuco Creek, which will help maintain habitat quality by reducing the potential for erosion, siltation, and pollution of the aquatic habitat. These conservation actions provide a positive but marginal benefit for conservation of arroyo chub. To provide for a level of conservation required for coverage of arroyo chub under the NCCPA, OCTA will implement a future restoration project focused on improving habitat conditions for arroyo chub,

In summary, the conservation actions under the Plan will provide for the conservation and management of arroyo chub and will ensure that the impacts from Covered Activities are minimized and mitigated to the maximum extent practicable. As such, the Plan has been developed to meet the requirements under NCCPA sections 2820(a) and 2821, and ESA section 10(a) for the issuance of permits for arroyo chub.

6.4.5 Coast Horned Lizard

Phrynosoma blainvillii

Legal Status:	Federal:	None
	State:	CDFW Species of Special Concern
	Forest Service:	Sensitive
	Recovery Plan:	None



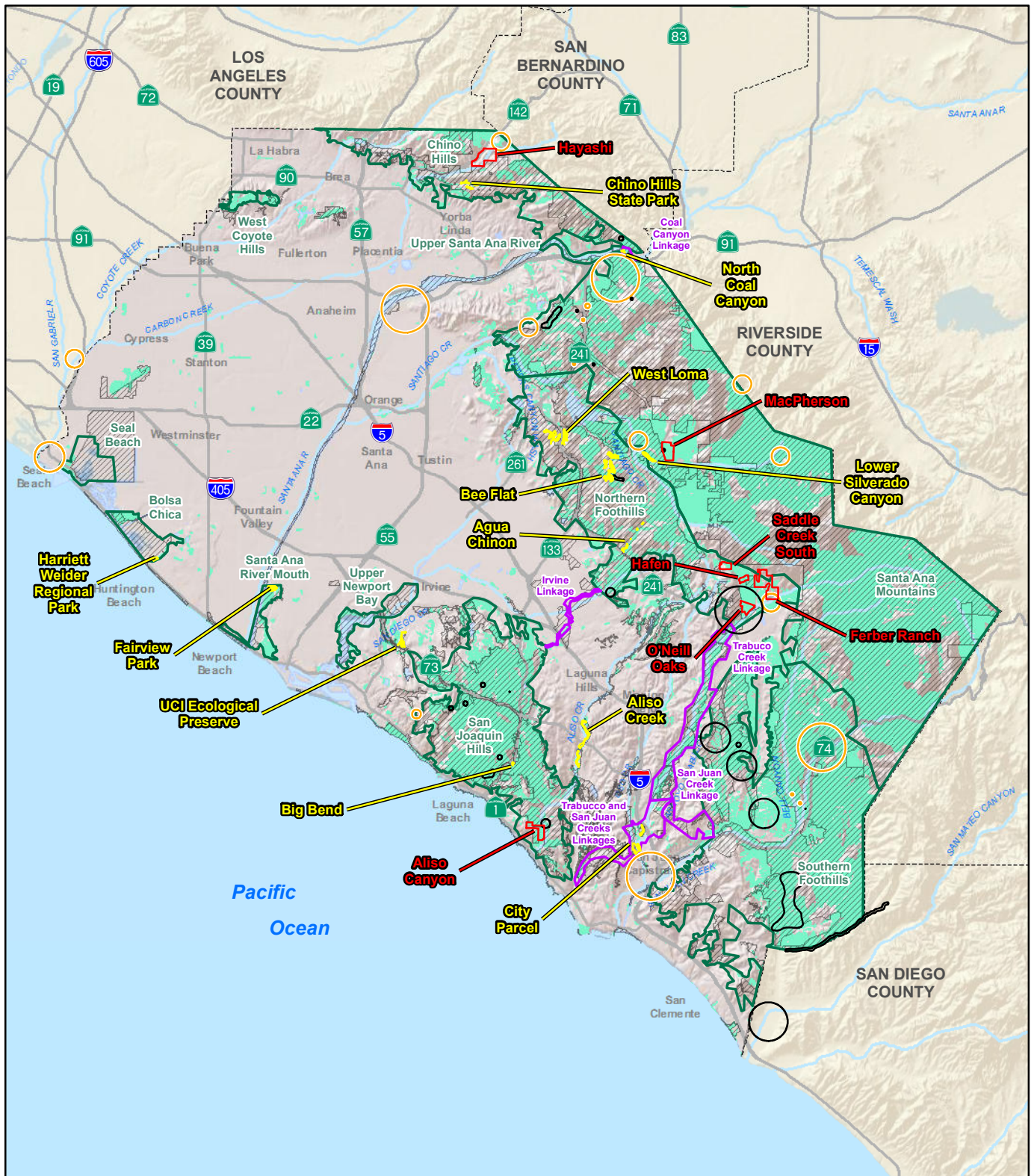
Background: The coast horned lizard (*Phrynosoma blainvillii*) is a terrestrial lizard that has conspicuously pointed scales along its body and large horns around the base of its head. This species is known to use a wide variety of vegetation types, including chaparral, coastal sage scrub, grassland, oak woodland, riparian woodland and coniferous forest. This species will typically use open areas caused by natural or anthropogenic disturbances, and favors loose, fine soil with high sand fraction, abundance of native ant species, open areas with limited overstory for basking, and areas with low, dense shrubs for refuge. Coast horned lizards are prey for a variety of natural predators, and are threatened by loss of habitat due to urban development, conversion of habitat to agricultural lands, grazing, off-road vehicles, and pesticide use (SDNHM 2015). They are also threatened by the displacement of native harvester ants (food source) by invasive, nonnative Argentine ants. See Appendix C.2, “Covered Species Accounts,” for more information on species life history, habitat requirements, distribution, core areas, habitat linkages, and trends.

There is a total of 96,100 acres of predicted suitable habitat for coast horned lizard in the Plan Area. Over 79% of the predicted habitat is currently protected (see Table 6-8 and Figure 6-13). Blocks of unprotected coast horned lizard suitable habitat occur across the Plan Area, with the largest blocks in the Santa Ana Mountains, Northern Foothills, and Southern Foothills core habitat areas. Other areas of unprotected coast horned lizard suitable habitat is mapped within the San Joaquin Hills, Chino Hills, Upper Santa Ana River, Upper Newport Bay, Santa Ana River Mouth, Seal Beach, Bolsa Chica, and West Coyote Hills core habitat areas.

Species Goal 5: Provide conservation of **coast horned lizard** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.

Species Objective 5.1: OCTA will acquire Preserves with natural habitat that includes areas with loose, fine soils with high sand fraction, open areas with limited overstory for basking, and other features known to support coast horned lizard. OCTA will also ensure that appropriate management monitoring actions are incorporated into the RMPs for each Preserve that include suitable habitat for coast horned lizard.

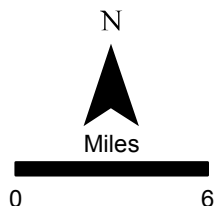
Conservation Analysis: During baseline biological surveys completed for the seven Preserves acquired by OCTA, it was noted that each of these Preserves provide quality habitat features for coast horned lizard. An observation of coast horned lizard was recorded on the MacPherson Preserve in an opening in southern mixed chaparral vegetation on the western portion of the property. Previously recorded occurrences of coast horned lizard, as documented in the CNDDDB, intersect with the O’Neill Oaks Preserve. If additional populations of coast horned lizard are detected in the Preserves, they will be protected and monitored as part of the Preserve RMPs. OCTA has approved



- Legend**
- Currently Protected Lands
 - OCTA Acquired Preserves
 - OCTA Funded Restoration Projects
 - Core Habitat Areas
 - Linkage
 - Predicted Habitat

- Species Occurrences**
- Current Occurrence (1990 or later)
 - Historic Occurrence (before 1990)

Sources:
 Species Occurrences Sources: Bonterra 2012, CNDBB 2013, USFWS 2013, USFS 2013, Bonterra-Psomas/OCTA/CDFW 2015
 Protected Lands: CBI 2009, ICF/TAIC/OCTA 2015
 Species Model: ICF/TAIC 2013
 Core and Linkage Areas: CBI 2009



Coast Horned Lizard
Predicted Habitat and Species Occurrences with Protected Lands

Figure 6-13

Table 6-8. Conservation Analysis Summary: Coast Horned Lizard

	Predicted Species Habitat Model (acres)	Current Known Occurrences (occurrences/ individuals)	Critical Habitat (acres)
Total in Plan Area	96,100	25/165	n/a
Currently Protected in Plan Area	76,797	24/164	n/a
Percentage Protected in Plan Area	79.9%	96.0%/99.4%	n/a
Estimated Effects from Covered Activities:			
Freeway Improvement Project Direct Effects ¹	63.4	0.0	--
Freeway Improvement Project Indirect Effects	184.2	0.0	--
Preserve Management Direct Effects	5.6	--	--
Targets²	230.2	--	n/a
Conservation (to date):			
Preserve Acquisitions	529.8	1/1	--
Restoration Projects	140.8	0	--
Total Conservation:	670.6	1/1	--
Conservation Above or Below Target	440.4	--	n/a
Protected in Plan Area After OCTA Acquisitions	77,327	25/165	n/a
Percentage Protected After OCTA Acquisitions	80.5%	100%/100%	n/a

¹ Estimated direct effects are based on a “planning-level” footprint and adjusted to account for low precision and accuracy of regional vegetation data. Actual effects will most likely be less through the implementation of avoidance and minimization measures.

² Targets were calculated using the following formula: (direct effects * 2) + (indirect effects * 0.5). Targets include a conservative estimate of the amount of conservation required to offset the direct and indirect effects from Covered Activities.

Relevant Avoidance and Minimization Measures: The following checked measures are relevant to the protection, avoidance, and minimization of direct and indirect effects on this species:

<input checked="" type="checkbox"/>	Avoidance and Minimization of Sensitive Biological Areas	<input type="checkbox"/>	Wetland and Riparian Streambed Protection Program
<input type="checkbox"/>	Aquatic Resources and Species Policy	<input type="checkbox"/>	Nesting Birds Policy
<input type="checkbox"/>	Covered Plant Species Policy	<input checked="" type="checkbox"/>	Wildfire Protection Techniques
<input checked="" type="checkbox"/>	Wildlife Crossing Policy	<input type="checkbox"/>	Stormwater and Water Quality BMPs

funding for ten restoration projects that will restore over 140.7 acres of scrub habitat that will enhance open areas, habitat quality, and availability for this species.

The seven Preserves acquired by OCTA are located within priority conservation areas of the Chino Hills, San Joaquin Hills, Northern Foothills, and Santa Ana Mountains core habitat areas. These core habitat areas have been identified at a regional scale as supporting coast horned lizard, and the acquisition of these Preserves contributes to the protection of these regionally important blocks of habitat (see Appendix C.5, “CBI Conservation Assessment Summary”). The Preserves are adjacent to existing protected areas with additional suitable habitat and known occurrences of coast horned lizard

(Figure 6-13 and Appendix C.7, “Additional Species Occurrence Maps”); therefore these conservation actions protect and enhance habitat connectivity of this species.

This objective will be considered achieved when OCTA records conservation easements for these seven Preserves, implements species monitoring and management according to the RMPs for these Preserves, and the ten restoration projects that included scrub habitat restoration have met their specific success criteria.

Rationale for Coverage:

The conservation actions and avoidance and minimization measures of the Plan are expected to achieve the biological goals and objectives for this species by conserving large blocks of habitat that are well-connected to adjacent protected areas, by restoring potentially suitable upland habitats, and monitoring and managing the species. Implementation of the conservation actions will exceed the Plan target of 230.2 acres by 440.4 acres.

There are no known current occurrences in the area of direct or indirect effects for planned freeway improvement projects. However, there is the potential for coast horned lizard to occur within the Permit Area. There are 63.4 acres of predicted suitable habitat for coast horned lizard estimated to be directly affected by the covered freeway improvement projects and 184.2 acres of coast horned lizard habitat within 300 feet of these projects that could be indirectly affected by an incremental increase in factors such as increased human presence, dust, and noise. In addition, up to 5.6 acres of coast horned lizard predicted suitable habitat could be impacted by Preserve management activities. There is a total of 96,100 acres of predicted suitable habitat within the Plan Area, so if this species occurs within the potential impact area, it is likely that only a small number of individuals would be harmed within this fraction of the total predicted suitable habitat within the Plan Area. Additionally, the habitat that will be conserved is of higher quality and well-connected to adjacent large blocks of protected habitat, while the predicted suitable habitat in the area of direct impact for covered freeway improvement projects is adjacent to major freeways and of marginal quality for this species.

All of the OCTA acquired Preserves and most of the restoration projects have predicted suitable habitat for coast horned lizard. Coast horned lizards have been observed on the MacPherson Preserve and previously documented within the O’Neill Oaks Preserve (previous CNDDDB occurrence), but the species tends to be broadly distributed within suitable habitat, so there is a high likelihood that it occurs within each of the Preserves and within or adjacent to the restoration projects. In total, there are 529.8 acres of coast horned lizard habitat in the Preserves, and an additional 140.8 acres of habitat that will be restored or enhanced. The Preserves in the Trabuco Canyon area help maintain landscape-level connectivity between the large conserved areas with coast horned lizard populations in the Central-Coastal NCCP/HCP Central Reserve system to the north and Orange County Southern Subregion HCP Reserve system to the south (Figure 6-13 and Appendix C.7). The Aliso Canyon, Hayashi, and MacPherson Preserves will expand the amount of suitable coast horned lizard habitat conserved with adjacent and existing conserved habitat. The MacPherson Preserve supports at least one coast horned lizard occurrence and the RMP will include species-specific management directives to ensure its continued existence on the site. The biological benefits to coast horned lizard from the conservation and management of these Preserves and the habitat restoration will be substantially greater than the potential direct loss of up to 69.0 acres of coast horned lizard predicted suitable habitat and indirect effects on 184.2 acres of predicted suitable habitat.

The conservation actions under the Plan will provide for the conservation and management of the coast horned lizard and will ensure that the impacts from Covered Activities are minimized and

mitigated to the maximum extent practicable. As such, the Plan has been developed to meet the requirements under NCCPA sections 2820(a) and 2821, and ESA section 10(a) for the issuance of permits for coast horned lizard.

6.4.6 Orangethroat Whiptail

Aspidoscelis hyperythra

Legal Status:	Federal:	None
	State:	CDFW Watch List
	Forest Service:	None
	Recovery Plan:	None



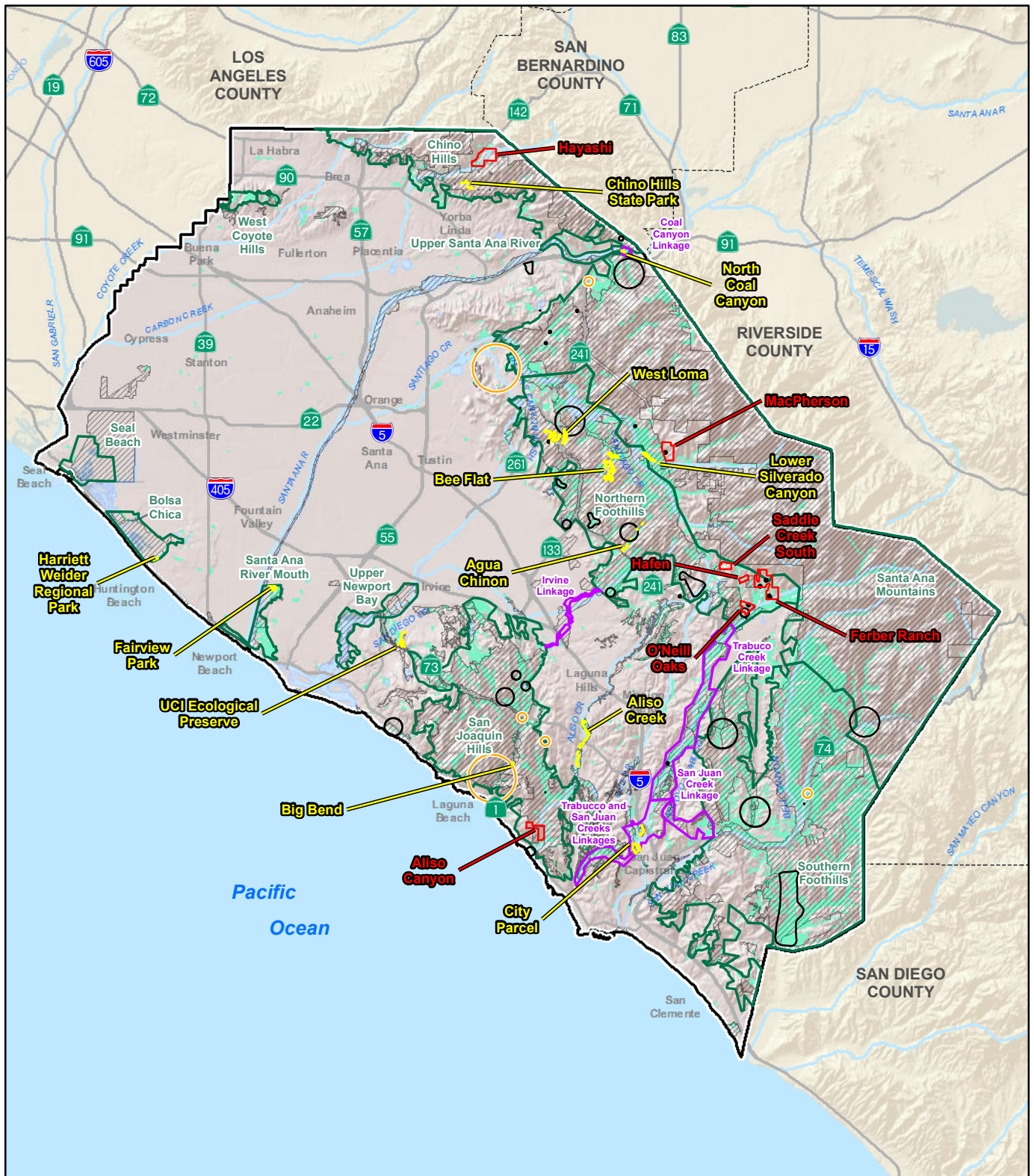
Background: The orangethroat whiptail is a small, slender, unspotted whiptail lizard, and adult males have a bright orange throat and chest. This species is known to occupy open, sparsely covered land, often with well-drained loose soils and rocks. Habitat types include chaparral, nonnative grassland, coastal sage scrub, juniper, and oak woodlands. California buckwheat appears to be an important indicator of suitable habitat for the orangethroat whiptail. This species may be associated with perennial vegetation because of its major food source (termites). Orangethroat whiptail is found from the Santa Ana River in Orange County south through the Baja California peninsula. The greatest threat to this species is the loss, alteration, and fragmentation of occupied habitat, but grazing, off-road vehicles, and predation by natural and urban edge predators are also factors affecting its status. See Appendix C.2, “Covered Species Accounts,” for more information on species life history, habitat requirements, distribution, core areas, habitat linkages, and trends.

There is a total of 23,469 acres of predicted suitable habitat for orangethroat whiptail in the Plan Area. Over 70% of the predicted habitat is currently protected (see Table 6-9 and Figure 6-14). Blocks of unprotected orangethroat whiptail suitable habitat occur across the Plan Area, with the largest blocks in the Northern Foothills and Southern Foothills core habitat areas. Other areas of unprotected coast horned lizard suitable habitat is mapped within the Santa Ana Mountains, San Joaquin Hills, Chino Hills, Upper Santa Ana River, Upper Newport Bay, Santa Ana River Mouth, Seal Beach, Bolsa Chica, and West Coyote Hills core habitat areas.

Species Goal 6: Provide conservation of **orangethroat whiptail** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.

Species Objective 6.1: OCTA will acquire Preserves that have documented occurrences of orangethroat whiptail. OCTA will ensure that appropriate management and monitoring actions are incorporated into the RMPs for each Preserve to protect and maintain habitat to support sustainable populations of orangethroat whiptail.

Conservation Analysis: The orangethroat whiptail has previously been documented on Ferber Ranch and O’Neill Oaks Preserves. The baseline surveys of the OCTA acquired Preserves also documented orangethroat whiptail on these same Preserves plus the MacPherson Preserve. In addition, it was noted that all of these Preserves provide quality habitat for the species. Known populations and those discovered in the future on the Preserves will be protected and monitored as part of the Preserve RMPs. OCTA has approved funding for ten restoration projects that will restore over 140.8 acres of scrub habitat that will enhance open areas, habitat quality, and availability for this species.



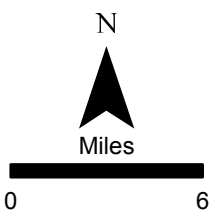
Legend

- Currently Protected Lands
- OCTA Acquired Preserves
- OCTA Funded Restoration Projects

- Core Habitat Areas
- Linkage

- Predicted Habitat
- Species Occurrences**
- Current Occurrence (1990 or later)
- Historic Occurrence (before 1990)

Sources:
 Species Occurrences Sources: Bonterra 2012, CNDDb 2013, USFWS 2013, USFS 2013, Bonterra-Psomas/OCTA/CDFW 2015
 Protected Lands: CBI 20009, ICF/TAIC/OCTA 2015
 Species Model: ICF/TAIC 2013
 Core and Linkage Areas: CBI 2009



**Orangethroat Whiptail
 Predicted Habitat and Species Occurrences with Protected Lands**

Figure 6-14

Table 6-9. Conservation Analysis Summary: Orangethroat Whiptail

	Predicted Species Habitat Model (acres)	Current Known Occurrences (occurrences/ individuals)	Critical Habitat (acres)
Total in Plan Area	23,469	40/182	n/a
Currently Protected in Plan Area	16,579	33/175	n/a
Percentage Protected in Plan Area	70.6%	82.5%/96.2%	n/a
Estimated Effects from Covered Activities:			
Freeway Improvement Project Direct Effects ¹	45.1	0.0	--
Freeway Improvement Project Indirect Effects	110.7	2/2	--
Preserve Management Direct Effects	0.5		
Targets²	146.7		n/a
Conservation (to date):			
Preserve Acquisitions	52.1	6/6	--
Restoration Projects	140.8	2/4	--
Total Conservation:	192.9	8/10	--
Conservation Above or Below Target	46.2		n/a
Protected in Plan Area After OCTA Acquisitions	16,631	39/181	
Percentage Protected After OCTA Acquisitions	70.9%	97.5%/99.5%	

¹ Estimated direct effects are based on a “planning-level” footprint and adjusted to account for low precision and accuracy of regional vegetation data. Actual effects will most likely be less through the implementation of avoidance and minimization measures.

² Targets were calculated using the following formula: (direct effects * 2) + (indirect effects * 0.5). Targets include a conservative estimate of the amount of conservation required to offset the direct and indirect effects from Covered Activities.

Relevant Avoidance and Minimization Measures: The following checked measures are relevant to the protection, avoidance, and minimization of direct and indirect effects on this species:

<input checked="" type="checkbox"/>	Avoidance and Minimization of Sensitive Biological Areas	<input type="checkbox"/>	Wetland and Riparian Streambed Protection Program
<input type="checkbox"/>	Aquatic Resources and Species Policy	<input type="checkbox"/>	Nesting Birds Policy
<input type="checkbox"/>	Covered Plant Species Policy	<input checked="" type="checkbox"/>	Wildfire Protection Techniques
<input checked="" type="checkbox"/>	Wildlife Crossing Policy	<input type="checkbox"/>	Stormwater and Water Quality BMPs

The seven Preserves acquired by OCTA are located within priority conservation areas of the Chino Hills, San Joaquin Hills, Northern Foothills, and Santa Ana Mountains core habitat areas. The Chino Hills, San Joaquin Hills, and Northern Foothills core habitat areas have been identified at a regional scale as supporting orangethroat whiptail (CBI 2009), and the acquisition of Preserves within these core habitat areas contributes to the protection of these regionally important blocks of habitat (see Appendix C.5, “CBI Conservation Assessment Summary”). There are additional known occurrences in existing protected areas adjacent to the Preserves, along with additional suitable habitat; therefore, these conservation actions protect and enhance habitat connectivity of this species.

This objective will be considered achieved when OCTA records conservation easements for the seven Preserves acquired by OCTA and implements species monitoring and management according to the RMPs for these Preserves, and the ten restoration projects that include scrub restoration have met their specific success criteria.

Rationale for Coverage:

The conservation actions and avoidance and minimization measures of the Plan are expected to achieve the biological goals and objectives for this species by conserving large blocks of habitat that are well-connected to adjacent protected areas, by restoring potentially suitable upland habitats, and monitoring and managing the species. Implementation of the conservation actions will exceed the Plan target of 146.7 acres by 46.2 acres.

There are no known occurrences in the area of direct effects for planned freeway improvement projects, but two known occurrences may have indirect effects. There are 45.1 acres of predicted suitable habitat for orangethroat whiptail estimated to be directly affected by the covered freeway improvement projects and 110.7 acres of orangethroat whiptail habitat within 300 feet of these projects that could be indirectly affected by an incremental increase in factors such as increased human presence, dust, and noise. In addition, up to 0.5 acre of orangethroat whiptail predicted suitable habitat could be impacted by Preserve management activities. There are a total of 23,469 acres of predicted suitable habitat within the Plan Area, so if this species occurs within the potential impact area, it is likely that only a small number of individuals would be impacted within this fraction of the total predicted habitat within the Plan Area. Furthermore, the predicted suitable habitat in the area of direct impact for covered freeway improvement projects is adjacent to major freeways and is not expected to be of high quality, while the conserved habitat is of much higher quality and is well-connected to adjacent large blocks of protected habitat.

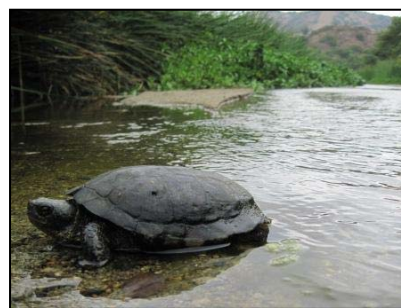
All seven of the Preserves and most of the restoration projects have predicted suitable habitat for orangethroat whiptail. Orangethroat whiptails have only been documented within three of the Preserves, but the species tends to be broadly distributed within suitable habitat, so there is a high likelihood that it occurs within each of the Preserves and within or adjacent to the restoration projects. In total, there are 52.1 acres of orangethroat whiptail habitat in the Preserves, and an additional 140.8 acres of habitat will be restored or enhanced. The Preserves in the Trabuco Canyon area will help conserve habitat for this species and help maintain landscape-level connectivity between the large conserved areas with orangethroat whiptail populations in the Central Subregion of the Central-Coastal NCCP/HCP reserve system to the north and Orange County Southern Subregion HCP Reserve system to the south (Figure 6-14). The Aliso Canyon, Hayashi, and MacPherson Preserves will expand the amount of orangethroat whiptail habitat with adjacent and existing conserved habitat. The biological benefits to orangethroat whiptail from the conservation and management of these Preserves and the habitat restoration will be greater than the potential direct loss of up to 45.6 acres of orangethroat whiptail predicted suitable habitat and indirect effects on 110.7 acres of predicted suitable habitat.

The conservation actions under the Plan will provide for the conservation and management of orangethroat whiptail and will ensure that the impacts from Covered Activities are minimized and mitigated to the maximum extent practicable. As such, the Plan has been developed to meet the requirements under NCCPA sections 2820(a) and 2821, and ESA section 10(a) for the issuance of permits for orangethroat whiptail.

6.4.7 Western Pond Turtle

Emys marmorata

Legal Status:	Federal:	None
	State:	CDFW Species of Special Concern
	Forest Service:	Sensitive
	Recovery Plan:	None



Background: The western pond turtle is a medium-sized aquatic turtle that historically ranged from state of Washington to northern Baja California, Mexico. Breeding behavior has been observed from February through November; the peak nesting season occurs from May through June, with females selecting nesting sites in loose soil up to 400 meters (1,312 feet) from their aquatic habitat. This species is known to use both permanent and intermittent water sources ranging from rivers and lakes to ponds, streams, and irrigation ditches. Preferred habitat is pools within streams with a rocky or muddy bottom and a predominance of aquatic vegetation. Pond turtles will select areas with high quality refugia for basking (e.g., floating vegetation, logs, rocks, terrestrial islands, and human-made debris). The upland habitat is also an important factor, as these areas are used to lay eggs, overwinter, and for dispersal (most frequently less than 3 kilometers [1.9 miles]). The greatest threat to this species is loss, alteration, and fragmentation of occupied habitat; however, natural predators and nonnative predators may impact populations. Automobile strikes, as well as extended drought and associated wildfire can also result in significant mortality of western pond turtles.

The distribution of current (i.e., 1990 or later) and historical (i.e., before 1990) occurrences of western pond turtle from CNDDDB and USFWS data sources are shown in Figure 4-9 and 6-15. There are 12 current known occurrences in the Plan, eight are from three presumed breeding sites documented in the southern portion of Orange County: San Juan Creek (six locations), a stock pond in upper Cristianitos Canyon (one location), and Jerome's Lake in upper Gabino Canyon (one location) (USFWS 2007). According to IRC (2015), western pond turtles have been observed in Lower Silverado Creek with a known breeding population occurring in neighboring Ladd Canyon in 2005. Based on a more recent USGS study (Fisher et al. 2013), pond turtles were also found in the following Plan Area locations: Santa Ana River, San Juan/Oso/Trabuco creeks, Aliso Creek, San Diego Creek, and Shady Canyon Pond (within the San Joaquin Hills core habitat area). Shady Canyon Pond has 74 individual turtles and may be an important source population for future reintroduction efforts in the Plan Area (Fisher et al. 2013, IRC 2013). See Appendix C.2, "Covered Species Accounts," for more information on species life history, habitat requirements, distribution, core areas, habitat linkages, and trends.

There are a total of 5,963 acres of predicted suitable aquatic habitat and 90,120 acres of predicted suitable upland habitat for western pond turtle in the Plan Area. Over 83% of the predicted aquatic habitat and 72% of the predicted upland habitat is currently protected (see Table 6-10 and Figure 6-15). Areas of unprotected western pond turtle suitable habitat occur across the Plan Area, with the largest blocks in the Upper Newport Bay, Chino Hills, Northern Foothills and Southern Foothills core habitat areas. Other areas of unprotected western pond turtle suitable habitat are mapped within the Santa Ana Mountains, San Joaquin Hills, Chino Hills, Upper Santa Ana River, Upper Newport Bay, Santa Ana River Mouth, Seal Beach, Bolsa Chica, and West Coyote Hills core habitat areas.



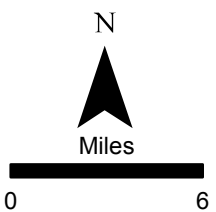
Legend

- Currently Protected Lands
- OCTA Acquired Preserves
- OCTA Funded Restoration Projects
- Core Habitat Areas
- Linkage

- Predicted Habitat**
- Aquatic Habitat
 - Upland Habitat

- Species Occurrences**
- Current Occurrence (1990 or later)
 - Historic Occurrence (before 1990)

Sources:
 Species Occurrences Sources: Bonterra 2012, CNDBB 2013, USFWS 2013, USFS 2013, Bonterra-Psomas/OCTA/CDFW 2015
 Protected Lands: CBI 2009, ICF/TAIC/OCTA 2015
 Species Model: ICF/TAIC 2013
 Core and Linkage Areas: CBI 2009



**Western Pond Turtle
 Predicted Habitat and Species Occurrences with Protected Lands**

Figure 6-15

Table 6-10. Conservation Analysis Summary: Western Pond Turtle

	Predicted Species Habitat Model		Current Known Occurrences (occurrences/ individuals)	Critical Habitat (acres)
	Aquatic (acres)	Upland (acres)		
Total in Plan Area	5,963	90,120	12/54	n/a
Currently Protected in Plan Area	4,962	65,064	9/39	n/a
Percentage Protected in Plan Area	83.2%	72.2%	75.0%/72.2%	n/a
Estimated Effects from Covered Activities:				
Freeway Improvement Project Direct Effects ¹	3.1	45.8	1/2	--
Freeway Improvement Project Indirect Effects	16.5	283.8	1/7	--
Preserve Management Direct Effects	0.1	5.9	--	--
Targets²	14.7	245.3	--	n/a
Conservation:				
Preserve Acquisitions	9.9	561.2	--	--
Restoration Projects	22.1	88.3	6/7	--
Total Conservation:	32.0	649.5	6/7	--
Conservation Above or Below Target	17.3	404.2	--	n/a
Protected in Plan Area After OCTA Acquisitions	4,972	65,625	9/39	n/a
Percentage Protected After OCTA Acquisitions	83.4%	72.8%	75.0%/72.2%	n/a

¹ Estimated direct effects are based on a “planning-level” footprint and adjusted to account for low precision and accuracy of regional vegetation data. Actual effects will most likely be less through the implementation of avoidance and minimization measures.

² Targets were calculated using the following formula: (direct effects * 2) + (indirect effects * 0.5). Targets include a conservative estimate of the amount of conservation required to offset the direct and indirect effects from Covered Activities.

Relevant Avoidance and Minimization Measures: The following checked measures are relevant to the protection, avoidance, and minimization of direct and indirect effects on this species:

<input checked="" type="checkbox"/>	Avoidance and Minimization of Sensitive Biological Areas	<input checked="" type="checkbox"/>	Wetland and Riparian Streambed Protection Program
<input checked="" type="checkbox"/>	Aquatic Resources and Species Policy	<input type="checkbox"/>	Nesting Birds Policy
<input type="checkbox"/>	Covered Plant Species Policy	<input checked="" type="checkbox"/>	Wildfire Protection Techniques
<input checked="" type="checkbox"/>	Wildlife Crossing Policy	<input checked="" type="checkbox"/>	Stormwater and Water Quality BMPs

Species Goal 7: Provide conservation of **western pond turtle** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.

Species Objective 7.1: OCTA will acquire a Preserve(s) with the potential to expand western pond turtle populations, potentially via translocation. OCTA will enhance the riparian and streambed habitat within the Preserve(s) to create and/or improve permanent and intermittent water sources that could provide habitat for western pond turtle.

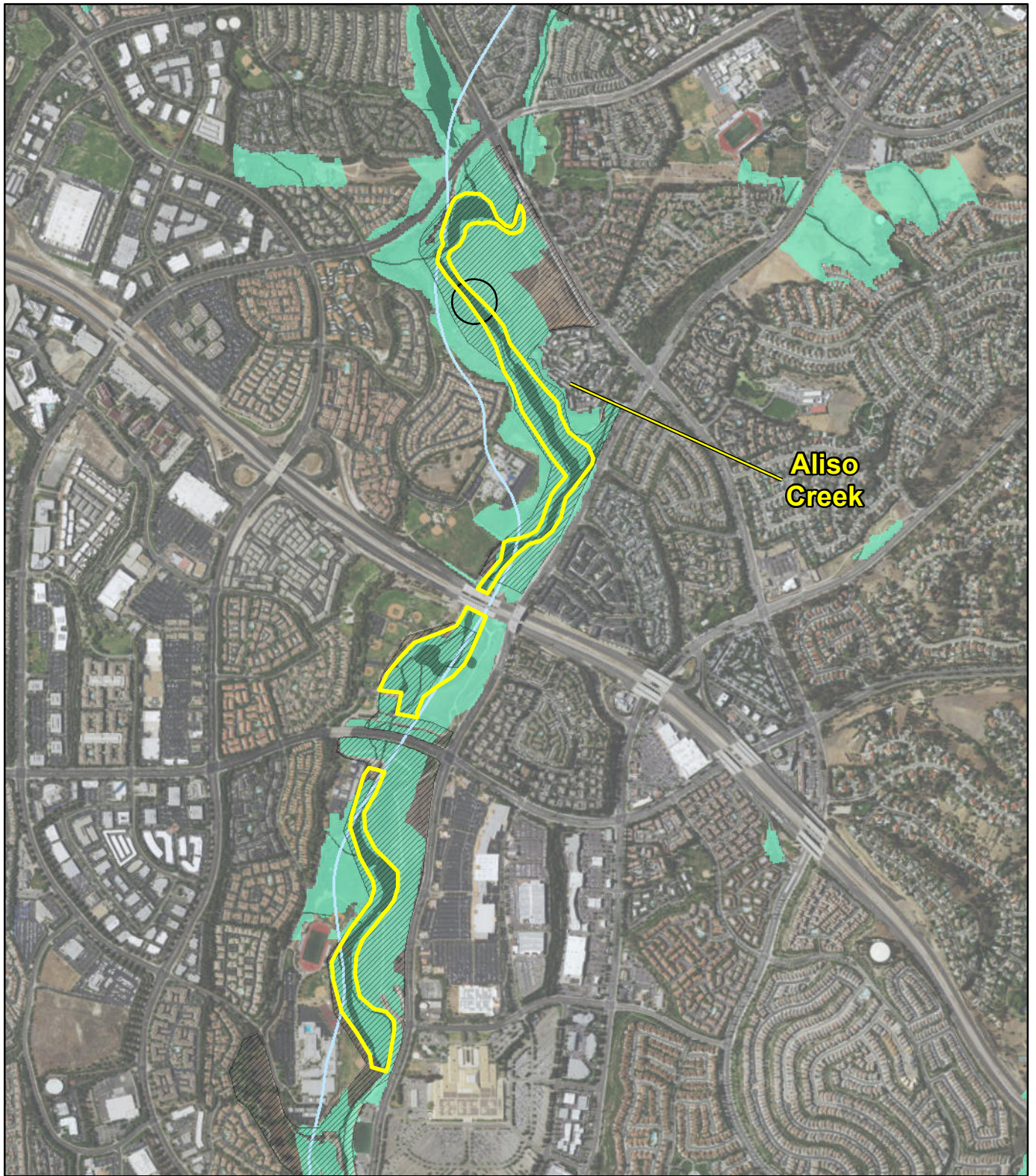
Conservation Analysis: OCTA has acquired the Hayashi Preserve in the Chino Hills area. The 2012 baseline survey of the Hayashi Preserve did not identify western pond turtles within the Preserve, but incidental observations of western pond turtle have been reported (observed in 2011) by Chino Hills State Park staff. OCTA has had fencing installed to remove grazing from the Preserve, which will allow the Soquel Canyon riparian zone to passively recover and expand. In addition, after the Freeway Complex Fire in 2008, numerous agencies and non-profits partnered to remove non-native species arundo (*Arundo donax*) from Carbon Creek, thereby expanding opportunities for aestivation and nesting habitat adjacent to the Hayashi Preserve. OCTA will identify appropriate management actions to improve western pond turtle habitat and use of the Preserve, such as monitoring and as-needed adaptive management through collaboration with, and agreement between, OCTA and the Wildlife Agencies, as part of the Preserve RMP. In order to understand the likelihood of pond turtle populations expanding into the Soquel Canyon riparian zone, OCTA will research and survey the area between the Hayashi Preserve and where nearby occurrence records have shown western pond turtle to be located to see if there are barriers to dispersal that could be addressed.

The Hayashi Preserve is located within a priority conservation area (unit “C”) of the Chino Hills core habitat area. This priority conservation area has been identified at a regional scale as supporting western pond turtle (CBI 2009), and the acquisition of the Hayashi Preserve contributes to the protection of this regionally important block of habitat (see Appendix C.5, “CBI Conservation Assessment Summary”). There are five known occurrences (two current and three historic) within 5 miles of the Hayashi Preserve. Therefore, acquisition of the Hayashi Preserve will protect habitat connectivity and enhance the potential to expand the distribution of western pond turtle.

This objective will be considered achieved when OCTA records conservation easements for the Hayashi Preserve and addresses species monitoring and management within the Hayashi RMP.



Species Objective 7.2: OCTA will implement a restoration project that will directly benefit known populations of western pond turtle by removing nonnative invasive plant species degrading the stream course, expanding ponds and open water, and/or exposing potential basking sites.

Conservation Analysis: OCTA has approved funding for the Aliso Creek restoration project, which involves 55 acres of riparian and transitional habitat restoration, including the removal of dense stands of arundo that have clogged the stream course and substantially degraded the quality of the stream as habitat for western pond turtle. There are five known occurrences of western pond turtle within the restoration project site, one CNDDDB record and four occurrences shown on a map of species occurrences at Aliso Creek provided by County of Orange (see Figure 6-16 and Appendix C.7, “Additional




**Aliso
Creek**

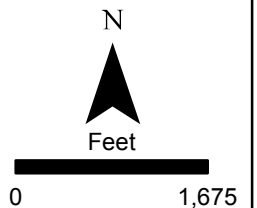
Legend

-  Currently Protected Lands
-  OCTA Funded Restoration Projects

- Predicted Habitat**
-  Aquatic Habitat
 -  Upland Habitat

- Species Occurrences**
-  Current Occurrence (1990 or later)

Sources:
 Species Occurrences: CNDDB 2013, USFWS 2013, USFS 2013
 Protected Lands: CBI 20009, ICF/TAIC/OCTA 2013
 Species Model: ICF/TAIC 2013



**Western Pond Turtle - Predicted Habitat and
Species Occurrences at Aliso Creek Restoration Project Site**

Figure 6-16

Species Occurrence Maps”). The restoration actions will improve western pond turtle habitat by improving water quality and aquatic habitat (exposing ponds and basking sites), enhancing aestivation habitat and access to aestivation habitat, and improving upland nesting habitat.

Western pond turtle have been documented upstream and downstream of the Aliso Creek restoration project location in relatively large numbers in Aliso and Woods Canyon Wilderness Park (Fisher et al. 2013). General habitat assessments and trapping have occurred within the southern portion of Aliso Creek, and it has been determined that there is a regionally significant population residing within the park. Studies and surveys have included western pond turtle relocations conducted as mitigation for other projects as well as USGS trapping efforts.

Restoration strategies and methods to benefit western pond turtle incorporated into the Aliso Creek Restoration Plan include:

- **Aestivation Habitat Enhancement**—western pond turtles utilize leaf litter, dried cattail marsh mats, existing burrows, and rock crevices to aestivate and over winter. The key requirement is that western pond turtles can find areas with relatively stable temperatures. Enhancing the southern willow scrub and mulefat scrub will be the most beneficial habitat feature for this species. These are the natural habitat types that western pond turtle would utilize to over winter or aestivate. It is particularly notable that dense populations of arundo will be removed from this habitat zone. The extensive arundo invasion of both aestivation and nesting habitat (discussed below) has significantly impeded western pond turtle movement, nesting, and aestivation, thereby impeding western pond turtle population growth.
- **Nesting Habitat Enhancement**—Because western pond turtles nesting strategy is to maximize soil surface temperatures for egg incubation, females typically lay their eggs at exposed bare ground patches within low-density vegetation (usually coastal sage scrub) in transitional zone or grass areas. Accordingly, transitional zone habitat will be planted to allow for appropriate density to encourage nesting.
- **Aquatic Enhancement**—Though the grading of new pools would benefit the species, the restoration project does not include grading or contouring within the stream channel. Nonetheless, removal of dense stands of arundo and other invasive species will enhance and expose existing pools. The improved pools and hydrologic functions will allow for western pond turtles to better thermo-regulate, avoid predators, locate mates for breeding, and provide areas for cover.
- **Basking Enhancement**—The addition of granite basking boulders will be evaluated in coordination with OCTA and Wildlife Agency personnel for possible addition to the project. Funds have been set aside within the budget to achieve this so long as the permit requirements (still to be analyzed) are not unexpectedly complicated or expensive to fulfill.
- **Establishment of New Western Pond Turtle Populations or Enhancement of Existing Populations**—Translocation of western pond turtle from other populations within Aliso Creek is also a consideration that will be evaluated in coordination with OCTA and Wildlife Agency personnel. There is presently a drop-structure barrier

separating the project from the large population of western pond turtle in lower Aliso Creek, thus, translocation may be a key step in supporting a larger western pond turtle population in the middle and northern portions of Aliso Creek, including the project.

This objective will be considered achieved when the Aliso Creek restoration project has met the specific success criteria.

Species Objective 7.3: OCTA will establish policies and procedures to avoid and minimize impacts on western pond turtle and its habitat.

Conservation Analysis: The Plan includes the Aquatic Resources and Species Policy that outlines appropriate avoidance and minimization measures for construction activities in aquatic resources, such as rivers, creeks, and riparian areas. Prior to ground-disturbing activities in or near aquatic habitats, the Construction Lead will conduct preconstruction surveys for western pond turtles to determine their presence or absence within the construction footprint. If western pond turtles are found within the construction footprint, the occupied habitat and appropriate buffer, as determined by a qualified biologist, will be avoided to the maximum extent practicable. If avoidance is not possible and the species is determined to be present in work areas, the biologist may capture turtles prior to construction activities and relocate them to nearby, suitable habitat a minimum of 300 feet downstream from the work area. Alternatively, if recommended and approved by the Wildlife Agencies, the turtles may be captured and either temporarily held or relocated to an appropriate, nearby location. Other policies that will provide for the protection of western pond turtle include the Avoidance and Minimization of Sensitive Biological Areas, Wildlife Crossing Policy, Stormwater and Water Quality BMPs, Wildfire Protection Techniques, and Wetland and Riparian Streambed Protection Program.

Rationale for Coverage:

The conservation actions and avoidance and minimization measures of the Plan are expected to achieve the biological goals and objectives for this species by conserving suitable aquatic and upland habitat, enhancing habitat quality by removing grazing impacts and enhancing riparian habitat on conserved land, enhancing and restoring habitat at restoration sites occupied by western pond turtle, and monitoring and managing the species. Implementation of the conservation actions will exceed the Plan target of 14.7 acres for aquatic habitat by 17.3 acres and will exceed the target of 245.3 acres for upland habitat by 404.4 acres.

This analysis focuses on effects on aquatic habitat and documented occurrences because modeled upland habitat is so broadly distributed within the Plan Area that it has limited value for this analysis. Nevertheless, as described above, impacts on modeled upland habitat are fully offset through conservation and restoration.

Approximately 3.1 acres of predicted aquatic habitat for western pond turtle are estimated to be directly affected by the covered freeway improvement projects, and 16.5 acres of western pond turtle aquatic habitat are within 300 feet of these projects and could be indirectly affected by an incremental increase in factors such as increased dust, pollution, and noise. In addition, up to 0.1 acre of aquatic habitat could be impacted by Preserve management activities. The impacts described above are out of a total of 5,963 acres of modeled aquatic habitat, so they represent a fraction of the

available habitat. There is one occurrence within the area of direct effects (Project C along Oso Creek) and one occurrence in the area of indirect effects (Project G along Brea Creek) for planned freeway improvement projects. There are 12 current pond turtle occurrences documented as part of the CNDDDB within the Plan Area and 18 historical occurrences, many of which may still be extant but have not been surveyed recently. Avoidance and minimization measures prior to and during project construction should minimize the potential effects on these areas, and the occurrences within the area of direct and indirect effects are anticipated to persist following project implementation. The predicted suitable habitat and occurrence in the area of direct impact for covered freeway improvement projects is not expected to be of high quality due to the proximity to the freeway, while the habitat that will be conserved and restored is expected to be of much higher quality and is well-connected to adjacent areas of protected suitable occupied habitat along the conserved and restored riparian corridors.

Conservation for western pond turtle includes the acquisition and preservation of 9.9 acres and the restoration of 22.1 acres of western pond turtle aquatic habitat. Known occupied habitat occurs within the Hayashi Preserve, and western pond turtles occur adjacent to the Aliso Creek restoration site and are anticipated to use the area following restoration. The conservation of the Hayashi Preserve will ensure that western pond turtles on the property are protected, and conservation will benefit the population by managing the habitat in a manner that benefits the species (e.g., removing grazing, enhancing basking sites). The Aliso Creek restoration project will substantially increase the quality of occupied habitat for western pond turtle and will enhance habitat connectivity along Aliso Creek. The biological benefits to western pond turtle from the conservation and management of the Hayashi Preserve and the restoration of Aliso Creek will be substantially greater than project-related impacts of up to 3.2 acres of western pond turtle aquatic habitat and indirect effects on 16.5 acres of habitat.

In summary, the conservation actions under the Plan will provide for the conservation and management of western pond turtle and will ensure that the impacts from Covered Activities are minimized and mitigated to the maximum extent practicable. As such, the Plan has been developed to meet the requirements under NCCPA sections 2820(a) and 2821, and ESA section 10(a) for the issuance of permits for western pond turtle.

6.4.8 Cactus Wren

Campylorhynchus brunneicapillus

Legal Status:	Federal:	Birds of Conservation Concern
	State:	CDFW Species of Special Concern
	Forest Service:	Sensitive

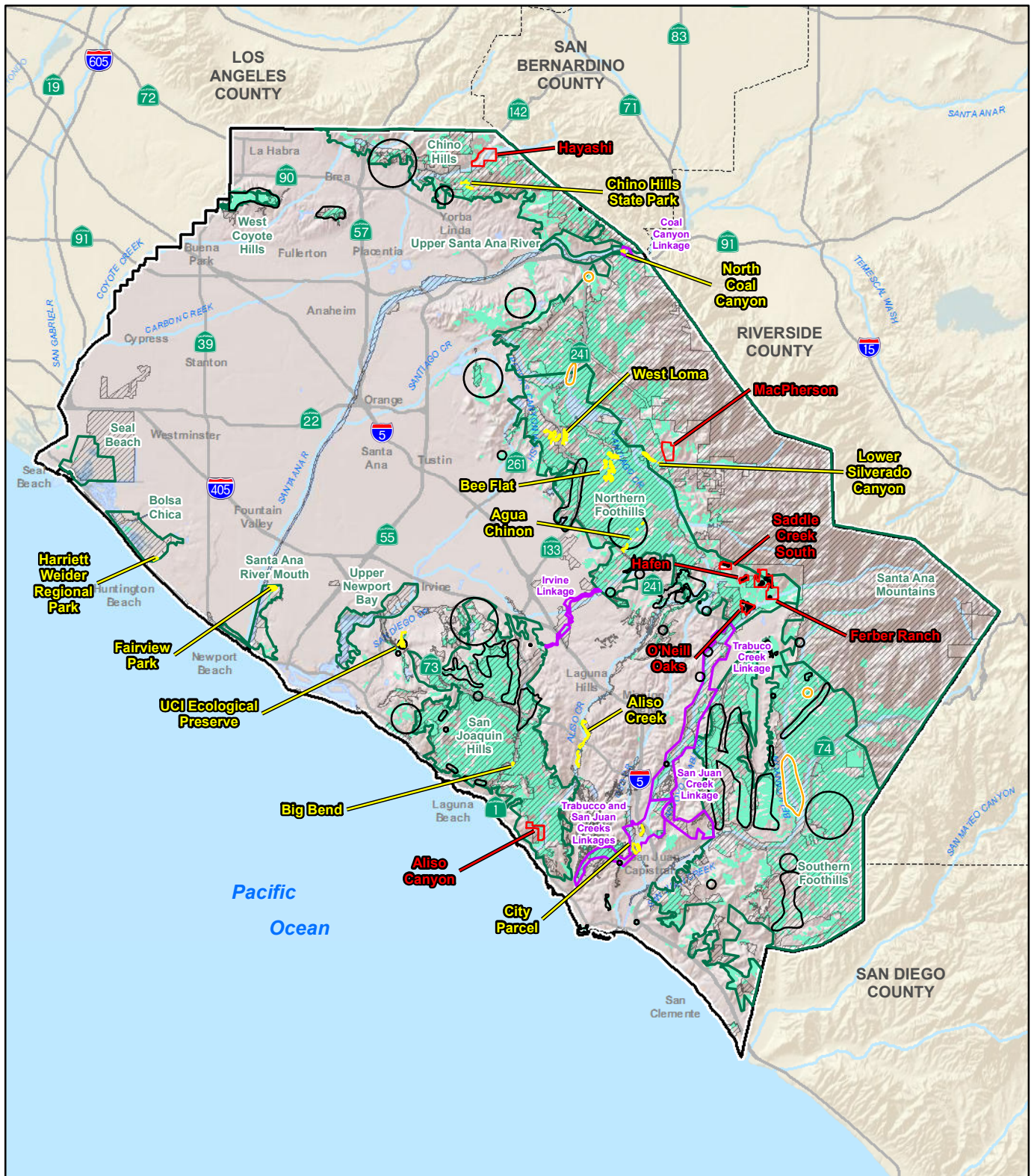
Recovery Plan:	None
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Background: The cactus wren is a diurnal non-migratory bird that is highly dependent on stands of cactus associated with the coastal sage scrub plant community and is rarely observed outside this specialized habitat. Nest sites are almost always associated with cactus thickets and are maintained throughout the year for both nesting and roosting purposes. Dispersal away from their breeding sites is minimal; young males often set up new territories just outside of their parental territory, and the average territory is 1.3 hectares (3.2 acres), varying from 0.8–2 hectares (2–5 acres). The range of the coastal cactus wren is very limited, extending from extreme northwestern Baja California north through the coastal lowlands of San Diego County and into Orange, Los Angeles, and Ventura counties and eastward to Riverside County. Continued threats to the cactus wren include habitat loss and fragmentation from urbanization and agricultural development. Intense fires may kill cactus plants and eliminate habitat. Recommendations for protecting the cactus wren include protection and maintenance of large blocks of cactus scrub with a substantial cactus component through fire suppression.



A 2015 study conducted by USGS examined the genetic structure of cactus wren in coastal southern California (Barr et al. 2015). The study determined that there are two populations within the Plan Area, the central Orange County population and coastal Orange County population. Although the effective population size of the coastal population is much smaller, it has a similar level of genetic diversity as the central population. Although there is evidence of recent genetic bottlenecks in both populations (attributed to past wildfire events), Barr et al. (2015) notes that “restoration of genetic connectivity among populations in future management plans could facilitate regional persistence of cactus wrens.” The Barr et al. (2015) study also notes that in places where there are not opportunities to restore connectivity, increasing available habitat can increase local population sizes and make them more robust to possible extinction as well as build genetic diversity over time. See Appendix C.2, “Covered Species Accounts,” for more information on species life history, habitat requirements, distribution, core areas, habitat linkages, and trends.




There are a total of 55,651 acres of predicted suitable habitat for cactus wren in the Plan Area. Over 77% of the predicted suitable habitat is currently protected (see Table 6-11 and Figure 6-17). Areas of unprotected cactus wren predicted habitat occur across the Plan Area, with the largest blocks in the Northern Foothills and Southern Foothills core habitat areas. Other areas of unprotected western cactus wren predicted habitat are mapped within the Upper Newport Bay, Chino Hills, Santa Ana Mountains, San Joaquin Hills, Chino Hills, Upper Newport Bay, Santa Ana River Mouth, Seal Beach, and West Coyote Hills core habitat areas.



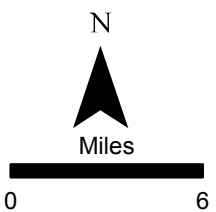
Legend

-  Currently Protected Lands
-  OCTA Acquired Preserves
-  OCTA Funded Restoration Projects

-  Core Habitat Areas
-  Linkage

-  Predicted Habitat
- Species Occurrences**
-  Current Occurrence (1990 or later)
-  Historic Occurrence (before 1990)

Sources:
 Species Occurrences Sources: Bonterra 2012, CNDBB 2013, USFWS 2013, USFS 2013, Bonterra-Psomas/OCTA/CDFW 2015
 Protected Lands: CBI 2009, ICF/TAIC/OCTA 2015
 Species Model: ICF/TAIC 2013
 Core and Linkage Areas: CBI 2009



Cactus Wren
Predicted Habitat and Species Occurrences with Protected Lands

Figure 6-17

Table 6-11. Conservation Analysis Summary: Cactus Wren

	Predicted Species Habitat Model (acres)	Current Known Occurrences (occurrences/individuals)	Critical Habitat (acres)
Total in Plan Area	55,651	80/558	n/a
Currently Protected in Plan Area	42,885	40/475	n/a
Percentage Protected in Plan Area	77.1%	50.0%/85.1%	n/a
Estimated Effects from Covered Activities:			
Freeway Improvement Project Direct Effects ¹	9.7	0	--
Freeway Improvement Project Indirect Effects	85.2	2/3	--
Preserve Management Direct Effects	2.7	--	--
Targets²	67.4	--	n/a
Conservation (to date):			
Preserve Acquisitions	254.7	26/26	--
Restoration Projects	14.5	4/19	--
Total Conservation:	269.2	30/45	--
Conservation Above or Below Target	201.8	--	n/a
Protected in Plan Area After OCTA Acquisitions	43,140	66/501	n/a
Percentage Protected After OCTA Acquisitions	77.5%	82.5%/89.8%	n/a

¹ Estimated direct effects are based on a “planning-level” footprint and adjusted to account for low precision and accuracy of regional vegetation data. Actual effects will most likely be less through the implementation of avoidance and minimization measures.

² Targets were calculated using the following formula: (direct effects * 2) + (indirect effects * 0.5). Targets include a conservative estimate of the amount of conservation required to offset the direct and indirect effects from Covered Activities.

Relevant Avoidance and Minimization Measures: The following checked measures are relevant to the protection, avoidance, and minimization of direct and indirect effects on this species:

<input checked="" type="checkbox"/>	Avoidance and Minimization of Sensitive Biological Areas	<input type="checkbox"/>	Wetland and Riparian Streambed Protection Program
<input type="checkbox"/>	Aquatic Resources and Species Policy	<input checked="" type="checkbox"/>	Nesting Birds Policy
<input type="checkbox"/>	Covered Plant Species Policy	<input checked="" type="checkbox"/>	Wildfire Protection Techniques
<input type="checkbox"/>	Wildlife Crossing Policy	<input type="checkbox"/>	Stormwater and Water Quality BMPs

Species Goal 8: Provide conservation of **cactus wren** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.

Species Objective 8.1: OCTA will protect and manage blocks of occupied cactus wren habitat to support sustainable populations and maintain habitat linkages between cactus wren populations within the Plan Area.

Conservation Analysis: OCTA has acquired four Preserves—Ferber Ranch, Hafen, O’Neill Oaks, and Saddle Creek South in the Trabuco Canyon area—that support nesting populations of cactus wren. During the baseline biological surveys of the Preserves, cactus wren occurrences were recorded on these Preserves. Additional observations of

cactus wren have been noted during monitoring visits at Ferber Ranch in 2013 (see image).



The acquisition of Preserves meets the broader biological goals and objectives of protecting viable populations of cactus wren within blocks of natural habitat connected to other areas of protected lands. The four Preserves in the Trabuco Canyon area are located within priority conservation areas of the Northern Foothills and Santa Ana Mountains core habitat areas. The acquisition of habitat Preserves within the Northern Foothills core habitat area provides for the conservation of core populations of cactus wren and adds to the protection of an important block of cactus scrub patches between the Orange County Southern Subregion HCP and Central-Coastal NCCP/HCP reserve systems (see Appendix C.5, “CBI Conservation Assessment Summary,” and Appendix C.7, “Additional Species Occurrence Maps”). In addition, based on available fire data, the vast majority of the Trabuco Canyon Preserves have not burned since 1919 (Unnamed Fire). These Preserves likely served as refugia for cactus wren during adjacent wildfire events (three in the past 50 years). Lastly, recent USGS genetics studies determined that the highest levels of habitat connectivity for cactus wren exists within the genetic cluster that includes Orange County (Barr et al. 2013, 2015). Barr et al. (2013) indicates that this cluster may be the most robust to stochastic processes and efforts to limit further habitat fragmentation should help retain genetic exchange among existing aggregations. By purchasing cactus wren occupied habitat in the Trabuco Canyon area, OCTA has further enhanced habitat connectivity for this important genetic cluster of cactus wren and implemented an important management recommendation for this species. There are 41 occurrences of cactus wren within 5 miles of the Preserves in the Trabuco Canyon area. The Aliso Canyon, Hayashi, and MacPherson Preserves have limited and/or marginally suitable habitat for cactus wren and no occurrences were recorded at these Preserves during the baseline surveys.

This objective will be considered achieved when OCTA records conservation easements for the four Preserves in the Trabuco Canyon area and implements species monitoring and management according to the RMPs for these Preserves.

Species Objective 8.2: OCTA will implement restoration projects focused on creating cactus scrub habitat to expand habitat in areas of known cactus wren populations.

Conservation Analysis: OCTA has approved for funding two restoration projects—UC Irvine Ecological Reserve and Chino Hills State Park—that include 14.5 acres of cactus scrub habitat in locations known to support cactus wren. Restoration of suitable cactus patches on these restoration sites is expected to increase the number of suitable nesting territories in the Plan Area and directly benefit this species.

The UC Irvine Ecological Reserve cactus scrub restoration project was installed in November 2011. The restoration site was selected based on the high density of exotic species, lack of mature cactus, soil type, aspect, and proximity to existing cactus wren. A total of 326 prickly pear cactus plants/clumps and segments were salvaged from the UC Irvine donor site and transplanted in 60 groups distributed across the restoration site. A

total of 1,200 cactus pads were collected and planted around the cactus clumps and segments and in clouds between the groups of clumps and segments. Even at the early stages of establishment, both cactus wrens and coastal California gnatcatchers were observed using the restoration area. The southern half of the restoration site has been used by a family group of cactus wren. Cactus wrens were observed foraging in the restoration site and a juvenile cactus wren was observed calling from planted prickly pear cactus clumps (Land IQ 2014).

Barr et al. (2015) notes that “restoration of genetic connectivity among populations in future management plans could facilitate regional persistence of cactus wrens.” The study also notes that in places where there are no opportunities to restore connectivity, increasing available habitat can increase local population sizes and make them more robust to possible extinction as well as build genetic diversity over time. The NCC, with matching funds from the California Natural Resources Agency (EEMP grant), CDFW LAG, California Department of Parks and Recreation (CDPR), and Caltrans, has funded approximately 45 acres of cactus scrub restoration (NCC 2014, 2015), while OCTA is funding the restoration of 14.5 acres of cactus scrub habitat including 8.5 acres in the Coastal Reserve, and 6 acres in Chino Hills State Park (Table 6-11). At least two of the restored sites are being used by cactus wrens including, as noted above, the OCTA-funded UC Irvine Ecological Reserve site (NCC 2014, Land IQ 2014). Additionally, NCC has translocated cactus wrens belonging to the central Orange County population to areas in the Coastal Reserve, which has resulted in offspring between translocated and resident birds (Kamada and Mitrovich 2015). This may help increase genetic diversity in the coastal Orange County population and further increase its chances of persistence, as gene flow, even when weak, has been shown to counter the loss of genetic diversity (Palstra and Ruzzante 2008).

This objective will be considered achieved when the UC Irvine Ecological Reserve and Chino Hills State Park restoration projects have met their specific success criteria.

Species Objective 8.3: OCTA will establish policies and procedures to avoid and minimize impacts on cactus wren habitat, including cactus scrub.

Conservation Analysis: The Plan includes policies that will require covered freeway improvement projects to be designed and constructed in a manner that avoids and/or minimizes impacts on sensitive biological resources, including cactus scrub. Temporary staging areas, access roads, and other project components that have the flexibility to be sited outside of sensitive areas will be incorporated into the project design. Best management practices will be followed to delineate environmentally sensitive areas and provide for training and monitoring to ensure these areas are protected. If temporary impacts on cactus sage scrub cannot be avoided, these areas will be restored to their previous conditions. Other policies that will provide for the protection of cactus wren include the Nesting Birds Policy and Wildfire Protection Techniques.

This objective will be considered achieved through implementation of the Plan avoidance and minimization measures.

Rationale for Coverage:

The conservation actions and avoidance and minimization measures of the Plan are expected to achieve the biological goals and objectives for this species by conserving and restoring large blocks of occupied cactus wren habitat, by expanding the amount of available suitable habitat, and monitoring and managing the species. Implementation of the conservation actions will exceed the Plan target of 67.4 acres by 201.8 acres.

There are no known occurrences within the area of direct effects and two known occurrences within the area of indirect effects for planned freeway improvement projects. Approximately 9.7 acres of predicted suitable habitat occur are estimated to be directly affected by covered freeway improvement projects, and 85.2 acres of cactus wren habitat within 300 feet of these projects could be indirectly affected by an incremental increase in factors such as increased nitrogen deposition, dust, and noise. In addition, up to 2.7 acres of cactus wren habitat could be impacted by Preserve management activities. There are 55,651 acres of predicted suitable habitat in the Plan Area, so the impacts represent a fraction of the total predicted habitat within the Plan Area. The amount of habitat with cactus patches suitable for nesting habitat within the predicted suitable habitat area is unknown but is far less than the total area of predicted suitable habitat. Potential effects on cactus wren habitat are expected to be minimal. Cactus wren populations occur on several Preserves and restoration sites, which indicate the higher quality of this habitat as compared to the potentially impacted habitat. The conservation and restoration areas are well-connected to large blocks of protected habitat and other areas of occupied cactus wren habitat.

OCTA has acquired four Preserves in the Trabuco Canyon area, with 17 cactus wren occurrences observed during recent protocol surveys. In addition, two of the restoration projects include cactus scrub restoration contiguous with habitat that is occupied by cactus wrens. In total, there are 254.7 acres of cactus wren predicted suitable habitat in the Preserves, and an additional 14.5 acres of cactus scrub that will be restored or enhanced. The Preserves in the Trabuco Canyon area will help conserve occupied habitat for this species and help maintain landscape-level connectivity between the large cactus wren populations in the Central-Coastal NCCP/HCP Central Reserve system to the north and in the Orange County Southern Subregion HCP Reserve system to the south (Figure 6-17). The biological benefits to cactus wrens from the conservation and management of these Preserves and the habitat restoration will be substantially greater than the potential direct loss of up to 12.4 acres of cactus wren predicted suitable habitat and indirect effects on 85.2 acres of predicted suitable habitat.

In summary, the conservation actions under the Plan will provide for the conservation and management of cactus wren and will ensure that the impacts from Covered Activities are minimized and mitigated to the maximum extent practicable. As such, the Plan has been developed to meet the requirements under NCCPA sections 2820(a) and 2821, and ESA section 10(a) for the issuance of permits for cactus wren.

6.4.9 Coastal California Gnatcatcher

Polioptila californica californica

Legal Status:	Federal:	Threatened
	State:	CDFW Species of Special Concern

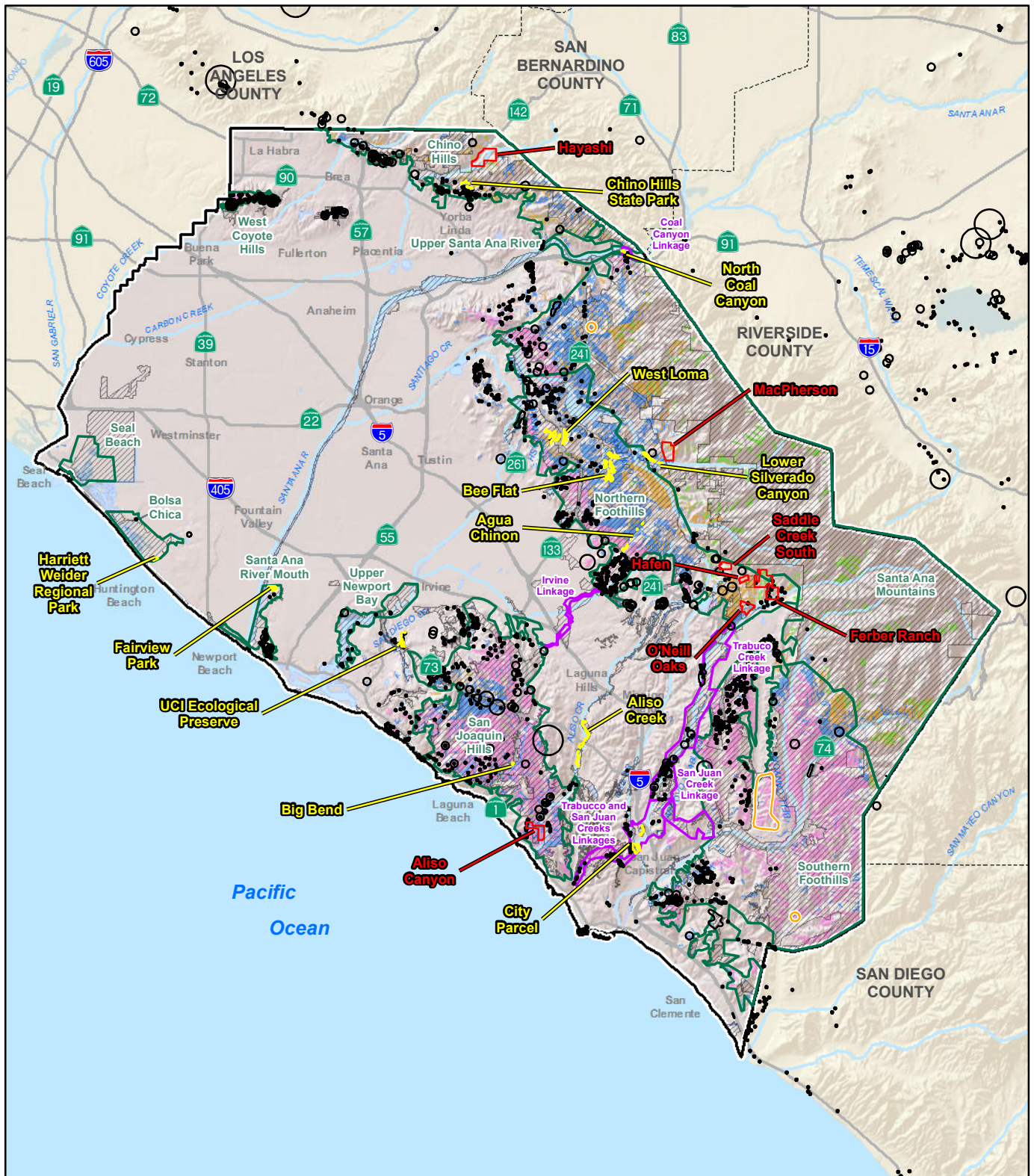
Recovery Plan:	None
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Background: The coastal California gnatcatcher (gnatcatcher) is the northern subspecies of a small gray, slender songbird, with a predominantly black tail below. The breeding season for the gnatcatcher extends from February through August, with the peak months being March through June. The gnatcatcher is a local, uncommon, obligate resident of the maritime and coastal climate zones of southern California, primarily below about 500 meters (1,600 feet), with records extending rarely to about 1,000 meters (3,280 feet). These gnatcatchers are dependent upon, and occur in or near, sage scrub vegetation. Currently, the subspecies is known to occur on coastal slopes of southern California, ranging from southern Ventura County southward through Palos Verdes Peninsula in Los Angeles County through Orange, Riverside, San Bernardino, and San Diego counties into Baja California to El Rosario, Mexico. The primary threat to gnatcatchers is the loss and degradation of coastal sage scrub habitat, exacerbated by fragmentation, edge effects, environmental variability, and the risks of small population size. Both fire and brown-headed cowbird brood parasitism have increased in frequency, and threaten the species. See Appendix C.2, “Covered Species Accounts,” for more information on species life history, habitat requirements, distribution, core areas, habitat linkages, and trends.

The predicted suitable habitat model for coastal California gnatcatcher ranks patches of scrub habitat based on nesting habitat value to the gnatcatcher. The criteria for determining habitat value were patch size and shape, slope, and elevation, all of which have been shown to be correlated with use by the coastal California gnatcatcher. This model has been used as part of the preparation of other regional conservation plans in southern California (e.g., the San Diego and North County Multiple Species Conservation Programs) and validated by USFWS for regional monitoring of gnatcatchers (Winchell and Doherty 2008). There are 65,607 acres of predicted coastal California gnatcatcher suitable habitat in the Plan Area. Over 77% of the predicted habitat is currently protected (see Table 6-12 and Figures 6-18). Areas of unprotected coastal California gnatcatcher suitable habitat occur across the Plan Area, with the largest blocks in the Santa Ana Mountains, Northern Foothills, and Southern Foothills core habitat areas and other areas within the Upper Newport Bay, Chino Hills, San Joaquin Hills, Santa Ana River Mouth, Seal Beach, and West Coyote Hills core habitat areas.

A study by USGS (Vandergast et al. 2014) evaluating the genetic structure of coastal California gnatcatcher in southern California identified the individual relatedness patterns and population genetic structure among gnatcatcher aggregations throughout their U.S. range, which includes portions of Ventura, Los Angeles, Orange, Riverside, San Bernardino, and San Diego Counties. A total of 268 individuals from across this region were genotyped and determined to form a single genetic cluster (i.e. genetic population). Vandergast et al. (2014) state that “gnatcatchers are able to move among most patches of suitable habitat given the current spatial arrangement of coastal sage scrub habitat in southern California and their intrinsic movement and dispersal behavior. As a consequence, gnatcatchers form a linked metapopulation with a large effective population size over most of the southern California range.” More information is included in Appendix C.3, “Covered Species Models.”



Legend

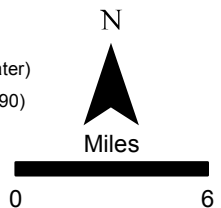
- Currently Protected Lands
- OCTA Acquired Preserves
- OCTA Funded Restoration Projects
- Core Habitat Areas
- Linkage

- Habitat Suitability**
- Very High
 - High
 - Low
 - Moderate

- Species Occurrences**
- Current Occurrence (1990 or later)
 - Historic Occurrence (before 1990)

Sources:

Species Occurrences Sources: Bonterra 2012, CNDDb 2013, USFWS 2013, USFS 2013, Bonterra-Psomis/OCTA/CDFW 2015
 Protected Lands: CBI 2009, ICF/TAIC/OCTA 2015
 Species Model: ICF/TAIC 2015
 Core and Linkage Areas: CBI 2009



**Coastal California Gnatcatcher
 Predicted Habitat and Species Occurrences with Protected Lands**

Figure 6-18

Table 6-12. Conservation Analysis Summary: Coastal California Gnatcatcher

	Predicted Species Habitat Model (acres)					Current Known Occurrences (occurrences/individuals)	Critical Habitat (acres)
	Very High	High	Mod.	Low	Total		
Total in Plan Area	30,066	22,355	8,430	4,756	65,607	1,828/3,419	18,752
Currently Protected in Plan Area	23,607	17,469	6,320	3,733	51,129	1,208/2,259	8,463
Percentage Protected in Plan Area	78.5%	78.1%	75.0%	78.5%	77.9%	66.0%/66.1%	45.1%
Estimated Effects from Covered Activities:							
Freeway Improvement Project Direct Effects ¹	2.4	3.5	2.7	1.7	10.3	2/6	53.9
Freeway Improvement Project Indirect Effects	13.9	53.1	24.2	4.8	96.0	5/9	182.7
Preserve Management Direct Effects	1.2	0.8	1.4	1.1	4.5	-	6.4
Targets²	14.1	35.1	20.3	8.0	77.5	-	212.0
Conservation (to date):							
Preserve Acquisitions	110.4	73.5	131.9	106.3	422.1	15/26	608.5
Restoration Projects	14.3	126.5	0.0	0.0	140.8	13/21	5.5
Total Conservation:	124.7	200.0	131.9	106.3	562.9	28/47	614.0
Conservation Above or Below Target	110.6	164.9	111.6	98.3	485.4	-	402.0
Protected in Plan Area After OCTA Acquisitions	23,717	17,543	6,452	3,839	51,551	1,223/2,285	9,072
Percentage Protected After OCTA Acquisitions	78.9%	78.5%	76.5%	80.7%	78.6%	66.9%/66.8%	48.4%

¹ Estimated direct effects are based on a “planning-level: footprint and adjusted to account for low precision and accuracy of regional vegetation data. Actual effects will most likely be less through the implementation of avoidance and minimization measures.

² Targets were calculated using the following formula: (direct effects * 2) + (indirect effects * 0.5). Targets include a conservative estimate of the amount of conservation required to offset the direct and indirect effects from Covered Activities.

Relevant Avoidance and Minimization Measures: The following checked measures are relevant to the protection, avoidance, and minimization of direct and indirect effects on this species:

<input checked="" type="checkbox"/>	Avoidance and Minimization of Sensitive Biological Areas	<input type="checkbox"/>	Wetland and Riparian Streambed Protection Program
<input type="checkbox"/>	Aquatic Resources and Species Policy	<input checked="" type="checkbox"/>	Nesting Birds Policy
<input type="checkbox"/>	Covered Plant Species Policy	<input checked="" type="checkbox"/>	Wildfire Protection Techniques
<input type="checkbox"/>	Wildlife Crossing Policy	<input type="checkbox"/>	Stormwater and Water Quality BMPs

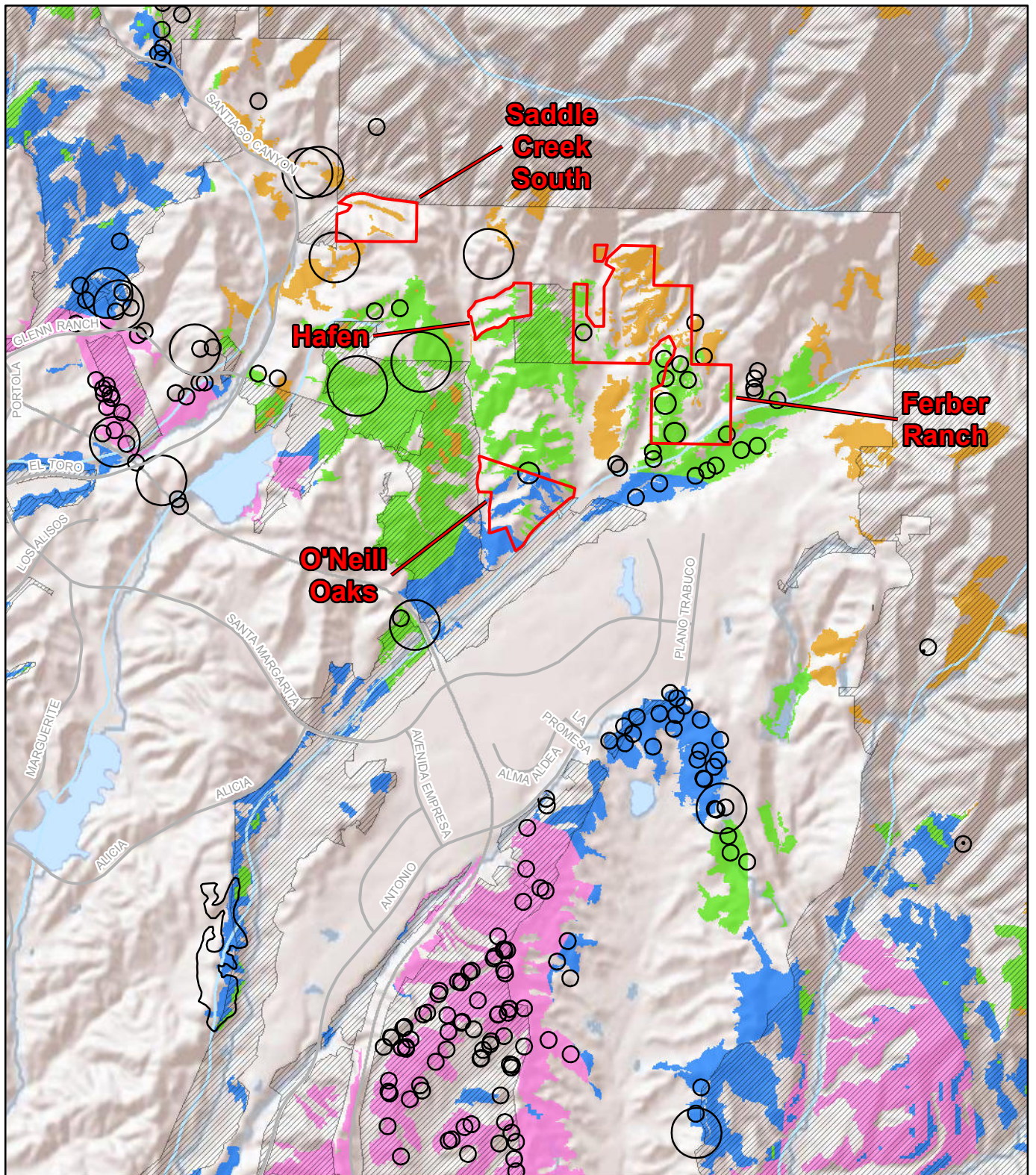
Species Goal 9: Provide conservation of **coastal California gnatcatcher** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.

Species Objective 9.1: OCTA will protect and manage blocks of occupied gnatcatcher nesting habitat to support sustainable populations and maintain habitat linkages between coastal California gnatcatcher populations within the Plan Area.



Conservation Analysis: OCTA has acquired six Preserves—Aliso Canyon, Ferber Ranch, Hafen, MacPherson, O’Neill Oaks, and Saddle Creek South—that protect coastal sage scrub habitat and/or support nesting populations of coastal California gnatcatchers. During baseline surveys of the Preserves, occurrences of coastal California gnatcatchers were noted at the Ferber Ranch and O’Neill Oaks Preserves and adjacent to the Aliso Canyon Preserve (see Appendix C.6, “Baseline Biological Survey Reports”). In addition, previous sightings have been recorded at Saddle Creek South and Ferber Ranch Preserves. Coastal California gnatcatcher were not observed at MacPherson, although coastal sage scrub habitat within this Preserve is high quality and is in large enough patches to support pairs. While the MacPherson Preserve is near the edge of the elevation range of coastal California gnatcatcher, the location of this Preserve could serve as a habitat refugia from fire, a stepping stone for regional connectivity, and/or support coastal California gnatcatcher in the future based on habitat/range changes due to climate change. The populations on the Preserves and any additional populations detected on the Preserves in the future will be protected and monitored as part of the Preserve RMPs. Management actions could include restricting access in proximity to occupied habitat, managing fire frequency, and restoring/managing quality of coastal sage scrub.

The four Preserves in the Trabuco Canyon area are located within the priority conservation areas of the Northern Foothills and Santa Ana Mountains core habitat areas. The acquisition of habitat Preserves within the Northern Foothills Core Habitat area provides for the conservation of core populations of coastal California gnatcatcher and contributes to the protection of a block of habitat with high biodiversity (see Appendix C.5, “CBI Conservation Assessment Summary”). These Preserves add to the protection of important blocks of coastal sage scrub between the Orange County Southern Subregion HCP and Central-Coastal NCCP/HCP reserve systems and provide suitable habitat at a low elevation for movement of gnatcatchers. The Preserves are adjacent to existing protected areas with additional suitable habitat and known occurrences of coastal California gnatcatcher (Figure 6-19 and Appendix C.7, “Additional Species Occurrence Maps”). There are 397 known occurrences of coastal California gnatcatchers within 5 miles of the Preserves in the Trabuco Canyon area. The acquisition and management of the Preserves in the Trabuco Canyon area will protect and enhance habitat connectivity of this species.





This objective will be considered achieved when OCTA records conservation easements for these six Preserves, and implements species monitoring and management according to the RMPs for these Preserves.




Legend

-  Currently Protected Lands
-  OCTA Acquired Preserves

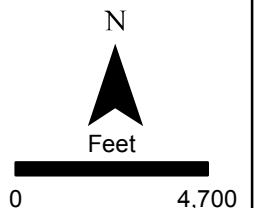
Habitat Suitability

-  Very High
-  High
-  Moderate
-  Low

Species Occurrences

-  Current Occurrence (1990 or later)

Sources:
 Species Occurrences: CNDDB 2013, USFWS 2013, USFS 2013, Bonterra 2012
 Protected Lands: CBI 20009, ICF/TAIC/OCTA 2015
 Species Model: ICF/TAIC 2015



Coastal California Gnatcatcher - Predicted Habitat and Species Occurrences at Trabuco Canyon Preserves

Figure 6-19

Species Objective 9.2: OCTA will restore and/or enhance coastal sage scrub habitat to expand coastal California gnatcatcher habitat.

Conservation Analysis: OCTA has approved funding for eight restoration projects that include restoration of coastal sage scrub and cactus scrub habitat, totaling 140.7 acres. The Big Bend, City Parcel, Fairview Park, Harriett Weider Regional Park, Lower Silverado Canyon, UC Irvine Ecological Reserve, Chino Hills State Park, and North Coal Canyon restoration projects will restore coastal sage scrub and cactus scrub habitat in locations important for providing for coastal California gnatcatcher movement and dispersal. The coastal sage scrub restoration that is part of the West Loma and Agua Chinon/Bee Flat Canyon restoration projects will improve coastal California gnatcatcher habitat within the Central-Coastal NCCP/HCP Central Reserve system. The restoration of coastal sage scrub habitat is expected to increase the availability of nesting territories, expand foraging habitat, and improve habitat connectivity in the Plan Area.

This objective will be considered achieved when the Big Bend, City Parcel, Fairview Park, Harriett Weider Regional Park, Lower Silverado Canyon, UC Irvine Ecological Reserve, Chino Hills State Park, and North Coal Canyon restoration projects have met their specific success criteria.

Species Objective 9.3: OCTA will establish policies and procedures to avoid and minimize impacts on coastal California gnatcatcher habitat, including coastal sage scrub.

Conservation Analysis: The Plan includes policies that will require covered freeway improvement projects be designed in a manner that avoids and/or minimizes impacts on sensitive biological resources, including coastal sage scrub. Temporary staging areas, access roads, and other project components that have the flexibility to be sited outside of sensitive areas will be incorporated into the project design. Best management practices will be followed to delineate environmentally sensitive areas and provide for training and monitoring to ensure these areas are protected. If temporary impacts on coastal sage scrub cannot be avoided, these areas will be restored to their previous conditions. Other policies that will provide for the protection of coastal California gnatcatcher include the Nesting Birds Policy and Wildfire Protection Techniques.

This objective will be considered achieved through implementation of the Plan avoidance and minimization measures.

Rationale for Coverage:

The conservation actions and avoidance and minimization measures of the Plan are expected to achieve the biological goals and objectives for this species by conserving large blocks of suitable breeding habitat within the Trabuco Canyon area, restoring additional habitat in multiple locations, and monitoring and managing the species. Implementation of the conservation actions will exceed the Plan target of 77.5 acres of total coastal California gnatcatcher predicted suitable habitat by 485.4 acres.

Two known occurrences are in the area of direct effects and five occurrences are in the area of indirect effects for planned freeway improvement projects. There are 10.3 acres of predicted suitable habitat for coastal California gnatcatcher estimated to be directly affected by covered freeway improvement projects and 96.0 acres of coastal California gnatcatcher habitat within 300 feet of these projects that could be indirectly affected by an incremental increase in factors such as

increased nitrogen deposition, dust, and noise. In addition, up to 4.5 acres of coastal California gnatcatcher habitat could be impacted by Preserve management activities. There are 65,608 acres of predicted suitable habitat and 1,825 current gnatcatcher occurrences within the Plan Area, so the expected effect on individuals of this species in the potential impact area represents a fraction of the total population within the Plan Area. The predicted suitable habitat in the area of direct impact for covered freeway improvement projects is adjacent to major freeways and not expected to be of high quality, while the conserved and restored habitat will be of much higher quality and is well-connected to adjacent large blocks of protected habitat.

OCTA has acquired four Preserves in the Trabuco Canyon area that support 15 occurrences of coastal California gnatcatchers. In addition, eight of the restoration projects include coastal sage scrub or cactus scrub restoration that is within or adjacent to habitat occupied by coastal California gnatcatchers. In total, there are 422.1 acres of coastal California gnatcatcher habitat in the Preserves (Figure 6-19), and an additional 140.8 acres of coastal sage scrub and cactus scrub will be restored or enhanced. The Preserves in the Trabuco Canyon area will help conserve occupied habitat for this species and help maintain landscape-level connectivity between the large coastal California gnatcatcher populations in the Central-Coastal NCCP/HCP Central Reserve system to the north and in the Orange County Southern Subregion HCP Reserve system to the south (Figure 6-17). The Trabuco Canyon and MacPherson Preserves are situated in locations that can serve as habitat refugia from fire and/or stepping stones for regional connectivity. The biological benefits to coastal California gnatcatchers from the conservation and management of these Preserves and the habitat restoration will be substantially greater than the potential direct loss of up to 14.8 acres of coastal California gnatcatcher habitat and indirect effects on 96.0 acres of habitat.

The conservation actions under the Plan will provide for the conservation and management of coastal California gnatcatchers and will ensure that the impacts from Covered Activities are minimized and mitigated to the maximum extent practicable. As such, the Plan has been developed to meet the requirements under NCCPA sections 2820(a) and 2821, and ESA section 10(a) for the issuance of permits for coastal California gnatcatchers.

6.4.10 Least Bell's Vireo

Vireo bellii pusillus

Legal Status: Federal: Endangered
State: Endangered

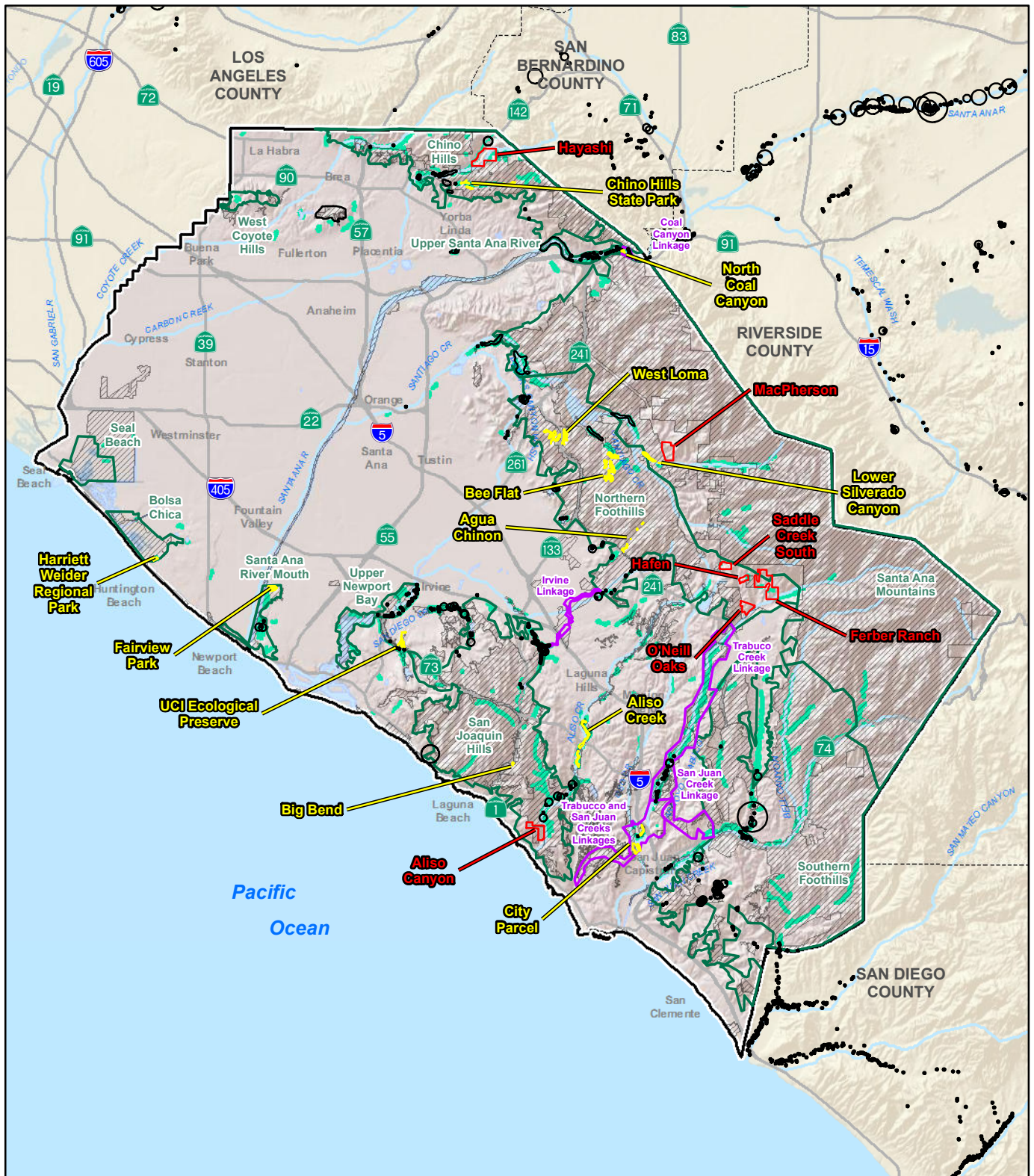
Recovery Plan: No



Background: The least Bell's vireo is a small, migratory species with a breeding season from mid-March through August. Least Bell's vireo is a riparian species typically associated with southern willow scrub, cottonwood forest, mule fat scrub, sycamore alluvial woodland, coast live oak riparian forest, and arroyo willow riparian. They prefer areas with dense cover within 2 meters (7 feet) above the ground and a dense, stratified canopy. The increase of, and parasitism by, the brown headed cowbird combined with clearing of riparian vegetation had decimated the least Bell's vireo populations during the latter half of the 20th century. Least Bell's vireo formerly was a common and widespread summer resident below about 600 meters (2,000 feet) throughout the Sacramento and San Joaquin valleys and in the coastal valleys and foothills from Santa Clara County south into northern Mexico. It also occurred east of the Sierra Nevada below about 1,200 meters (4,000 feet) in the Owens and Benton valleys and along the Mojave River and other streams of the western to central deserts. Least Bell's vireo has experienced habitat losses throughout their historic range, resulting in small fragmented, widely dispersed subpopulations. Furthermore, their susceptibility to cowbird parasitism increases as their preferred riparian habitat gets fragmented and more exposed. Other threats include alteration of water supplies to riparian systems, stream modification and channelization, overgrazing, road noise, pollutants, and invasion of habitat by nonnative plant species.

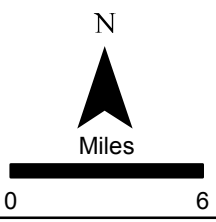
The largest current concentrations of least Bell's vireo are in San Diego County along the Santa Margarita River on Marine Corps Base Camp Pendleton and in Riverside County at the Prado flood control basin (USFWS 2006). The vireo population in the U.S. has increased tenfold since its listing in 1986, from 291 to 2,968 known territories (USFWS 2006). Population growth has been greatest in San Diego County and Riverside County, with lesser but significant increases in Orange, Ventura, San Bernardino, and Los Angeles Counties (USFWS 2006). It is currently likely that any drainage with suitable habitat in the Plan Area support least Bell's vireo (Galvin pers. comm.). See Appendix C.2, "Covered Species Accounts," for more information on species life history, habitat requirements, distribution, core areas, habitat linkages, and trends.

There are 4,466 acres of predicted least Bell's vireo suitable habitat in the Plan Area. Over 72% of the predicted habitat is currently protected (see Table 6-13 and Figure 6-20). Areas of unprotected least Bell's vireo suitable habitat occur across the Plan Area, with the largest blocks in the Upper Santa Ana River, Santa Ana Mountains, Northern Foothills, Chino Hills, and Upper Newport Bay core habitat areas. Other areas of unprotected least Bell's vireo suitable habitat are mapped within the San Joaquin Hills, Southern Foothills, Santa Ana River Mouth, Bolsa Chica, and West Coyote Hills core habitat areas.



- Legend**
- Currently Protected Lands
 - OCTA Acquired Preserves
 - OCTA Funded Restoration Projects
 - Core Habitat Areas
 - Linkage
 - Predicted Habitat
 - Current Occurrence (1990 or later)

Sources:
 Species Occurrences Sources: Bonterra 2012, CNDDDB 2013, USFWS 2013, USFS 2013, Bonterra-Psomas/OCTA/CDFW 2015
 Protected Lands: CBI 20009, ICF/TAIC/OCTA 2015
 Species Model: ICF/TAIC 2013
 Core and Linkage Areas: CBI 2009



Least Bell's Vireo
Predicted Habitat and Species Occurrences with Protected Lands

Figure 6-20

Table 6-13. Conservation Analysis Summary: Least Bell’s Vireo

	Predicted Species Habitat Model (acres)	Current Known Occurrences (occurrences/ individuals)	Critical Habitat (acres)
Total in Plan Area	4,466	413/874	n/a
Currently Protected in Plan Area	3,224	258/576	n/a
Percentage Protected in Plan Area	72.2%	62.5%/65.9%	n/a
Estimated Effects from Covered Activities:			
Freeway Improvement Project Direct Effects ¹	4.9	4/21	--
Freeway Improvement Project Indirect Effects	55.2	10/14	--
Preserve Management Direct Effects	0.1	--	--
Targets²	37.5	--	n/a
Conservation (to date):			
Preserve Acquisitions	8.7	0	--
Restoration Projects	110.4	8/8	--
Total Conservation:	119.1	8/8	--
Conservation Above or Below Target	81.6	--	n/a
Protected in Plan Area After OCTA Acquisitions	3,233	258/576	n/a
Percentage Protected After OCTA Acquisitions	72.4%	62.5%/65.9%	n/a

¹ Estimated direct effects are based on a “planning-level” footprint and adjusted to account for low precision and accuracy of regional vegetation data. Actual effects will most likely be less through the implementation of avoidance and minimization measures.

² Targets were calculated using the following formula: (direct effects * 2) + (indirect effects * 0.5). Targets include a conservative estimate of the amount of conservation required to offset the direct and indirect effects from Covered Activities.

Relevant Avoidance and Minimization Measures: The following checked measures are relevant to the protection, avoidance, and minimization of direct and indirect effects on this species:

<input checked="" type="checkbox"/>	Avoidance and Minimization of Sensitive Biological Areas	<input checked="" type="checkbox"/>	Wetland and Riparian Streambed Protection Program
<input type="checkbox"/>	Aquatic Resources and Species Policy	<input checked="" type="checkbox"/>	Nesting Birds Policy
<input type="checkbox"/>	Covered Plant Species Policy	<input checked="" type="checkbox"/>	Wildfire Protection Techniques
<input type="checkbox"/>	Wildlife Crossing Policy	<input type="checkbox"/>	Stormwater and Water Quality BMPs

Species Goal 10: Provide conservation of **least Bell’s vireo** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.

Species Objective 10.1: OCTA will acquire a Preserve with the potential to enhance riparian habitat to expand least Bell’s vireo habitat.

Conservation Analysis: OCTA has acquired the Hayashi Preserve in the Chino Hills area, which has an existing riparian corridor along Soquel Canyon that has been historically disturbed by grazing. OCTA has taken steps to remove grazing from the riparian corridor by installing fencing to allow for the passive restoration of riparian habitat. This approach has had recent documented success where grazing was removed in the

adjacent Chino Hills State Park. The habitat recovered shortly after grazing was removed from the riparian zone and least Bell's vireo subsequently reoccupied the area. There are known least Bell's vireo occurrences above and below the Hayashi Preserve that are expected to act as a source population for vireo to recolonize the Hayashi riparian habitat as the riparian habitat recovers. A total of 41 known occurrences of least Bell's vireo are within 5 miles of the Hayashi Preserve.

The Hayashi Preserve is located within a priority conservation area (unit "C") of the Chino Hills core habitat area. This priority conservation area has been identified at a regional scale as supporting least Bell's vireo (CBI 2009), and the acquisition of the Hayashi Preserve contributes to the conservation of this regionally important block of habitat (see Appendix C.5, "CBI Conservation Assessment Summary").

This objective will be considered achieved when OCTA records conservation easements for the Hayashi Preserve and implements species monitoring and management according to the Hayashi RMP.

Species Objective 10.2: OCTA will restore and/or enhance riparian habitat adjacent to occupied least Bell's vireo habitat.

Conservation Analysis: OCTA has approved funding for the Aliso Creek and City Parcel restoration projects, which include restoration of 68.0 acres of riparian habitat. Each of these restoration projects has documented occurrences of least Bell's vireo within the project site. There are seven known occurrences at the Aliso Creek restoration site (see Appendix C.7, "Additional Species Occurrence Maps," showing an occurrence map from County of Orange) and one known occurrence on the City Parcel restoration site (CNDDDB occurrence). The restoration of riparian habitat on Aliso Creek and Arroyo Trabuco is expected to increase the availability of suitable nesting habitat for least Bell's vireo and improve habitat connectivity in the Plan Area.

This objective will be considered achieved when the Aliso Creek and City Parcel restoration projects have met their specific success criteria.

Species Objective 10.3: OCTA will restore and/or enhance riparian habitat in areas not currently occupied by least Bell's vireo to encourage future expansion of the species distribution within the Plan Area.

Conservation Analysis: OCTA has approved funding for five restoration projects that include restoration of riparian habitat (totaling 41.4 acres) in locations with documented occurrences of least Bell's vireo in the vicinity. These restoration projects are Fairview Park, Lower Silverado Canyon, Chino Hills, West Loma, and Agua Chinon/Bee Flat Canyon. These riparian habitat restoration projects will create suitable least Bell's vireo habitat with the potential to support foraging/nesting for least Bell's vireo in the future.

This objective will be considered achieved when the Fairview Park, Lower Silverado Canyon, Chino Hills, West Loma, and Agua Chinon/Bee Flat Canyon restoration projects have met their specific success criteria.

Species Objective 10.4: OCTA will establish policies and procedures to avoid and minimize impacts on least Bell's vireo habitat, including riparian habitat.

Conservation Analysis: The Plan includes policies that will require covered freeway improvement projects to be designed in a manner that avoids and/or minimizes impacts on sensitive biological resources, including riparian habitat. Temporary staging areas, access roads, and other project components that have the flexibility to be sited outside of sensitive areas will be incorporated into the project design. Best management practices will be followed to delineate environmentally sensitive areas and provide for training and monitoring to ensure these areas are protected. If temporary impacts on riparian habitat cannot be avoided, these areas will be restored to their previous conditions. Other policies that will provide for the protection of least Bell's vireo include the Nesting Birds Policy and Wildfire Protection Techniques.

This objective will be considered achieved through implementation of the Plan avoidance and minimization measures.

Rationale for Coverage:

The conservation actions and avoidance and minimization measures of the Plan are expected to achieve the biological goals and objectives for this species by conserving and enhancing suitable habitat in the Chino Hills near occupied least Bell's vireo habitat, restoring habitat in the important riparian corridors on Aliso Creek and Arroyo Trabuco, and managing and monitoring the species. Implementation of the conservation actions will exceed the Plan target of 37.5 acres by 81.6 acres.

There are three known occurrences in the area of direct effects (two on the Santa Ana River and Project J; and one at an unnamed drainage on Project L), and ten occurrences are in the area of indirect effects for planned freeway improvement projects. There are a total of 4.9 acres of predicted suitable habitat for least Bell's vireo estimated to be directly affected by the covered freeway improvement projects and 55.2 acres of least Bell's vireo habitat within 300 feet of these projects that could be indirectly affected by an incremental increase in factors such as increased nitrogen deposition, dust, and noise. In addition, up to 0.1 acre of least Bell's vireo habitat could be impacted by Preserve management activities. There are a total of 4,466 acres of predicted suitable habitat within the Plan Area, so the expected effect on individuals of this species in the potential impact area represents a fraction of the total population within the Plan Area. The predicted suitable habitat and occurrences in the area of direct impact for covered freeway improvement projects is adjacent to major freeways, and thus already exposed to relatively high levels of noise and other indirect effects, while the conserved and restored occupied habitat will be within and surrounded by large areas of conserved habitat.

OCTA has acquired the Hayashi Preserve in the Chino Hills area and removed grazing from an existing disturbed riparian corridor on the property; least Bell's vireo are upstream and downstream of the Hayashi Preserve, so it is likely that they will re-occupy the riparian habitat on the Hayashi Preserve with the removal of the grazing disturbance. In addition, seven of the restoration projects include restoration of riparian habitat that will be suitable for least Bell's vireos. Several of these restoration projects are in proximity to occupied least Bell's vireo habitat and are anticipated to be quickly occupied by least Bell's vireo following restoration, while other sites may become occupied in the future. In total, there are 8.7 acres of least Bell's vireo habitat in the Preserves, and an additional 110.4 acres of least Bell's vireo habitat will be restored or enhanced. The conservation and restoration sites with least Bell's vireo habitat are scattered throughout the Plan Area, as are the least

Bell's vireo occurrences (Figure 6-20). The biological benefits of the conservation and restoration projects will be a net increase in available habitat and habitat connectivity at multiple locations. The biological benefits to least Bell's vireos from the conservation and management of the Preserves and the habitat restoration will be substantially greater than the potential direct loss of up to 5.0 acres of least Bell's vireo habitat and indirect effects on 55.2 acres of habitat.

In summary, the conservation actions under the Plan will provide for the conservation and management of least Bell's vireo and will ensure that the impacts from Covered Activities are minimized and mitigated to the maximum extent practicable. As such, the Plan has been developed to meet the requirements under NCCPA sections 2820(a) and 2821, and ESA section 10(a) for the issuance of permits for least Bell's vireo.

6.4.11 Southwestern Willow Flycatcher

Empidonax traillii extimus

Legal Status: Federal: Endangered
State: Endangered

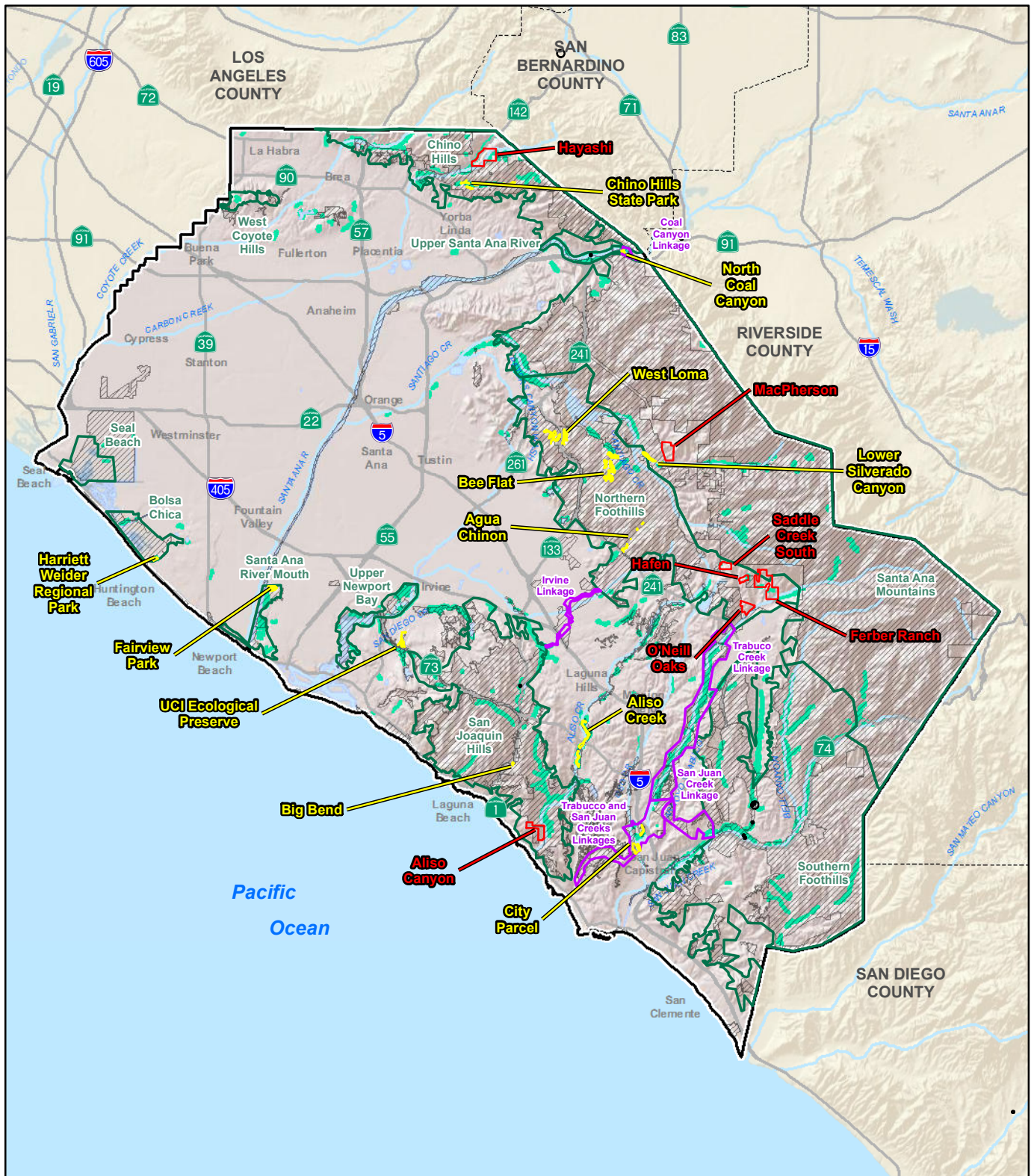
Recovery Plan: Yes



Background: The southwestern willow flycatcher is a riparian species that winters in Mexico, Central America, and perhaps northern South America. Males of this subspecies typically arrive in southern California from late April to mid-May, and females arrive approximately 1 week later. Southwestern willow flycatchers use dense riparian habitat along streams and rivers with mature stands of willows, cottonwoods, oaks, or spring fed boggy areas with willows or alders. Suitable flycatcher habitat is most likely to develop in more extensive areas along low gradient streams with wide floodplains dominated by willows. Once considered a common summer resident throughout southern California, the southwestern willow flycatcher has declined precipitously throughout its range during the last 50 years. The major threats to the species are the destruction, modification, or degradation of its habitat and nest parasitism by the brown-headed cowbird. Other stressors include modification of habitat due to indirect effects of urban and agricultural development, water diversion and impoundment, channelization, livestock grazing, off-road vehicle and other recreational uses, and the resulting hydrological and water quality changes from these and other land uses.

Between 1999 and 2001, Kus et al. (2003) documented that 90% of flycatcher population sites in California each consisted of five territories or less (with populations ranging from 1 to 50 territories in size). Although these smaller populations are likely more susceptible to stochastic events, some do persist, and all are important to the recovery of the species. The Santa Margarita and San Luis Rey River populations (outside Plan Area) likely act as source populations for outlying flycatcher breeding territories in coastal southern California (Kus et al. 2003). Based on information provided by USGS, a pair of southwestern willow flycatchers have persisted at the San Juan Creek-Canada Gobernadora location until 2009 (Howell pers. comm.). This is the last confirmed record for breeding southwestern willow flycatcher in the Plan Area. According to Paul Galvin, expert on southwestern willow flycatcher in the Plan Area, potential habitat is still present in the Plan Area including San Diego Creek upstream of the I-405, Rattlesnake Reservoir, Siphon Reservoir, San Joaquin Marsh, Peter's Canyon, Irvine Park Dam, and Arroyo Trabuco Creek (Galvin pers. comm.). See Appendix C.2, "Covered Species Accounts," for more information on species life history, habitat requirements, distribution, core areas, habitat linkages, and trends.

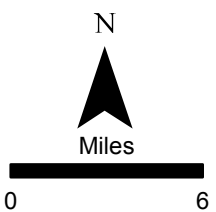
There are 4,807 acres of predicted southwestern willow flycatcher suitable habitat in the Plan Area. Over 72% of the predicted habitat is currently protected (see Table 6-14 and Figure 6-21). Areas of unprotected southwestern willow flycatcher suitable habitat occur across the Plan Area, with the largest blocks in the Upper Santa Ana River, Santa Ana Mountains, Northern Foothills, Chino Hills, and Upper Newport Bay core habitat areas. Other areas of unprotected southwestern willow flycatcher suitable habitat are mapped within the San Joaquin Hills, Southern Foothills, Santa Ana River Mouth, Bolsa Chica, and West Coyote Hills core habitat areas.



Legend

- Currently Protected Lands
- OCTA Acquired Preserves
- OCTA Funded Restoration Projects
- Core Habitat Areas
- Linkage
- Predicted Habitat
- Current Occurrence (1990 or later)

Sources:
 Species Occurrences Sources: Bonterra 2012, CNDDb 2013, USFWS 2013,
 USFS 2013, Bonterra-Psomas/OCTA/CDFW 2015
 Protected Lands: CBI 2009, ICF/TAIC/OCTA 2015
 Species Model: ICF/TAIC 2013
 Core and Linkage Areas: CBI 2009



**Southwestern Willow Flycatcher
 Predicted Habitat and Species Occurrences with Protected Lands**

Figure 6-21

Table 6-14. Conservation Analysis Summary: Southwestern Willow Flycatcher

	Predicted Species Habitat Model (acres)	Current Known Occurrences (occurrences/individuals)	Critical Habitat (acres)
Total in Plan Area	4,807	9/15	n/a
Currently Protected in Plan Area	3,471	9/15	n/a
Percentage Protected in Plan Area	72.2%	100%/100%	n/a
Estimated Effects from Covered Activities:			
Freeway Improvement Project Direct Effects ¹	5.1	0.0	0.0
Freeway Improvement Project Indirect Effects	60.5	0.0	0.0
Preserve Management Direct Effects	0.1	--	--
Targets²	40.6	--	n/a
Conservation (to date):			
Preserve Acquisitions	8.7	0.0	--
Restoration Projects	110.4	3/3	--
Total Conservation:	119.1	3/3	n/a
Conservation Above or Below Target	78.5	0.0	n/a
Protected in Plan Area After OCTA Acquisitions	3,480	9/15	n/a
Percentage Protected After OCTA Acquisitions	72.4%	100%/100%	n/a

¹ Estimated direct effects are based on a “planning-level” footprint and adjusted to account for low precision and accuracy of regional vegetation data. Actual effects will most likely be less through the implementation of avoidance and minimization measures.

² Targets were calculated using the following formula: (direct effects * 2) + (indirect effects * 0.5). Targets include a conservative estimate of the amount of conservation required to offset the direct and indirect effects from Covered Activities.

Relevant Avoidance and Minimization Measures: The following checked measures are relevant to the protection, avoidance, and minimization of direct and indirect effects on this species:

<input checked="" type="checkbox"/>	Avoidance and Minimization of Sensitive Biological Areas	<input checked="" type="checkbox"/>	Wetland and Riparian Streambed Protection Program
<input type="checkbox"/>	Aquatic Resources and Species Policy	<input checked="" type="checkbox"/>	Nesting Birds Policy
<input type="checkbox"/>	Covered Plant Species Policy	<input checked="" type="checkbox"/>	Wildfire Protection Techniques
<input type="checkbox"/>	Wildlife Crossing Policy	<input type="checkbox"/>	Stormwater and Water Quality BMPs

Species Goal 11: Provide conservation of **southwestern willow flycatcher** habitat within the Plan Area and minimize and mitigate impacts associated with Covered Activities.

Species Objective 11.1: OCTA will restore and/or enhance riparian habitat adjacent to suitable southwestern willow flycatcher habitat.

Conservation Analysis: OCTA has approved funding for the Aliso Creek restoration project, which includes 55.0 acres of riparian habitat restoration. The Aliso Creek restoration project site has had three occurrences of southwestern willow flycatcher within the project site (see Appendix C.7, “Additional Species Occurrence Maps”). Information is not available regarding whether these occurrences were nesting sites or

observations of transients. The restoration of riparian habitat along Aliso Creek is expected to increase the availability of suitable nesting and foraging habitat for southwestern willow flycatcher and improve habitat connectivity in the Plan Area.

This objective will be considered achieved when the Aliso Creek restoration project has met the specific success criteria.

Species Objective 11.2: OCTA will establish policies and procedures to avoid and minimize impacts on southwestern willow flycatcher habitat, including riparian habitat.

Conservation Analysis: The Plan includes policies that will require covered freeway improvement projects be designed in a manner that avoids and/or minimizes impacts on sensitive biological resources, including riparian habitat. Temporary staging areas, access roads, and other project components that have the flexibility to be sited outside of sensitive areas will be incorporated into the project design. Best management practices will be followed to delineate environmentally sensitive areas and provide for training and monitoring to ensure these areas are protected. If temporary impacts on riparian habitat cannot be avoided, these areas will be restored to their previous conditions. Other policies that will provide for the protection of southern willow flycatcher include the Nesting Birds Policy and Wildfire Protection Techniques.

This objective will be considered achieved through implementation of the Plan avoidance and minimization measures.

Rationale for Coverage:

The conservation actions and avoidance and minimization measures of the Plan are expected to achieve the biological goals and objectives for this species by restoring and enhancing suitable habitat on Aliso Creek adjacent to occupied southwestern willow flycatcher habitat, and managing and monitoring the species. Implementation of the conservation actions will exceed the Plan target of 40.6 acres by 78.5 acres.

There are no known occurrences in the area of direct or indirect effects for planned freeway improvement projects. There are 5.1 acres of predicted suitable habitat for southwestern willow flycatcher estimated to be directly affected by covered freeway improvement projects and 60.5 acres of southwestern willow flycatcher predicted suitable habitat within 300 feet of these projects that could be indirectly affected by an incremental increase in factors such as increased nitrogen deposition, dust, and noise. In addition, up to 0.1 acre of southwestern willow flycatcher habitat could be impacted by Preserve management activities. There are 4,807 acres of predicted suitable habitat within the Plan Area, so the expected effect on individuals of this species in the potential impact area represents a fraction of the total population within the Plan Area. Furthermore, the predicted suitable habitat in the area of direct impact for covered freeway improvement projects is adjacent to major freeways, so it is already exposed to relatively high levels of noise and other indirect effects, while the conserved and restored occupied habitat will be within and surrounded by large areas of conserved habitat.

The Preserves include 8.7 acres of predicted suitable southwestern willow flycatcher habitat, and seven of the restoration projects include restoration of riparian habitat of 110.4 acres that could be suitable southwestern willow flycatcher habitat. The conservation and restoration sites with southwestern willow flycatcher habitat are scattered throughout the Plan Area, but there are only a few documented willow flycatcher occurrences (Figure 6-21). The biological benefits of the

conservation and restoration projects will be a net increase in available habitat and habitat connectivity at multiple locations. Most of the areas that will be restored will be suitable for use as foraging and sheltering habitat by dispersing flycatchers, but the large restoration project on Aliso Creek may provide opportunities for nesting as well. The biological benefits to southwestern willow flycatchers from the conservation and management of the Preserves and the habitat restoration will be substantially greater than the potential direct loss of up to 5.2 acres of southwestern willow flycatcher habitat and indirect effects on 60.5 acres of habitat.

In summary, the conservation actions under the Plan will provide for the conservation and management of southwestern willow flycatcher and will ensure that the impacts from Covered Activities are minimized and mitigated to the maximum extent practicable. As such, the Plan has been developed to meet the requirements under NCCPA sections 2820(a) and 2821, and ESA section 10(a) for the issuance of permits for southwestern willow flycatcher.

6.4.12 Bobcat

Lynx rufus

Legal Status: Federal: None
State: None

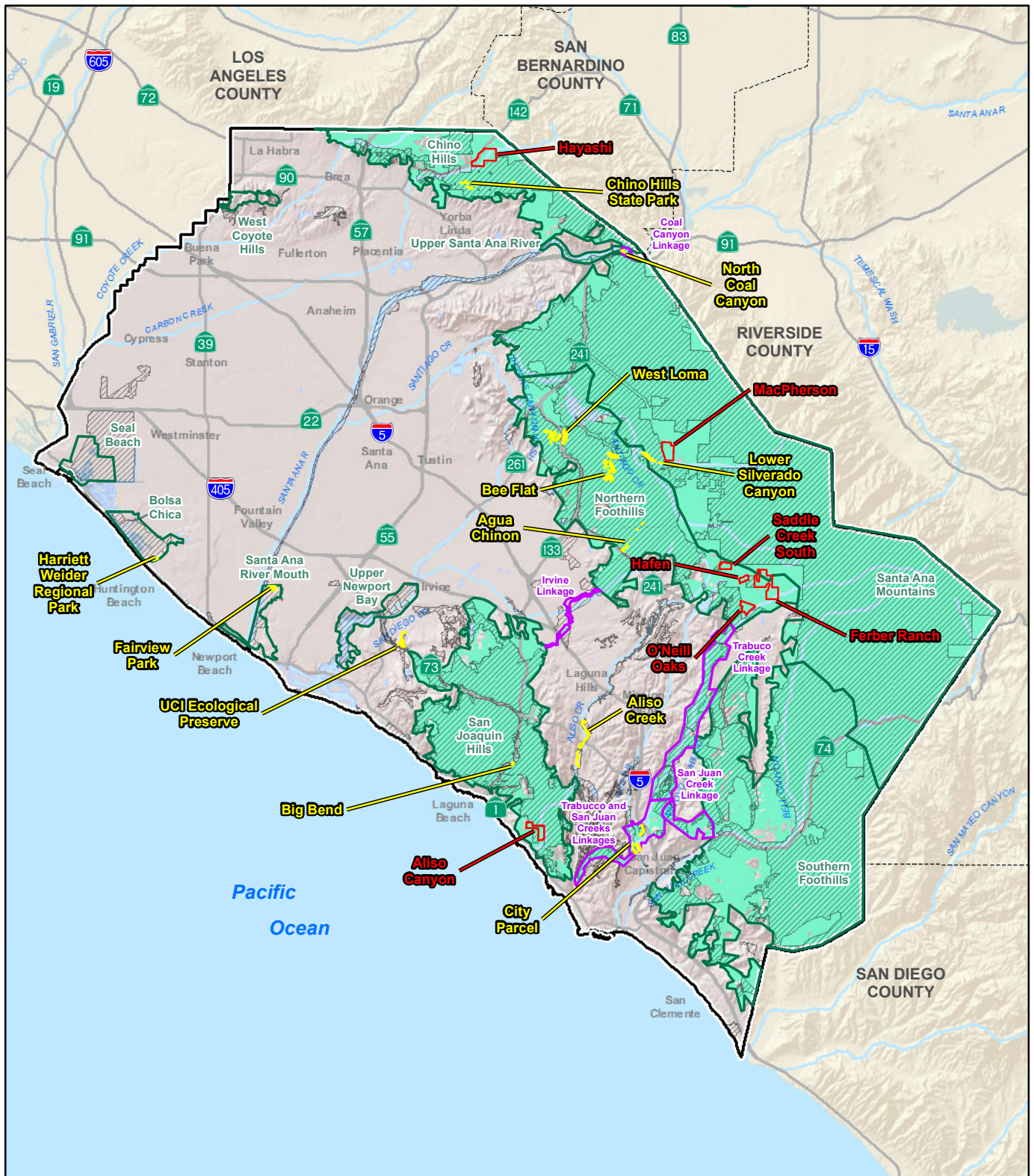
Recovery Plan: None



Background: The bobcat is a medium sized member of the cat family and a permanent resident throughout most of California, making use of nearly all vegetation types and successional stages. Optimal habitat includes all stages of chaparral and low- to mid-elevation forests dominated by conifers, oak, riparian vegetation, and/or junipers. The availability of water may limit their distribution in more arid areas. They are most closely associated with rocky and brushy areas near springs or other perennial water sources, primarily in foothills composed of chaparral habitats. Bobcats prefer areas with adequate cover in the form of rock cavities, snags, stumps, and dense brush, but they occur in any sizable area of relatively undisturbed scrub habitat. Bobcats are solitary, territorial, and non-migratory. Bobcats are threatened by loss of habitat, habitat fragmentation, and disease. Viable populations rely heavily on large, undisturbed blocks of habitat. Adequate linkages between these large blocks are a key requirement for the long-term persistence of this species. They are an apex predator, but the young may be susceptible to predation by large birds of prey and mountain lions.

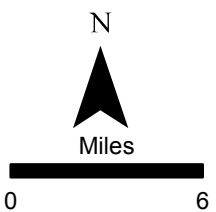
Recent studies of bobcat movement patterns, genetics, and risk of disease have been undertaken in the Plan Area and vicinity (Riley et al. 2003, Lyren et al. 2006, Lyren et al. 2008a and 2008b, Ordenana et al. 2010, Ruell et al. 2012, Tracey et al. 2013, Alonso et al. 2014, Poessel et al. 2014). These studies have shown that southern California bobcats have home ranges averaging 0.50–5.17 square miles with male bobcats having larger home ranges than females. Habitat fragmentation caused by urban development (i.e., roads) has been shown as a threat to wide ranging, larger carnivores such as bobcats, and in general, both male and female bobcats avoid urbanized landscapes to the degree that they are able given the urbanized environment of the Plan Area. Primary and secondary roads transect most bobcat territories in the Plan Area and these roads can act as barriers to bobcat movement. Collision with automobiles is a concern in the Plan Area as it is a leading cause of bobcat mortality in other regions of California. In general, these studies have documented bobcat persistence throughout the Plan Area but individuals in the coastal blocks of habitat tend to be less genetically diverse than those in the inland areas. These studies emphasize the importance of appropriately designed undercrossings for the safe movement of bobcats within and throughout the Plan Area. Landscape-level connectivity is the key to the persistence of wide-ranging large carnivores in southern California. See Appendix C.2, “Covered Species Accounts,” for more information on species life history, habitat requirements, distribution, core areas, habitat linkages, and trends.

There are 189,607 acres of predicted bobcat suitable habitat in the Plan Area. Over 78% of the predicted habitat is currently protected (see Table 6-15 and Figure 6-22). Large blocks of unprotected bobcat suitable habitat occur in the Chino Hills, Northern Foothills, Santa Ana Mountains, Southern Foothills, Upper Santa Ana River, and San Joaquin Hills core habitat areas.



- Legend**
- Currently Protected Lands
 - OCTA Acquired Preserves
 - OCTA Funded Restoration Projects
 - Core Habitat Areas
 - Linkage
 - Predicted Habitat

Sources:
 Protected Lands: CBI 2009, ICF/TAIC/OCTA 2015
 Species Model: ICF/TAIC 2013
 Core and Linkage Areas: CBI 2009



Bobcat
Predicted Habitat and Species Occurrences with Protected Lands

Figure 6-22

Table 6-15. Conservation Analysis Summary: Bobcat

	Predicted Species Habitat Model (acres)	Current Known Occurrences (occurrences/individuals)	Critical Habitat (acres)
Total in Plan Area	189,607	n/a	n/a
Currently Protected in Plan Area	149,554	n/a	n/a
Percentage Protected in Plan Area	78.9%	n/a	n/a
Estimated Effects from Covered Activities:			
Freeway Improvement Project Direct Effects ¹	45.9	--	--
Freeway Improvement Project Indirect Effects	246.0	--	--
Preserve Management Direct Effects	13.0	--	--
Targets²	240.8	--	n/a
Conservation (to date):			
Preserve Acquisitions	1,232.5	--	--
Restoration Projects	311.7	--	--
Total Conservation:	1,544.2	--	--
Conservation Above or Below Target	1,303.4	--	n/a
Protected in Plan Area After OCTA Acquisitions	150,787	--	n/a
Percentage Protected After OCTA Acquisitions	79.5%	--	n/a

¹ Estimated direct effects are based on a “planning-level” footprint and adjusted to account for low precision and accuracy of regional vegetation data. Actual effects will most likely be less through the implementation of avoidance and minimization measures.

² Targets were calculated using the following formula: (direct effects * 2) + (indirect effects * 0.5). Targets include a conservative estimate of the amount of conservation required to offset the direct and indirect effects from Covered Activities.

Relevant Avoidance and Minimization Measures: The following checked measures are relevant to the protection, avoidance, and minimization of direct and indirect effects on this species:

<input checked="" type="checkbox"/>	Avoidance and Minimization of Sensitive Biological Areas	<input type="checkbox"/>	Wetland and Riparian Streambed Protection Program
<input type="checkbox"/>	Aquatic Resources and Species Policy	<input type="checkbox"/>	Nesting Birds Policy
<input type="checkbox"/>	Covered Plant Species Policy	<input checked="" type="checkbox"/>	Wildfire Protection Techniques
<input checked="" type="checkbox"/>	Wildlife Crossing Policy	<input type="checkbox"/>	Stormwater and Water Quality BMPs

Species Goal 12: Provide conservation of **bobcat** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.

Species Objective 12.1: OCTA will protect and manage natural habitat that includes a combination of land cover types important for wildlife movement of mammals such as bobcat.

Conservation Analysis: OCTA has acquired seven Preserves that include 1,232.5 acres of predicted suitable habitat for bobcat. Incidental observations of bobcat have been noted during the biological surveys on Hayashi Preserve, and photo monitoring stations on the O’Neill Oaks and Ferber Preserves also detected bobcat in 2013. All six of the seven Preserves are a part of a 40-mile stretch of nearly continuous wildlife habitat

within Orange County that spans from MCB Camp Pendleton in the south to Chino Hills State Park in the north. The strategic location of these six Preserves improves the protection of habitat that provides opportunities for movement of bobcat. The Aliso Canyon Preserve is located in the San Joaquin Hills core habitat area near the coast that expands and connects protection of open space with the 4,500-acre Aliso and Woods Canyon reserve.

The seven Preserves acquired by OCTA are located within priority conservation areas of the Chino Hills, San Joaquin Hills, Northern Foothills, and Santa Ana Mountains core habitat areas. The acquisition of habitat Preserves within these priority conservation areas provides for the conservation and connectivity of bobcat habitat and contributes to the protection of a block of habitat with high biodiversity (see Appendix C.5, “CBI Conservation Assessment Summary”).

This objective will be considered achieved when OCTA records conservation easements for the seven Preserves acquired by OCTA and implements species monitoring and management according to the RMPs for these Preserves.

Species Objective 12.2: OCTA will implement a restoration project(s) designed to improve wildlife movement by mammals such as bobcat.

Conservation Analysis: OCTA has approved funding for the West Loma restoration project, which includes fence realignment around a key wildlife corridor in the vicinity of the 241 toll road. With fencing improvements and the restoration of habitat along the wildlife corridor, the crossing is expected to become more attractive to wildlife, including bobcat, and will reduce road kill and improve connectivity for bobcat and other species.

This objective will be considered achieved when the West Loma restoration project has met the specific success criteria.

Species Objective 12.3: OCTA will restore or enhance habitat through restoration projects that improve habitat connectivity and wildlife movement for bobcat.

Conservation Analysis: OCTA has approved funding for four restoration projects located in areas highly important for habitat connectivity and wildlife movement. These restoration projects are the North Coal Canyon (located in the Coal Canyon linkage), Big Bend (important connection between Aliso and Wood Canyons Wilderness Park to the Laguna Coast Wilderness Park), Aliso Creek (riparian corridor linking several open space Preserves), and City Parcel (located in the Trabuco and San Juan Creeks linkage). The location of these four restoration projects is expected to improve habitat connectivity that would provide opportunities for movement of bobcat. See Section 6.2, Landscape Objective 2.2 for a brief summary of the conditions at each of these restoration sites and a discussion of how the restoration activities will enhance and support wildlife movement through these areas.

This objective will be considered achieved when the North Coal Canyon, Big Bend, Aliso Creek, and City Parcel restoration projects have met their specific success criteria.

Species Objective 12.4: OCTA will establish policies and procedures to protect and maintain wildlife movement corridors.

Conservation Analysis: The Plan includes the Wildlife Crossing Policy (see Section 5.6.2.3) that requires OCTA to evaluate, during preconstruction surveys, whether existing structures function as important wildlife movement crossings. If it is determined that an existing structure does function as an important wildlife crossing, the Construction Lead will implement appropriate design features to ensure that the wildlife crossing maintains or improves functionality after the freeway construction improvements are completed.

This objective will be considered achieved through implementation of the Wildlife Crossing Policy.

Rationale for Coverage:

The conservation actions and avoidance and minimization measures of the Plan are expected to achieve the biological goals and objectives for this species by conserving large blocks of habitat providing landscape-scale connectivity for bobcat movement; restoring habitat in Coal Canyon, Big Bend, Aliso Creek, and the Trabuco Creek wildlife linkages; providing improved fencing and habitat enhancement of the wildlife crossing at the West Loma restoration project; and monitoring and management of the species. Implementation of the conservation actions will exceed the Plan target of 240.8 acres by 1,303.4 acres.

Occurrences for bobcat are not recorded in regional species occurrence databases, and there is no information of any specific occurrences of bobcat in the area of direct or indirect effects for covered freeway improvement projects. There are 45.9 acres of predicted suitable habitat estimated to be directly affected by the freeway improvement projects and 246.0 acres of predicted suitable habitat within 300 feet of these projects that could be indirectly affected by an incremental increase in factors such as increased light and noise. In addition, up to 13.0 acres of predicted suitable habitat could be impacted by Preserve management activities. There are 189,607 acres of predicted suitable habitat within the Plan Area, so the expected effect on predicted bobcat habitat in the potential impact area represents a fraction of the total potential habitat within the Plan Area. The predicted suitable habitat in the area of direct impact for covered freeway improvement projects is adjacent to major freeways and is not expected to be of high quality, while the conserved and restored habitat will be of much higher quality and is well-connected to adjacent large blocks of protected habitat.

Impacts on bobcat will be offset through the conservation and management of 1,232.5 acres of high-quality bobcat habitat, restoration of 311.7 acres of upland and riparian habitats, and improvements to wildlife exclusionary fencing at a wildlife undercrossing along SR-241 in the Central-Coastal NCCP/HCP Central Reserve system. Bobcats are broadly distributed within suitable habitat in the Plan Area and are expected to use all of the Preserves and restoration sites. The benefits of Plan implementation will be the conservation of a substantial area of occupied habitat for the bobcat and the maintenance of landscape-level connectivity, which will facilitate the movement of foraging and dispersing bobcats throughout the Plan Area. In particular, the conservation within Trabuco Canyon will help connect the Central-Coastal NCCP/HCP Central Reserve system to the north to the Orange County Southern Subregion HCP Reserve system to the south. The biological benefits to bobcat from the conservation and management of the Preserves, habitat restoration, and fencing modifications to improve wildlife dispersal will be substantially greater than the potential direct loss of up to 58.9 acres of bobcat predicted suitable habitat and indirect effects on 246.0 acres of bobcat predicted suitable habitat.

In summary, the conservation actions under the Plan will provide for the conservation and management of bobcat and will ensure that the impacts from Covered Activities are minimized and mitigated to the maximum extent practicable. As such, the Plan has been developed to meet the requirements under NCCPA sections 2820(a) and 2821, and ESA section 10(a) for the issuance of permits for bobcat.

6.4.13 Mountain Lion

Puma concolor

Legal Status: Federal: None
 State: CDFW Specially Protected Mammal

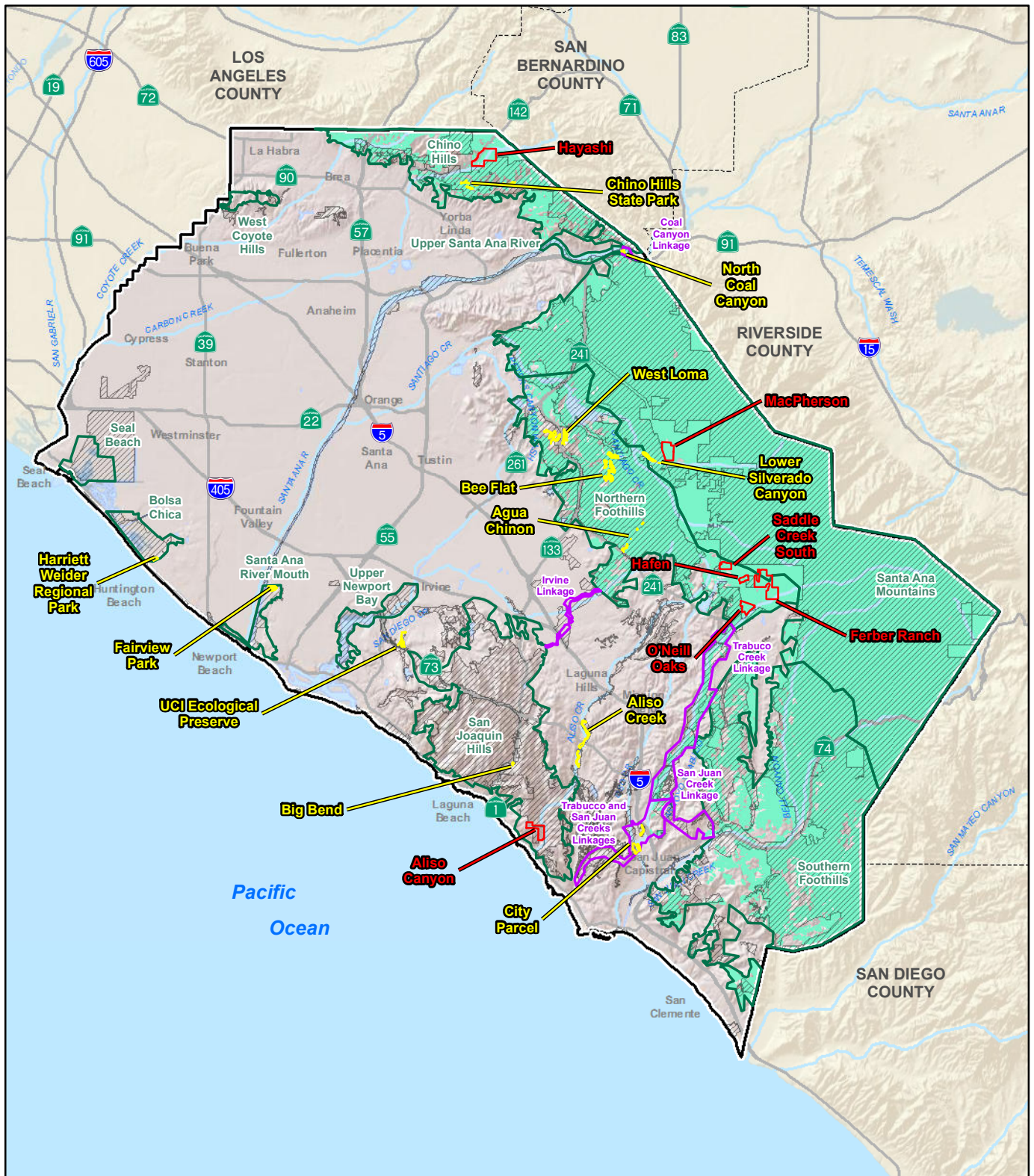
Recovery Plan: None



Background: The mountain lion, also known as cougar, puma, or panther, is a large predatory cat that ranges in color from a tawny or rufous brown to dusky or slate gray. Mountain lions are non-migratory at larger scales but will make seasonal movements within a fixed range in response to prey movement patterns. The mountain lion is a widespread, uncommon species known to inhabit areas from sea level to alpine meadows. Though most abundant in riparian areas, they utilize nearly all of the vegetation types in California except some of the driest regions of the Mojave and Colorado deserts. Mountain lions use rocky areas, cliffs, and ledges that provide cover within open woodlands and chaparral, as well as riparian areas that provide protective habitat connections for movement among fragmented core habitat areas. A major threat to this species is fragmentation of habitat by spread of human developments and associated roads, power transmission corridors, and other support facilities that restrict movement and increase interactions with humans. Other stressors include disease, road mortality, indiscriminate shooting, animal control measures, and loss of or declines in natural prey base.

Vickers et al. (2015) published results of a study using radio-collared mountain lions with complimentary multi-generational genetic analyses to inform mountain lion conservation in southern California. Despite protection from hunting, annual survival for radio-collared mountain lions was surprisingly low (55.8%), and humans caused the majority of mountain lion deaths. The most common sources of mortality were vehicle collisions (28% of deaths), and mortalities resulting from depredation permits issued after mountain lions killed domestic animals (17% of deaths). Other human-caused mortalities included illegal shootings, public safety removals, and human-caused wildfire. As noted by Vickers et al. (2015), conserving core habitat areas and functional wildlife corridors has been the main focus of conservation efforts for mountain lions in southern California and coordinated regional action in the form of targeted investment in habitat protection is especially urgent to maintain viability of the Santa Ana Mountains population. However, their analysis highlights that land protection alone will not be sufficient to ensure mountain lion persistence in the region. Also important will be directed focus on improving road infrastructure to facilitate safe wildlife crossings, and reducing depredation conflicts (through land owner outreach and education) that precipitate mountain lion deaths. See Appendix C.2, "Covered Species Accounts," for more information on species life history, habitat requirements, distribution, core areas, habitat linkages, and trends.

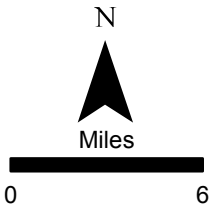
There are 140,725 acres of predicted mountain lion suitable habitat in the Plan Area. Over 83% of the predicted habitat is currently protected (see Table 6-16 and Figure 6-23). Large blocks of unprotected mountain lion suitable habitat occur in the Chino Hills, Northern Foothills, Santa Ana Mountains, Southern Foothills, and Upper Santa Ana River core habitat areas.



Legend

- Currently Protected Lands
- OCTA Acquired Preserves
- OCTA Funded Restoration Projects
- Core Habitat Areas
- Linkage
- Predicted Habitat

Sources:
 Protected Lands: CBI 2009, ICF/TAIC/OCTA 2013
 Species Model: ICF/TAIC 2013
 Core and Linkage Areas: CBI 2009



Mountain Lion
Predicted Habitat and Species Occurrences with Protected Lands

Figure 6-23

Table 6-16. Conservation Analysis Summary: Mountain Lion

	Predicted Species Habitat Model (acres)	Current Known Occurrences (occurrences/individuals)	Critical Habitat (acres)
Total in Plan Area	140,725	n/a	n/a
Currently Protected in Plan Area	117,293	n/a	n/a
Percentage Protected in Plan Area	83.3%	n/a	n/a
Estimated Effects from Covered Activities:			
Freeway Improvement Project Direct Effects ¹	24.5	--	--
Freeway Improvement Project Indirect Effects	118.8	--	--
Preserve Management Direct Effects	10.7	--	--
Targets²	129.7	--	n/a
Conservation (to date):			
Preserve Acquisitions	1,013.3	--	--
Restoration Projects	130.4	--	--
Total Conservation:	1,143.7	--	--
Conservation Above or Below Target	1,014.0	--	n/a
Protected in Plan Area After OCTA Acquisitions	118,306	--	n/a
Percentage Protected After OCTA Acquisitions	84.1%	--	n/a

¹ Estimated direct effects are based on a “planning-level” footprint and adjusted to account for low precision and accuracy of regional vegetation data. Actual effects will most likely be less through the implementation of avoidance and minimization measures.

² Targets were calculated using the following formula: (direct effects * 2) + (indirect effects * 0.5). Targets include a conservative estimate of the amount of conservation required to offset the direct and indirect effects from Covered Activities.

Relevant Avoidance and Minimization Measures: The following checked measures are relevant to the protection, avoidance, and minimization of direct and indirect effects on this species:

<input checked="" type="checkbox"/> Avoidance and Minimization of Sensitive Biological Areas	<input type="checkbox"/> Wetland and Riparian Streambed Protection Program
<input type="checkbox"/> Aquatic Resources and Species Policy	<input type="checkbox"/> Nesting Birds Policy
<input type="checkbox"/> Covered Plant Species Policy	<input checked="" type="checkbox"/> Wildfire Protection Techniques
<input checked="" type="checkbox"/> Wildlife Crossing Policy	<input type="checkbox"/> Stormwater and Water Quality BMPs

Species Goal 13: Provide conservation of **mountain lion** within the Plan Area and minimize and mitigate impacts associated with Covered Activities.

Species Objective 13.1: OCTA will protect and manage natural habitat that includes a combination of land cover types important for wildlife movement of large mammals such as mountain lion.

Conservation Analysis: OCTA has acquired six Preserves in the Trabuco/Silverado Canyon and Chino Hills areas that include 1,013.3 acres of predicted suitable habitat for mountain lion. Radiotelemetry data collected by Dr. Winston Vickers has documented widespread use throughout eastern portions of Orange County, including Trabuco

Canyon and Silverado Canyon areas. Recent observations of mountain lion were noted on the O'Neill Oaks Preserve during the baseline biological surveys conducted in 2012. In addition, wildlife cameras set up on both the O'Neill Oaks and Ferber Preserves have documented mountain lions in 2013 and 2014. While there are no radio-collared mountain lion using the Chino Hills areas that were included in the recent study by Dr. Winston Vickers (Vickers et al. 2015), multiple observations has occurred in the Olinda Village nearby the Hayashi Preserve within the past three years as reported to the California Department of Parks and Recreation. All six Preserves are a part of a 40-mile stretch of nearly continuous wildlife habitat within Orange County that spans from MCB Camp Pendleton in the south to Chino Hills State Park in the north. The strategic location of these six Preserves improves the protection of habitat that provides opportunities for movement of mountain lions.

These six Preserves are located within priority conservation areas of the Chino Hills, Foothills, and Santa Ana Mountains core habitat areas. The acquisition of habitat Preserves within these priority conservation areas provides for the conservation and connectivity of mountain lion habitat and contributes to the protection of a block of habitat with high biodiversity (see Appendix C.5, "CBI Conservation Assessment Summary").

This objective will be considered achieved when OCTA records conservation easements for the Ferber Ranch, Hafen, Hayashi, MacPherson, O'Neill Oaks, and Saddle Creek South Preserves, and implements species monitoring and management according to the RMPs for these Preserves.

Species Objective 13.2: OCTA will implement a restoration project(s) designed to improve wildlife movement by large mammals such as mountain lion.

Conservation Analysis: OCTA has approved for funding the West Loma restoration project, which includes fence realignment around a key wildlife corridor in the vicinity of the 241 toll road. With fencing improvements and the restoration of habitat along the wildlife corridor, the crossing is expected to become more attractive to wildlife including mountain lion, and will reduce road kill and improve connectivity for mountain lion and other species.

This objective will be considered achieved when this restoration project has met the specific success criteria.

Species Objective 13.3: OCTA will restore or enhance habitat through restoration projects that improve habitat connectivity and wildlife movement for mountain lion.

Conservation Analysis: OCTA has approved funding for the North Coal Canyon project located in an area highly important for habitat connectivity and wildlife movement. The North Coal Canyon project (located in the Coal Canyon linkage) occurs at a critical wildlife linkage across Highway 91 that can serve as corridor for use by mountain lions. See Section 6.2, Landscape Objective 2.2 for a brief summary of the conditions of this restoration project and a discussion of how the restoration activities will enhance and support wildlife movement through this area. Other restoration projects in the eastern portion of the County (Chino Hills State Park, Lower Silverado Canyon, West Loma, Agua

Chinon/Bee Flat Canyon) include restoration of riparian or scrub habitat that can provide cover for mountain lion. These projects total 130.4 acres of restored habitat.

This objective will be considered achieved when the North Coal Canyon, Chino Hills State Park, Lower Silverado Canyon, West Loma, and Agua Chinon/Bee Flat Canyon restoration projects have met their specific success criteria.

Species Objective 13.4: OCTA will establish policies and procedures to protect and maintain wildlife movement corridors.

Conservation Analysis: The Plan includes the Wildlife Crossing Policy (Section 5.6.2.3) that requires OCTA to evaluate, during preconstruction surveys, whether an existing structure functions as an important wildlife movement crossing. If it is determined that an existing structure does function as an important wildlife crossing, the Construction Lead will implement appropriate design features to ensure that the wildlife crossing experiences maintains or improves functionality after the freeway construction improvements are completed.

This objective will be considered achieved through implementation of the Wildlife Crossing Policy.

Rationale for Coverage:

The Conservation Actions and avoidance and minimization measures of the Plan are expected to achieve the biological goals and objectives for this species by conserving large blocks of habitat providing landscape-scale connectivity for mountain lion movement; providing improved fencing and habitat enhancement of the wildlife crossing at the West Loma restoration project; restoring habitat in the Coal Canyon wildlife linkage; restoring habitat as part of the Chino Hills State Park, Lower Silverado Canyon, West Loma, and Agua Chinon/Bee Flat Canyon restoration projects that provide cover for mountain lion in the eastern part of the County; and monitoring and management of the species. Implementation of the conservation actions will exceed the Plan target of 129.7 acres by 1,014.0 acres.

Occurrences for mountain lion are not recorded in regional species occurrence databases, and there is no public information of any specific occurrences of mountain lion in the area of direct or indirect effects for covered freeway improvement projects. However, radiotelemetry studies of mountain lion within Orange County have documented distribution and use of habitat in the eastern portions of Orange County. There are 24.5 acres of predicted suitable habitat estimated to be potentially directly affected by the covered freeway improvement projects and 118.8 acres of predicted suitable habitat within 300 feet of these projects that could be indirectly affected by an incremental increase in factors such as increased light and noise. In addition, up to 10.7 acres of predicted suitable habitat could be impacted by Preserve management activities. There are 140,725 acres of predicted suitable habitat within the Plan Area, so the expected effect on mountain lion habitat in the potential impact area represents a fraction of the total potential habitat within the Plan Area. The predicted suitable habitat in the area of direct impact for covered freeway improvement projects is adjacent to major freeways and is not expected to be of high quality, while the conserved and restored habitat will be of much higher quality and is well-connected to adjacent large blocks of protected habitat.

Impacts on mountain lion will be offset through the conservation and management of 1,013.3 acres of high-quality mountain lion habitat, restoration of 130.4 acres of upland and riparian habitats in the eastern portions of Orange County, and improvements to wildlife exclusionary fencing at a wildlife

undercrossing along SR-241 in the Central-Coastal NCCP/HCP Central Reserve system. The benefits of Plan implementation will be the conservation of a substantial area of occupied habitat for the mountain lion and the maintenance of landscape-level connectivity, which will facilitate the movement of foraging and dispersing mountain lion throughout the Plan Area. In particular, the conservation within Trabuco Canyon will help connect the Central-Coastal NCCP/HCP Central Reserve system to the north to the Orange County Southern Subregion HCP Reserve system to the south. The biological benefits to mountain lion from the conservation and management of the Preserves, habitat restoration, and fencing modifications to improve wildlife dispersal will be substantially greater than the potential direct loss of up to 35.2 acres of mountain lion habitat and indirect effects on 123.0 acres of mountain lion habitat.

In summary, the conservation actions under the Plan will provide for the conservation and management of mountain lion and will ensure that the impacts from Covered Activities are minimized and mitigated to the maximum extent practicable. As such, the Plan has been developed to meet the requirements under NCCPA sections 2820(a) and 2821, and ESA section 10(a) for the issuance of permits for mountain lion.

6.5 Summary of Additional Conditions for Coverage

The following is a summary of additional conditions for coverage:

- **Arroyo Chub**—As part of future restoration project funding, OCTA will implement a future restoration project that will achieve a direct benefit to an existing population of arroyo chub. This restoration project could include actions to improve water quality in a subwatershed known to have arroyo chub (e.g., in Bell Canyon), removal or modification of check dams to facilitate fish passage (e.g., along San Juan Creek in USFS lands), and/or a focused nonnative fish removal within a select tributary (e.g., fish trapping of source populations of nonnatives in Oso Creek).
- **Many-stemmed Dudleya**—To ensure that the Plan provides conservation and management for many-stemmed dudleya, OCTA will protect, enhance, and/or establish a major population (i.e., 500 individuals) of many-stemmed dudleya. This threshold can be accomplished through the protection, enhancement, and/or establishment of many-stemmed dudleya populations at multiple locations or at a single location. During baseline surveys of the Preserves, four occurrences with 60 individuals were identified on the Aliso Canyon Preserve. Ongoing Preserve management may improve habitat suitability (e.g., reduction of invasive species) that results in the expansion of the existing population on Aliso Canyon Preserve and/or establishment/detection of new populations on the other OCTA Preserves. Also, future non-drought conditions may result in the detection of new occurrences at Aliso Canyon. If a minimum of 500 individuals are eventually identified on the Preserves or within the approved restoration projects within the 10 years from Plan adoption, then this objective will be considered complete. If this objective cannot be met within the first 10 years as described, OCTA will select and oversee implementation of a restoration project designed to establish or expand a population of many-stemmed dudleya.

Chapter 7

Management and Monitoring

This chapter describes the management and monitoring requirements and approach for the Plan. The types of monitoring addressed in this chapter include:

1. Compliance Monitoring
2. Preserve Management and Monitoring
3. Long-Term Management and Monitoring of the Restoration Projects

7.1 Compliance Monitoring

Compliance Monitoring, also known as Implementation Monitoring, is a process used to ensure that the conservation strategy is implemented in accordance with Permit requirements. Compliance Monitoring provides information that allows the Wildlife Agencies to track Plan implementation. Key elements of Compliance Monitoring will include:

1. **Tracking Impacts** – The NCCP/HCP Administrator will be responsible for collecting and maintaining information that tracks impacts on natural resources resulting from Covered Activities to ensure that the amount of impacts that ultimately occur under the Plan stays below the amount of impacts estimated during Plan development. OCTA will track impacts for the following areas: (1) habitat types resulting from covered freeway improvement projects, (2) covered plant species resulting from Covered Activities, and (3) habitat types resulting from Covered Activities within Preserves (see Section 5.8.1, “Tracking Impacts”). A template for tracking impacts is included in Appendix F, “Impact Tracking Template.” OCTA will use this information to make sure the Plan maintains rough proportionality of project impacts with conservation measures (see Section 5.8.2, “Maintaining Rough Proportionality”).
2. **Oversight of Preserve Management and Monitoring** – OCTA will provide oversight of the Preserve Managers, as outlined in Section 7.2, “Preserve Management and Monitoring.” The NCCP/HCP Administrator will actively coordinate with the Preserve Managers on an as-needed basis to address a variety of potential issues related to public access, enforcement, adaptive management, and funding. In addition, the NCCP/HCP Administrator will host bi-annual meetings involving the Preserve Managers, Monitoring Biologists, the NCCP/HCP Administrator, and the Wildlife Agencies where implementation, policy, and technical issues of Preserve management will be addressed.
3. **Tracking and Facilitation of Restoration Project Implementation** – OCTA will provide oversight and tracking of the Restoration Project sponsors to ensure the restoration projects meet the following criteria under the Plan.
 - a. The restored habitat meets final success criteria identified in final restoration plans approved by the Wildlife Agencies. The Wildlife Agencies will be responsible for the review and approval of restoration projects to sign off that the success criteria has been met.

- b. The restored habitat is conserved through an existing real estate protection instrument or (as necessary) through a new conservation easement, deed restriction, or other mechanism approved by the Wildlife Agencies.
 - c. The restoration site will be managed in accordance with activities outlined in an existing management plan or conservation easement that defines the role for managing the biological values of the restoration project location (see Section 5.5.2, “Contribution of Restoration Projects to Plan Obligations”).
4. **Annual Reporting** – OCTA will prepare an Annual Report summarizing activities over the reporting year (January 1 to December 31). A public meeting on the report will be held in conjunction with the report submittal. The annual report will include descriptions and location of Covered Activities completed, summary of any Minor or Major Amendments, summary of impact tracking, status of Preserve management and monitoring, status of restoration projects, and summary of Plan funding (see Section 8.4, “Annual Reporting Requirements”).

7.2 Preserve Management and Monitoring

This section describes the Preserve Management and Monitoring Program (PMMP) for the Plan. The purpose of the PMMP is to assess and monitor the status of Covered Species, natural communities, and ecosystem processes on the Preserves and evaluate the effects of Preserve management actions to ensure the success of the Plan’s conservation strategy. The PMMP establishes guidelines for the management and monitoring of the Preserves to ensure the long-term health and viability of species and ecological values throughout the Preserves.

OCTA has acquired seven properties, resulting in the protection of 1,232.5 acres of natural habitat (see Section 5.4, “Preserve Acquisitions”) (Note that the total acreage of the five properties is approximately 1,300 acres, but the amount of protected natural habitat credited to OCTA is less because portions of the properties are developed or include trails. In addition, the Saddle Creek South property was acquired, in part, with funding from the National Fish and Wildlife Foundation and credits were adjusted accordingly). The location of the Preserves are distributed across the Plan Area (see Figure 5-1).

The PMMP establishes two distinct roles for on-the-ground management of the acquired Preserves: Preserve Manager and Monitoring Biologist (described further in Section 7.2.7.1, “Roles and Responsibilities [for Adaptive Management and Monitoring of the Preserves]” and Section 8.2, “Roles and Responsibilities [for Plan Implementation]”). The Preserve Manager is responsible for basic property management and Preserve management. The Preserve Manager also addresses issues related to stewardship of the ecological values and recreational uses in each Preserve (see Section 7.2.2, “Levels of Preserve Management and Monitoring” [Levels 1 and 2]). The Preserve Manager is a continuous role that starts with the establishment of the first Preserve under the M2 NCCP/HCP and may be fulfilled by one or multiple entities. The Preserve Manager reports periodically (no less than quarterly) to the NCCP/HCP Administrator regarding the status of the Preserves (including cursory surveys for presence of covered/sensitive species, as appropriate for a given Preserve), progress of active management actions, and issues that need addressing.

The Monitoring Biologist is responsible for completing monitoring of the status of natural communities and Covered Species within the Preserves. The Monitoring Biologist’s role will be based primarily on the schedule for effectiveness monitoring of Covered Species and natural

communities established in the Plan. The Monitoring Biologist will also be available to assist the Preserve Managers with targeted monitoring efforts associated with adaptive management implementation. Monitoring data are collected according to accepted monitoring methods for species and natural communities. The Monitoring Biologist provides OCTA and the Preserve Manager with monitoring reports and lends biological expertise (e.g., for interpreting results and making recommendations for future Preserve management actions) that can be applied toward adaptive management decisions. The Monitoring Biologist's role may be fulfilled by one or multiple entities.

The PMMP presented here includes guidelines that the Preserve Managers will follow in developing site-specific RMPs. It outlines the types of monitoring that will be done on the Preserves and explains how an adaptive approach will be followed using an iterative decision-making and learning process. Preserve management and monitoring will use the following approach:

1. Preserve Managers will manage the Preserves in accordance with the principles and procedures for adaptive management, as set forth in Section 7.2.7, "Adaptive Management and Monitoring of the Preserves." A separate adaptive management fund will be established to support adaptive management efforts above and beyond ongoing Preserve management responsibilities (refer to Section 8.2, "Plan Funding").
2. Effectiveness monitoring will be completed approximately every 4 years for Covered Species (including vegetative statistical sampling) and 10 years for natural communities to evaluate and measure Plan goals and objectives.
3. The RMPs will set forth Preserve-specific goals and objectives that tie in with Plan goals and objectives. Additional targeted monitoring will be integrated where necessary to address site-specific threats to Covered Species and natural communities within the Preserves and/or address issues related to adaptive management that will be defined and prioritized as part of the development of individual Preserve RMPs. RMPs will be revised (as needed) approximately every 5 years.
4. OCTA, Preserve Managers, and the Monitoring Biologist will coordinate with each other, Wildlife Agencies, and other preserve management entities in the region to share concepts, techniques, and resources to the extent practicable for adaptive management.

7.2.1 Regulatory Context

An NCCP must include both a monitoring program and an adaptive management program (California Fish and Game Code Sections 2820[7] and [8]). An NCCP also must integrate adaptive management strategies, which are periodically reviewed and modified on the basis of the results of monitoring efforts and other sources of new information (California Fish and Game Code Section 2820[a][2]).

Similarly, an HCP must incorporate conservation measure monitoring and the response of Covered Species to the measures (50 CFR 17.22[b][1][iii] and 50 CFR 222.22[b][5][iii]). An adaptive management strategy is a recommended component of plans with data gaps that could substantively affect how the species is managed and monitored in the future (65 FR 35251). The USFWS and NMFS Five-Point Policy (65 FR 35241–35257) describes adaptive management as an integrated method for addressing uncertainty in natural resource management and states that management must be linked to measurable biological goals and monitoring.

The monitoring and adaptive management program described in this chapter outlines an iterative and structured learning process and sets forth requirements to monitor Covered Species, natural communities, and species response to management activities. Implementation of this program will include periodic review and incorporation of new recommendations for monitoring and adaptive management based on the most recent guidelines provided by CDFW, USFWS, and the U.S. Geological Survey (USGS) for regional NCCPs and HCPs (Atkinson et al. 2004), and other entities involved in adaptive management development and implementation.

7.2.2 Levels of Preserve Management and Monitoring

Four levels of management are identified here to guide stewardship, management, and monitoring of M2 NCCP/HCP Preserves.

Level 1—Property Management. Level 1 management is basic stewardship monitoring and management and includes establishing and maintaining property boundaries with fencing and gates; posting signs that indicate Preserve rules, restrictions, and regulations; and controlling public access and trash collection, with enforcement as needed.

Level 2—Preserve Management. Level 2 management focuses on management activities that protect Covered Species and natural communities and provide compatible recreational opportunities for the public. The Preserve Management level includes all Level 1 management actions as well as monitoring and management of the overall condition of the Preserve, invasive species, erosion, sedimentation, trails and public use facilities, and, occasionally, restoration.

Level 3—Species Management and Monitoring. Level 3 management and monitoring consists of all Level 1 and 2 management activities as well as species-specific and habitat-specific monitoring and management. Examples of Level 3 activities include focused species surveys, species-/habitat-specific protection measures (e.g., fencing and manual weed removal in a rare plant area), and habitat enhancement projects (e.g., restoration of coastal California gnatcatcher habitat).

Level 4—Regional Monitoring. Regional monitoring consists of monitoring vegetation communities, wildlife movement, and species population trends across the Plan Area. OCTA will not be responsible for conducting regional monitoring outside of their specific preserves but will contribute monitoring data collected at OCTA Preserves in a format that can be integrated with regional monitoring databases as appropriate. Data will be submitted to an appropriate data repository, such as the Biogeographic Information and Observation System (BIOS), CNDDDB, or other regional monitoring databases. In addition, OCTA will stay abreast of regional monitoring issues through coordination with other management/monitoring entities, and may either participate in collecting data on its Preserves for regional monitoring purposes or will provide access to Preserves for other entities to collect regional biological monitoring data if needed.

7.2.3 Phases of Preserve Management

7.2.3.1 Start-up Management Phase

The first phase (start-up) is intended to establish the baseline for Covered Species status, habitat condition, and the overall property condition of the Preserve Area. The start-up phase should occur within the first year after a property is acquired. Active property management (Level 1) will occur

during this phase to protect the biological values from trespass or other activities that may cause negative impacts.

7.2.3.2 Interim Management Phase

The second (interim) management phase includes development of site-specific resource management objectives and initiation of regular, ongoing management of the acquired Preserves to address issues identified during the start-up phase. The interim management phase occurs prior to finalization of the NCCP/HCP and/or prior to recording of the conservation easement for the property. Conservation easements for the acquired Preserves will be recorded within 2 years after Permit issuance. The interim management phase includes Preserve management (Level 2) as well as property management (Level 1).

During the interim phase, from the time a Preserve is acquired (including acquisitions occurring prior to Permit issuance), Preserves will be managed to maintain their biological value and integrity by implementing the measures outlined below.

Preserve Maintenance

- Remove trash, trimmings, debris, and other solid waste.
- Maintain trails and fences. Erect fencing and signage as necessary to control unauthorized public access.
- Implement security programs to enforce “no trespassing” rules and curtail activities that degrade resources, such as grazing, unauthorized trail cutting, shooting, illegal planting, illegal dumping, off-road traffic, and walking dogs (with the exception of the Aliso Canyon Preserve) in the Preserves.

Preserve Management

- Implement activities to maintain and/or improve, operate, and manage the Preserves.
- Maintain habitat values through the removal and control of exotic species (e.g., weed abatement).

Preserve Monitoring

Preserve monitoring should also be conducted during the interim period, between Permit issuance and the development of the RMPs. The primary emphasis of the initial Preserve monitoring effort is to establish a baseline for Preserve status and condition as well as for the presence and distribution of Covered Species and natural communities.

The following monitoring activities will be implemented during the interim period:

- Conduct initial reconnaissance monitoring of the Preserve to determine areas of highest management priority (e.g., invasive species; erosion; problems from unauthorized public access; encroachment along preserve boundaries, including residential structures, ornamental landscaping, irrigation runoff; fencing that may hinder wildlife movement, areas that need fencing to control public access; trail condition; etc.).
- Identify threats to the Preserve, which will be prioritized and remedied by management actions identified in the Preserve RMPs.

- Identify gaps in current baseline data associated with natural communities mapping and plant and animal surveys within the Preserve. Conduct baseline (inventory) monitoring, as described under Section 7.2.7.4, “Monitoring Guidelines.”

7.2.3.3 Long-term Management Phase

The final phase is management of the Preserve in perpetuity, which starts after the baseline conditions have been established, a conservation easement has been recorded, and an RMP has been created. The long-term management phase includes species management (Level 3) as well as Level 1 and Level 2 management. In addition, Preserve-level monitoring and management will be coordinated among the Preserves in the M2 NCCP/HCP and other regional conservation programs to contribute to regional monitoring (Level 4).

7.2.4 Preparation of Resource Management Plans

An RMP will be developed for each Preserve that will include Preserve-specific goals and objectives relating to natural communities, Covered Species, and other ecosystem function(s) (e.g., for connectivity/wildlife movement), which demonstrate how the Preserve supports and will be based on the overall goals and objectives of the OCTA NCCP/HCP. In order to accomplish the identified Preserve goals and objectives, the RMP will identify required site-specific management strategies and actions for Covered Species and natural communities, and also include guidelines for managing public access and education. Importantly, the RMP will set forth an adaptive management approach for iterative decision-making and learning and will identify critical uncertainties to be resolved in order to accomplish the Preserve-specific and/or Plan goals and objectives (examples are provided in Section 7.2.7, “Adaptive Management and Monitoring of the Preserves”). RMP development will be guided by the baseline surveys and ongoing experience from managing the Preserves during the interim management phase. RMPs will be prepared following the general format presented in Appendix H. This will be accomplished within 2 years of Permit issuance or within 2 years of the acquisition of the Preserve if the Preserve is acquired after Permit issuance. The RMPs will be reviewed every 5 years and updated as necessary to prioritize management actions based on the changing Preserve needs. The RMP, including subsequent revisions, must be reviewed and approved by the Wildlife Agencies. The Wildlife Agencies will make a concerted effort to provide written comments within 30 days of receiving the documents. OCTA has initiated the preparation of RMPs for the seven Preserves acquired.

7.2.4.1 Recording of Conservation Easements

In addition to RMPs, conservation easements will be recorded for each Preserve that will provide a legal mechanism to ensure each Preserve is maintained and managed in perpetuity as a habitat Preserve. Conservation easements will be recorded not later than 2 years from Permit issuance or within 2 years of the acquisition of the Preserve if the Preserve is acquired after Permit issuance. Conservation easements for each Preserve will be held by appropriate entities, depending upon the Preserve Manager.

7.2.5 Preserve Management Guidelines

The guidelines below provide the framework that OCTA and its Preserve Managers will use when preparing the RMPs. Because each Preserve is unique, these guidelines are meant to describe the range of management activities that could be needed, depending on a variety of Preserve-specific

conditions. Preserve management strategies, the types of activities that could be authorized on each Preserve, and monitoring obligations will then be further refined to suit each Preserve. In addition, Preserve Managers will provide information to adjacent landowners regarding how to avoid/minimize conflicts with Preserve commitments and reduce edge effects.

7.2.5.1 Vegetation Management

Native Plants

Pruning of native vegetation will generally be avoided except when necessary as part of fuel management and fire control activities or minor road maintenance activities, as described in Section 7.3.5, "Land Uses Adjacent to Preserves." A dense canopy, multi-layered understory, and mid-story growth provide valuable nesting, foraging, and sheltering opportunities for wildlife species and thus should be protected from unnecessary pruning.

Any native leaf litter, duff materials, and native vegetation/tree trimmings resulting from permitted management and maintenance activities will be retained on-site and placed in appropriate native habitat areas based on restoration ecologist recommendations. Native materials preserved on-site should be kept out of fuel modification areas and away from public roads (unless they are being utilized as a management tool) to prevent the risk of fire. Decomposing vegetation provides valuable microhabitats for invertebrates, reptiles, small mammals, and birds. In addition, the decomposition of dead wood and leaf litter is necessary for the replacement of soil nutrients and minerals.

If pruning of native tree foliage, limbs, and/or root zones is necessary for permitted maintenance activities, a certified arborist will provide recommendations for appropriate pruning locations and methods.

The collection of plant species, except for approved research, study, and/or restoration, is prohibited. Coordination between the Preserve Manager, OCTA, the Wildlife Agencies, and the researcher will take place, as appropriate.

Invasive Nonnative Plants

The control of invasive nonnative plant species is one of the most important components of an RMP because these species can aggressively out-compete native species, thereby reducing habitat quality within the Preserve Area.

- Prioritize areas for nonnative species control based on the aggressiveness of invasive species, the degree of threat to Covered Species, native vegetation, and ecosystem processes, and the ability to manage those invasive species. The Preserve Manager will monitor those species with high priority for eradication, as determined by the current California Invasive Plant Inventory (Cal-IPC 2006). A species with a Cal-IPC rating of "high" will be a priority for eradication or control, with the objective to control and remove it as soon as possible after discovery. Examples of high-priority plant species include arundo, salt cedar (*Tamarix spp.*), castor bean (*Ricinus communis*), fennel (*Foeniculum vulgare*), tree tobacco (*Nicotiana glauca*), artichoke thistle (*Cynara cardunculus*), and pampas grass (*Cortaderia spp.*). Species rated "moderate" or "limited" are a lower priority and may be allowed to persist if monitored at low population levels following initial eradication efforts or may be selectively controlled as part of species enhancement or habitat restoration efforts (e.g., invasive annual grasses or forbs).

- Develop and implement an early detection program for invasive plant species to ensure that emerging invasive species (including species new to the region or a Preserve) are detected in a timely fashion and eradicated before they become a long-term problem. Preserve Managers will maintain a list of potentially occurring invasive species, based on regional and local sources (e.g., CalWeedMapper, other conserved lands in the South Coast region). The Preserve Manager will monitor for these species during general stewardship activities, while the Monitoring Biologist will record these species during biological monitoring activities.
- Where feasible, use an Integrated Pest Management (IPM) approach (i.e., an approach that achieves the desired goals with the least biologically intrusive control method at the most appropriate period of the growth cycle) to eradicate undesirable species.
- Consider both mechanical and chemical methods of control. Only herbicides that are compatible with the biological goals and objectives will be used. A list of herbicides to be used within the Preserve will be provided in the RMP, which will be reviewed by the Wildlife Agencies. Licensed pest control advisors who are familiar with Department of Pesticide regulations will be used to make specific pest control recommendations.
- Dispose of all invasive plant materials that are removed from the Preserves at a landfill or on-site at a secure, designated location to avoid the spread of nonnative plant species through seeds or propagules. Nonnative vegetation will be chipped and staged in a designated mulch site. All removed plant materials will be covered during transport, and the compost pile will be periodically spot-treated with herbicide to kill any resprouting plants. Nonnative plant material will be removed off-site to a “green” waste recycling facility or otherwise legally disposed of, as necessary.
- If applicable, revegetate invasive plant removal areas with native species appropriate to the biological goals and objectives for the Preserve Area and/or adjacent native habitat.

7.2.5.2 Wildlife Species Management

Protection measures specific to wildlife species management include seasonal restrictions, wildlife corridor protection measures, and general restrictions, as described below.

Seasonal Restrictions

As noted above, native vegetation removal is prohibited on the Preserves, except when necessary as part of fuel management and fire control activities, minor road maintenance activities, habitat enhancement for Covered Species, or Covered Activities. Use of equipment and power tools may be necessary for fuel management and road maintenance tasks as well as Preserve Management activities such as nonnative weed control and the installation of erosion control BMPs. In the event that vegetation clearing—including native and nonnative tree and vegetation removal and the use of loud and disruptive equipment and tools—is required as part of these permitted activities, these activities will be restricted during the general breeding season for birds, including raptor species (March 1 to September 15). If vegetation clearing or other loud/disruptive activities are required within or adjacent to areas that potentially support nesting bird species between March 1 and September 15, a preconstruction nesting bird survey will be performed prior to these activities. Work activities will be restricted within designated buffer areas around any active nests, as determined by a qualified wildlife biologist. The wildlife biologist will monitor all clearing activities. If there are no nesting birds within the work area, work may proceed under the supervision of the wildlife biologist. Note that in the event that emergency maintenance and fire management/control

activities (non-Covered Activities) are performed to maintain public safety, preconstruction nesting bird surveys or biological monitoring may not be performed.

In general, the use of pesticides and rodenticides, release of any animal species, feeding of wildlife species, and collection or harassment of wildlife species—except as approved by the Wildlife Agencies for monitoring, management, or scientific/research studies—is prohibited in the Preserves.

Wildlife Corridor Restrictions

OCTA has acquired or will acquire Preserves within areas that are important for regional wildlife movement. There are a number of wildlife corridor protection and management guidelines that apply to the activities permitted in the Preserves, including the following:

- **Permanent Road/Trail Closure.** Certain roads/trails may be permanently closed because of their proximity to existing wildlife corridors. Equipment storage and staging will not occur within any designated wildlife corridors. Locked gates will be used to control access to closed roads and roads that are off-limits to vehicles.
- **Speed Limit.** The speed limit on all roads in the Preserves may be restricted.
- **Signage.** Signs that identify wildlife crossings and corridors will be posted within 100 feet of each point where an existing road traverses the wildlife corridor.
- **Fencing.** Wildlife-friendly fencing will be used for all internal fences and exterior fencing, where appropriate, to allow for wildlife movement. Fencing may also be installed to direct wildlife through safer routes such as road undercrossings.

Invasive Nonnative Species

- Control the spread of invasive ant species by following the guidelines below:
 - Ensure that all landscaping and native habitat restoration materials do not contain invasive ant or other species by inspecting all container stock before it enters the Preserves.
 - Monitor landscaping irrigation adjacent to the Preserves to avoid any overflow, which may attract and sustain nonnative ants by increasing soil moisture.
 - Empty trash receptacles located along trails and/or associated with edges of the Preserves on a regular basis, as determined by the manager's monitoring of actual needs.
- Manage aquatic predators such as nonnative species of turtles, fish, bullfrogs, and crayfish by following the guidelines below:
 - Monitor and control nonnative aquatic predators when in conflict with native species.
 - Coordinate with the Wildlife Agencies to implement nonnative animal trapping and eradication activities when necessary. Methods may include trapping, netting, electro-fishing (prior approval by CDFW needed), or hand captures.

Cowbird Trapping

- Document and periodically monitor (as determined by a qualified biologist) the extent of cowbird parasitism on Covered Species nests in conserved habitat and near equestrian use

areas where feed is given and stored, such as stables, feed lots, staging corrals, and equestrian trails.

- If necessary, establish a cowbird trapping program to increase nesting success of Covered Species affected by cowbird parasitism.
- Adaptively implement cowbird trapping as necessary in response to observed and/or documented parasitism. Place traps in select locations that maximize cowbird captures and reduce cowbird parasitism pressures. Cowbird traps will be operated consistent with current state and federal protocols.

Feral and Domestic Animal Control

- Prohibit dogs on trails within the Preserves, with the exception of the Aliso Canyon Preserve (see Section 5.4.2.1, 'Aliso Canyon Preserve'), whether on leash or unleashed.
- Document evidence of feral or domestic animal activity in the Preserves.
- If a problem exists, establish a feral animal removal program for conserved habitat or refer the problem to the local animal control agency.
- If a site manager resides on a Preserve and has a pet dog, ensure that the dog stays in the immediate vicinity of the house and is not allowed to be off leash in the Preserve.
- If a problem exists, fence areas between conserved habitat and adjacent housing to keep pets out of the Preserves, to the degree feasible.

7.2.5.3 Property Management

Trash and Debris

- Remove loose trash and debris on an as-found or as-reported basis. Trash and debris can be an attractant and a hazard for wildlife and may support nonnative ant species (e.g., Argentine ants).
- Locate wildlife-proof trash receptacles in or near all areas of public access. Patrol public use areas to pick up any loose trash and debris, and empty trash receptacles regularly, based on the amount of use.

Lighting and Noise

- Eliminate lighting in or adjacent to conserved habitat except where essential for roadway use, facility use, safety, or security purposes. Use low-pressure sodium illumination sources. Do not use low-voltage outdoor or trail lighting, spotlights, or bug lights. Shield light sources adjacent to conserved habitat so that the lighting is focused downward.
- Do not allow public access or trail use during nighttime hours .
- If Covered Activities that generate noise cannot be completed outside of breeding season, address potential indirect effects of noise at the nest location of covered bird species by keeping noise levels at or below 60 dBA Leq(1) or not increasing noise levels more than 3 dB above ambient noise levels, whichever is greater, during the breeding season. Avoid the use of noise-generating equipment and noise-generating public activities (e.g., generators, organized trail runs, marathons, etc.).

- Prepare and disseminate informational materials to adjacent neighbors and users of conserved habitat areas to educate the public about the importance of minimizing edge effects such as nighttime lighting and noise.

Fencing

- Eliminate unnecessary fencing from interior habitat areas that may impede the movement of native wildlife (unless the fencing enables implementation of a rotational grazing plan that benefits habitat and Covered Species or the fencing serves as a second level of protection against adjacent grazing).
- Maintain or install fencing when necessary to:
 - Limit road kills
 - Direct wildlife through wildlife movement corridors, including undercrossings
 - Discourage off-trail use that may cause habitat degradation
 - Control incidental grazing by stray livestock
 - Protect erosion control or revegetation efforts
 - Protect native vegetation during construction
 - Protect particularly sensitive resources (e.g., vernal pools, small populations of sensitive plants)
 - Provide public safety or security
- Select fencing that best accomplishes access control with minimal wildlife interference. Fencing to control human use of an area will generally be a minimum of 5 to 6 feet high. Fences within or at the boundary of the conserved habitat will consist of three- to five-strand wire (barbed or smooth), which does not significantly impede wildlife movement. Welded wire fences, tall wooden fences, split-rail fences (where appropriate and sufficient), or masonry/stone walls are all potentially suitable at the perimeter of human use areas to restrict human and domestic pets from the Preserve Area. Smaller portions of chain link fencing may exist in some locations. This fencing may be left in place unless it is determined that the fencing is prohibiting wildlife movement. The RMP may prioritize that chain link fencing is removed early on in the long-term management phase to be consistent with local specific plans. Fences installed to minimize road kill must meet height and design standards based on current research for effective directional fencing (e.g., UCSB 2005). The specific type(s) of fencing used will depend on the particular Preserve landscape; for example, smooth wire may be considered in areas of a Preserve adjacent to where there are young children and/or grazing is not an issue.
- Maintain fence lines in a way that minimizes impacts on sensitive species and habitats.

Signage

- Provide educational brochures, kiosks, interpretive centers, and signs to educate the public about the Preserve's conservation goals, biological/physical resources, and appropriate uses on and adjacent to the Preserve, including appropriate trail user etiquette.

- Install signage for access control and education at the periphery of conserved habitat that is open to human access. Post signs to prohibit firearms, open flames, smoking, and pets (both leashed and unleashed).
- Limit the use of signs to attract attention to the specific location of species that are sensitive to human disturbance.
- Use temporary signs to indicate habitat restoration or erosion control areas.
- Use barriers and informational signs to discourage shortcuts from being developed in the trail system.

7.2.5.4 Hydrology and Erosion Control

Changes in natural hydrology due to Covered Activities within the Preserves and/or urbanization and flood control projects upstream of the Preserves can have many adverse effects on water quality, habitats, and native species in wetland and upland communities.

- Install permanent or temporary BMPs as necessary to reduce bank erosion (excess scour and undercutting) or sedimentation caused by changes in hydrology due to upstream hardscaping.
- Inspect vulnerable areas, such as trails and drainages, immediately after a heavy rainstorm to identify problems with erosion and sedimentation. Install BMPs as soon as possible to avoid further damage.
- If existing flood control channels are present in the Preserves, coordinate the performance of standard maintenance, such as clearing and dredging, during the months of September through February to avoid disturbance during the breeding season of riparian birds (generally March 1 through August 15) and other breeding wildlife.

7.2.5.5 Land Uses within Preserves

Conditionally Allowed Uses

The following land uses are typically conditionally allowed within dedicated Preserves, provided that they can be demonstrated to have minimal impacts on resource values within the Preserve Area:

- **Recreation**—including daytime activities such as hiking or bird watching that does not require the conversion of natural habitats or facility construction. The creation/maintenance of trails for hiking, biking, or equestrian use is conditionally allowed in some Preserves, provided the trails are sited to avoid sensitive resources, marked with signage to keep all activities strictly on the trails, monitored and maintained, and designed to meet all other goals and guidelines of the Plan. Limited impacts on natural resources from new trails, interpretative structures, staging areas, and kiosks are allowed within the habitat impact caps established by the Plan.
- **Public infrastructure**—including construction, replacement, or maintenance of electrical transmission lines, gas pipelines, water lines, sewer lines, or other linear facilities that generally result in minor and temporary impacts on natural habitats, provided the habitats are restored to preconstruction conditions following any impacts.
- **Public services**—such as law enforcement, fire control, and actions by other agencies when responding to natural disasters.

Prohibited Uses

The following land uses and activities are generally prohibited within all dedicated Preserves:

- Development involving the construction of buildings, parking lots, or other structures. This includes residential, commercial, industrial, and institutional development. A limited amount of construction for new maintenance facilities is allowed within the habitat impact caps established by the Plan.
- Agricultural uses that require the conversion of natural habitats, including all row crops, orchards, improved pastures, nurseries, greenhouses, and feedlots.
- Active recreation, including ball fields, golf courses, improved park facilities, off-road vehicle areas, geocaching, or any other recreational activity that requires the conversion of native habitats (e.g., clearing, grubbing, or planting of nonnative vegetation or turf grasses) or facility construction (e.g., equestrian facilities, buildings, or paved pathways) or otherwise negatively affects natural vegetation or wildlife habitat values.
- Camping.
- Mineral extraction, including all sand and gravel mining activities.
- Landfills.
- Itinerant worker camps.
- Brush control or fuel management, except where it is necessary to prevent the loss of human life or property or prevent the loss of sensitive biological resources. Existing and new development adjacent to Preserves must accommodate fuel management zones or other vegetation management actions outside of the Preserve boundary.
- Shooting, target practice, hunting.
- Paintball.
- Off-road vehicle use.
- Dog walking, whether leashed or unleashed (with the exception of Aliso Canyon Preserve, see Section 5.4.2.1, "Aliso Canyon Preserve").

Public Access

- Ensure that public access to Preserves included in the M2 NCCP/HCP is consistent with the protection and enhancement of biological resources.
- Monitor existing access areas to ensure that they do not degrade biological values, and site future access areas away from the most sensitive biological resources (e.g., riparian areas, areas occupied by Covered Species).
- Seasonally restrict access to certain trails if deemed necessary to prevent disturbance of breeding activities or to minimize the potential for erosion.
- Close and restore unnecessary trails to minimize biological impacts. Close and restore steep eroding trails and/or trails that bisect sensitive habitat types with the potential to support Covered Species.

- Locate new trails away from sensitive biological resources or restrict their use so that Covered Species or sensitive species (e.g., nesting raptors) are not adversely affected.
- Construct trails to prominent features or viewpoints, as appropriate, which are likely to attract trail users, thereby preventing extensive off-trail trampling and compaction.
- Install water breaks on steep trails to prevent accelerated runoff and erosion.
- Establish patrols to identify trail maintenance needs, garbage, vandalism, and habitat degradation and enforce land use restrictions. Utilize cameras and other technologies as appropriate.

7.2.5.6 Land Uses Adjacent to Preserves

Preserve Managers will enforce trespassing regulations and prevent and remove illegal intrusions into Preserves. Barriers (fencing, rocks/boulders, appropriate vegetation) and/or signage in communities will be installed where necessary to protect the Preserves' sensitive biological resources and direct public access to appropriate locations. Additionally, educational information will be disseminated to adjacent residents and landowners to heighten their awareness of the Preserves' role in achieving the M2 NCCP/HCP biological goals, and provide information regarding approved access, appropriate plantings, restrictions on construction or disturbance within Preserve boundaries, pet and livestock control, fire management, and other adjacency issues.

To the extent practicable, OCTA will coordinate with local land use authorities (e.g., for the CEQA public review process) to ensure that new developments adjacent to the Preserves adhere to the following adjacency guidelines:

- **Drainage**—all developed and paved areas must prevent the release of toxins, chemicals, petroleum products, excess water, exotic plant materials, and other elements that might degrade or harm the natural environment or ecosystem processes within the Preserves. This will be accomplished using a variety of methods, including natural detention basins, grass swales, or mechanical trapping devices.
- **Lighting**—Lighting of all developed areas adjacent to the Preserve should be directed away from the Preserve wherever feasible and consistent with public safety. Low-pressure sodium lighting should be used whenever possible.
- **Noise**—Uses adjacent to the Preserve should be designed to minimize noise impacts. Berms or walls should be constructed adjacent to commercial areas and any other use that may introduce noises that could affect or interfere with wildlife utilization of the Preserve.
- **Invasive species**—No invasive nonnative plant or animal species can be introduced into areas immediately adjacent to the Preserve. All open space slopes immediately adjacent to the Preserve should be planted with native species that reflect the adjacent native habitat.
- **Buffers**—There are no requirements for buffers outside the Preserve, except as may be required for wetlands pursuant to federal and/or state permits or by local agency CEQA mitigation conditions.
- **Fuel modification zones**—Fuel modification zones should be fully contained on adjacent properties for all new development. Prior to implementing new developments adjacent to the Preserve, the local fire authority should review and approve proposed fuel modification treatments to ensure that no new fuel modification will be required within the Preserve.

7.2.5.7 Recreation

The primary purpose of acquiring the Preserves is to meet the biological requirements of the NCCP/HCP; however, the M2 Environmental Mitigation Program is anticipated to provide additional benefits, such as opportunities for passive recreation. Activities within the Preserves should be for daytime hours only and only those that are shown to be compatible with the protection of the Covered Species and natural communities. The location, type, seasonal timing, and frequency of activities in the Preserves can all be modified to reduce or remove impacts on and stressors to biological resources.

Passive recreational use in the Preserves will be managed to accommodate the diversity of compatible recreational uses but must first and foremost be consistent with the protection and enhancement of biological resources. Passive recreation includes activities such as walking, jogging, hiking, bird watching, non-competitive mountain biking, equestrian use, and limited picnicking. Existing recreational facilities should be managed to promote the maintenance of habitat value surrounding these facilities. Passive recreation will be allowed within some of the Preserves but will be managed and directed away from the more sensitive biological resources.

OCTA has initiated limited and managed public access by offering several Preserve tours. In 2011, a Saddle Creek South Preserve tour was offered to the public during the commemoration event celebrating OCTA's first property acquisition. In 2012, OCTA partnered with the Transportation Corridors Agency (TCA) to present a tour of Saddle Creek South and the TCA adjoining property Live Oak Canyon. In 2013, the public attended a hike and equestrian ride wilderness day on the Ferber Ranch Preserve. Additional hikes and equestrian rides have been open to the public on Ferber Ranch to date. Hikes have also been offered on the O'Neill Oaks and Aliso Canyon Preserves in 2016.

Each RMP will include a recreation plan component that addresses recreational issues and allowable uses within different areas that are compatible with the goal and objectives of this Plan. The following guidelines should be considered for the recreation component of each Preserve's RMP:

- Determine appropriate levels of passive recreational activities within the Preserve, depending on the resources to be protected, season, and successional stage of the vegetation.
- Designate authorized and approved trails as part of the development of RMPs for each Preserve. Align authorized trails with existing access and fire roads. Keep trails away from creeks and jurisdictional wetlands, and minimize creek crossings. Provide signage to demarcate both authorized and unauthorized trails within the Preserve. Where there are existing authorized trails (designated as part of a regional or general plan) that occur within a Preserve and are compatible with the goals and objectives of the OCTA NCCP/HCP, these trails will be incorporated into the RMP as appropriate. This Preserve is located within the Coastal Zone and existing coastal access trails will remain in place in accordance with the Coastal Act.
- Prohibit nighttime use of trails.
- Prohibit recreational activities that require construction of new facilities or roads that remove or degrade habitat for Covered Species required to achieve M2 NCCP/HCP conservation goals, unless offset by the addition or restoration of habitat with equivalent or greater habitat value for those species.
- Develop design standards for new trail construction that address the avoidance of sensitive species, unique habitats, wildlife corridors, erosion control, and access to major features.

- Establish a recreational area patrol to monitor/enforce allowed uses in the Preserves.

Guidelines and requirements for specific recreational activities are addressed below.

Passive Uses

- Limit or restrict passive uses in critical wildlife areas during the breeding season, as determined appropriate.
- Minimize adverse effects of passive recreation, such as trampling vegetation and erosion.
- Provide litter control measures, such as closed garbage cans and recycling bins, at access points in each Preserve Area.

Day Use

- Hiking and other passive uses along authorized trails allowed during daylight hours only.
- Site picnic areas at the edges of Preserves.
- Collect garbage frequently and instruct (through signage) day users not to feed wildlife.

Equestrian Use

Trails may vary in width and surface material, depending on site-specific factors. Bicycles will generally be allowed on all authorized trails except where specifically prohibited. Equestrian use of trails should be limited to existing authorized equestrian trails (not including trails closed for restoration or protection of biological values). Where equestrian uses are allowed within the Preserve, the following guidelines will apply:

- Prohibit horses along riparian areas and minimize creek crossings. Allow trails that are away from riparian or other sensitive habitat.
- Mulch trail surfaces to minimize erosion, if necessary, as determined by the Preserve Manager. Do not use materials for trail mulch that are a seed source of invasive exotic species. Prohibit use of eucalyptus chips that could suppress native plant growth adjacent to trails.
- Limit equestrian use to specified trails that are wider than foot trails (minimum of 8 feet wide) to prevent trail edge disturbance, with grades no greater than 25%. If trails become degraded because of heavy use, rotate or limit use during certain seasons to minimize further degradation.
- Restrict or significantly limit development of new corrals, arenas, stables, and other associated equestrian facilities within the Preserve. Locate staging areas for trailheads adjacent to existing roads and away from sensitive biological resource areas and in previously disturbed areas to the maximum extent possible.

Mountain Biking

- Limit mountain bike trails to areas that are not highly susceptible to erosion and out of riparian and/or wetland areas or other biologically sensitive areas.
- Maintain trails that are wider than foot trails (minimum of 6 feet wide) to prevent trail edge disturbance, with grades no greater than 25%.
- Rotate bike use by closing and rehabilitating trails periodically to prevent trail degradation if a problem develops.

- Construct barriers to restrict access to sensitive areas.
- Discourage competitive mountain bike racing that often involves riding off of trails.

7.2.5.8 Enforcement of Public Access

Damage caused by unauthorized public access or adjacent land use is one of the greatest threats in Preserves near urban population centers. Without enforcement, it is often difficult to change human behavior, especially in areas that have been used historically for activities that are not compatible with habitat conservation (e.g., off-road vehicle use).

Recognizing the importance of appropriately managing recreational use within the Preserves to protect habitat areas from intrusions, Preserve Managers shall take the following steps to increase enforcement capabilities and thereby minimize impacts of recreational use on Preserve habitat values:

- Trail user groups shall be encouraged to develop and participate in “self-monitoring and policing” programs to minimize instances of off-trail activities and other abuses to habitat resources within the Preserve.
- As allowed by state and local regulations, Preserve Managers and their staff may be given the authority to issue citations for misuse of trail and other Preserve facilities. Only specific state and county entities are given the authority to issue citations.
- Fines levied for abuse of Preserve facilities resulting in harm to species or sensitive habitat shall be enough to discourage repeat occurrences.
- Repeated offenses by multiple users shall provide the grounds for temporary closure of trail segments and, where necessary, an entire Preserve as a means of avoiding unacceptable adverse impacts on habitats/species within the Preserve. Such temporary closures will also serve to educate users concerning the need to obey Preserve rules and regulations, thereby reducing future recreational impacts on biological resources of the Preserve.

Enforcement of laws and regulations in Preserves falls into two categories of offences. First are the minor infractions, such as hiking or riding off trail or on a closed trail, unauthorized equestrian or mountain biking use, and over-watering the adjacent landscape that leads to erosion or degradation on Preserve lands. Minor infractions should be handled by the Preserve Manager through discussion and education of the offending party. Preserve Managers can work together and with local community groups on a public education program to explain goals and regulations as well as educate the public about the area’s resources.

Major infractions would include illegal off-road vehicle use; illegal dumping; repetitive hiking or riding off trail or on closed trails; vandalism, including cutting vegetation or building new trails or bike jumps; illegal encampments (itinerant workers and transients); and excessive repeat offences of minor infractions. Unfortunately, vandalism is a common occurrence in many Preserves, and fencing and signage are frequent targets of vandals. Involvement of law enforcement officials is necessary to address major infractions.

Enforcement during the interim period will be coordinated through the enforcement authority of adjacent established Preserves, private security, county/city parks, and/or the county sheriff or local police departments.

Ongoing management of public use activities may include the following:

- Maintain effective access control through fencing and signage, regular enforcement patrols, and penalties.
- Develop an educational/outreach program to inform the public and adjacent landowners about allowable uses and activities in and around the Preserve. The program may include distributing brochures in surrounding neighborhoods, working with homeowners associations in the vicinity, developing an informational website, installing educational kiosks, providing outdoor experiences, etc.
- Accommodate scientific research within the Preserve by allowing researchers and students to access the areas. Scientific research projects are subject to approval by the Preserve Manager, who will informally discuss the costs and benefits of the proposed work with the Wildlife Agencies.
- Coordinate with special interest groups and the Wildlife Agencies to encourage volunteer opportunities, such as trash pick-up and weed removal programs that support the goals of this Plan.
- Periodically review access and recreational uses within the Preserves to determine their consistency with the evolving Preserve management policies, practices, and priorities under the adaptive management program.

7.2.5.9 Fire Management

Preserve Managers will have the responsibility for brush management on lands they manage. Preserve management for fire will include the following elements, which will be incorporated into a fire management section of the RMPs:

- In consultation with local fire department and Orange County Fire Authority (OCFA), prepare site-specific fire management plans as part of the preparation of RMPs for the Preserve. Include local fire department contacts and guidelines for pre-fire prevention activities, fire suppression, and post-fire restoration.
- Conduct pre-fire management, as appropriate, such as the limited removal of combustible, nonnative plants.
- Establish fuel management zones. If necessary, exceptions to avoid impacts on sensitive species and habitats will be identified by the Preserve Managers, with concurrence sought from the local fire authority.
- Coordinate with surrounding landowners to ensure that adequate setbacks are established that allow fuel management zones to be established outside of the Preserve (up to 100 feet from structures and 30 feet from roads) for new structures and facilities. For new structures or facilities constructed within the Preserve, ensure that a fuel management zone is established around these structures/facilities and include these areas as impacts against the caps allowed under the Plan.
- When available, establish fuel management zones that take advantage of existing roads and disturbed or developed habitats, thus avoiding sensitive habitats. Where feasible, provide approximately 15 feet of horizontal clearance to enable fire authority vehicle access to major access roads within the Preserve.
- Clear vegetation outside of the avian breeding season (as described in Section 7.3.1, "Species and Habitat Management," above), unless a preconstruction nesting survey determines that no

nesting birds will be affected by clearing activities. If clearing must occur at a time or in a manner that may affect nesting birds, the Preserve Manager will consult with the Wildlife Agencies to review any issues prior to the initiation of activities.

- Avoid impacts on narrow endemic plant populations during fire road maintenance operations and the clearing of fuel management zones. However, if high fuel load levels develop in a given year, mowing/trimming may have to occur to meet fire management requirements.
- If clearing must occur at a time or in a manner that may adversely affect sensitive resources, the Preserve Manager will consult with the Wildlife Agencies and fire agency to minimize impacts prior to project initiation.
- Work with the local fire department to ensure that wildfire suppression activities are conducted in ways that sustain long-term ecosystem health and reduce impacts on sensitive species.
- Conduct emergency post-fire erosion control where necessary. Repair and restore fences, trails, culverts, and landscaped contours to pre-fire conditions. Monitor post-fire recovery closely and immediately remediate new problems associated with erosion, sedimentation, invasion by nonnative species, etc.
- Plan all post-fire actions, such as restoration, invasive species removal, erosion control, or trail stabilization, in consultation with the Wildlife Agencies prior to project initiation.

7.2.6 Public Outreach and Education

Public education and involvement are critical components for ensuring successful management and public support of the Preserve System. If the public is properly informed of the biological values, goals, and activity restrictions within the Preserve, it is more likely that management goals and guidelines will be respected and followed. The OCTA NCCP/HCP Administrator and Preserve Managers will coordinate to determine the most effective methods and materials for educating the public. They may include the following:

- Hold annual public meetings to present information regarding Preserve goals, guidelines, restrictions, and compatible uses. These meetings may be held concurrently with the annual NCCP/HCP reporting meeting and a regularly scheduled Environmental Oversight Committee meeting and will be announced with the property public notice.
- Establish information on OCTA's website that provides information on the Preserve, Preserve Manager contact information, and links to additional information on Preserve goals and guidelines.
- Provide signs, displays, and pamphlets that explain Preserve rules and management goals.
- Develop a volunteer program that addresses a variety of education and management issues, including, but not limited to, preparation of educational materials, trail repair, erosion control, invasive species removal, native habitat and plant restoration, trash removal, biological monitoring, and management patrols.
- Prevent and remove illegal trails, trail modifications (e.g., bike jumps), and other intrusions into the Preserve, and enforce land use and recreational activity restrictions.

7.2.7 Adaptive Management and Monitoring of the Preserves

Adaptive management and monitoring of the Preserves will be implemented to (1) ensure that OCTA is in compliance with Plan requirements, (2) assess the status and trend of conserved resources (Covered Species, natural communities, ecosystems), (3) measure the effectiveness of conservation and management actions, and (4) provide information to guide and refine management actions to benefit conserved resources and improve the health and stewardship of acquired Preserves.

Adaptive management is an iterative decision-making and learning process used when there is uncertainty regarding resource responses to management actions (Atkinson et al. 2004, Williams et al. 2009, Lewison and Deutschman 2014). The USFWS and NMFS Five-Point Policy defines *adaptive management* as “an integrated method for addressing uncertainty in natural resource management that incorporates a structured process for learning by doing.” Pursuant to Section 2805(a) of the California Fish and Game Code, “adaptive management’ means to use the results of new information gathered through the monitoring program of the plan and from other sources to adjust management strategies and practices to assist in providing for the conservation of covered species.” Adaptive management seeks to reduce uncertainty and improve success in achieving conservation goals through structured monitoring and evaluation of management actions. Under this Plan, RMPs for each Preserve will include an adaptive management component.

This section provides the framework for developing, implementing, and evaluating conservation strategies to meet measurable biological goals and objectives and modifying management actions in accordance with new findings or changed conditions. In this way, adaptive management incorporates flexibility into long-term planning and management of covered species and habitats (Atkinson et al. 2004, Williams et al. 2009). General guidelines for Preserve-level monitoring and adaptive management are described below; detailed guidelines will be included in the RMPs.

7.2.7.1 Roles and Responsibilities

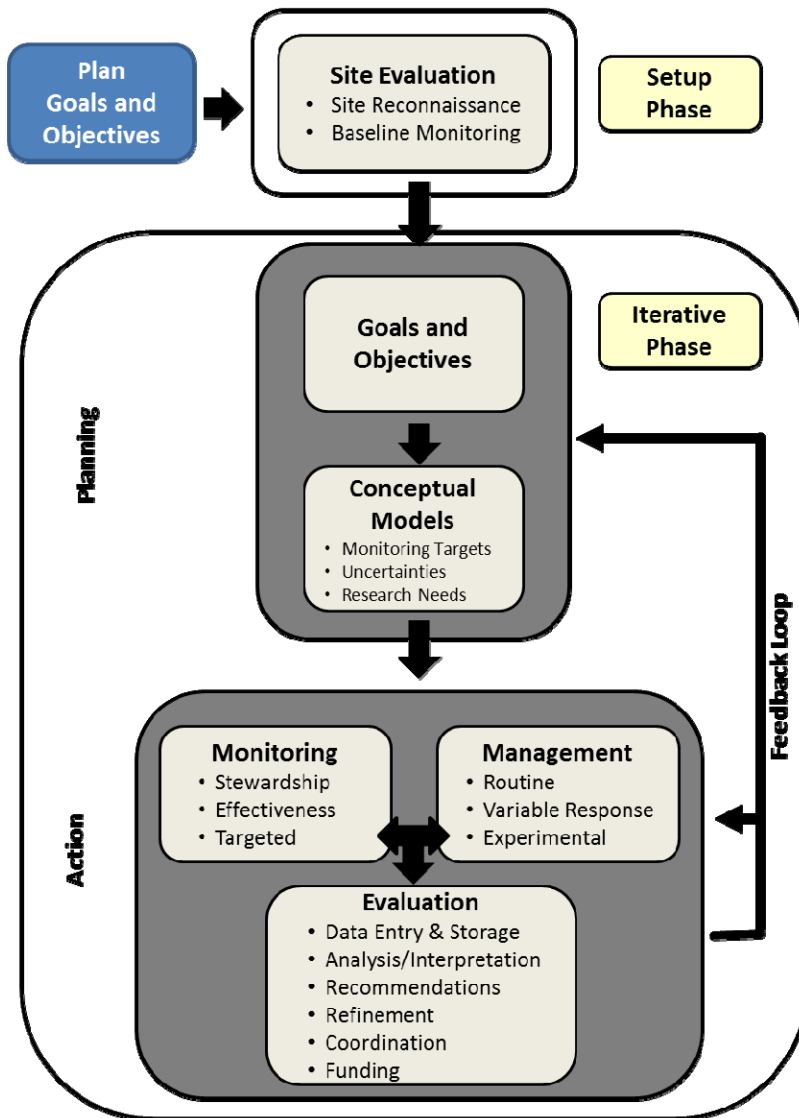
The monitoring and adaptive management of the Preserves will be a cooperative effort between OCTA, Preserve Managers, Monitoring Biologists, Wildlife Agencies, and the public. Preserve Managers will be responsible for general stewardship monitoring, while Monitoring Biologists will be responsible for monitoring conserved resources (e.g., Covered Species, natural communities, ecosystems). Both Preserve Managers and Monitoring Biologists will implement and monitor management actions and evaluate their effectiveness. Regular coordination will occur with the NCCP/HCP Administrator as well to ensure that all activities are consistent with commitments made within the NCCP/HCP. OCTA will be responsible for the development of the RMPs as well as the NCCP/HCP annual report. The Wildlife Agencies will review and approve these documents and will be involved in regular Preserve oversight through bi-annual meetings. These documents will be available to the public for review and input. In addition, coordination with other regional Preserve managers will occur to help determine and address regional and local trends in adaptive management that may be occurring across the Plan Area. See Section 8.2, “Roles and Responsibilities [for Plan implementation]” for more details of the Plan participants.

7.2.7.2 Adaptive Approach

Monitoring and adaptive management will follow guidelines set forth in Atkinson et al. (2004) and refined in later documents (e.g., Hierl et al. 2007, Lewison and Deutschman 2014). This approach

includes setup, planning, and action phases (see Figure 7-1), and should be initiated early in Preserve management and RMP development. The Set-up phase identifies Preserve-level conservation resources and potential threats and stressors. The Planning phase defines and prioritizes monitoring and management issues. The Action phase (1) monitors resources to assess status or trends and determine management needs, (2) implements management actions to enhance resource functions and reduce adverse effects from threats and stressors, (3) evaluates resource response to management actions, and (4) modifies monitoring and management actions, as necessary. Except for the initial site evaluation, all elements are iterative; thus, planning and action phases may overlap.

Figure 7-1. Adaptive Management Process



Source: Lewison and Deutschman 2014.

Key elements of Preserve-level adaptive management and monitoring include:

- Site Evaluation
- Goals and Objectives

- Conceptual Models
- Uncertainties
- Research
- Monitoring
- Management
- Evaluation

It is important to reiterate that adaptive management is used when there is uncertainty regarding management outcomes. Management issues that do not include uncertainty do not require an adaptive management approach. This topic is discussed further in Section 7.2.7.5, “Management.”

7.2.7.3 Adaptive Management Guidelines

Biological monitoring and management are mandatory elements of all NCCPs and HCPs and interdependent components of any adaptive management program. The sections below provide a structured process for developing, implementing, and evaluating monitoring and management actions to protect and enhance conserved resources, minimize or avoid threats to those resources, and improve management effectiveness and efficiency through iterative learning.

Site Evaluation

Site evaluation will be conducted within 1 year of Preserve acquisition. The Preserve Manager and Monitoring Biologist will evaluate available data for the Preserve, conduct a site reconnaissance to identify what field surveys should be prioritized and a proposed timeframe (e.g., for covered species), identify appropriate land uses and roads or trails that should be closed, and identify immediate management and maintenance needs (e.g., fencing, runoff from adjacent properties, invasive species, removal of structures or trash). Baseline surveys for conserved resources will be conducted subsequent to the site reconnaissance in order to obtain data necessary to assess resource status and management needs. Plan goals and objectives will focus the evaluation on key conservation resources (e.g., Covered Species, vegetation communities, ecosystems, connectivity) and potential threats and stressors.

Existing regional and preserve-level documentation will be reviewed to identify and describe conservation resources (including types of data available), data gaps, and site history (i.e., land uses, fire, any previous management and monitoring) relevant to resource management. Potential data sources include (but are not limited to) the Plan, biological reports, regional databases (e.g., CNDDDB, BIOS, Cal-IPC Weed Mapper), other conserved lands near the Preserves, and expert opinion (species experts, science advisors, other Preserve Managers, Wildlife Agencies). Based on this assessment, the Preserve Manager and Monitoring Biologist will prepare a Preserve-specific list of conservation resources and data gaps, including potential threats and stressors.

As part of the initial site reconnaissance or subsequent baseline surveys, the Monitoring Biologist will map vegetation communities (using *A Manual of California Vegetation* [Sawyer et al. 2009] and *Vegetation Classification Manual for Orange County* [release pending]) and level of disturbance, identify threats and stressors, and evaluate the potential of the property to support covered species. Prior to surveys, the Monitoring Biologist will identify type(s) of data required to evaluate status and/or management needs for each resource to ensure appropriate data collection and desired outputs. The emphasis during this stage is on surveys that are broad-based, comprehensive, and

relatively rapid, with a focus on habitat condition and potential to support covered species (Lewison and Deutschman 2014).

Upon completion of site evaluation (site reconnaissance and baseline monitoring), the Preserve Manager and Monitoring Biologist, in consultation with and with approval by the Wildlife Agencies, will develop the RMP (including adaptive management program) for the Preserve and a 5-yr timeline of priority surveys and management needs.

Baseline surveys have been conducted for the seven OCTA-acquired Preserves (see Appendix C.6). Resources (Covered Species, natural communities, ecosystems) and potential management issues (threats) identified during baseline surveys are listed in Section 7.2.7.7, “Summary of Adaptive Management Actions for Conserved Resources” by species and for natural communities.

Goals and Objectives

Goals and objectives guide decision-making and provide a standard for measuring management effectiveness and, ultimately, the biological success of the Plan (Atkinson et al. 2004, Lewison and Deutschman 2014). Goals are “broad, concise visionary statements that set the overall direction for monitoring and management, while objectives are concrete, measurable statements that detail how a specific goal can be attained” (Lewison et al. 2011). A single goal may have multiple objectives. Further, each objective may require one or more management actions (implementation tasks) (Lewison et al. 2011).

Plan goals and objectives are presented in Section 5.3. Using site evaluation and baseline monitoring results, if available, as a guideline, OCTA will review Plan goals and objectives for applicability at the Preserve-level and will identify and incorporate Preserve-level goals and objectives into the Preserve RMPs.

Preserve-level objectives will be refined to meet SMART criteria (Adamcik et al. 2004, Lewison et al. 2011, SD MMP 2013, Lewison and Deutschman 2014), which are defined as:

- Specific – objectives will be detailed, clear, concise, and unambiguous
- Measurable – objectives will include criteria for measuring progress
- Achievable – objectives will not be unrealistic to achieve nor below acceptable standards
- Results-oriented – objectives will specify an end result
- Time-fixed – objectives will specify an end-point for being met

Well-defined objectives promote effective and efficient use of management and monitoring resources.

All objectives will be prioritized. Priority 1 objectives will be implemented on an ongoing basis and, in general, accomplished through the implementation of effectiveness monitoring, general stewardship monitoring, and general Preserve management. Each Preserve will have funds allocated to cover activities for Priority 1 objectives. The Priority 1 objectives will occur first, and the results of the Priority 1 efforts will inform further adaptive management decisions that will be prioritized as Priority 2 objectives. Priority 2 objectives will be funded, in general, using either funds allocated for adaptive management, by reprioritizing general stewardship monitoring and Preserve management actions, as appropriate, or using outside funding sources (e.g., grants).

Priority 2 objectives will be implemented in consultation with the Wildlife Agencies for conserved resources that are impacted or declining, based on monitoring results. Within Priority 2, objectives will be further prioritized based on (1) alignment with Plan goals and objectives, (2) regional context (e.g., value or importance of a Preserve for a given resource), (3) level of threat, (4) expected effectiveness of proposed action (e.g., proven methods available to affect change) (5) logical sequencing (e.g., invasive species control may precede restoration), (6) catastrophic events (e.g., wildfire may necessitate a shift in priorities), (7) funding and staffing, and (8) 'SMARTness' of objectives (i.e., well-defined objectives are easier to achieve than poorly defined objectives).

Examples of goals and objectives for conserved resources based on the results of baseline surveys are included in Section 7.2.7.5, "Management," by species and for natural communities.

Conceptual Models

Conceptual models provide a vision or concept of how a species, habitat, or ecosystem functions and how it might be influenced by management actions (Atkinson et al. 2004, Hierl et al. 2007, Williams et al. 2009, Deutschman et al. 2012, Lewison and Deutschman 2014). Further, conceptual models organize and articulate the relationship between change agents and natural drivers. For example, a conceptual model for a Covered Species will depict life history traits that influence species persistence, as well as natural and anthropogenic drivers (threats and stressors) and uncertainties that may affect those traits. Conceptual models allow for structured decision-making and are used to test management hypotheses and identify appropriate monitoring targets, uncertainties, and research needs.

Conceptual models vary in complexity and format, and numerous sources are available to assist in model development (e.g., Atkinson et al. 2004, Hierl et al. 2007, Williams et al. 2009, Deutschman et al. 2012, Lewison and Deutschman 2014). To be scientifically defensible, model development must be based on existing data and literature- or field-based assumptions; documentation of these sources is an integral part of model development. The following principles and format elucidated in Hierl et al. (2007) and refined by the Institute for Ecological Monitoring and Management (IEMM) in a conceptual model workshop (Deutschman et al. 2012), Adaptive Management Framework (Lewison and Deutschman 2014), and species-specific models (Strahm 2012) are useful guidelines for model development for adaptive management:

- Simpler models that represent the current state of knowledge and are supported by data are preferable to complex models with a high degree of uncertainty.
- Models should clearly identify management and monitoring goals.
- Models should include those life history traits (species variables) that influence persistence and should focus on those variables that may respond to monitoring and adaptive management (potential monitoring targets).
- Models should identify and differentiate between anthropogenic (threats and stressors) and natural drivers of the system.
- Putative or secondary relationships, if included, should be differentiated from data-based primary relationships.
- Proposed management actions should support the management goal; proposed monitoring should measure the effectiveness of management actions, followed by a modification in management, if warranted.

Examples of conceptual models have been developed for conserved resources that occur in the Preserve Area and are included in Section 7.2.7.7, “Summary of Adaptive Management Actions for Conserved Resources,” by species and for natural communities. Preserve Managers and Monitoring Biologists will review these models for applicability at the preserve-level. Where models have been designed for other regions or purposes, they may be refined to reflect Preserve-specific conditions and/or simplified to focus on key management questions. Where models do not exist, Preserve Managers and Monitoring Biologists will need to work with experts to develop models to guide the adaptive management process. Conceptual models can be developed for threats and stressors as well as conservation resources. Further, a single conceptual model may serve multiple resources that share similar life histories and natural and anthropogenic drivers (e.g., covered plant species, riparian birds, scrub-dependent reptiles). During the action phase of adaptive management, monitoring results will be used to refine Conceptual Models, as appropriate.

Uncertainties

Sources of uncertainty will be identified through the site evaluation process and visualized through conceptual models. Types of uncertainty may include (1) effectiveness of management actions, (2) relationship between resource function and threats and stressors, and (3) larger ecosystem processes (e.g., annual variations in climate and climate change). Although many of these uncertainties may be addressed and reduced through Preserve-level management and monitoring, others are best addressed at regional or landscape-levels. For the latter, external sources (e.g., literature, regional monitoring programs) may be useful in understanding and reducing uncertainties.

Research Needs

Potential research needs will be identified through site evaluation, development of conceptual models, and responses to management actions. Appropriately structured monitoring programs are expected to answer some research questions, particularly those that have a direct bearing on management. The Preserve Manager will ensure that Preserve-level data are available for analysis by other management entities or researchers focused on key management questions. In addition, the Preserve Manager should encourage research on Preserve lands by qualified (and funded) researchers where these efforts benefit Preserve resources and do not jeopardize Preserve goals and objectives.

7.2.7.4 Monitoring Guidelines

Monitoring guidelines presented in this section will help the Monitoring Biologist and Preserve Managers collect the appropriate data to ensure that the goals and objectives of the Plan and individual Preserves are met, determine if Preserve management strategies are having the desired effect, and evaluate if underlying biological assumptions are supported by field-collected data from the Preserves. These guidelines include the following activities:

- Tracking the distribution and condition of natural communities and habitats throughout the Preserves.
- Periodic monitoring of Covered Species to determine presence/absence and/or relative abundance and distribution over time.
- Monitoring to evaluate effectiveness of specific management actions.

- Identifying and monitoring threats to habitat condition and to Covered Species, including introduction or spread of invasive species and other edge effects.
- Monitoring the effects of public use, encroachment, and other activities within and adjacent to the Preserves.

Biological monitoring measures the effectiveness of the overall conservation approach, supports informed adaptive management decisions, assists in defining and modifying biological goals and objectives, and provides the OCTA and Wildlife Agencies with information to conduct assessments of baseline conditions and species status. The following guidelines have been developed to assist the Monitoring Biologists and Preserve Managers in prioritizing monitoring tasks and completing them efficiently and within a reasonable budget and schedule.

The Preserve Manager and Monitoring Biologist, in consultation with the Wildlife Agencies, will identify the appropriate types of monitoring to address management questions and select monitoring methods that align with goals and objectives. In some cases, consultation with species experts or experts in monitoring or sampling design may be necessary.

Definitions of Monitoring Types

1. **Initial Reconnaissance Monitoring.** The site reconnaissance identifies survey needs, priorities, and a proposed timeframe (e.g., for covered species), identifies appropriate land uses and roads or trails that should be closed, and identifies immediate management and maintenance needs (e.g., fencing, runoff from adjacent properties, invasive species, removal of structures or trash).
2. **Baseline (Inventory) Monitoring.** Baseline monitoring establishes conditions at a given point in time. This monitoring requires biological expertise and will be conducted by the Monitoring Biologist. It is a one-time event that characterizes the status of conserved resources, as well as threats and stressors, for planning or future comparisons. For OCTA Preserves, baseline monitoring will also include an inventory of existing trails. Baseline monitoring is a necessary precursor to development of a RMP as it identifies both target resources and management issues. Baseline surveys were completed for the seven OCTA acquired Preserve and are included in Appendix C.6.
3. **General Stewardship Monitoring.** General stewardship monitoring identifies general management issues and documents whether management actions are carried out as planned. This monitoring is used for general land management activities (e.g., trail closures, erosion control, fence repair, signage installation, routine invasive plant inventory and control). General stewardship monitoring may commence upon Preserve acquisition and does not generally involve an adaptive management component because uncertainty in management outcomes is low and BMPs are available to address the issue(s) of concern. Preserve Managers will conduct general stewardship monitoring visits (monthly or as appropriate) of their Preserves as part of their ongoing responsibilities and will report any issues to the NCCP/HCP Administrator within 1 week of discovery. As part of general stewardship monitoring, the status and identified threats to biological resources on the Preserve will be recorded.
4. **Effectiveness Monitoring.** Effectiveness monitoring assesses status and trends, as well as threats and stressors, and requires biological expertise. The Monitoring Biologist will be responsible for effectiveness monitoring to assess and track progress towards achieving the Plan's biological goals and objectives, as well as those of the Preserve. Effectiveness monitoring will be completed, at a minimum, following the frequency and survey protocols listed in Table 7-1

in perpetuity. OCTA will ensure that the Monitoring Biologist and Wildlife Agencies have permanent rights of access to the Preserves as part of conservation easements and any legal arrangement to transfer fee title to the Preserve Manager(s). The effectiveness monitoring of the Preserves will be compared with baseline surveys and subsequent periodic biological surveys.

5. **Targeted Monitoring.** Targeted monitoring is used to answer specific management questions (hypotheses) and determine the effect of management actions on target resources. Targeted monitoring is conducted by the Monitoring Biologist, and may require additional input from outside sources with respect to sampling design, data collection, and analyses. In addition, results may be used to develop or refine BMPs. Targeted monitoring necessary to address site-specific threats to Covered Species and habitats on the Preserves will be identified and prioritized as part of the development of individual Preserve RMPs or through subsequent stewardship or effectiveness monitoring.
6. **Regional Monitoring.** OCTA will not be responsible for collecting additional biological monitoring data (outside of their Preserves) for regional assessments but may contribute to such efforts, as appropriate/feasible, through the collection of comparable data. Data comparability will be facilitated through regular interaction with the Wildlife Agencies and Preserve Managers in other NCCP/HCP areas to support the use of similar methods, coordination of survey schedules, and other relevant efforts regarding monitoring issues. OCTA will provide access to Preserves for other entities to collect regional biological monitoring data, as appropriate, and will submit Preserve data to an appropriate data repository, such as the Biogeographic Information and Observation System (BIOS), California Natural Diversity Database (CNDDDB), or other regional databases.

Methods

There are many monitoring methods or protocols available to address goals, objectives, and management questions. Different methods may be required for different types of monitoring, and methods should be objective-driven. For example, if the objective is to determine whether a species occurs on the preserve, then presence/absence monitoring will suffice. If the objective is to determine whether population size is stable, increasing, or declining over time (trend), full census/total counts, probability sampling (transects, quadrats, trapping lines, grids, visual encounter surveys), or mark-recapture surveys may be required, depending on level of impact of the monitoring effort. Further, linking change to specific threats will require some measure or assessment of those threats. Method selection will also be dependent on the monitoring target, as identified through existing protocols or conceptual models. For many resources, the monitoring target will be obvious (e.g., the species of concern), although targets may also be other objects of interest (e.g., burrows, nests, tracks). Finally, monitoring protocols should be consistent with other protocols in Orange County and/or southern California to facilitate comparison and help inform data analysis.

It is important to point out that all species may not need the same level, frequency, or intensity of monitoring, depending on status and threats. Further, there are some species for which habitat monitoring may be sufficient to determine trends and threats. However, assumptions about species-habitat relations must be supported by data prior to relying on 'surrogate' monitoring (Atkinson et al. 2004). Surrogate monitoring is generally more appropriate for widely distributed species that do not require specific vegetation characteristics and would benefit from habitat management.

Table 7-1 presents protocols and a timeline for effectiveness monitoring of biological resources. It is possible these protocols will adjust over time, and OCTA will coordinate regularly with Wildlife Agencies, Preserve managers in other NCCP/HCP areas, and other relevant efforts about monitoring issues to ensure that the most current, established protocols are being used. Preserve Managers and Monitoring Biologists, in consultation with the Wildlife Agencies and other species experts, will review and select the most appropriate monitoring method(s) to address resource-specific management questions. Monitoring methods will be included in RMPs.

Table 7-1. Type and Frequency of Periodic Surveys for Effectiveness Monitoring

Type	Frequency	Protocols/Methods
Vegetation		
Comprehensive	10 Years	Comprehensive vegetation mapping will be completed based on field surveys using the classification system from <i>A Manual of California Vegetation</i> , second edition, ¹ and <i>Vegetation Classification Manual for Orange County</i> (release pending).
Invasive Species	Annually	Invasive plant surveys will be conducted along natural conduits for dispersal (trails, drainages, disturbed areas) during general stewardship or biological monitoring, or through volunteer patrols.
Statistical Sampling	TBD (assumed every 4 years for this Plan)	Statistical sampling of vegetation cover will be completed at each Preserve to measure ecological changes using sampling design and field protocols developed in conjunction with NROC. ² This will involve stratified random sampling that takes into account habitat types, acreage, and statistical sampling.
Covered Species		
<i>Plants</i>		
Rare Plant Surveys	3 to 5 years, depending on precipitation conditions	Special-status plant surveys will be completed following CNPS and CDFW survey guidelines. ³ In addition to population counts or estimates, surveys will collect covariate data on vegetation composition and cover, invasive nonnative plants and other threats, and map the perimeter of the population or suitable habitat. Surveys will be completed during the appropriate blooming periods for each of the plants, which vary depending on rainfall and temperature. Therefore, reference populations will be monitored to determine appropriate survey times (generally between March and July).
<i>Fish</i>		
Arroyo chub	4 years	If arroyo chub habitat is identified on a Preserve, arroyo chub survey methods and protocols will be coordinated with the regional CDFW fisheries biologist.

Type	Frequency	Protocols/Methods
<i>Reptiles</i>		
Coast horned lizard	4 years	Focused visual encounter surveys will be conducted for terrestrial reptiles during the peak activity period for the species. These surveys will follow the time-constrained search methodology. ⁴ Enough time should be devoted to each survey area to allow for complete coverage. Equal effort is expended in each area searched, as measured by the number of staff hours spent searching.
Orangethroat whiptail	4 years	Focused visual encounter surveys will be conducted for terrestrial reptiles during the peak activity period for the species. These surveys will follow the time-constrained search methodology. ⁴ Enough time should be devoted to each survey area to allow for complete coverage. Equal effort is expended in each area searched, as measured by the number of staff hours spent searching.
Western pond turtle	4 years	Visual surveys will be conducted for western pond turtle employing the USGS protocol ⁵ designed to determine pond turtle presence. This protocol requires that all aquatic habitat be broken into 250-meter segments and scanned for the presence of basking sites, aquatic refugia, streamside refugia, and upland nesting habitat. Attention will be focused on identifying pond turtles within open pools and potential basking areas.
<i>Birds</i>		
Cactus wren	4 years	Because of similar habitat requirements of cactus wren and coastal California gnatcatchers, surveys for cactus wren will be completed simultaneously with coastal California gnatcatcher surveys using the same protocols. ⁶
Coastal California gnatcatcher	4 years	Two surveys will be conducted in suitable habitats with at least 1 week between site visits; the surveys should be conducted in late winter/early spring. All visits must take place during the morning hours, and no more than 100 acres of suitable habitat may be surveyed per visit. With the exception of the timing and number of visits, surveys for coastal California gnatcatcher will follow USFWS coastal California gnatcatcher protocol, which includes playing tape vocalizations. ⁶
Least Bell's vireo	4 years	A total of three surveys will be conducted—one in mid-May, one in June, and one in early July. With the exception of the number and timing of visits, surveys for least Bell's vireo will follow the USFWS Least Bell's Vireo Survey Guidelines. ⁷
Southwestern willow flycatcher	4 years	A total of three surveys will be conducted—one in mid-May, one in June, and one in early July. With the exception of the number and timing of visits, surveys for southwestern willow flycatcher will follow the USFWS Southwestern Willow Flycatcher Protocol Revision, which includes playing tape vocalizations. ⁸

Type	Frequency	Protocols/Methods
<i>Mammals</i>		
Bobcat	4 years	Prior to effectiveness monitoring surveys, set up wildlife movement cameras for at least 6 months to document current movement of wildlife on Preserve to be used by a qualified wildlife biologist to assess wildlife movement and connectivity.
Mountain lion	4 years	Prior to effectiveness monitoring surveys, set up wildlife movement cameras for at least 6 months to document current movement of wildlife on Preserve and to be used by a qualified wildlife biologist to assess wildlife movement and connectivity.

- ¹ Sawyer et al 2009. *A Manual of California Vegetation*, second edition. California Native Plant Society. Sacramento CA.
- ² Deutschman et al. 2008. *Improving Statistical Sampling and Vegetation Monitoring for Open Space in Central Orange County*. Prepared for The Nature Reserve of Orange County (NROC).
- ³ California Native Plant Society 2001. *CNPS Botanical Survey Guidelines*. Sacramento CA. Available: <http://www.cnps.org/cnps/rareplants/pdf/cnps_survey_guidelines.pdf>. Accessed: August 29 2012.
- ⁴ Corn and Bury 1990. *Sampling Methods for Terrestrial Amphibians and Reptiles*. USDA Forest Service, General and Technical Report PNW-GTR-256, 34 pp.
- ⁵ USGS 2006. *USGS Western Pond Turtle (Emys marmorata) Visual Survey Protocol for the Southcoast Ecoregion, Survey Protocol, Version 1*.
- ⁶ USFWS 1997. *Coastal California Gnatcatcher (Poliopitila californica californica) Presence/Absence Survey Guidelines*. Report from Carlsbad, California, Field Office, Dated July 28, 1997.
- ⁷ USFWS 2001. *Least Bell's Vireo Survey Guidelines*. Report from Carlsbad, California, Field Office, dated January 19, 2001. 3 pp.
- ⁸ USFWS 2000. *Southwestern Willow Flycatcher Protocol Revision 2000*. Unpublished report with cover letter dated July 11, 2000.

The monitoring requirements outlined in this section and as part of the avoidance and minimization measures set forth in Section 5.5 will be completed by a qualified biologist with the appropriate expertise and level of experience to complete these tasks. Table 7-2 defines the skills and experience for qualified biologist to complete effectiveness monitoring. General stewardship monitoring will require a biologist with at least 3 years of experience with the general biological resources of Orange County to identify and evaluate threat to Covered Species and habitats.

Table 7-2. Qualified Biologist Skills and Expertise Requirements

Type	Task	Skills and Expertise
Vegetation		
	Comprehensive and Statistical Sampling	Botanist with at least 3 years of experience mapping southern California vegetation communities; working knowledge of the classification system used in <i>A Manual of California Vegetation</i> , second edition. ¹ and <i>Vegetation Classification Manual for Orange County</i> (release pending).

Type	Task	Skills and Expertise
Covered Species		
<i>Plants</i>		
Rare Plant Surveys	Effectiveness Monitoring	Botanist with experience conducting floristic field surveys; knowledge of plant taxonomy and plant community ecology and classification; familiarity with plants of the area, including special-status and locally significant plants; familiarity with appropriate state and federal statutes related to plants and plant collecting; and experience analyzing impacts of a project on native plants. ²
<i>Fish</i>		
Arroyo chub	Effectiveness Monitoring	Biologist with at least 2 years of independent experience conducting arroyo chub surveys; should have demonstrated experience in identifying and handling arroyo chub.
<i>Reptiles</i>		
Coast horned lizard	Effectiveness Monitoring	Biologist with at least 2 years of independent experience conducting herpetological surveys; should have demonstrated experience in identifying coast horned lizard.
Orangethroat whiptail	Effectiveness Monitoring	Biologist with at least 2 years of independent experience conducting herpetological surveys; should have demonstrated experience in identifying orangethroat whiptail.
Western pond turtle	Effectiveness Monitoring	Biologist with at least 2 years of independent experience conducting surveys for western pond turtle using USGS visual survey protocol. ³
<i>Birds</i>		
Cactus wren	Effectiveness Monitoring	Trained ornithologist with at least 40 hours of observation in the field of the target species and documented experience locating and monitoring nests of the target species, or demonstrated expertise to the satisfaction of the Wildlife Agencies.
Coastal California gnatcatcher	Effectiveness Monitoring	Trained ornithologist with at least 40 hours of observation in the field of the target species and documented experience locating and monitoring nests of the target species, or demonstrated expertise to the satisfaction of the Wildlife Agencies; must have a current a USFWS Section 10(a)(1)(A) permit for coastal California Gnatcatcher.
Least Bell's vireo	Effectiveness Monitoring	Trained ornithologist with at least 40 hours of observation in the field of the target species and documented experience locating and monitoring nests of the target species; must have a current a USFWS Section 10(a)(1)(A) permit for Least Bell's vireo
Southwestern willow flycatcher	Effectiveness Monitoring	Trained ornithologist with at least 40 hours of observation in the field of the target species and documented experience locating and monitoring nests of the target species; must have a current a USFWS Section 10(a)(1)(A) permit for southwestern willow flycatcher.

Type	Task	Skills and Expertise
<i>Mammals</i>		
Bobcat	Effectiveness Monitoring	Trained wildlife biologist with at least 5 years of independent experience evaluating wildlife movement and habitat connectivity.
Mountain lion	Effectiveness Monitoring	Trained wildlife biologist with at least 5 years of independent experience evaluating wildlife movement and habitat connectivity.

¹ Sawyer et al. 2009. *A Manual of California Vegetation*, second edition. California Native Plant Society. Sacramento CA.
² California Native Plant Society 2001. *CNPS Botanical Survey Guidelines*. Sacramento CA. Available: <http://www.cnps.org/cnps/rareplants/pdf/cnps_survey_guidelines.pdf> Accessed: August 29 2012.
³ USGS 2006. *USGS Western Pond Turtle (Emys marmorata) Visual Survey Protocol for the Southcoast Ecoregion, Survey Protocol, Version 1*.

7.2.7.5 Management

Adaptive management deals with reducing uncertainty and improving management effectiveness through iterative monitoring and evaluation. While management may be required for a variety of issues, only those management actions that involve some measure of uncertainty and can be adjusted in response to what is learned (i.e., there are opportunities for iterative decision making) will require an adaptive management approach. In these cases, the level of uncertainty will dictate the type of management and monitoring design. Management approaches based on levels of uncertainty are discussed below (including the 'No Uncertainty' alternative). Detailed implementation tasks will be developed at the Preserve-level for specific management issues.

Where there is no uncertainty in the management outcome, adaptive management is not required, and management may proceed immediately. BMPs are well-established and management triggers are well-understood (Lewison and Deutschman 2014). Monitoring will be simple and relatively inexpensive and will focus on documenting the management action. Management actions that fall into this category may include (but are not limited to) general stewardship activities such as trash and debris removal, runoff control, fencing and signage installation and repair, routine (minor) weed control, illegal access and encroachment violations, seasonal restrictions and trail closures, trail maintenance, vandalism repair, erosion control, fuel modification, public outreach and education, and enforcement of Preserve regulations. General preserve management guidelines (Section 7.3) will be sufficient to address most or all of these issues.

An adaptive management approach is required where there is some uncertainty in the management outcome. Information exists to support the management action, but the response may be variable. An example is the response of native species to invasive species control. While this type of management does not require a detailed experimental design, it does require data collection and analyses. Modifications to the prescribed management or alternative management actions may be implemented if outcomes are unsuccessful or if an alternative approach is identified that can achieve the specified biological objective(s) in a more efficient and/or cost-effective manner.

An adaptive management approach is also required where uncertainty is high. In this case, neither BMPs nor adequate information are available to support management outcomes, and an experimental approach is required to determine both management response and cause and effect between management action and response. This type of management requires a detailed

experimental design (control, alternative treatments, replication, and randomization). This approach can be time- and cost-intensive, but offers a high return in terms of reducing uncertainty (Lewison and Deutschman 2014).

7.2.7.6 Evaluation (Feedback Loop)

The final step in the adaptive management process is evaluating or interpreting data to determine whether goals and objectives have been met and to guide future monitoring and management. This evaluation will be conducted yearly, and information will be used to refine goals, objectives, conceptual models, monitoring methods, and management actions.

Implementation of adaptive management is defined as successful if progress is made toward achieving management goals through a learning-based (adaptive) decision process. The individual RMPs for each Preserve will include an adaptive management component to ensure that site-specific objectives are being met and are contributing to the overarching goals and objectives of the Plan. Revisions to management components identified through adaptive management will be documented in the annual report and incorporated as a revised approach/method in the annual work plan as applicable for each Preserve.

Data Entry and Storage. It is anticipated that a significant amount of data will be collected yearly at each Preserve. OCTA will maintain a GIS database of monitoring results from all Preserves in a format that is consistent with other state and regional monitoring databases, such as BIOS and CNDDDB. The GIS database will include species, habitat, and management-relevant data, and should allow data to be input and extracted easily. Additional databases may be required to store non-digital data (e.g., data forms, photodocumentation).

Data Analysis and Interpretation. Data analysis and interpretation are necessary to evaluate management effectiveness, improve understanding of the system, and reduce uncertainty. Data analysis can be simple or complex, depending on the management approach selected. Where uncertainty is absent or low, analyses may consist of graphics, summary statistics, or simple hypothesis testing. Where uncertainty is high, complex statistical analyses may be required. In the latter case, the Preserve Manager and Monitoring Biologist may need to work with outside entities to ensure that data are analyzed appropriately. Data results and interpretation will be presented in the Preserve's Annual Report. OCTA will include results, analyses, and recommendations from each Preserve in the Plan's Annual Report (see Section 8.4, "Annual Reporting Requirements").

Evaluation. Evaluation completes the 'feedback loop' or iterative learning process for adaptive management. Evaluation includes documentation and dissemination of results and recommendations, and refinements to goals, objectives, conceptual models, monitoring methods and management actions, as necessary.

Decision-making. The accumulation of understanding and subsequent adaptation of a management strategy depends on feeding information obtained from monitoring results back into the decision-making process. The link between the technical and decision-making steps requires regular interaction and an exchange of information between the technical staff and decision-makers. This will be accomplished by bi-annual meetings involving the Preserve Managers, Monitoring Biologists, NCCP/HCP Administrator, and the Wildlife Agencies where both policy and technical expertise can be integrated into revising goals and objectives, refining models, adjusting management and/or monitoring activities, or allocating funding. Meetings should be timed such that any new information discussed assists with the planning of upcoming seasonal work (i.e., invasive species control,

vegetation management, or biological surveys). Timing some meetings to coordinate with other regional conservation planning meetings is encouraged to maximize communication and cooperation in the region.

Annual Report. The Preserve Manager, in coordination with the Monitoring Biologist, will prepare an Annual Report that summarizes monitoring and management activities on the Preserve including (but not limited to) baseline surveys, general stewardship monitoring, effectiveness monitoring, and targeted monitoring. The report will document monitoring results and link results to goals and objectives. The report will identify new or ongoing management issues and threats and stressors, and provide recommendations for future monitoring, management, and research. The Preserve annual reports will be submitted to the NCCP/HCP Administrator for incorporation into the M2 NCCP/HCP annual report (Section 8.4, "Reporting Requirements") and will guide the work plan for the upcoming year. In addition, the following information should be submitted with the annual report for inclusion in the OCTA GIS (and other) databases.

- A digital copy of monitoring data, including metadata (e.g., Excel spreadsheet).
- Spatial data (GIS shapefiles).
- Photodocumentation.
- A comprehensive annual assessment identifying and documenting the major threats to conserved habitat and Covered Species, impacts from public use, management needs, and issues requiring focused research.

Evaluate Management Actions. The Preserve Manager and Monitoring Biologist will evaluate management actions yearly (or at a frequency determined by the management action) to determine whether changes are warranted based on resource response and/or new information. This evaluation will address progress (positive and negative) toward goals and objectives. Proposed changes will be summarized in the annual report and detailed in the work plan for the upcoming year.

Evaluate Monitoring Programs. The Preserve Manager and Monitoring Biologist will evaluate monitoring programs yearly (or at a frequency determined by specific monitoring programs) to ensure that data are (1) collected efficiently, (2) address information needs, and (3) adequately assess resource responses to management actions. Changes in monitoring methods, protocols, or frequency will be summarized in the annual report and detailed in the work plan for the upcoming year.

Evaluate Goals and Objectives. The Preserve Manager and Monitoring Biologist, in consultation with the Wildlife Agencies, will evaluate monitoring or management results that indicate that conservation actions will not meet RMP goals and objectives. Where the cause of poor performance is understood, prescriptive actions will be implemented, including (but not limited to) adjusting success criteria based on monitoring data or other scientifically-defensible sources of information, or implementing alternative management actions.

Update Conceptual Models. Based on results from monitoring or other sources (e.g., literature reviews, species experts, science advisors, other Preserve Managers, and the Wildlife Agencies), Preserve Managers and Monitoring Biologists will update conceptual models, as appropriate, to reflect new information and guide future monitoring and management. Information that results in changes to underlying assumptions or hypotheses may warrant changes in monitoring and/or

management. Revised conceptual models (including documentation of changes) will be included in the annual report.

Coordination. OCTA will promote coordination among Preserve Managers in the region and within southern California to ensure that results of monitoring and management are shared and to encourage consistency in goals, objectives, monitoring methods, and monitoring priorities. Forums for coordination may be annual or bi-annual meetings (OCTA) or regional workshops. At the discretion of the Preserve Manager, Monitoring Biologists may attend OCTA or regional meetings.

Funding. The support required for an adaptive approach includes not only funding for monitoring and evaluation but also an investment in inclusive and robust decision-making processes. OCTA has included adaptive management as part of the formula for determining long-term funding requirements on this Plan (see Section 8.3, “Plan Funding”). Identification of a long-term funding mechanism demonstrates OCTA’s commitment to adaptive management, and it strengthens the planning and implementation approach for successful adaptive management (Williams et al. 2009). Management and monitoring objectives and budgets should be formulated on a 5-year schedule, and adjusted as necessary annually.

7.2.8 Summary of Adaptive Management Actions for Conserved Resources

A summary of the adaptive management guidelines and examples for conserved resources (13 Covered Species and natural communities) is included on the following pages. In some instances, species have been grouped when the ecology, threats, and adaptive management monitoring requirements are similar.

7.2.8.1 Covered Plant Species—Intermediate Mariposa Lily, Many-stemmed Dudleya, and Southern Tarplant

Intermediate Mariposa Lily

Calochortus weedii var. *intermedius*

Legal Status: Federal: None
State: None
Forest Service: Sensitive Species

CNDDDB Rank (2010): T2 /S2.2

CNPS List (2013): 1B.2

Recovery Plan: n/a



Many-stemmed Dudleya

Dudleya multicaulis

Legal Status: Federal: None
State: None
Forest Service: Sensitive Species

CNDDDB Rank (2010): G2/S2

CNPS List (2013): 1B.2

Recovery Plan: n/a



Southern Tarplant

Centromadia parryi ssp. *australis*

Legal Status: Federal: None
State: None
Forest Service: None

CNDDDB Rank (2010): G4T2/S2.1

CNPS List (2013): 1B.1

Recovery Plan: n/a



Plants species covered under this Plan (intermediate mariposa lily, many-stemmed dudleya, southern tarplant) have, in general, similar threats and management requirements. While each plant has different habitat requirements, the overall adaptive management strategy is similar enough that these species are addressed together in this section.

Background

Habitat: Intermediate mariposa lily occurs on dry, rocky, open slopes in coastal sage scrub, chaparral, and grassland communities between 105 and 855 meters (350 to 2,800 feet) above mean sea level. Many-stemmed dudleya is a perennial, deciduous succulent in the Crassulaceae family that is endemic to southern California. Habitat for many-stemmed dudleya includes areas within open

chaparral, coastal sage scrub, and valley and foothill grasslands, often on heavy, clay soils from 15 to 790 meters (2,592 feet) above mean sea level. Southern tarplant (previously under the scientific name of *Hemizonia parryi* ssp. *australis*) is an annual herb in the Asteraceae family that is known from both California and Baja California. Southern tarplant is known to occur at the margins of marshes and swamps, in vernal mesic (saline) valley and foothills grasslands, and vernal pools below 425 meters (1,394 feet) above mean sea level.

Ecology: Intermediate mariposa lily is a perennial in the Liliaceae family that blooms from May to July. Intermediate mariposa lily is an obligate fire resprouter, relying upon the survival of the buried bulb for fire survival. Many-stemmed dudleya blooms from April through July. Dudleyas have the ability to tolerate long periods of drought, and population size varies considerably from year to year both in number of seedlings produced and number of mature plants leafing out. Southern tarplant is a summer-blooming annual that looks and acts weedy where it occurs, and its spiny morphology resembles that of tumbleweed.

Threats: Each of the rare plants on the covered species list is considered imperiled within the Plan Area due to population fragmentation. The primary threats include development, road construction, fuel modification, grazing, frequent fires, competition from nonnative plants, and collecting by horticulturalists. Other Preserve-specific threats include recreational activities (trampling, soil disturbance) and road maintenance.

See species accounts in Appendix C.2, “Covered Species Accounts” for more details.

Conservation Strategy

Preserves: To the extent feasible, OCTA will acquire Preserves with known occurrences and/or potential habitat of covered plant species. OCTA will ensure that appropriate management and monitoring actions are incorporated into the RMPs for each Preserve to support sustainable populations of covered plant species. OCTA completed baseline biological surveys of the seven acquired Preserves. During these surveys, intermediate mariposa lily were detected at six of the seven Preserves—Aliso Canyon, Ferber Ranch, Hafen, MacPherson, O’Neill Oaks, and Saddle Creek South—with a total of 93 identified locations and a minimum total population of 597 plants. During the baseline surveys, many-stemmed dudleya were detected at Aliso Canyon Preserve and it was determined that suitable habitat exists at Ferber Ranch and Hayashi and that marginally suitable habitat exists at O’Neill Oaks, Hafen, MacPherson, and Saddle Creek South. For southern tarplant, suitable habitat was noted only on the Hayashi Preserve, but no individuals were observed during the baseline surveys. Southern tarplant has also been observed in Chino Hills State Park immediately south of the Hayashi Preserve. The proximity and comparable conditions suggest Hayashi would be a suitable location for translocation of southern tarplant. The current absence of southern tarplant on Hayashi may be attributed to heavy grazing that has occurred on this property for many decades. Efforts are now underway to remove all cattle from this Preserve through the use of fences and active removal of the cattle.

Restoration: OCTA will implement restoration projects in the vicinity of known occurrences of covered plant species with the expectation that the restoration actions will improve and enhance habitat for covered plant species. As appropriate, the restoration design plan will include elements to promote the expansion of covered plant species as part of the restoration efforts. OCTA has approved funding for the Harriet Weider Regional Park restoration project, which has southern tarplant mapped in the project vicinity. The restoration project sponsor has agreed to include specific measures as part of the restoration project design plan to achieve the establishment of

southern tarplant. Southern tarplant seeds have been harvested from mature plants near the restoration site and will be included in the restoration seed mix. OCTA will ensure that focused surveys are conducted for southern tarplant as part of their monitoring efforts to quantify the population established through the restoration process. OCTA has approved funding for two restoration projects, West Loma and Big Bend, in which occurrences of many-stemmed dudleya have been documented as overlapping or within 50 feet of these projects. The restoration actions are anticipated to improve the potential for many-stemmed dudleya to become established in these areas. To ensure that the Plan provides conservation and management for a major population of many-stemmed dudleya, OCTA will select and oversee implementation of a future restoration project specifically designed to establish or expand a population of many-stemmed dudleya within an area of protected open space. The many-stemmed dudleya restoration project will result in an increase of a current population or establishment of a new population with a targeted minimum of 500 individuals to achieve coverage under this Plan.

Avoidance and Minimization Measures: OCTA will establish policies and procedures that require OCTA to identify, track, mitigate, and report annually any unavoidable impacts on covered plant species. There are no known occurrences of covered plant species in the area of direct or indirect effects for covered freeway improvement projects; however, project-specific surveys have the potential to detect this species within the Permit Area. The Plan includes the Covered Plant Species Policy (see 5.6.2.2), which sets forth policies and procedures for OCTA to evaluate impacts based on project-specific field surveys and to mitigate the impacts (at a 3:1 ratio) using credits resulting from the Plan conservation actions. Credits are determined through field surveys of Preserves and/or restoration actions to enhance, restore, and create populations of covered plant species as part of restoration projects approved for funding by OCTA. OCTA will maintain a ledger-type accounting system to track credits and debits related to covered plant species and report status as part of the Plan's annual report.

See Chapters 5 and 6 for more details.

Potential Adaptive Management Issues at Preserves (including threats, uncertainties, research needs)

- How do the covered plant species respond to fire and fire frequency? What are the most effective fire management procedures that minimize the direct disturbance to covered plant species occurrences as a result of fire suppression efforts?
- Does vegetation management for access roads (either manual removal/trimming or application of herbicides along the edge of access roads on the Preserves) threaten the viability of covered plant occurrences adjacent to access roads? Can vegetation management methods be adjusted to protect occurrences adjacent to access roads?
- Are nonnative grasses or other invasive species out-competing covered plant species and causing a decline in known populations within Preserves? Are there opportunities for broader vegetation management and/or invasive species control (e.g., dethatching) to maintain a more open cover that allows for covered plant species to compete?
- If known populations of covered plant species within the Preserve are determined to be in decline, are there opportunities for focused restoration to re-establish, enhance, and/or expand populations through introduction of propagules (e.g., seed, bulbs)?

- Is public access and recreational use within the Preserves resulting in direct or indirect impacts (trampling, grazing, and erosion) that threaten known populations of covered plant species and/or potential habitat?

Adaptive Management Goals and Objectives

The following are examples of goals and objectives to be included in a Preserve RMP to guide adaptive management:

Adaptive Management Goal: Provide conservation of covered plant species within the Preserves.

Adaptive Management Objective: Determine and monitor the presence and status of covered plant species within the Preserve by monitoring every 3–5 years (depending on precipitation conditions) using established protocols (priority 1).

Strategy/Management Action: Comprehensive surveys of the Preserve will be completed during baseline surveys and completed in perpetuity every 3–5 years (depending on rainfall) as part of effectiveness monitoring. Special-status plant surveys will be completed following CNPS and CDFW survey guidelines (see Table 7-1). In addition to population counts, surveys will collect covariate data on vegetation composition and cover, collect data on invasive nonnative plants and other threats, and map the perimeter of the population or suitable habitat. Surveys will be completed during the appropriate blooming periods for each of the plants, which vary depending on rainfall and temperature. Therefore, reference populations will be monitored to determine appropriate survey times (generally between March and July). Where surveys show a decline in covered plant species populations that can be attributed to anthropogenic threats, specific management actions will be implemented, as discussed below. These may include (but are not limited to) vegetation management along access roads, invasive plant species control, public access and trail use management, and restoration. Data will be shared with other regional Preserve managers in order to help decipher upward or downward regional trends.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, complete a fire management plan (FMP) that identifies environmentally sensitive areas (including covered plant species occurrences) to reduce, if feasible, the threat of covered plant species being irreparably harmed during fire suppression efforts within the Preserve (priority 1).

Strategy/Management Action: Preserve Manager will develop a FMP in coordination with the OCFA and NCCP/HCP Administrator. The FMP will include maps of known occurrences of covered plant species and strategies to minimize direct impacts to covered plant species during fire suppression efforts, where feasible.

Adaptive Management Objective: Within 5 years from the adoption of the Preserve RMP, complete an evaluation of the vegetation management methods used along Preserve access roads to determine if existing practices should be modified to improve the protection of occurrences of covered plant species adjacent to access roads (priority 1).

Strategy/Management Action: The Preserve Manager will coordinate with the Monitoring Biologist and NCCP/HCP Administrator to collect information on current methods used for vegetation management along access roads (e.g., manual removal or

application of herbicides along the edge of access roads) and monitor the response of known occurrences of covered plant species that occur adjacent to the access road. The monitoring data will be evaluated to assess different vegetation management methods to determine a BMP for protection of covered plant species occurrences adjacent to access roads.

Adaptive Management Objective: If known populations of covered plant species are declining within the Preserve, restore or enhance grasslands with suitable soils to provide additional habitat for covered plant species and pollinators, thereby improving connectivity between populations (priority 2).

Strategy/Management Action: If the evaluation of monitoring data indicates that known populations of covered plant species within the Preserve are declining due to competition from nonnative grasses, the Preserve Manager will coordinate with the Monitoring Biologist and a Restoration Ecologist to determine if there are opportunities to restore or enhance grasslands by thinning or dethatching. The goal of thinning nonnative grasses will be to provide better opportunity for covered plant species to compete. The Preserve Manager may implement quantitative or semi-quantitative monitoring to evaluate the BMPs and effectiveness of these focused vegetation management and/or invasive species control efforts. This will be completed using either (1) funding allocated for adaptive management, or (2) reallocation of existing management priorities as appropriate.

Adaptive Management Objective: If known populations of covered plant species are declining within the Preserve as a result of fire or other factors, restore and/or expand conserved populations through introduction of propagules (e.g., seed, bulbs) (priority 2).

Strategy/Management Action: If the evaluation of monitoring data indicates that known populations of covered plant species within the Preserve are declining as a result of fire or other factors, the Preserve Manager will coordinate with the Monitoring Biologist and a Restoration Ecologist to determine if there are opportunities to implement focused restoration efforts using the introduction of propagules (e.g., seed, bulbs). The Preserve Manager may implement quantitative or semi-quantitative monitoring to evaluate the best methods for the focused restoration of covered plant species. This will be completed using either (1) funding allocated for adaptive management, (2) reallocation of existing management priorities as appropriate, and/or (3) funding set aside for Changed Circumstances, if appropriate.

Adaptive Management Objective: Within 5 years from the adoption of the Preserve RMP, evaluate the effects of the public access policy and recreational trail use as a threat (direct and indirect) on covered plant species occurrences within the Preserve (priority 2).

Strategy/Management Action: The Preserve Manager may initiate a targeted monitoring of covered plant species occurrences to determine the degree to which recreational trail use negatively affects covered plant species success. This may be implemented using quantitative or semi-quantitative methods and conducted in coordination with other efforts to monitor trail use and activity. Where recreational impacts are identified, known covered plant species would be protected by fencing, signage, or possibly trail closures or realignment, as appropriate.

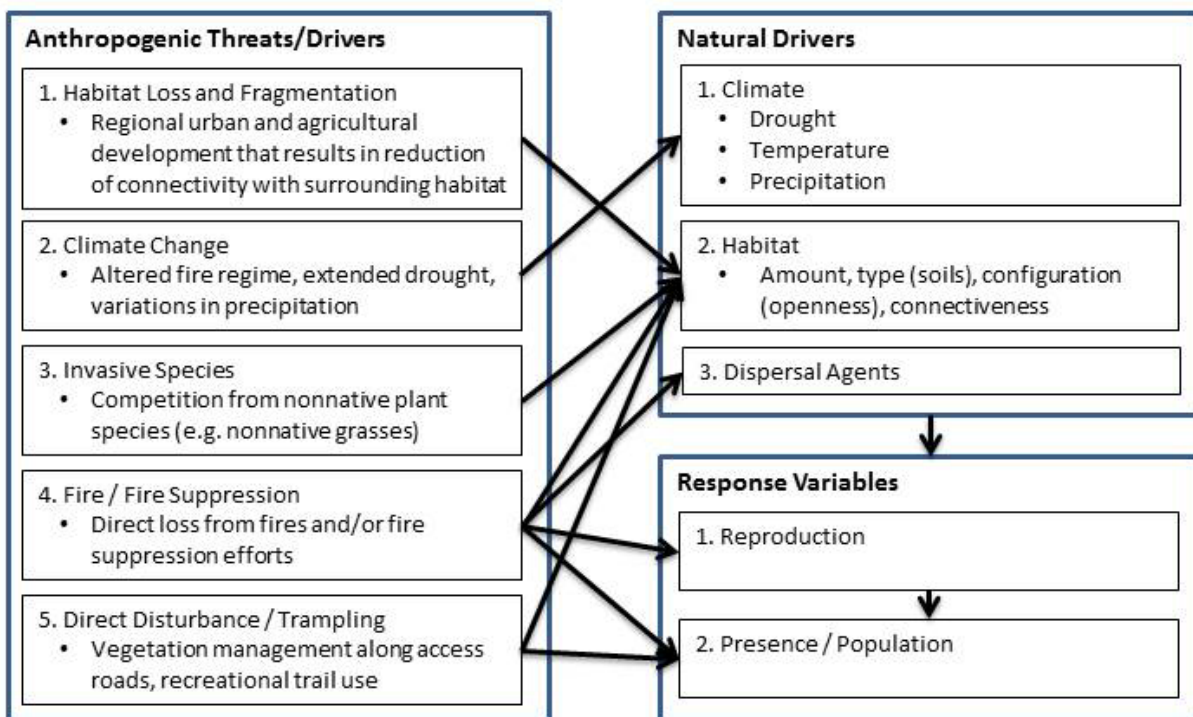
Monitoring Methods

- **Baseline Monitoring.** Comprehensive special-status plant surveys will be completed of the entire Preserve following CNPS and CDFW survey guidelines (see Table 7-1). In addition to population counts, surveys will collect covariate data on vegetation composition and cover, collect data on invasive nonnative plants and other threats, and map the perimeter of the population or suitable habitat. Surveys will be completed during the appropriate blooming periods for each of the plants, which vary depending on rainfall and temperature. Therefore, reference populations will be monitored to determine appropriate survey times (generally between March and July).
- **General Stewardship Monitoring.** Ongoing general stewardship monitoring will be completed as appropriate (e.g., monthly, quarterly) and will include biological surveys to record and/or track impacts to covered plant species resulting from trail use, vegetation management along access roads, and other potential disturbance activity. General stewardship monitoring will also include the recording of incidental observations of covered plant species.
- **Effectiveness Monitoring.** Every 3–5 years, special-status plant surveys of the suitable habitat will be completed as part of effectiveness monitoring (using same methods used for baseline monitoring) to determine trends in population status (size, distribution) over time at the Preserve-level. Where declining trends are observed, attribute and climatic data will be assessed for potential causal effects (e.g., trampling from trail use, erosion). Results that are linked to anthropogenic threats (e.g., vegetation management, trail use) will require management. Results from all Preserves will be evaluated at the Plan-level to determine Plan-level status and management priorities.
- **Targeted Monitoring.** Targeted monitoring will be designed and implemented by the Preserve Manager to evaluate management actions, such as vegetation management, public access controls, invasive species control to thin nonnative grasses, or focused restoration with the introduction of propagules. Methods may include quantitative methods (e.g., point-intercept, quadrats) for assessing experimental outcomes. The Preserve Manager may need to get support from the Monitoring Biologist and/or other outside specialist to develop an experimental design. Success criteria or targets may include (1) habitat structure, cover, and composition, or (2) presence or number. Where success criteria are not met, modified or alternative management strategies may be implemented.

Conceptual Model

The following is a draft conceptual model that will serve as an initial framework to guide Preserve Managers on adaptive management focused on covered plant species. This conceptual model will continue to be adjusted and refined over time.

Covered Plant Species Conceptual Model for Preserve Management - Example



Management Actions

Preserve-level

- Determine and monitor the presence of covered plant species (addresses Response Variables (RV) 1 and 2)
- Implement invasive species control plan that addresses situations in which nonnative grasses should be thinned or dethatched to allow covered plant species to effectively compete (Threat 3, Natural Drive (ND) 2)
- If there is a decline in the population of known occurrences of covered plant species through fire and/or climate factors, pursue opportunities for focused restoration using propagules (Threat 2 and 4, RV 2)
- Implement fire management plan that emphasizes fire suppression and outlines a fire suppression strategy to minimize damages to known locations of covered plant species (Threat 4, ND 2 and 3, RV 1 and 2)
- Identify and use best management practices for vegetation management along access roads to minimize impacts to known occurrences of covered plant species (Threat 5, RV 2)
- Manage trail use and public access to limit impact to known occurrences of covered plant species (Threat 5, ND 2, RV 2)

Regional

- Contribute monitoring data for regional assessments of covered plant species (could address/benefit all threats and drivers)

7.2.8.2 Arroyo Chub (*Gila orcutti*)

Legal Status:	Federal:	None
	State:	CDFW Species of Special Concern
	Forest Service:	Sensitive
	Recovery Plan:	None



Background

Habitat: The arroyo chub is a small, chunky minnow in the Cyprinidae family. The arroyo chub has a very restricted range in southern California, and southern Orange County populations in San Juan and Trabuco creeks are among the largest remaining natural habitats for the species. Preferred habitat is slow-moving or backwater sections of warm to cool streams with substrates of sand or mud and depth greater than 40 centimeters (16 inches).

Ecology: Breeding takes place continuously from February through August, with a peak in June and July. Arroyo chub usually spawn in pools or slow-moving side waters with temperatures of 14 to 22°C during March and April. Natural dispersal is up- or downstream as conditions and suitable habitat permit and is typically facilitated by flooding events. The arroyo chub is omnivorous, feeding primarily on algae but also known to eat aquatic plants, insects, insect larvae, small crustaceans, and roots of water ferns (*Azolla* spp.) occupied by nematodes.

Threats: Threats include water quality issues, predation, competition from nonnative species, and degradation of streams and habitat loss due to stream modifications, check dams, or channelization that fragments and reduces the populations.

See species accounts in Appendix C.2, “Covered Species Accounts” for more details.

Conservation Strategy

Preserves: OCTA will conserve natural habitat in the headwaters of streams supporting arroyo chub to protect in-stream water quality. OCTA completed baseline biological surveys of the seven acquired Preserves. There is habitat with a limited potential to support arroyo chub on the Hayashi Preserve in Carbon Canyon Creek, but this area is isolated from known populations. There is no potentially suitable habitat on any of the other Preserves; however, the Ferber Ranch, Hafen, and O’Neill Oaks Preserves are located in headwaters of Trabuco Creek. The protection of 540.7 acres of natural habitat in this location contributes to the protection of water quality, sedimentation, and hydrological processes important for arroyo chub habitat downstream in Trabuco Creek.

Restoration: OCTA will restore and enhance riparian habitat in areas that potentially support arroyo chub. The City Parcel restoration project results in 13.0 acres of riparian restoration along lower reaches of Trabuco Creek. This restoration effort includes removal of nonnative plant species, removal of debris and trash, and planting of native plant species. These restoration activities will contribute to the improvement of the natural hydrological functions and water quality for this important coastal stream course and will improve Trabuco Creek as potential habitat for arroyo chub. To provide for additional conservation of arroyo chub, OCTA will fund a future restoration project that will achieve a direct benefit to an existing population of arroyo chub. This restoration

project could include actions to improve water quality in a subwatershed known to have arroyo chub (e.g., in Bell Canyon), removal or modification of check dams to facilitate fish passage (e.g., along San Juan creek in USFS lands), and/or a focused nonnative fish removal within a select tributary (e.g., fish trapping of source populations of nonnatives in Oso Creek).

Avoidance and Minimization Measures: The Plan includes the Aquatic Resources and Species Policy that outlines appropriate avoidance and minimization measures for construction activities in aquatic resources, such as rivers, creeks, and riparian areas. The Construction Lead will retain a qualified biologist during any project that could result in impacts on potential arroyo chub habitat to determine if arroyo chub might be present and subject to potential injury or mortality from construction activities. When arroyo chub are present, the project biologist will identify appropriate methods to capture, handle, exclude, and relocate those individuals. All fish exclusion and salvage activities will adhere to accepted NOAA Fisheries Service and CDFW protocols. Other policies that will provide for the protection of arroyo chub include the Avoidance and Minimization of Sensitive Biological Areas, Wildlife Crossing Policy, Stormwater and Water Quality BMPs, Wildfire Protection Techniques, and Wetland and Riparian Streambed Protection Program.

See Chapters 5 and 6 for more details.

Potential Adaptive Management Issues at Preserves (including threats, uncertainties, research needs)

- Are there opportunities for OCTA to improve hydrological conditions and/or apply BMPs for erosion control that will provide enhanced protection of headwaters of streams known to support arroyo chub?
- If there are no (or limited) arroyo chub using suitable habitat within the Preserve, are there opportunities to coordinate with Wildlife Agencies and other entities to translocate arroyo chub to the Preserve?

Adaptive Management Goals and Objectives

The following are examples of goals and objectives to be included in a Preserve RMP to guide adaptive management:

Adaptive Management Goal: OCTA will restore and enhance riparian habitat in areas that potentially support arroyo chub and conserve natural habitat in the headwaters of a stream supporting arroyo chub to protect in-stream water quality.

Adaptive Management Objective: Determine and monitor the presence and status of arroyo chub and its suitable habitat within the Preserve by monitoring every 4 years using established protocols (priority 1).

Strategy/Management Action: If a Preserve has potential habitat for arroyo chub, surveys will be completed during baseline surveys and completed in perpetuity every 4 years as part of effectiveness monitoring. Arroyo chub survey methods and protocols will be coordinated with the regional CDFW fisheries biologist (see Table 7-1). Where surveys show a decline in arroyo chub populations or habitat quality that can be attributed to anthropogenic threats, specific management actions will be implemented, as discussed below. These may include (but are not limited to) nonnative aquatic species control, participation on regional programs for arroyo chub translocation, and

erosion control to maintain headwaters. Data will be shared with other regional Preserve managers in order to help decipher upward or downward regional trends.

Adaptive Management Objective: If arroyo chub are determined to be located within the Preserve, an evaluation of the potential threat of nonnative aquatic species will be conducted within 1 year (priority 2).

Strategy/Management Action: If information from effectiveness monitoring or other monitoring on the Preserves shows arroyo chub are using habitat within the Preserve, the Preserve Manager will coordinate with the Monitoring Biologist and NCCP/HCP Administrator to conduct an evaluation of potential predation and/or competition from nonnative species (e.g. largemouth bass, red shiner) at the Preserve. If it is determined that nonnative species are a threat, the Preserve Manager will determine if there are opportunities to participate with other entities in program(s) to trap and remove nonnative aquatic species.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, an invasive species control plan will be prepared that will identify if invasive plant species can and should be actively treated/controlled and, if appropriate, restored with habitat beneficial for arroyo chub (priority 1).

Strategy/Management Action: Within 2 years from the adoption of the Preserve RMP, the Preserve Manager will contract with a Restoration Ecologist to prepare an invasive species control plan that will identify remedial actions to be taken, identify which species are likely to be controlled versus eradicated, and provide necessary monitoring and reporting to ensure that the desired positive effects are occurring to the specified habitat areas. The invasive species control plan will identify any situations in which invasive plant species (e.g., tamarisk and/or arundo) should be actively removed and replaced with improved stream habitat that will be beneficial to arroyo chub. If the Preserve has the appropriate hydrological conditions, the restoration will be designed to create habitat that is preferred as arroyo chub habitat (clean, clear pools and flowing streams with cobble and riffles).

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, inspect and identify areas vulnerable to erosion and warrant implementation of BMPs to reduce bank erosion and sedimentation that may impact arroyo chub habitat (priority 1).

Strategy/Management Action: Within 2 years from the adoption of the Preserve RMP, the Preserve Manager will identify situations that warrant erosion control and methods to reduce bank erosion and sedimentation. This may include BMPs for erosion control (e.g., sand bags, swales), closure of trails within and adjacent to creeks and streams, and improvements to flood control features.

Monitoring Methods

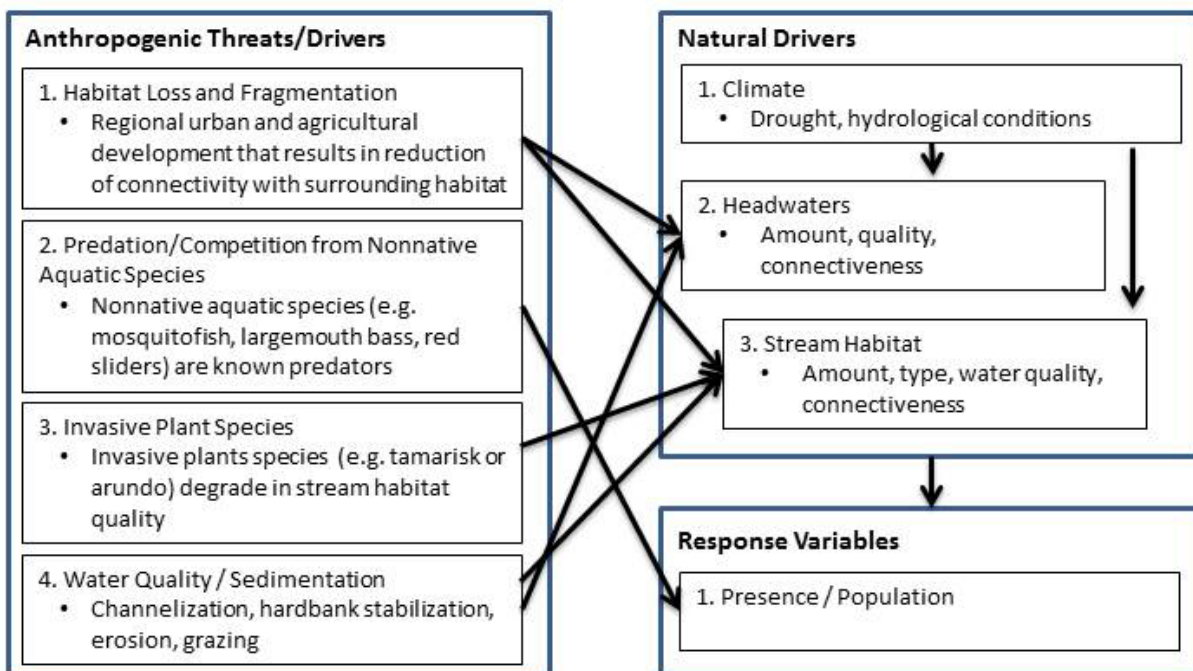
- **Baseline Monitoring.** If a Preserve has potential habitat for arroyo chub, surveys will be completed during baseline surveys. Arroyo chub survey methods and protocols will be coordinated with the regional CDFW fisheries biologist (see Table 7-1). Attention will be focused on identifying threats to arroyo chub habitat and headwaters.

- **General Stewardship Monitoring.** Ongoing general stewardship monitoring will be completed as appropriate (e.g., monthly, quarterly) and will include biological surveys to record and/or track impacts on arroyo chub habitats and headwaters, including monitoring of erosion control issues.
- **Effectiveness Monitoring.** Every 4 years, surveys of arroyo chub will be completed as part of effectiveness monitoring (using same methods used for baseline monitoring) to determine trends in population status (size, distribution) over time at the Preserve level. Where declining trends are observed, attribute and climatic data will be assessed for potential causal effects (e.g., competition and predation from nonnative aquatic species, erosion). Results that are linked to anthropogenic threats (e.g., nonnative predators, invasive plant species, erosion) will require management. Results from all Preserves will be evaluated at the Plan level to determine Plan-level status and management priorities.
- **Targeted Monitoring.** Targeted monitoring will be designed and implemented by the Preserve Manager to evaluate management actions, such as nonnative aquatic species control, invasive species control to improve stream habitat, or erosion control measures. Methods may include quantitative methods (e.g., point-intercept, quadrats) for assessing experimental outcomes. The Preserve Manager may need to get support from the Monitoring Biologist and/or other outside specialist to develop an experimental design. Success criteria or targets may include (1) aquatic habitat structure, cover, and composition, (2) nonnative aquatic species removal success, or (3) presence or number. Where success criteria are not met, modified or alternative management strategies may be implemented.

Conceptual Model

The following is a draft conceptual model that will serve as an initial framework to guide Preserve Managers on adaptive management focused on arroyo chub. This conceptual model will continue to be adjusted and refined over time.

Arroyo Chub Conceptual Model for Preserve Management - Example



Management Actions

Preserve-level

- Determine and monitor the presence of arroyo chub (addresses Response Variables (RV) 1)
- Implement program to manage and control nonnative aquatic species that are known predators and/or competitors of arroyo chub (addresses Threat 2, RV 1)
- Implement invasive species control plan to remove nonnative plant species (e.g. tamarisk or arundo) that degrades aquatic habitat (Threat 3, ND 3)
- Identify and implement erosion control best management practices and other measures to maintain and enhance headwaters of stream known to support arroyo chub (Threat 4, ND 2 and 3)
- Identify opportunities to translocate arroyo chub to suitable habitat on the Preserve (RV 1)

Regional

- Contribute monitoring data for regional assessments of arroyo chub (could address/benefit all threats and drivers)

7.2.8.3 Western Pond Turtle (*Emys marmorata*)

Legal Status:	Federal:	None
	State:	CDFW Species of Special Concern
	Forest Service:	Sensitive
	Recovery Plan:	None



Background

Habitat: The western pond turtle is a medium-sized aquatic turtle that historically ranged from state of Washington to northern Baja California, Mexico. Breeding behavior has been observed from February through November; the peak nesting season occurs from May through June, with females selecting nesting sites in loose soil up to 400 meters (1,312 feet) from their aquatic habitat. This species is known to use both permanent and intermittent water sources ranging from rivers and lakes to ponds, streams, and irrigation ditches. Preferred habitat is pools within streams with a rocky or muddy bottom and a predominance of aquatic vegetation. Pond turtles will select areas with high quality refugia for basking (e.g., floating vegetation, logs, rocks, terrestrial islands, and human-made debris). The upland habitat is also an important factor, as these areas are used to lay eggs, overwinter, and for dispersal (most frequently less than 3 kilometers [1.9 miles]).

Ecology: Pond turtles are active year round in warmer climates, but have peak activity from February through November. Pond turtles are opportunistic omnivores. Their diet is known to include aquatic plants, water beetles, duck carrion, adult larval insects, spiders, fish, frogs, tadpoles, coyote (*Canis latrans*) scat, and snails.

Threats: The greatest threat to this species is loss, alteration, and fragmentation of habitat; however, natural predators and nonnative predators may impact populations. Automobile strikes, as well as extended drought and associated wildfire can also result in significant mortality of western pond turtles.

See species accounts in Appendix C.2, “Covered Species Accounts” for more details.

Conservation Strategy

Preserves: OCTA will acquire a Preserve(s) with the potential to expand western pond turtle populations, potentially via translocation. OCTA will enhance the riparian and streambed habitat within the Preserve(s) to create and/or improve permanent and intermittent water sources that could provide habitat for western pond turtle. OCTA has acquired the Hayashi Preserve in the Chino Hills area which has potential western pond turtle habitat. The 2012 baseline survey of the Hayashi Preserve did not identify western pond turtles within the Preserve, but incidental observations of western pond turtle have been reported (observed in 2011) by Chino Hills State Park staff. OCTA has had fencing installed to remove grazing from the Preserve, which will allow the Soquel Canyon riparian zone to passively recover and expand. OCTA will identify appropriate management actions to improve western pond turtle habitat and use of the Preserve, such as monitoring and as-needed adaptive management through collaboration with, and agreement between, OCTA and the Wildlife Agencies, as part of the Preserve RMP. In order to understand the likelihood of pond turtle populations expanding into the Soquel Canyon riparian zone, OCTA will research and survey the

area between the Hayashi Preserve and where nearby occurrence records have shown western pond turtle to be located to see if there are barriers to dispersal that could be addressed.

Restoration: OCTA will implement a restoration project that will directly benefit known populations of western pond turtle by removing nonnative invasive plant species degrading the stream course, expanding ponds and open water, and/or exposing potential basking sites. OCTA has approved funding for the Aliso Creek restoration project, which involves 55 acres of riparian and transitional habitat restoration, including the removal of dense stands of arundo that have clogged the stream course and substantially degraded the quality of the stream as habitat for western pond turtle. There were five known occurrences of western pond turtle documented within the restoration project site. The restoration actions will improve western pond turtle by improving water quality and aquatic habitat (potentially exposing ponds and basking sites), enhancing aestivation habitat and access to aestivation habitat, and improving upland nesting habitat. Translocation of western pond turtle from other populations within Aliso Creek is also a consideration that will be evaluated in coordination with OCTA and Wildlife Agency personnel.

Avoidance and Minimization Measures: The Plan includes the Aquatic Resources and Species Policy that outlines appropriate avoidance and minimization measures for construction activities in aquatic resources, such as rivers, creeks, and riparian areas. Prior to ground-disturbing activities in or near aquatic habitats, the Construction Lead will conduct preconstruction surveys for western pond turtles to determine their presence or absence within the construction footprint. If western pond turtles are found within the construction footprint, the occupied habitat and appropriate buffer, as determined by a qualified biologist, will be avoided to the maximum extent practicable. If avoidance is not possible and the species is determined to be present in work areas, the biologist may capture turtles prior to construction activities and relocate them to nearby, suitable habitat a minimum of 300 feet downstream from the work area. Alternatively, if recommended and approved by the Wildlife Agencies, the turtles may be captured and either temporarily held or relocated to an appropriate, nearby location. Other policies that will provide for the protection of western pond turtle include the Avoidance and Minimization of Sensitive Biological Areas, Wildlife Crossing Policy, Stormwater and Water Quality BMPs, Wildfire Protection Techniques, and Wetland and Riparian Streambed Protection Program.

See Chapters 5 and 6 for more details.

Potential Adaptive Management Issues at Preserves (including threats, uncertainties, research needs)

- What are the BMPs to control nonnative species (e.g. bullfrogs, largemouth bass, exotic turtles) within in-stream habitats that are predators and/or compete with western pond turtle for habitat (basking sites) or food supply?
- Are there opportunities to make some in-stream habitat improvements (e.g. creation or enhancement of basking sites/ponds) that would benefit western pond turtle?
- If there are no (or limited) western pond turtle utilizing suitable habitat within the Preserve, are there opportunities to coordinate with Wildlife Agencies and other entities to translocate western pond turtle?
- Are there situations in which invasive species (e.g. tamarisk or arundo) should be actively treated/controlled and restored with in-stream habitat that is suitable for western pond turtle (e.g. ponds, basking sites)?

- Is illegal pet collection of western pond turtle a potential problem on the Preserve that requires active management?

Adaptive Management Goals and Objectives

The following are examples of goals and objectives to be included in a Preserve RMP to guide adaptive management:

Adaptive Management Goal: Protect and manage in-stream and upland habitat suitable for western pond turtle within the Preserve.

Adaptive Management Objective: Determine and monitor the presence and status of western pond turtle and its suitable habitat within the Preserve by monitoring every 4 years using established protocols (priority 1).

Strategy/Management Action: Comprehensive surveys of the Preserve will be completed during baseline surveys and completed in perpetuity every 4 years as part of effectiveness monitoring. Visual surveys will be completed following USGS protocols (see Table 7-1). In addition, vegetation monitoring (comprehensive mapping every 10 years and statistical sampling every 4 years) and annual invasive species monitoring will be conducted and this information will be used to inform the assessment of pond turtle habitat. Where surveys show a decline in western pond turtle populations or habitat quality that can be attributed to anthropogenic threats, specific management actions will be implemented, as discussed below. These may include (but are not limited to) nonnative aquatic species control, invasive plant species control, and enforcement of illegal pet collection. Data will be shared with other regional Preserve managers in order to help decipher upward or downward regional trends.

Adaptive Management Objective: If western pond turtle are determined to be located within the Preserve, an evaluation of the potential threat of nonnative aquatic species will be conducted within 3 years (priority 2).

Strategy/Management Action: If information from effectiveness monitoring or other monitoring on the Preserves shows western pond turtle are using in-stream habitat within the Preserve, the Preserve Manager will coordinate with the Monitoring Biologist and NCCP/HCP Administrator to conduct an evaluation of potential predation and/or competition from nonnative species (e.g. bullfrogs, exotic turtles, sliders) at the Preserve. If it is determined that nonnative species are a threat, the Preserve Manager will implement a program to remove or control nonnative species.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, an invasive species control plan will be prepared that will identify if invasive plant species can and should be actively treated/controlled and, if appropriate, restored with in-stream habitat suitable for western pond turtle (priority 1).

Strategy/Management Action: Within 2 years from the adoption of the Preserve RMP, the Preserve Manager will contract with a Restoration Ecologist to prepare an invasive species control plan that will identify remedial actions to be taken, identify which species are likely to be controlled versus eradicated, and provide necessary monitoring and reporting to assure that the desired positive effects are occurring to the specified habitat areas. The invasive species control plan will identify any situations (e.g. tamarisk

and/or arundo) that should be actively removed and replaced, if appropriate and feasible, with in-stream habitat (ponds, basking sites) that are suitable as western pond turtle habitat.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, complete an assessment of potential vehicle mortality of western pond turtle either on access roads within the Preserve or on roadways adjacent to the Preserve (priority 1).

Strategy/Management Action: The Preserve Manager will coordinate with the Monitoring Biologist and NCCP/HCP Administrator to evaluate the threat of vehicle mortality for western pond turtle along roadways within or adjacent to the Preserve. Possible management may include signage or adjustments to speed limits.

Adaptive Management Objective: Within the first year from the initiation of Preserve management and ongoing in perpetuity, implement patrols and enforcement measures to ensure illegal pet collection is not occurring within the Preserve (priority 1).

Strategy/Management Action: Pet collection has been identified as an illegal activity within the Preserves under this Plan. The Preserve Manager will use signage and establish a schedule for patrols and enforcement to make sure restrictions on pet collection are actively enforced within the Preserve. The frequency of patrols will depend upon the level of public access allowed on the Preserve and information of pet collection activities.

Monitoring Methods

- **Baseline Monitoring.** Visual surveys will be completed to identify western pond turtle presence employing the USGS protocol (see Table 7-1). This protocol requires that all aquatic habitat be broken into 250-meter segments and scanned for the presence of basking sites, aquatic refugia, streamside refugia, and upland nesting habitat. Attention will be focused on identifying basking or underwater pond turtles within open pools and potential basking areas. In addition, comprehensive vegetation mapping, vegetation statistical sampling, and inventory of invasive species will be conducted during baseline surveys and will be used to assess of pond turtle habitat areas. Baseline monitoring will also identify specific threats for western pond turtle and its habitat.
- **General Stewardship Monitoring.** Ongoing general stewardship monitoring will be completed as appropriate (e.g. monthly, quarterly) and will include biological surveys to record and/or track impacts to pond turtles and pond turtle suitable habitats, including vehicle mortality. General stewardship monitoring also includes patrols and enforcement actions to ensure illegal pet collection of pond turtles is not occurring on the Preserve.
- **Effectiveness Monitoring.** Every 4 years, visual surveys of the suitable pond turtle habitat will be completed as part of effectiveness monitoring (using same methods used for baseline monitoring) to determine trends in population status (size, distribution) over time at the Preserve-level. In addition, vegetation monitoring (comprehensive mapping every 10 years and statistical sampling every 4 years) and annual invasive species monitoring will be conducted and this information will be used to evaluate trends in habitat types used by pond turtles. Where declining trends are observed, attribute and climatic data will be assessed for potential causal effects (e.g., degradation or reduction of aquatic habitat, sedimentation). Results that are linked to anthropogenic threats (e.g., nonnative predators, invasive plant species, pet collection) will

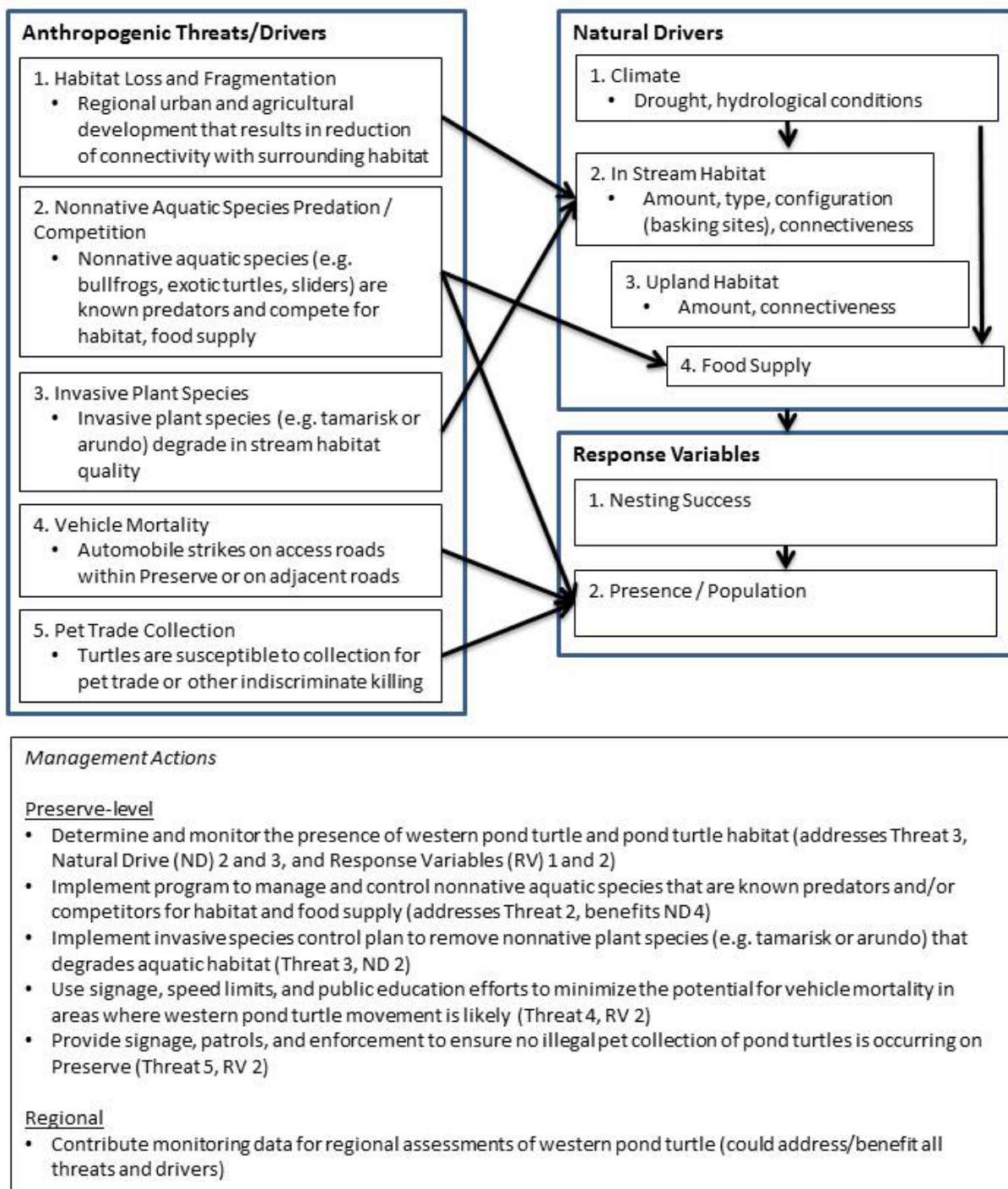
require management. Results from all Preserves will be evaluated at the Plan-level to determine Plan-level status and management priorities.

- Targeted Monitoring. Targeted monitoring will be designed and implemented by the Preserve Manager to evaluate management actions, such as nonnative aquatic species control, invasive species control to improve aquatic habitat, or movement relative to vehicle use. Methods may include quantitative methods (e.g., point-intercept, quadrats) for assessing experimental outcomes. The Preserve Manager may need to get support from Monitoring Biologist and/or other outside specialist to develop an experimental design. Success criteria or targets may include (1) aquatic habitat structure, cover, and composition, or (2) nonnative aquatic species removal success, or (3) presence or number. Where success criteria are not met, modified or alternative management strategies may be implemented.

Conceptual Model

The following is a draft conceptual model that will serve as an initial framework to guide Preserve Managers on adaptive management focused on western pond turtle. This conceptual model will continue to be adjusted and refined over time.

Western Pond Turtle Conceptual Model for Preserve Management - Example



7.2.8.4 Coast Horned Lizard and Orangethroat Whiptail

Coast Horned Lizard

Phrynosoma blainvillii

Legal Status:	Federal:	None
	State:	CDFW Species of Special Concern
	Forest Service:	Sensitive
Recovery Plan:	None	



Orangethroat Whiptail

Aspidoscelis hyperythra

Legal Status:	Federal:	None
	State:	CDFW Watch List
	Forest Service:	None
Recovery Plan:	None	



Coast horned lizard and orangethroat whiptail have similar habitat requirements, threats, and management needs and are addressed together in this section.

Background

Habitat: The coast horned lizard is a terrestrial lizard that has conspicuously pointed scales along its body and large horns around the base of its head. The orangethroat whiptail is a small, slender, unspotted whiptail lizard, and adult males have a bright orange throat and chest. Both species is known to use a wide variety of vegetation types, but rely on the use of open areas, with loose, fine soil with high sand fraction, open areas with limited over story for basking, and areas with low, dense shrubs for refuge. The orangethroat whiptail may be associated with perennial vegetation because of its major food source (termites).

Ecology: The coast horned lizard feed primarily on native harvester ants (90% of their diet) but will also prey on other slow moving insects, such as beetles, flies, and caterpillars. Termites comprise 72 to 92% of the orangethroat whiptail's diet.

Threats: Coast horned lizard and orangethroat whiptail are primarily threatened by loss of habitat (open areas) due to urban development, conversion of habitat to agricultural lands, and invasive species (e.g. nonnative grasslands). Other threats include predation, grazing, off-road vehicles, pesticide use, and trampling along trails by mountain bikes and/or horses. Coast horned lizard is particularly threatened by the displacement of native harvester ants (food source) by invasive, nonnative Argentine ants.

See Appendix C.2, "Covered Species Accounts," for more information on species life history, habitat requirements, distribution, core areas, habitat linkages, and trends.

Conservation Strategy

Preserves: OCTA will acquire Preserves with natural habitat that includes areas with loose, fine soils with high sand fraction, open areas with limited overstory for basking, and other features known to support coast horned lizard and orangethroat whiptail. During baseline biological surveys completed for the seven Preserves acquired by OCTA, it was noted that each of these Preserves provide quality habitat features and within the range for coast horned lizard and orangethroat whiptail. Occurrences of coast horned lizard have been noted on MacPherson and O'Neill Oaks Preserves and orangethroat whiptail has been reported on Ferber Ranch, MacPherson, and O'Neill Oaks Preserves.

Restoration: OCTA has approved funding for 11 restoration projects that will restore over 140.8 acres of scrub habitats that have the potential to enhance habitat quality and availability for coast horned lizard and orangethroat whiptail.

See Chapters 5 and 6 for more details.

Potential Adaptive Management Issues at Preserves (including threats, uncertainties, research needs)

- Are there situations in which invasive species (e.g. nonnative grasslands) should be actively treated/controlled to maintain open habitat which is important for coast horned lizard and orangethroat whiptail?
- Is recreational trail use and/or trail locations resulting in situations in which coast horned lizard and orangethroat whiptail could be trampled? Are there certain types of trail use (mountain biking, equestrian, hiking) that are more likely to result in trampling?
- Is illegal off road vehicle use a potential problem on the Preserve that requires active management?
- Have Argentine ants infested portions of the Preserve? Are there activities (e.g. over watering of landscaping) along the urban-wildlife interface that are facilitating the infestation of Argentine ants?

Adaptive Management Goals and Objectives

The following are examples of goals and objectives to be included in a Preserve RMP to guide adaptive management for coast horned lizard and orangethroat whiptail:

Adaptive Management Goal: Protect, manage, and enhance open habitat important for coast horned lizard and orangethroat whiptail.

Adaptive Management Objective: Determine and monitor the presence and status of coast horned lizard and orangethroat whiptail within the Preserve by monitoring every 4 years using established protocols (priority 1).

Strategy/Management Action: Focused visual encounter surveys following established protocols (see Table 7-1) will be conducted during baseline surveys and completed in perpetuity every 4 years as part of effectiveness monitoring. In addition, vegetation monitoring (comprehensive mapping every 10 years and statistical sampling every 4 years) and annual invasive species monitoring will be conducted, and this information will be used to inform the assessment of open habitat areas. Where surveys show a

decline in coast horned lizard and orangethroat whiptail populations or open habitat quality that can be attributed to anthropogenic threats, specific management actions will be implemented, as discussed below. These may include (but are not limited to) invasive species control, public access and trail use control, enforcing illegal off road vehicle use, and addressing urban-wildland interface situations that facilitate Argentine ant infestations. Data will be shared with other regional Preserve managers in order to help decipher upward or downward regional trends.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, an invasive species control plan will be prepared that will identify if invasive species (e.g., nonnative grasslands) can and should be actively treated/controlled to enhance open habitat (priority 1).

Strategy/Management Action: Within 2 years from the adoption of the Preserve RMP, the Preserve Manager will contract with a Restoration Ecologist to prepare an invasive species control plan that will identify remedial actions to be taken, identify which species are likely to be controlled versus eradicated, and provide necessary monitoring and reporting to assure that the desired positive effects are occurring to the specified habitat areas. The invasive species control plan will identify any situations (e.g., nonnative grasslands) that should be actively removed and/or dethatched to maintain and improve open habitat.

Adaptive Management Objective: As part of the preparation of the Preserve RMP, a public access plan will be developed that balances managed recreational trail use with the protection of open habitat that is important for coast horned lizard and orangethroat whiptail (priority 1).

Strategy/Management Action: The Preserve Manager will coordinate with the Monitoring Biologist and NCCP/HCP Administrator to determine what portions of the open habitat within the Preserve are important for coast horned lizard and orangethroat whiptail. This information will be evaluated relative to the Preserve public access and recreational trail use strategy to determine if trail use should be limited in these portions of the Preserve to minimize the threat of trampling. Some trails may need to be reassessed for use to maintain a balance of undisturbed open habitat.

Adaptive Management Objective: Within the first year from the initiation of Preserve management and ongoing in perpetuity, implement patrols and enforcement measures to ensure illegal off road vehicle use is not occurring within the Preserve (priority 1).

Strategy/Management Action: Off road vehicle (motorcycles, quads, ATVs, cars/unrelated to Preserve management) use has been identified as an illegal activity within the Preserves under this Plan. The Preserve Manager will establish a schedule for patrols and enforcement to make sure restrictions on off road vehicle use are actively enforced within the Preserve. The frequency of patrols will depend upon the level of public access allowed on the Preserve and information of off road vehicle use activities.

Adaptive Management Objective: Within the first year from the initiation of Preserve management and ongoing in perpetuity, implement general stewardship monitoring along the urban-wildland interfaces of the Preserve to identify any activities that facilitate Argentine ant infestations (priority 1).

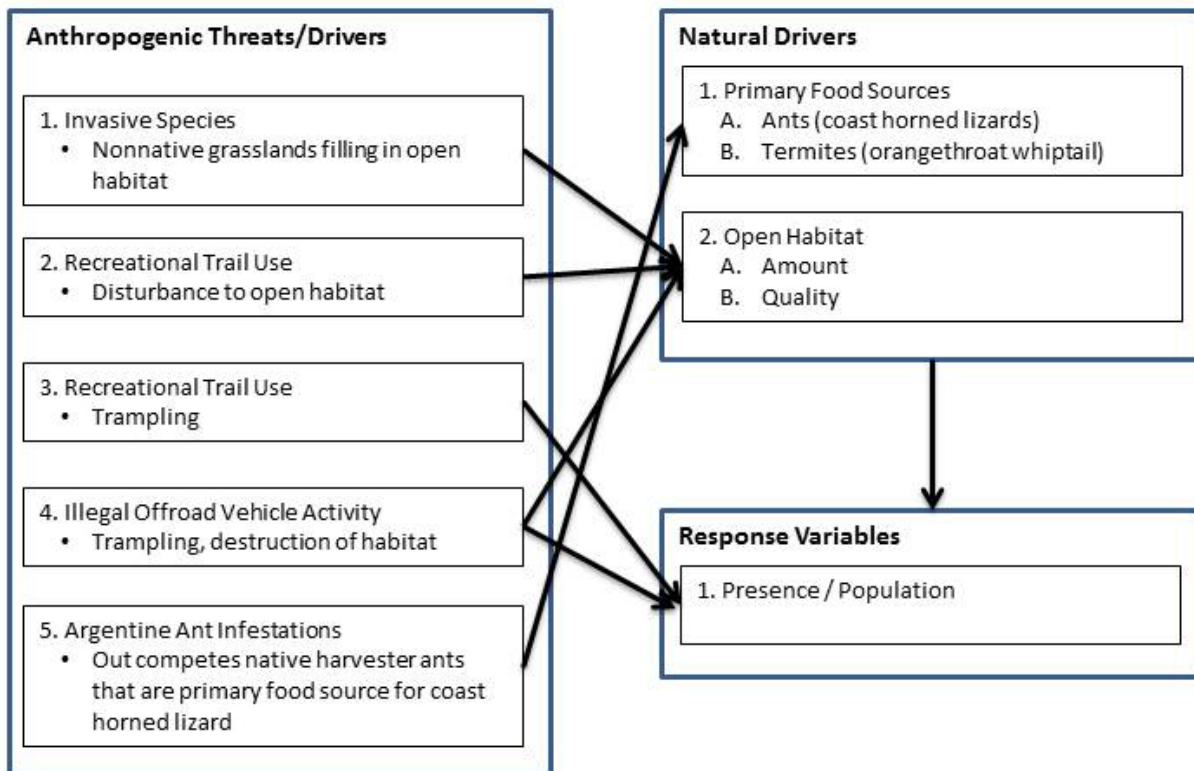
Strategy/Management Action: Argentine ant infestations can be facilitated by over-watering of landscaping which can create an artificially damp soil conditions preferred by Argentine ants. The Preserve Manager will establish a schedule for general stewardship monitoring along the urban/wildlands interface to identify any activities that facilitate Argentine ant infestations. If situations occur, the Preserve Manager will coordinate with adjacent land owners to address the situation. The frequency of urban/wildlands interface monitoring will depend upon the level of urban/wildlands interface that occurs on the Preserve and the type of urban development.

Monitoring Methods

- **Baseline Monitoring.** Visual encounter surveys within appropriate open habitat of the Preserve will be completed to identify coast horned lizard and orangethroat whiptail. Surveys will be completed following approved protocols (see Table 7-1). In addition, comprehensive vegetation mapping, vegetation statistical sampling, and inventory of invasive species will be conducted during baseline surveys and will be used to assess of open habitat areas. Baseline monitoring will also identify specific threats for coast horned lizard and orangethroat whiptail.
- **General Stewardship Monitoring.** Ongoing general stewardship monitoring will be completed as appropriate (e.g. monthly, quarterly) and will include surveys along the urban/wildlands interface to identify situations that could facilitate the infestation of Argentine ants. General stewardship monitoring will also record and/or track impacts to open habitat potentially resulting from recreational trail use, and includes patrols and enforcement actions to ensure illegal off road vehicle use is not occurring on the Preserve.
- **Effectiveness Monitoring.** Every 4 years, visual encounter surveys within appropriate open habitat of the Preserve will be completed as part of effectiveness monitoring (using same methods used for baseline monitoring) to determine trends in population status (presence, distribution) over time at the Preserve-level. In addition, vegetation monitoring (comprehensive mapping every 10 years and statistical sampling every 4 years) and annual invasive species monitoring will be conducted and this information will be used to assess open habitat areas important for coast horned lizard and orangethroat whiptail. Where declining trends are observed, attribute and climatic data will be assessed for potential causal effects (e.g., open habitat and invasive species cover and composition, surface disturbance). Results that are linked to anthropogenic threats (e.g., invasive species, trail use, Argentine ants) will require management. Results from all Preserves will be evaluated at the Plan-level to determine Plan-level status and management priorities.
- **Targeted Monitoring.** Targeted monitoring will be designed and implemented by the Preserve Manager to evaluate management actions, such as invasive species control of nonnative grassland to improve open habitat. Methods may include quantitative methods (e.g., point-intercept, quadrats, pitfall traps) for assessing experimental outcomes. The Preserve Manager may need to get support from Monitoring Biologist and/or other outside specialist to develop an experimental design. Success criteria or targets may include (1) open habitat structure, cover, and composition, (2) limitation of Argentine ant infestations, or (3) presence or number. Where success criteria are not met, modified or alternative management strategies may be implemented.

Conceptual Model

The following is a draft conceptual model that will serve as an initial framework to guide Preserve Managers on adaptive management focused on coast horned lizard and orangethroat whiptail. This conceptual model will continue to be adjusted and refined over time.



Management Actions

Preserve-level

- Determine and monitor the presence of coast horned lizard and orangethroat whiptail (addresses Response Variables (RV) 1)
- Control/treat invasive species to improve open habitat (addresses Threat 1, benefits Natural Driver (ND) 2)
- Manage trail use and public access to balance amount of impact to open habitat important for coast horned lizard and orangethroat whiptail (Threats 2 and 3, ND 2, RV 1)
- Aggressive monitor and enforce illegal off-road vehicle use within the Preserve (Threat 4, ND 2, RV 1)
- Monitor and address issues along urban-wildlands interface that can facilitate the infestation of Argentine ants (Threat 5, ND 1A)

Regional

- Contribute monitoring data for regional assessments of coast horned lizard and orangethroat whiptail (could address/benefit all threats and drivers)

7.2.8.5 Cactus Wren (*Campylorhynchus brunneicapillus*)

Legal Status:	Federal:	Birds of Conservation Concern (BCC)
	State:	CDFW Species of Special Concern
	Forest Service:	Sensitive
Recovery Plan:	None	



Background

Habitat: The cactus wren is a diurnal non-migratory bird that is highly dependent on stands of cactus associated with the coastal sage scrub plant community and is rarely observed outside this specialized habitat. The cactus wren forages on the ground and in low vegetation for insects and other small invertebrates, cactus fruits and other fruits, seeds and nectar.

Ecology: Nest sites are almost always associated with cactus thickets and are maintained throughout the year for both nesting and roosting purposes. Dispersal away from their breeding sites is minimal; young males often set up new territories just outside of their parental territory, and the average territory is 1.3 hectares (3.2 acres), varying from 0.8–2 hectares (2–5 acres). The range of the coastal cactus wren is very limited, extending from extreme northwestern Baja California north through the coastal lowlands of San Diego County and into Orange, Los Angeles, and Ventura counties and eastward to Riverside County.

Threats: Primary threats to the cactus wren include habitat loss and fragmentation from urbanization and agricultural development, and altered fire regime that causes direct mortality of birds and destroys cactus scrub, which can take many years to recover. Other threats include invasive plant species reducing open habitat for foraging, declines in productivity during drought, and predation by domestic cats, roadrunners, snakes, loggerhead shrikes, and especially Cooper’s hawks

See species accounts in Appendix C.2, “Covered Species Accounts” for more details.

Conservation Strategy

Preserves: Protect and manage blocks of occupied cactus wren habitat within Preserves. OCTA has acquired four Preserves—Ferber Ranch, Hafen, O’Neill Oaks, and Saddle Creek South in the Trabuco Canyon area—that support nesting populations of cactus wren. During the 2012 baseline biological surveys of the Preserves, 26 cactus wren occurrences were recorded on these Preserves. Additional observations of cactus wren have been noted during monitoring visits at Ferber Ranch in 2013.

Restoration: OCTA has approved funding two restoration projects—UC Irvine Ecological Reserve and Chino Hills State Park—that include 14.5 acres of cactus scrub habitat in locations known to support cactus wren.

Avoidance and Minimization Measures: The Plan includes policies that will require covered freeway improvement projects to be designed and constructed in a manner that avoids and/or minimizes impacts on sensitive biological resources, including cactus scrub. Temporary staging areas, access roads, and other project components that have the flexibility to be sited outside of

sensitive areas will be incorporated into the project design. BMPs will be followed to delineate environmentally sensitive areas and provide for training and monitoring to ensure these areas are protected. If temporary impacts on cactus sage scrub cannot be avoided, these areas will be restored to their previous conditions. Other policies that will provide for the protection of cactus wren include the Nesting Birds Policy and Wildfire Protection Techniques.

See Chapters 5 and 6 for more details.

Potential Adaptive Management Issues at Preserves (including threats, uncertainties, research needs)

- What are the most effective fire management procedures that minimize the direct disturbance on cactus scrub habitat as a result of fire suppression efforts?
- If a fire impacts cactus scrub habitat at a Preserve, how to apply cactus scrub habitat restoration BMPs (site selection, propagated versus non-propagated source plants, supplemental watering, herbivore protection) at the Preserve to restore habitat back to its original conditions?
- Are there opportunities on the Preserve for invasive species control and/or vegetation management around cactus patches that, if feasible, would be an effective approach to minimize damage to cactus patches during fires (e.g. reduce fire intensity) and reduce threats of nest predation (e.g. snakes)?
- Are there opportunities for invasive species control (e.g. dethatching of nonnative grassland) to maintain open ground to enhance cactus wren foraging habitat?
- Is public access and trail use reducing the viability of cactus wren nesting?

Adaptive Management Goals and Objectives

The following are examples of goals and objectives to be included in a Preserve RMP to guide adaptive management:

Adaptive Management Goal: Protect and manage cactus scrub habitat and known nesting locations of cactus wren within the Preserve.

Adaptive Management Objective: Determine and monitor the presence and status of cactus wren within the Preserve by monitoring every 4 years using established protocols (priority 1).

Strategy/Management Action: Comprehensive cactus wren surveys of the Preserve will be completed during baseline surveys and completed in perpetuity every 4 years as part of effectiveness monitoring. In addition, vegetation monitoring (comprehensive mapping every 10 years and statistical sampling every 4 years) and annual invasive species monitoring will be conducted, and this information will be used to inform the assessment of cactus wren habitat. Where surveys show a decline in cactus wren populations or habitat quality that can be attributed to anthropogenic threats, specific management actions will be implemented, as discussed below. These may include (but are not limited to) fire management, vegetation management (including invasive species control), post-fire habitat restoration, and public access control. Data will be shared with other regional Preserve managers in order to help decipher upward or downward regional trends.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, complete a detailed mapping and inventory of cactus scrub habitat on the Preserve following survey protocols used by NROC on other Orange County preserves (priority 1).

Strategy/Management Action: Detailed mapping and inventory of cactus scrub habitat to be completed and maintained during general stewardship monitoring. The mapping will be completed using the same methods and protocols used by NROC to map cactus patches on other Preserves in Orange County. The cactus scrub habitat will be categorized based on quality, 'cholla types', and an assessment of threats (e.g. invasive species). This information will serve as a baseline of cactus scrub habitat on the Preserve and will facilitate the exchange of information with other Preserve Managers on how to address cactus scrub habitat restoration and cactus wren habitat distribution.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, complete a FMP that identifies environmentally sensitive areas (including cactus patches) to reduce, if feasible, the threat of cactus patches being irreparably harmed during fire suppression efforts within the Preserve (priority 1).

Strategy/Management Action: Preserve Manager will develop fire management plan in coordination with OCFA and NCCP/HCP Administrator. The FMP will include maps of cactus patches and strategies to minimize direct impacts to cactus patches during fire suppression efforts, if feasible.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, complete a fire management plan that supports fire suppression within the Preserve as feasible to reduce the threat of cactus patches being irreparably harmed by frequent and/or intense fires (priority 1).

Strategy/Management Action: Preserve Manager will develop fire management plan (FMP) in coordination with OCFA and NCCP/HCP Administrator. The FMP will identify wildfire suppression activities and strategies, access points, fire hydrants, and potential staging areas. The FMP will emphasize a fire suppression strategy of controlling any smaller fires onsite if possible. Larger fires coming from outside the Preserve and moving across the Preserve may require control tactics within the Preserve. In these instances, OCFA will establish defenses within and nearby any adjacent homes to protect life and property. The Preserve Manager, NCCP/HCP Administrator and OCFA should collaborate to define the least damaging suppression strategy within the FMP and delineate this preferred area(s) graphically.

Adaptive Management Objective: If cactus patches are significantly impacted by fire, pursue opportunities for cactus scrub restoration (priority 2).

Strategy/Management Action: After a fire, the Preserve Manager will complete an inventory of cactus patches to determine the number and extent of cactus patches impacted. The Preserve Manager will coordinate with the Wildlife Agencies and Monitoring Biologist to determine if cactus scrub restoration is warranted. OCTA and Preserve Manager will work with the Wildlife Agencies and OCFA (as warranted) to complete restoration effort by either (1) utilizing funding allocated for adaptive management, (2) reallocate funding from existing management priorities as appropriate, (3) pursue outside funding sources or (4) seek authorization to use

Changed Circumstance funding. Cactus scrub restoration will be implemented using current information on best approaches and strategies for cactus scrub restoration, including propagation and planting techniques, post-planting watering regimes, herbivore protection, invasive plant control, and success criteria.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, identify situations in which invasive species control and/or vegetation management around cactus patches is warranted to reduce the threats of nest predation and fire intensity as well as enhance cactus wren foraging opportunities (priority 2).

Strategy/Management Action: Situations in which invasive species control (e.g. remove of exotic trees that provide perches for Cooper’s hawk above cactus wren nest) and/or vegetation management efforts (e.g. thinning, dethatching) could be feasibility implemented to reduce the size and density of other habitats immediately adjacent to cactus patches will be identified during General Stewardship monitoring. The goal of the habitat thinning will be to reduce the potential fire intensity around a cactus patch during a fire and reduce the opportunity for nest predation from ground species (e.g. snakes). The Preserve Manager may implement quantitative or semi-quantitative monitoring to evaluate the BMPs and effectiveness of these focused vegetation management and/or invasive species control efforts. This will be completed using either (1) funding allocated for adaptive management, or (2) reallocation of existing management priorities as appropriate.

Adaptive Management Objective: Within 5 years from the adoption of the Preserve RMP, evaluate the effects of the public access policy and recreational trail use as a threat (direct and indirect) on cactus wren nesting success (priority 2).

Strategy/Management Action: The Preserve Manager may initiate a targeted monitoring of cactus wren nest locations to determine the degree to which recreational trail use negatively affects cactus wren nesting success. This may be implemented using quantitative or semi-quantitative methods and conducted in coordination with other efforts to monitor trail use and activity. Where recreational impacts are identified, known nesting locations would be protected by limiting and adjusting access during the breeding season, as appropriate, through seasonal trail closures.

Monitoring Methods

- **Baseline Monitoring.** Comprehensive cactus wren surveys of the entire Preserve will be completed to map the cactus wren distribution and status. Because of similar habitat requirements of cactus wren and coastal California gnatcatchers, surveys for cactus wren will be completed simultaneously with coastal California gnatcatcher surveys using the same protocols (see Table 7-1). Two surveys will be conducted in suitable habitat with at least 1 week between site visits; the surveys should be conducted in late winter/early spring. In addition, comprehensive vegetation mapping, vegetation statistical sampling, and inventory of invasive species will be conducted during baseline surveys and will be used to assess of cactus wren habitat. Baseline monitoring will also identify specific threats for cactus wren and cactus wren habitat.
- **General Stewardship Monitoring.** Ongoing general stewardship monitoring will be completed as appropriate (e.g. monthly, quarterly) and will include biological surveys to record and/or track

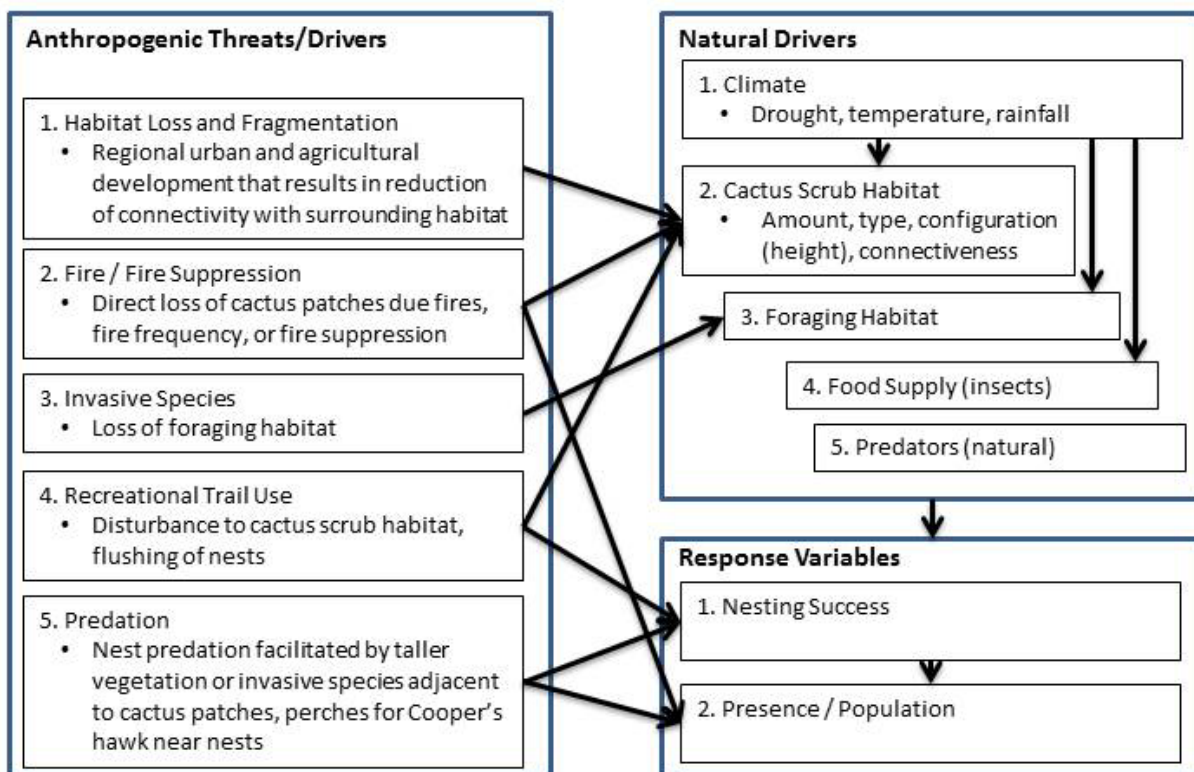
impacts to identified cactus wren habitat, including recreational uses. More detailed cactus scrub habitat mapping will be completed and updated during general stewardship monitoring using methods and protocols consistent used by NROC on other Orange County preserves.

- **Effectiveness Monitoring.** Every 4 years, comprehensive cactus wren surveys of the entire Preserve will be completed as part of effectiveness monitoring (using same methods used for baseline monitoring) to determine trends in population status (size, distribution) over time at the Preserve-level. In addition, vegetation monitoring (comprehensive mapping every 10 years and statistical sampling every 4 years) and annual invasive species monitoring will be conducted, and this information will be used to assess cactus wren nesting and foraging habitats. Where declining trends are observed, attribute and climatic data will be assessed for potential causal effects (e.g., native vegetation and invasive species cover and composition, surface disturbance). Results that are linked to anthropogenic threats (e.g., fire frequency, invasive species, recreational impacts) will require management. Results from all Preserves will be evaluated at the Plan-level to determine Plan-level status and management priorities.
- **Targeted Monitoring.** Targeted monitoring will be designed and implemented by the Preserve Manager to evaluate management actions, such as cactus scrub habitat restoration after a fire, invasive species control to improve open habitat for cactus wren foraging, vegetation management around existing cactus patches, or nesting success relative to recreational use. Methods may include quantitative methods (e.g., point-intercept, quadrats) for assessing experimental outcomes. The Preserve Manager may need to get support from Monitoring Biologist and/or other outside specialist to develop an experimental design. Success criteria or targets may include (1) cactus scrub structure, cover, and composition, or (2) cactus wren nesting success, or (3) presence or number. Where success criteria are not met, modified or alternative management strategies may be implemented.

Conceptual Model

The following is a draft conceptual model that will serve as an initial framework to guide Preserve Managers on adaptive management focused on cactus wren. This conceptual model will continue to be adjusted and refined over time.

Cactus Wren Conceptual Model for Preserve Management - Example



Management Actions

Preserve-level

- Determine and monitor the presence of cactus wren and cactus wren habitat (addresses Threat 3, Natural Drivers (ND) 2 and 3, and Response Variables (RV) 2)
- Implement fire management plan that emphasizes fire suppression and identify cactus patches as sensitive habitat to protect, if feasible, during fire suppression efforts (addresses Threat 2, ND 2, RV 2)
- If amount and quality of cactus scrub habitat reduces through fire and/or climate factors, pursue opportunities for cactus scrub restoration (Threat 2, ND 2)
- Implement invasive species control plan to improve foraging habitat quality (Threat 3, ND 3)
- Manage trail use and public access to limit impacts to cactus scrub habitat and known nesting sites (Threat 4, ND 2, RV 1)
- Implement invasive species and/or vegetation management control plan to reduce threat of predation of cactus wren and cactus wren nests (Threat 5, RV 1 and 2)

Regional

- Contribute monitoring data for regional assessments of cactus wren (could address/benefit all threats and drivers)

7.2.8.6 Coastal California Gnatcatcher (*Polioptila californica californica*)

Legal Status:	Federal:	Threatened
	State:	CDFW Species of Special Concern
	Recovery Plan:	None



Background

Habitat: The coastal California gnatcatcher (gnatcatcher) is the northern subspecies of a small gray, slender songbird, with a predominantly black tail below. The gnatcatcher is a local, uncommon, obligate resident of the maritime and coastal climate zones of southern California, primarily below about 500 meters (1,600 feet), with records extending rarely to about 1,000 meters (3,280 feet). They are dependent upon, and occur in or near, sage scrub vegetation.

Ecology: The breeding season for the gnatcatcher extends from February through August, with the peak months being March through June. The gnatcatcher is primarily an insectivorous species. They glean prey from foliage, primarily while moving slowly and methodically through the brush. The diet of gnatcatchers includes leaf- and plant hoppers and spiders as dominant prey, with true bugs, wasps, bees, and ants as minor components of their diet.

Threats: The primary threat to gnatcatchers is the loss and degradation of coastal sage scrub habitat, exacerbated by fragmentation, edge effects, environmental variability, and the risks of small population size. Alterations in fire frequency and invasive species can result in vegetation changes that threaten coastal sage scrub. Brown-headed cowbird brood parasitism has increased in frequency, and threatens the species.

See Appendix C.2, "Covered Species Accounts," for more details.

Conservation Strategy

Preserves: OCTA will protect and manage blocks of occupied gnatcatcher nesting habitat to support sustainable populations and maintain habitat linkages between coastal California gnatcatcher populations within the Plan Area. OCTA has acquired six Preserves (Aliso Canyon, Ferber Ranch, Hafen, MacPherson, O'Neill Oaks, and Saddle Creek South) that protect coastal sage scrub habitat and/or support nesting populations of coastal California gnatcatchers. During the baseline surveys of these Preserves, occurrences of coastal California gnatcatchers were noted at the Ferber Ranch and O'Neill Oaks Preserves and adjacent to the Aliso Canyon Preserve. In addition, previous sightings have been recorded at Saddle Creek South and Ferber Ranch Preserves. Coastal California gnatcatcher were not observed at MacPherson, although coastal sage scrub habitat within this Preserve is high quality and is in large enough patches to support pairs. While the MacPherson Preserve is near the edge of the elevation range of coastal California gnatcatcher, the location of this Preserve could serve as a habitat refugia from fire and/or a stepping stone for regional connectivity. The four Preserves in the Trabuco Canyon area are located within areas identified as important habitat for gnatcatcher conservation and add to the protection of important blocks of coastal sage scrub, specifically between the Orange County Southern Subregion HCP and Central-Coastal NCCP/HCP Central reserve systems.

Restoration: OCTA will restore and/or enhance coastal sage scrub habitat to expand coastal California gnatcatcher habitat. OCTA has approved funding for eight restoration projects that include restoration of coastal sage scrub and cactus scrub habitat, totaling 140.8 acres. The Big Bend, City Parcel, Fairview Park, Harriett Weider Regional Park, Lower Silverado Canyon, UC Irvine Ecological Reserve, Chino Hills State Park, and North Coal Canyon restoration projects will restore coastal sage scrub and cactus scrub habitat in locations important for providing for coastal California gnatcatcher movement and dispersal. The restoration of coastal sage scrub habitat is expected to increase the availability of nesting territories, expand foraging habitat, and improve habitat connectivity in the Plan Area.

Avoidance and Minimization Measures: The Plan includes policies that will require covered freeway improvement projects to be designed and constructed in a manner that avoids and/or minimizes impacts on sensitive biological resources, including coastal sage scrub. Temporary staging areas, access roads, and other project components that have the flexibility to be sited outside of sensitive areas will be incorporated into the project design. BMPs will be followed to delineate environmentally sensitive areas and provide for training and monitoring to ensure these areas are protected. If temporary impacts on coastal sage scrub cannot be avoided, these areas will be restored to their previous conditions. Other policies that will provide for the protection of coastal California gnatcatchers include the Nesting Birds Policy and Wildfire Protection Techniques.

See Chapters 5 and 6 for more details.

Potential Adaptive Management Issues at Preserves (including threats, uncertainties, research needs)

- Has there been a change to the fire regime and/or climatic factors that has resulted in vegetation type conversion that reduces the amount of coastal sage scrub that is habitat for coastal California gnatcatchers?
- If frequent and/or intense fire(s) have altered coastal sage scrub habitat at a Preserve, how to apply coastal sage scrub habitat restoration BMPs (site selection, supplemental watering, herbivore protection) at the Preserve to reestablish habitat?
- Are invasive plant species (e.g. nonnative grasses) outcompeting coastal sage scrub plant species?
- Is public access and trail use reducing the viability of coastal California gnatcatcher nesting and/or foraging habitat?
- If coastal California gnatcatchers are determined to be nesting with the Preserve, is cowbird parasitism a threat to nesting success? What are the opportunities for participation within a cowbird trapping program, if applicable?

Adaptive Management Goals and Objectives

The following are examples of goals and objectives to be included in a Preserve RMP to guide adaptive management:

Adaptive Management Goal: Protect and manage coastal sage scrub habitat and known nesting locations of coastal California gnatcatchers within the Preserve.

Adaptive Management Objective: Determine and monitor the presence and status of coastal California gnatcatchers within the Preserve by monitoring on regular intervals using established protocols (priority 1).

Strategy/Management Action: Comprehensive coastal California gnatcatcher surveys of the Preserve will be completed during baseline surveys and completed in perpetuity every 4 years as part of effectiveness monitoring. Surveys will be completed following USFWS protocols (see Table 7-1). In addition, vegetation monitoring (comprehensive mapping every 10 years and statistical sampling every 4 years) and annual invasive species monitoring will be conducted, and this information will be used to inform the assessment of gnatcatcher habitat. If surveys show a decline in coastal California gnatcatchers populations or habitat quality that can be attributed to anthropogenic threats, specific management actions will be implemented, as discussed below. These may include (but are not limited to) fire management, post-fire habitat restoration, invasive species control, public access control, and cowbird trapping. Data will be shared with other regional Preserve managers in order to help decipher upward or downward regional trends.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, complete a fire management plan that supports fire suppression within the Preserve, as feasible, to reduce the threat of type conversion of coastal sage scrub to grasslands from frequent and/or intense fires (priority 1).

Strategy/Management Action: Preserve Manager will develop a FMP in coordination with OCFA, NCCP/HCP Administrator and the Wildlife Agencies. The FMP will identify wildfire suppression activities and strategies, access points, fire hydrants, and potential staging areas. The FMP will emphasize a fire suppression strategy of controlling any smaller fires onsite if possible. Larger fires coming from outside the Preserve and moving across the Preserve may require control tactics within the Preserve. In these instances, OCFA will establish defenses within the Preserve and nearby any adjacent homes to protect life and property. The Preserve Manager, NCCP/HCP Administrator, OCFA and the Wildlife Agencies should collaborate to define the least damaging suppression strategy within the FMP.

Adaptive Management Objective: If coastal sage scrub habitat is significantly impacted by fire, pursue opportunities for coastal sage scrub restoration (priority 2).

Strategy/Management Action: After a fire, the Preserve Manager will complete an inventory of coastal sage scrub areas that have been affected and estimate the potential for the habitat to recover to its original state. The Preserve Manager will coordinate with the Wildlife Agencies and Monitoring Biologist to determine if coastal sage scrub restoration is warranted. OCTA and Preserve Manager will work with the Wildlife Agencies and OCFA (as warranted) to complete restoration effort by either (1) utilizing funding allocated for adaptive management, (2) reallocate funding from existing management priorities as appropriate, (3) pursue outside funding sources or (4) seek authorization to use Changed Circumstance funding. Coastal sage scrub restoration will be implemented using current information on best approaches and strategies for coastal sage scrub restoration, including planting techniques, post-planting watering regimes, herbivore protection, invasive plant control, and success criteria.

Adaptive Management Objective: If the distribution and amount of coastal sage scrub habitat within the Preserve changes over time as a result of altered fire regimes and/or climate factors, pursue opportunities for coastal sage scrub restoration (priority 2).

Strategy/Management Action: If monitoring of vegetation on the Preserve demonstrates that the amount and distribution of coastal sage scrub has altered over time to the degree that the Preserve can no longer support populations of coastal California gnatcatcher to the level that existed when the Preserve was acquired, the Preserve Manager will coordinate with the Wildlife Agencies and Monitoring Biologist to determine if coastal sage scrub restoration is warranted. OCTA and Preserve Manager will work with the Wildlife Agencies and OCFA (as warranted) to complete restoration efforts by either (1) utilizing funding allocated for adaptive management, (2) reallocate funding from existing management priorities as appropriate, (3) pursue outside funding sources or (4) seek authorization to use Changed Circumstance funding. Coastal sage scrub restoration will be implemented using current information on best approaches and strategies for coastal sage scrub restoration, including planting techniques, post-planting watering regimes, herbivore protection, invasive plant control, and success criteria.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, an invasive species control plan will be prepared that will identify situations in which invasive species control is warranted to maintain coastal sage scrub habitat (priority 2).

Strategy/Management Action: Within 2 years from the adoption of the Preserve RMP, the Preserve Manager will contract with a Restoration Ecologist to prepare an invasive species control plan that will identify remedial actions to be taken, identify which species are likely to be controlled versus eradicated, and provide necessary monitoring and reporting to assure that the desired positive effects are occurring to the specified habitat areas. The invasive species control plan will identify any situations (e.g. thinning or dethatching of nonnative grasslands) that could be feasibly implemented to allow coastal sage scrub habitat to more effectively compete. The Preserve Manager may implement quantitative or semi-quantitative monitoring to evaluate the BMPs and effectiveness of these invasive species control efforts. This will be completed using either (1) utilizing funding allocated for adaptive management, (2) reallocate funding from existing management priorities as appropriate, or (3) pursue outside funding sources.

Adaptive Management Objective: Within 5 years from the adoption of the Preserve RMP, evaluate the effects of the public access policy and recreational trail use as a threat (direct and indirect) on coastal California gnatcatcher (priority 2).

Strategy/Management Action: The Preserve Manager may initiate targeted monitoring of coastal California gnatcatcher nest and foraging locations to determine the degree to which recreational trail use negatively affects coastal California gnatcatcher. This may be implemented using quantitative or semi-quantitative methods and conducted in coordination with other efforts to monitor trail use and activity. Where recreational impacts are identified, known nesting locations and foraging areas would be protected by limiting and adjusting access during the breeding season, as appropriate, through seasonal or complete trail closures.

Adaptive Management Objective: If monitoring for coastal California gnatcatchers shows a decrease in presence and a reduction of nesting success within the Preserve, an evaluation of the potential threat of cowbird parasitism will be conducted (priority 2).

Strategy/Management Action: If information from effectiveness monitoring or other monitoring on the Preserves shows coastal California gnatcatchers a reduction in the presence of coastal California gnatcatcher and/or a reduction of nesting success, the Preserve Manager will coordinate with the Monitoring Biologist and NCCP/HCP Administrator to conduct an evaluation of potential cowbird parasitism at the Preserve. If it is determined that cowbird parasitism is a threat, the Preserve Manager will determine if there are opportunities to participate in other cowbird trapping program or initiate its own cowbird trapping program. Funding for a cowbird trapping program will come by either (1) utilizing funding allocated for adaptive management, (2) reallocate funding from existing management priorities as appropriate, or (3) pursue outside funding sources.

Monitoring Methods

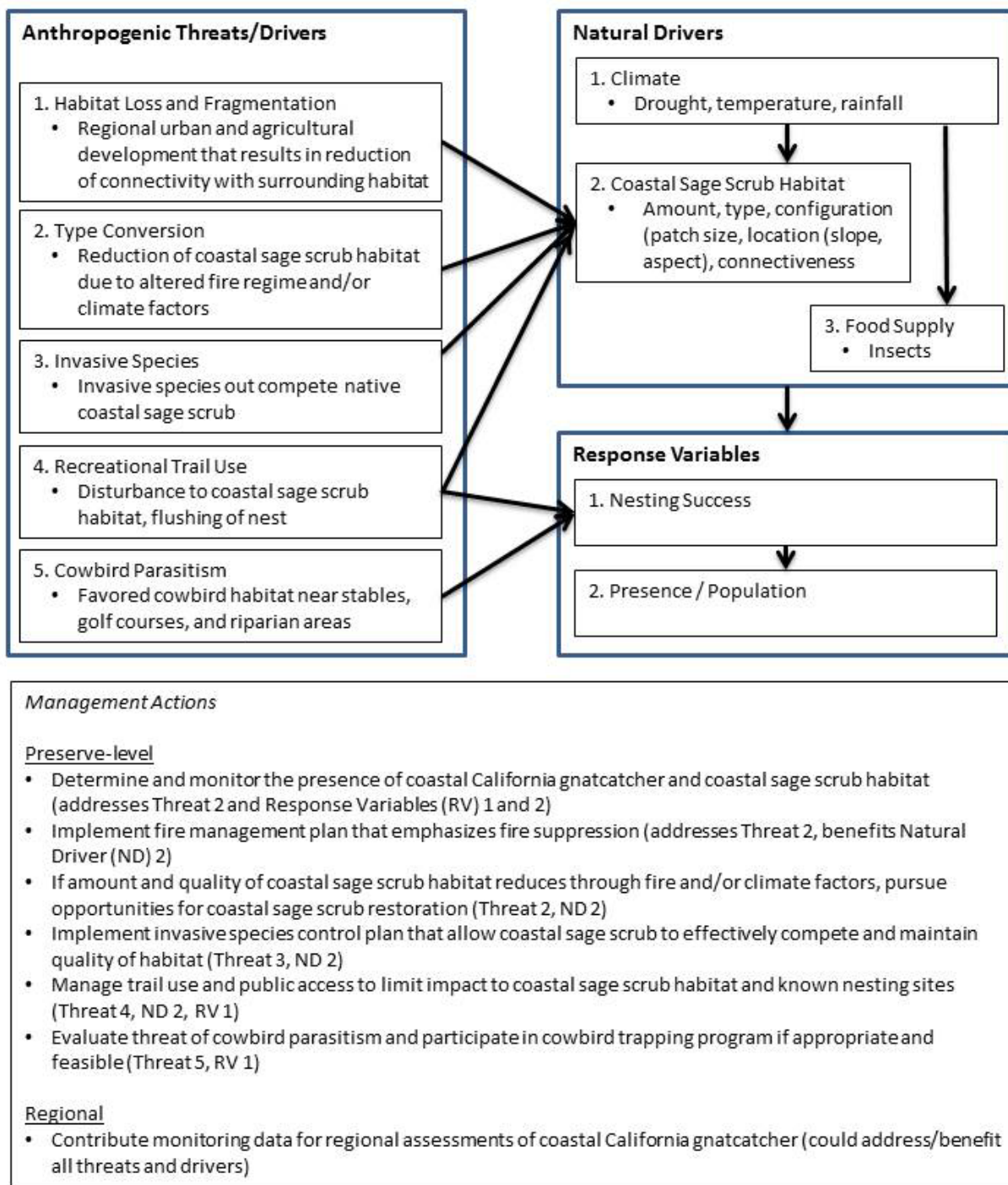
- **Baseline Monitoring.** Comprehensive surveys of the entire Preserve will be completed to map the coastal California gnatcatcher distribution and status. Surveys will be completed following USFWS protocols (see Table 7-1). Two surveys will be conducted in suitable habitat with at least 1 week between site visits; the surveys should be conducted in late winter/early spring. In addition, comprehensive vegetation mapping, vegetation statistical sampling, and inventory of invasive species will be conducted during baseline surveys and will be used to assess of coastal sage scrub habitat. Baseline monitoring will also identify specific threats for coastal California gnatcatchers and coastal sage scrub habitat.
- **General Stewardship Monitoring.** Ongoing general stewardship monitoring will be completed as appropriate (e.g., monthly, quarterly) and will include biological surveys to record and/or track impacts to identified coastal sage scrub habitat, including recreational uses.
- **Effectiveness Monitoring.** Every 4 years, comprehensive gnatcatcher surveys of the entire Preserve will be completed as part of effectiveness monitoring (using same methods used for baseline monitoring) to determine trends in population status (size, distribution) over time at the Preserve-level. In addition, vegetation monitoring (comprehensive mapping every 10 years and statistical sampling every 4 years) and annual invasive species monitoring will be conducted and this information will be used to assess coastal sage scrub habitat. Where declining trends are observed, attribute and climatic data will be assessed for potential causal effects (e.g., type conversion of coastal sage scrub to another vegetation type, surface disturbance). Results that are linked to anthropogenic threats (e.g., fire frequency, invasive species, recreational impacts) will require management. Results from all Preserves will be evaluated at the Plan-level to determine Plan-level status and management priorities.
- **Targeted Monitoring.** Targeted monitoring will be designed and implemented by the Preserve Manager to evaluate management actions, such as coastal sage scrub habitat restoration after a fire, invasive species control to improve coastal sage scrub, or nesting success relative to recreational use. Methods may include quantitative methods (e.g., point-intercept, quadrats) for assessing experimental outcomes. The Preserve Manager may need to get support from Monitoring Biologist and/or other outside specialist to develop an experimental design. Success criteria or targets may include (1) coastal sage scrub structure, cover, and composition, or (2)

coastal California gnatcatcher nesting success, or (3) presence or number. Where success criteria are not met, modified or alternative management strategies may be implemented.

Conceptual Model

The following is a draft conceptual model that will serve as an initial framework to guide Preserve Managers on adaptive management focused on coastal California gnatcatchers. This conceptual model will continue to be adjusted and refined over time.

Coastal California Gnatcatcher Conceptual Model for Preserve Management - Example



7.2.8.7 Least Bell’s Vireo and Southwestern Willow Flycatcher

Least Bell’s Vireo

Vireo bellii pusillus

Legal Status: Federal: Endangered
 State: Endangered

Recovery Plan: No



Southwestern Willow Flycatcher

Empidonax traillii extimus

Legal Status: Federal: Endangered
 State: Endangered

Recovery Plan: Yes



Least Bell’s vireo and southwestern willow flycatcher have similar habitat requirements, threats, and management needs and are addressed together in this section.

Background

Habitat: Least Bell’s vireo and southwestern willow flycatcher are riparian bird species. Least Bell’s vireo is typically associated with southern willow scrub, cottonwood forest, mule fat scrub, sycamore alluvial woodland, coast live oak riparian forest, and arroyo willow riparian. They prefer areas with dense cover within 2 meters (7 feet) above the ground and a dense, stratified canopy. Southwestern willow flycatchers use dense riparian habitat along streams and rivers with mature stands of willows, cottonwoods, oaks, or spring fed boggy areas with willows or alders. Suitable flycatcher habitat is most likely to develop in more extensive areas along low gradient streams with wide floodplains dominated by willows.

Ecology: Least Bell’s vireo and southwestern willow flycatcher are migratory birds. The least Bell’s vireo breeding season is from mid-March through August and southwestern willow flycatcher from approximately mid-May to mid-July.

Threats: Least Bell’s vireo and southwestern willow flycatcher have experienced habitat losses throughout their historic range, resulting in small fragmented, widely dispersed subpopulations. Furthermore, their susceptibility to cowbird parasitism increases as their preferred riparian habitat gets fragmented and more exposed. Other threats include alteration of water supplies to riparian systems, stream modification and channelization, overgrazing, pollutants, and invasion of habitat by nonnative plant species.

See Appendix C.2, “Covered Species Accounts,” for more details.

Conservation Strategy

Preserves: OCTA will protect and enhance riparian habitat to expand potential habitat for least Bell's vireo and southwestern willow flycatcher. OCTA has acquired the Hayashi Preserve in the Chino Hills area, which has an existing riparian corridor along Soquel Canyon Creek and Carbon Canyon Creek that has been historically disturbed (grazing and invasive plant species). OCTA has taken steps to remove grazing from Soquel Canyon Creek by installing fencing to allow for the passive restoration of riparian habitat. This approach has had recent documented success where grazing was removed in the adjacent Chino Hills State Park. The habitat recovered shortly after grazing was removed from the riparian zone and least Bell's vireo subsequently reoccupied the area. Efforts will also be made within the next five years to remove the invasive species within the Hayashi Preserve. There are known least Bell's vireo occurrences above and below the Hayashi Preserve that are expected to act as a source population for vireo to recolonize the Hayashi riparian habitat as the riparian habitat recovers.

Restoration: OCTA will implement restoration projects that will restore and/or enhance riparian habitat adjacent to occupied least Bell's vireo and southwestern willow flycatcher habitat. OCTA has approved funding for the Aliso Creek and City Parcel (within Trabuco Creek) restoration projects, which include restoration of 68.0 acres of riparian habitat. Each of these restoration projects has documented occurrences of least Bell's vireo within the project site and the Aliso Creek restoration project has documented occurrences of southwestern willow flycatcher. The restoration of riparian habitat on Aliso Creek and Trabuco Creek is expected to increase the availability of suitable nesting habitat for these riparian bird species and improve habitat connectivity in the Plan Area. In addition, OCTA will restore and/or enhance riparian habitat in areas not currently occupied by least Bell's vireo or southwestern willow flycatcher to encourage future expansion of these species distributions within the Plan Area. OCTA has approved funding for five restoration projects that include restoration of riparian habitat (totaling 42.4 acres) in locations with documented occurrences of least Bell's vireo in the vicinity. These restoration projects are Fairview Park, Lower Silverado Canyon, Chino Hills (Telegraph Creek), West Loma, and Agua Chino/Bee Flat Canyon. These riparian habitat restoration projects will create suitable habitat for riparian bird species with the potential to support foraging/nesting for least Bell's vireo and southwestern willow flycatcher in the future.

Avoidance and Minimization Measures: The Plan includes policies that will require covered freeway improvement projects to be designed in a manner that avoids and/or minimizes impacts on sensitive biological resources, including riparian habitat. Temporary staging areas, access roads, and other project components that have the flexibility to be sited outside of sensitive areas will be incorporated into the project design. BMPs will be followed to delineate environmentally sensitive areas and provide for training and monitoring to ensure these areas are protected. If temporary impacts on riparian habitat cannot be avoided, these areas will be restored to their previous conditions. Other policies that will provide for the protection of southern willow flycatcher include the Nesting Birds Policy and Wildfire Protection Techniques.

See Chapters 5 and 6 for more details.

Potential Adaptive Management Issues at Preserves (including threats, uncertainties, research needs)

- Are there situations in which invasive species (e.g., tamarisk or arundo) should be actively treated/controlled and replaced with native riparian plant species?

- Using passive restoration approaches (e.g. trail closures and/or grazing management), are there opportunities to enhance and improve riparian habitat abundance and quality within the Preserve?
- Is recreational trail use and/or trail locations negatively affecting nesting habitat for riparian birds?
- If least Bell's vireo or southwestern willow flycatcher are determined to be nesting within the Preserve, is cowbird parasitism a threat to nesting success? If so, what are the opportunities for participation within a cowbird trapping program?
- If a fire impacts riparian habitat on the Preserve, what are the appropriate steps to apply BMPs (erosion control, seedling planting) for riparian habitat restoration?

Adaptive Management Goals and Objectives

The following are examples of goals and objectives to be included in a Preserve RMP to guide adaptive management for least Bell's vireo and southwestern willow flycatcher:

Adaptive Management Goal: Protect, manage, and enhance riparian habitat with the potential to expand least Bell's vireo and southwestern willow flycatcher habitat.

Adaptive Management Objective: Determine and monitor the presence and status of least Bell's vireo and southwestern willow flycatcher within the Preserve by monitoring on regular intervals using established protocols (priority 1).

Strategy/Management Action: If there is potential habitat for least Bell's vireo and/or southwestern willow flycatcher on the Preserve, comprehensive surveys following USFWS protocols will be completed during baseline surveys and completed in perpetuity every 4 years as part of effectiveness monitoring. In addition, vegetation monitoring (comprehensive mapping every 10 years and statistical sampling every 4 years) and annual invasive species monitoring will be conducted, and this information will be used to inform the assessment of riparian habitat. If surveys show a decline in least Bell's vireo, southwestern willow flycatcher populations, or riparian habitat quality that can be attributed to anthropogenic threats, specific management actions will be implemented, as discussed below. These may include (but are not limited to) invasive species control, passive restoration of riparian habitat, public access and trail use control, cowbird trapping, fire management and post-fire habitat restoration. Data will be shared with other regional Preserve managers in order to help decipher upward or downward regional trends.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, an invasive species control plan will be prepared that will identify situations in which invasive species can and should be actively treated/controlled and allowed to restore with native riparian habitat (priority 1).

Strategy/Management Action: Within 2 years from the adoption of the Preserve RMP, the Preserve Manager will contract with a Restoration Ecologist to prepare an invasive species control plan that will identify remedial actions to be taken, identify which species are likely to be controlled versus eradicated, necessary monitoring and reporting to assure that the desired positive effects are occurring to the specified habitat areas. The invasive species control plan will identify any situations (e.g., tamarisk

and/or arundo) that should be actively removed. If native habitat does not increase through natural succession then native plant installation may be necessary.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, implement passive restoration actions that will improve and protect riparian habitat abundance and quality within the Preserve (priority 1).

Strategy/Management Action: The Preserve Manager will implement passive restoration actions that will have beneficial effects on riparian habitat. This will include erecting and maintaining fencing to control and/or eliminate grazing in riparian areas and/or closure of trails that follow or traverse riparian corridors. Trails should be aligned to keep away from creeks and riparian areas and minimize creek crossings.

Adaptive Management Objective: As part of the preparation of the Preserve RMP, a public access plan will be developed that balances recreational trail use with the protection of riparian habitat (priority 1).

Strategy/Management Action: The Preserve Manager will coordinate with the Monitoring Biologist and NCCP/HCP Administrator to determine if portions of the Preserve function as sensitive riparian corridors and function as nesting habitat for least Bell's vireo and/or southwestern willow flycatcher. This information will be evaluated relative to the Preserve public access and recreational trail use strategy to determine if trail use should be limited in these portions of the Preserve to minimize human interactions along sensitive riparian corridors. Trails should be aligned to keep away from creeks and riparian areas and minimize creek crossings.

Adaptive Management Objective: If least Bell's vireo and/or southwestern willow flycatcher are determined to be nesting within the Preserve, an evaluation of the potential threat of cowbird parasitism will be conducted within 1 year (priority 2).

Strategy/Management Action: If information from effectiveness monitoring or other monitoring on the Preserves shows least Bell's vireo and/or southwestern willow flycatcher are nesting within the Preserve, the Preserve Manager will coordinate with the Monitoring Biologist and NCCP/HCP Administrator to conduct an evaluation of potential cowbird parasitism at the Preserve. If it is determined that cowbird parasitism is a threat, the Preserve Manager will seek out opportunities to participate in other cowbird trapping program or initiate its own cowbird trapping program.

Adaptive Management Objective: If riparian habitat is significantly impacted by fire, opportunities for riparian habitat restoration will be pursued (priority 2).

Strategy/Management Action: After a fire, the Preserve Manager will complete an inventory of riparian habitat to determine the intensity and extent of riparian habitat impacted. The Preserve Manager will coordinate with the Wildlife Agencies and Monitoring Biologist to determine if riparian habitat restoration is necessary. OCTA and the Preserve Manager will work with the Wildlife Agencies and OCFA (as warranted) to complete a restoration effort by either (1) utilizing funding allocated for adaptive management, (2) reallocate funding from existing management priorities as appropriate, (3) pursue outside funding sources or (4) seek authorization to use Changed Circumstance funding. Riparian habitat restoration will be implemented using current information on best approaches and strategies for riparian habitat restoration,

including propagation and planting techniques, erosion control, invasive plant control, and success criteria.

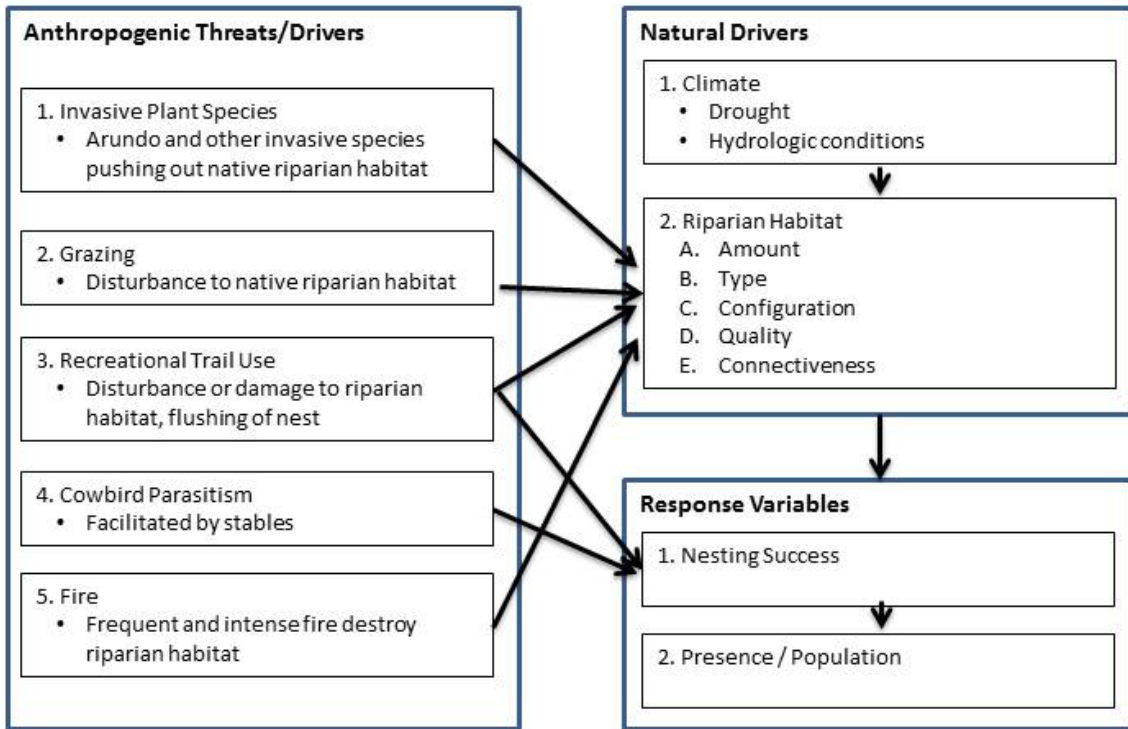
Monitoring Methods

- **Baseline Monitoring.** Comprehensive surveys of the entire Preserve will be completed to map least Bell's vireo and southwestern willow flycatcher distribution and status. Surveys will be completed following USFWS protocols (see Table 7-1). A total of 3 surveys will be conducted – one in mid-May, one in June, and one in early July. In addition, comprehensive vegetation mapping, vegetation statistical sampling, and inventory of invasive species will be conducted during baseline surveys and will be used to assess of riparian habitat. Baseline monitoring will also identify specific threats for least Bell's vireo and southwestern willow flycatcher and riparian habitat.
- **General Stewardship Monitoring.** Ongoing general stewardship monitoring will be completed as appropriate (e.g. monthly, quarterly) and will include biological surveys to record and/or track impacts to riparian habitat, including recreational trail use and photo monitoring of passive restoration efforts (e.g. trail closure and grazing management). General stewardship monitoring also includes patrols and enforcement actions to ensure illegal trail construction is not occurring on the Preserve.
- **Effectiveness Monitoring.** Every 4 years, comprehensive surveys of the entire Preserve will be completed as part of effectiveness monitoring (using same methods used for baseline monitoring) to determine trends in population status (size, distribution) over time at the Preserve-level. In addition, vegetation monitoring (comprehensive mapping every 10 years and statistical sampling every 4 years) and annual invasive species monitoring will be conducted and this information will be used to assess riparian habitat. Where declining trends are observed, attribute and climatic data will be assessed for potential causal effects (e.g., riparian habitat and invasive species cover and composition, surface disturbance). Results that are linked to anthropogenic threats (e.g., fire frequency, invasive species, cowbird parasitism, recreational impacts) will require management. Results from all Preserves will be evaluated at the Plan-level to determine Plan-level status and management priorities.
- **Targeted Monitoring.** Targeted monitoring will be designed and implemented by the Preserve Manager to evaluate management actions, such as riparian habitat restoration after a fire, invasive species control of arundo and replacement with native riparian habitat, or nesting success relative to cowbird parasitism. Methods may include quantitative methods (e.g., point-intercept, quadrats) for assessing experimental outcomes. The Preserve Manager may need to get support from Monitoring Biologist and/or other outside specialist to develop an experimental design. Success criteria or targets may include (1) riparian habitat structure, cover, and composition, or (2) least Bell's vireo and/or southwestern willow flycatcher nesting success, or (3) presence or number. Where success criteria are not met, modified or alternative management strategies may be implemented.

Conceptual Model

The following is a draft conceptual model that will serve as an initial framework to guide Preserve Managers on adaptive management focused on least Bell's vireo and southwestern willow flycatcher. This conceptual model will continue to be adjusted and refined over time.

Least Bell's Vireo and Southwestern Willow Flycatcher Conceptual Model for Preserve Management - Example



Management Actions

Preserve-level

- Determine and monitor the presence of least Bell's vireo and southwestern willow flycatcher (addresses Response Variables (RV) 1 and 2)
- Control/treat invasive species and replacement with native riparian habitat (addresses Threat 1, benefits Natural Driver (ND) 2A-D)
- Passively restore riparian habitat through grazing management and trail closures (Threats 2 and 3, ND 2A and 2D)
- Manage trail use and public access to limit impact to riparian habitat and known nesting sites (Threat 3, ND 2A and 2D, RV 1)
- Evaluate threat of cowbird parasitism and participate in cowbird trapping program if appropriate and feasible (Threat 4, RV 1)
- Complete post-fire riparian habitat restoration if appropriate and feasible (Threat 5, ND 2)

Regional

- Contribute monitoring data for regional assessments of least Bell's vireo and southwestern willow flycatcher (could address/benefit all threats and drivers)

7.2.8.8 Bobcat and Mountain Lion

Bobcat

Lynx rufus

Legal Status: Federal: None
 State: None
 Recovery Plan: None



Mountain Lion

Puma concolor

Legal Status: Federal: None
 State: CDFW Specially Protected Species
 Recovery Plan: None



Bobcat and mountain lion in general have similar habitat requirements, threats, and management needs. Some exceptions to their similarities include that bobcats will utilize smaller passages to pass under roadways where mountain lions appear to need more cover and are more sensitive to road barriers. Both species are addressed together in this section.

Background

Habitat: Bobcat and mountain lion are predatory cats with permanent residence throughout most of California. They are non-migratory at larger scales. In southern California, appreciable seasonal movements of the deer herds do not occur as the herds are not migratory. Mountain lion territories can commonly extend over 200 square miles. They are known to inhabit and occur in all habitats, but prefer adequate cover in the form of riparian areas, dense brush, rocky areas, cliffs and ledges.

Ecology: Bobcat and mountain lion are active year round. Bobcats are opportunistic, solitary predators with a majority of their diet consisting of rabbits and hares; however, they are known to eat squirrels, woodrats, kangaroo rats, mice, muskrats, young deer, birds, reptiles, fish, and insects. Mountain lions are solitary predators that prefer to stalk and ambush their prey. Mule deer make up the majority (60 to 80%) of their annual diet. Both bobcat and mountain rely heavily on large, undisturbed blocks of habitat to support viable populations.

Threats: Primary threats to these species include roadway mortality and habitat fragmentation. Other stressors include disease, killings secondary to depredation permits, illegal shootings, public safety removals, and human-caused wildfire.

See species accounts in Appendix C.2, “Covered Species Accounts” for more details.

Conservation Strategy

Preserves: Protect and manage blocks of natural habitat that includes a combination of land cover types important for wildlife movement of mammals such as bobcat and mountain lion. OCTA has acquired seven Preserves totaling 1,232.5 acres of natural habitat suitable for bobcat and 1,013.3 acres in areas important for mountain lion use. Incidental observations, photo monitoring, and other regional data including Dr. Winston Vickers mountain lion radio-collar tracking data has identified the presence and movement of bobcat and/or mountain lion in each of the Preserves (no data for mountain lion presence within the Hayashi Preserve and not expected at the Aliso Canyon Preserve). Six of the Preserves are a part of a 40-mile stretch of nearly continuous wildlife habitat within Orange County that spans from MCB Camp Pendleton in the south to Chino Hills State Park in the north. The strategic location of these six Preserves improves the protection of habitat that provides opportunities for movement of bobcat and mountain lion.

Restoration: OCTA will implement restoration projects designed to improve wildlife movement by large- and medium- sized mammals such as bobcat and mountain lion. OCTA has approved funding for the West Loma restoration project, which includes fence realignment around a key wildlife corridor in the vicinity of the 241 toll road. With fencing improvements and the restoration of habitat along the wildlife corridor, the crossing is expected to become more attractive to wildlife, including bobcat and mountain lion, and will reduce road kill and improve connectivity for these species. OCTA has also approved funding for four restoration projects located in areas highly important for habitat connectivity and wildlife movement. These restoration projects are the North Coal Canyon (located in the Coal Canyon linkage), Big Bend (important connection between Aliso and Wood Canyons Wilderness Park to the Laguna Coast Wilderness Park), Aliso Creek (riparian corridor linking several open space Preserves), and City Parcel (located in the Trabuco and San Juan Creeks linkage). It is important to note that mountain lions have not been documented west of the I-5 (North of San Clemente in Orange County) in over ten years. All of these projects are anticipated to contribute to movement for bobcat, mule deer and other mammals within Orange County. The location of these four restoration projects is expected to improve habitat connectivity that would provide opportunities for mammal movement.

Avoidance and Minimization Measures: The Plan includes the Wildlife Crossing Policy (Section 5.6.2.3) that requires OCTA to evaluate, during preconstruction surveys, whether an existing structure functions as an important wildlife movement crossing. If it is determined that an existing structure does function as an important wildlife crossing, the Construction Lead will implement appropriate design features to ensure that the wildlife crossing maintain functionality after the freeway construction improvements are completed.

See Chapters 5 and 6 for more details.

Potential Adaptive Management Issues at Preserves (including threats, uncertainties, research needs)

- Is the Preserve adjacent to a major roadway that is a threat for vehicle mortality? Are there opportunities to direct wildlife movement that can reduce vehicle mortality?
- Are there interior fences within the Preserve that restrict large- and medium-sized mammal movement that can be removed?
- What is the appropriate wildlife-friendly fencing that should be used along the exterior of the Preserve to control public access but allow for wildlife movement?

- Are there key areas of the Preserve that function as a wildlife corridor that should be managed differently (e.g. restrict/limit trail use)?
- Are there safety concerns related to the presence of mountain lions and recreational trail use on the Preserve that should be addressed?
- Is illegal hunting of bobcat, mountain lion, or prey (e.g., deer) a potential problem on the Preserve that requires active management?

Adaptive Management Goals and Objectives

The following are examples of goals and objectives to be included in a Preserve RMP to guide adaptive management:

Adaptive Management Goal: Protect and manage natural habitat that includes a combination of land cover types important for wildlife movement of mammals including bobcat and mountain lion.

Adaptive Management Objective: Determine and monitor the presence and status of bobcat and mountain lion within the Preserve every 4 years using established protocols (priority 1).

Strategy/Management Action: Surveys of the Preserve will be completed using wildlife movement cameras during baseline surveys and completed in perpetuity every 4 years as part of effectiveness monitoring. Prior to effectiveness monitoring surveys, OCTA will set up wildlife movement cameras for at least 6 months to document current movement of wildlife on Preserve and this information will be used by a qualified wildlife biologist to assess wildlife movement and connectivity. In addition, information on wildlife movement will be coordinated with other researchers conducting regional wildlife movement assessments (e.g., Dr. Winston Vickers' mountain lion radio-collar tracking) to evaluate the Preserve for large- and medium-sized mammal presence and movement. Where surveys show a decline in bobcat and/or mountain lion presence or movement within the Preserve that can be attributed to anthropogenic threats, specific management actions will be implemented, as discussed below. These may include (but are not limited to) fencing, wildlife crossings to adjacent roadways, limiting recreational trail use, and control of illegal hunting. Data will be shared with other regional Preserve managers and researchers in order to help decipher upward or downward regional trends.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, complete a detailed mapping and inventory of existing fencing and future fencing requirements and develop a fencing plan using a wildlife friendly fencing that allows for wildlife movement (priority 1).

Strategy/Management Action: Detailed mapping and inventory of existing fencing and/or future fencing needs will be completed as part of baseline surveys and/or general stewardship monitoring. Some fencing, particularly the exterior fence lines, will be installed during the startup phase of the Preserve. Fencing will be wildlife friendly (e.g. 3-strand wire fence) that allows wildlife movement. The Preserve Manager will look for opportunities to improve wildlife movement relative to fencing based on monitoring data. For instance, the bottom strand of the exterior fence could be removed along certain portions of the Preserve that are actively used by wildlife to improve movement while making sure the fence still functions effectively for access control.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, complete an assessment of wildlife movement on the Preserve and determine if directional fencing or other protection mechanisms are warranted to reduce vehicle mortality along adjacent and/or interior roadways (priority 1).

Strategy/Management Action: Using information from wildlife camera monitoring and other wildlife movement studies, the Preserve Manager will coordinate with the Monitoring Biologist and NCCP/HCP Administrator to evaluate the threat of vehicle mortality for bobcat and mountain lion along roadways within or adjacent to the Preserve. If a safer wildlife crossing is available (e.g. culvert), the Preserve Manager will evaluate the opportunities to install directional fencing to reduce vehicle mortality. If directional fencing is used, additional restoration and/or plantings around the crossing may be needed to improve cover.

Adaptive Management Objective: Within the first year from the initiation of Preserve management and ongoing in perpetuity, implement patrols and enforcement measures to ensure illegal hunting is not occurring within the Preserve (priority 1).

Strategy/Management Action: Hunting has been identified as an illegal activity within the Preserves under this Plan. The Preserve Manager will establish a schedule for patrols and enforcement to make sure restrictions on hunting are actively enforced within the Preserve. The frequency of patrols will depend upon the level of public access allowed on the Preserve and information of hunting activities.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, complete an assessment of wildlife movement on the Preserve to determine if portions of the Preserve function as wildlife corridors that should have limited recreational trail use (priority 2).

Strategy/Management Action: Using information from wildlife camera monitoring and other wildlife movement studies, the Preserve Manager will coordinate with the Monitoring Biologist and NCCP/HCP Administrator to determine if portions of the Preserve function as key wildlife corridors (e.g. ridgelines or riparian corridor that connects to adjoining open space). This information will be evaluated relative to the Preserve public access and recreational trail use strategy to determine if trail use should be limited in portions of the Preserve to minimize human interactions along wildlife corridors.

Monitoring Methods

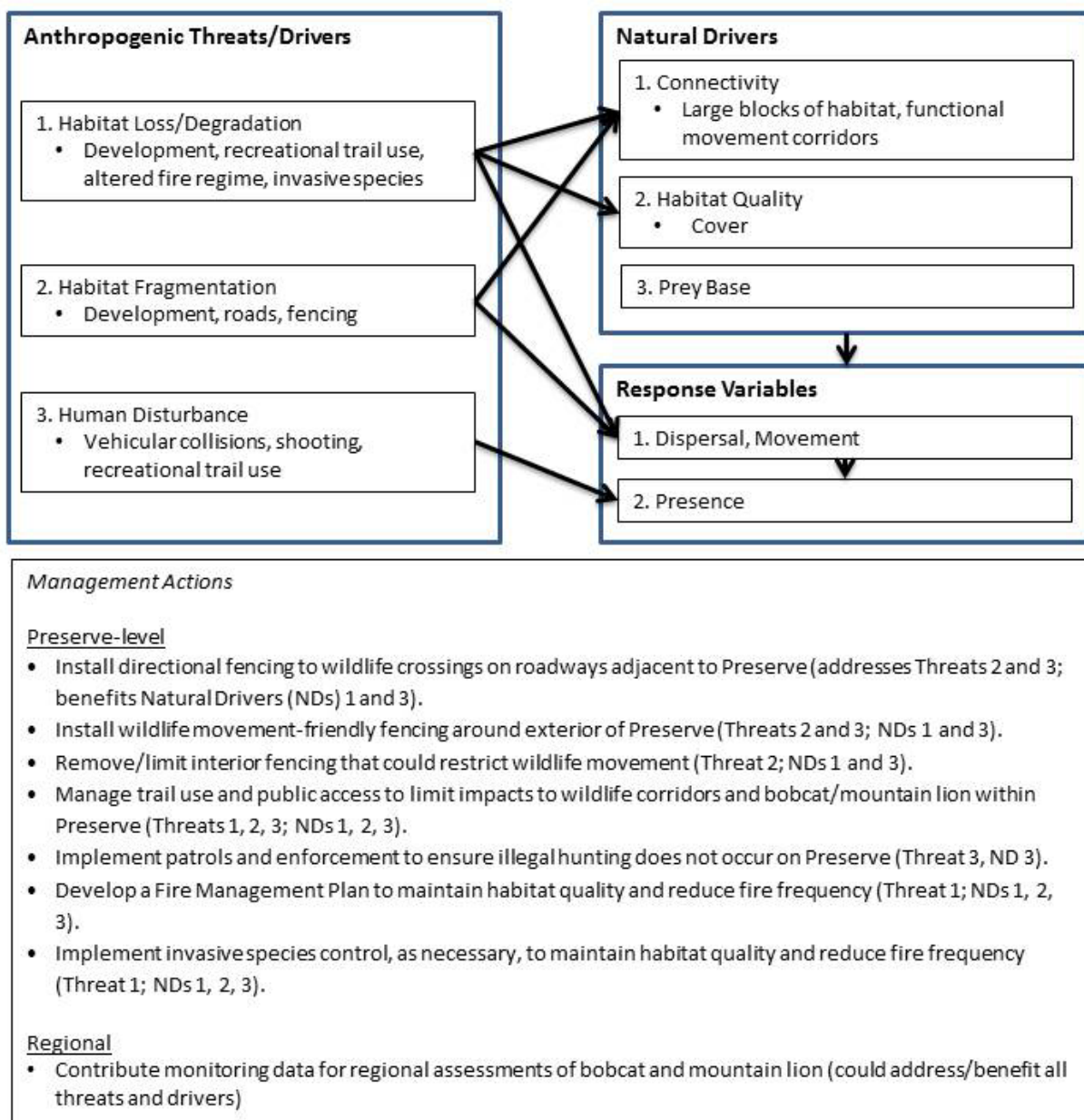
- **Baseline Monitoring.** Wildlife movement cameras will be set up for 6 months as part of baseline monitoring to document the presence of movement of bobcat, mountain lion, and other mammals. Baseline monitoring will also identify specific threats for bobcat and mountain lion.
- **General Stewardship Monitoring.** Ongoing general stewardship monitoring will be completed as appropriate (e.g. monthly, quarterly) and will include biological surveys to record and/or track impacts to bobcat and mountain lion and wildlife movement corridors, including recreational trail use. General stewardship monitoring also includes patrols and enforcement actions to ensure illegal hunting is not occurring on the Preserve.

- Effectiveness Monitoring. Prior to effectiveness monitoring surveys for other Covered Species that are completed every 4 years, Preserve Managers will set up wildlife movement cameras for at least 6 months to document current movement of wildlife on Preserve and to be used by a qualified wildlife biologist to assess wildlife movement and connectivity (see Table 7-1). Results from all Preserves will be evaluated at the Plan-level to determine Plan-level status and management priorities.
- Targeted Monitoring. Targeted monitoring will be designed and implemented by the Preserve Manager to evaluate management actions, such as installation and effectiveness of directional fencing, adjustments to trail use near wildlife corridors, and changes to fencing (interior or exterior). Methods may include quantitative analysis of data from wildlife movement cameras or use of other wildlife movement tracking methods. The Preserve Manager may need to get support from Monitoring Biologist and/or other outside specialist to develop an experimental design. Success criteria or targets may include (1) number of occurrences over time, (2) reduction in vehicle mortality, or (3) amount of movement. Where success criteria are not met, modified or alternative management strategies may be implemented.

Conceptual Model

The following is a draft conceptual model that will serve as an initial framework to guide Preserve Managers on adaptive management focused on bobcat and mountain lion. This conceptual model will continue to be adjusted and refined over time.

Bobcat and Mountain Lion Conceptual Model for Preserve Management - Example



7.2.8.9 Natural Communities

The Plan sets forth biological targets, goals, and objectives at the natural communities-level. Figure 6-7 shows (at a Plan Area scale) the major natural communities that are currently protected and where OCTA Preserves and OCTA restoration projects are located. Biological targets were developed for each major natural community based on the type and level of take estimated to occur from the Covered Activities. The targets represent an estimate of the amount of conservation to offset the direct and indirect effects from Covered Activities. Table 6-3 provides a summary of the total natural communities in the Plan Area, the amount currently protected, the amount protected as a result of the OCTA acquisition of Preserves, the amount restored/enhanced through OCTA restoration projects, and a comparison with targets.

The major natural community types addressed under the Plan and the Covered Species associated with each natural community type includes:

Natural Community Type	Covered Species Associated with Natural Community Type
Chaparral	intermediate mariposa lily, many-stemmed dudleya, coast horned lizard, orangethroat whiptail, bobcat, and mountain lion
Coniferous Forest	bobcat and mountain lion
Grasslands	intermediate mariposa lily, many-stemmed dudleya, southern tarplant, coast horned lizard, orangethroat whiptail, and bobcat
Riparian	arroyo chub, western pond turtle, least Bell’s vireo, southwestern willow flycatcher, bobcat, and mountain lion
Scrub	intermediate mariposa lily, many-stemmed dudleya, coast horned lizard, orangethroat whiptail, cactus wren, California gnatcatcher, bobcat, and mountain lion
Water / Wet Meadow / Marsh	southern tarplant, arroyo chub, western pond turtle, least Bell’s vireo, southwestern willow flycatcher
Woodland	coast horned lizard, orangethroat whiptail, bobcat and mountain lion

See Appendix C.1, “Natural Community Profiles” for a detailed description of each natural community type.

Conservation Strategy

Preserves: OCTA will acquire habitat Preserves to protect, manage, and enhance natural communities to promote native biodiversity. OCTA has acquired seven properties resulting in the protection of 1,232.5 acres of natural habitat (note that the total acreage of the five properties is approximately 1,300 acres, but the amount of protected natural habitat credited to OCTA is less because portions of the properties are developed or trails, and the Saddle Creek South Preserve was acquired, in part, with funding from the National Fish and Wildlife Foundation and credits were adjusted accordingly). Each Preserve will be protected with a conservation easement, and sufficient funding will be set aside to ensure that the properties are properly monitored and managed in perpetuity. The selection of Preserves was designed to meet the biological goals and objectives of the Plan and contribute to the collective goals of the existing regional network of protected areas

within the Plan Area. Each of the Preserves acquired adds to the protection of large blocks of natural open space in areas important for regional conservation.

Restoration: OCTA has approved funding for 11 restoration projects to date totaling 357.4 acres of restored habitat. The restoration projects occur throughout the Plan Area in core habitat areas, within key habitat linkages, and riparian corridors. The restoration projects are on lands currently protected and will enhance habitat for Covered Species. OCTA has committed to funding additional restoration projects with the remaining restoration funds (approximately \$400,000 remains from the previous round of restoration project selection) and through future restoration project selection.

Avoidance and Minimization Measures: The Plan includes policies that will require covered freeway improvement projects to be designed and constructed in a manner that avoids and/or minimizes impacts on sensitive biological resources. Temporary staging areas, access roads, and other project components that have the flexibility to be sited outside of sensitive areas will be incorporated into the project design. BMPs will be followed to delineate environmentally sensitive areas and provide for training and monitoring to ensure these areas are protected. If temporary impacts on sensitive biological resources cannot be avoided, these areas will be restored to their previous conditions. Other avoidance and minimization policies that will provide for the protection of natural communities include the Wildfire Protection Techniques, Stormwater and Water Quality BMPs, and Streambed Program.

See Chapters 5 and 6 for more details.

Potential Adaptive Management Issues at Preserves (including threats, uncertainties, research needs)

- What are the BMPs to use at the Preserve to ensure invasive plant species do not degrade the quality of natural communities?
- What are the BMPs to protect woodlands and other natural communities from invasive pest and other nonnative (exotic) species or diseases?
- What are the most effective fire management procedures that minimize the direct disturbance on sensitive habitat as a result of fire suppression efforts?
- If a fire impacts the Preserve, how to apply BMPs (erosion control, seeding) to restore habitat back to its original conditions?
- Has there been a change to the fire regime and/or climatic factors that has resulted in a type conversion of natural communities that reduces the potential of the Preserve to provide habitat for Covered Species?
- Is public access and trail use reducing the quality of natural communities on the Preserve?
- Are there opportunities to improve hydrological conditions and/or apply BMPs for erosion control to protect natural communities?
- What are the most effective procedures to minimize edge effects and encroachment from degrading natural communities?

Adaptive Management Goals and Objectives

The following are examples of goals and objectives to be included in a Preserve RMP to guide adaptive management:

Adaptive Management Goal: Protect, manage, and enhance natural communities to promote native biodiversity within the Preserve.

Adaptive Management Objective: Determine and monitor the status of natural communities within the Preserve by monitoring using established protocols (priority 1).

Strategy/Management Action: Comprehensive vegetation mapping of the Preserve will be completed during baseline surveys and completed in perpetuity every 10 years as part of effectiveness monitoring. In addition, vegetation statistical sampling will occur every 4 years and invasive species monitoring every year (see Table 7-1). Where surveys show a decline in the quality of natural communities that can be attributed to anthropogenic threats, specific management actions will be implemented, as discussed below. These may include (but are not limited to) invasive species control, habitat restoration, fire management, public access and trail use management, erosion control, vegetation management and enforcement of policies related to the urban/wildlands interface. Data will be shared with other regional Preserve managers in order to help decipher upward or downward regional trends.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, identify situations in which invasive plant species can and should be actively treated/controlled to maintain the quality of natural communities (priority 1).

Strategy/Management Action: Within 2 years from the adoption of the Preserve RMP, the Preserve Manager will contract with a Restoration Ecologist to prepare an invasive species eradication plan that will identify remedial actions to be taken, identify which species are likely to be controlled versus eradicated, and provide realistic, measurable goals to achieve. The invasive species eradication plan will identify any situations that should be actively removed and restored with natural communities.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, complete a FMP that identifies environmentally sensitive areas to reduce, where feasible, the sensitive natural habitats being irreparably harmed during fire suppression efforts within the Preserve (priority 1).

Strategy/Management Action: Preserve Manager will develop fire management plan in coordination with OCFA and NCCP/HCP Administrator. The FMP will include maps of sensitive natural communities (e.g., native grassland patches) and strategies to minimize direct impacts during fire suppression efforts, if feasible.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, complete a fire management plan that supports fire suppression within the Preserve as feasible to reduce the threat of natural communities being degraded by frequent and/or intense fires (priority 1).

Strategy/Management Action: Preserve Manager will develop fire management plan (FMP) in coordination with OCFA and NCCP/HCP Administrator. It may also be beneficial to coordinate with other entities included U.S. Forest Service, CalFire, State Parks, and OC Parks depending on the location of the Preserve relative to other entities addressing for fire management. The FMP will identify wildfire suppression activities and strategies, access points, fire hydrants, and potential staging areas. The FMP will emphasize a fire suppression strategy of controlling any smaller fires onsite if possible.

Larger fires coming from outside the Preserve and moving across the Preserve may require control tactics within the Preserve. In these instances, OCFA will establish defenses within and nearby any adjacent homes to protect life and property. The Preserve Manager, NCCP/HCP Administrator and OCFA should collaborate to define the least damaging suppression strategy within the FMP and delineate this preferred area(s) graphically.

Adaptive Management Objective: If natural communities on the Preserve are significantly impacted by fire, pursue opportunities for habitat restoration (priority 2).

Strategy/Management Action: After a fire, the Preserve Manager will complete an inventory of natural communities impacted. The Preserve Manager will coordinate with the Wildlife Agencies and Monitoring Biologist to determine if habitat restoration is warranted. OCTA and Preserve Manager will work with the Wildlife Agencies and OCFA (as warranted) to complete restoration efforts by either (1) utilizing funding allocated for adaptive management, (2) reallocate funding from existing management priorities as appropriate, (3) pursue outside funding sources or (4) seek authorization to use Changed Circumstance funding. Habitat restoration will be implemented using current information on best approaches and strategies for post-fire restoration, including erosion control, seeding, and success criteria.

Adaptive Management Objective: If the distribution and/or amount of natural communities within the Preserve changes over time as a result of altered fire regimes and/or climate factors, pursue opportunities for restoration if warranted (priority 2).

Strategy/Management Action: If monitoring of vegetation on the Preserve demonstrates that the amount and distribution of natural communities has altered over time to the degree that the Preserve can no longer support populations of Covered Species to the level that existed when the Preserve was acquired, the Preserve Manager will coordinate with the Wildlife Agencies and Monitoring Biologist to determine if habitat restoration is warranted. OCTA and Preserve Manager will work with the Wildlife Agencies to complete restoration efforts by either (1) utilizing funding allocated for adaptive management, (2) reallocate funding from existing management priorities as appropriate, (3) pursue outside funding sources or (4) seek authorization to use Changed Circumstance funding. Habitat restoration will be implemented using current information on best approaches and strategies for restoration.

Adaptive Management Objective: If woodlands and other natural communities are threatened from invasive pests and other nonnative (exotic) species or diseases, identify BMPs to protect natural communities and pursue opportunities for treatment/restoration as appropriate (priority 2).

Strategy/Management Action: If woodlands and other natural communities are threatened from invasive pests and other nonnative (exotic) species or diseases, such as goldspotted oak borer (*Agrilus auroguttatus*), polyphagous shot hole borer (*Euwallacea* sp.), oak ambrosia beetle (*Monarthrum* sp.), and fusarium dieback fungus (*Fusarium* sp.), the Preserve Manager will complete an inventory of natural communities at risk on the Preserve. The Preserve Manager will coordinate with the Wildlife Agencies, Monitoring Biologist, and other entities addressing this issue to determine BMPs and appropriate actions (e.g., treatment, removal, restoration). OCTA and Preserve Manager

will work with the Wildlife Agencies to develop and implement an invasive species/pest/disease control plan by either (1) utilizing funding allocated for adaptive management, (2) reallocate funding from existing management priorities as appropriate, (3) pursue outside funding sources or (4) seek authorization to use Changed Circumstance funding.

Adaptive Management Objective: Within 5 years from the adoption of the Preserve RMP, evaluate the effects of the public access policy and recreational trail use as a threat (direct and indirect) on the quality of natural communities (priority 2).

Strategy/Management Action: The Preserve Manager may initiate a targeted monitoring of natural communities to determine the degree to which recreational trail use negatively affects the quality of habitats on the Preserve. This may be implemented using quantitative or semi-quantitative methods and conducted in coordination with other efforts to monitor trail use and activity. Where recreational impacts are identified, sensitive natural communities would be protected by limiting and adjusting access during the certain seasons, trail closures, or trail realignments, as appropriate.

Adaptive Management Objective: Within 2 years from the adoption of the Preserve RMP, inspect and identify areas vulnerable to erosion and warrant implementation of BMPs to reduce bank erosion that may impact natural communities (priority 1).

Strategy/Management Action: Within 2 years from the adoption of the Preserve RMP, the Preserve Manager will identify situations that warrant erosion control and methods to reduce bank erosion. This may include BMPs for erosion control (e.g. sand bags, swales), closure of trails within and adjacent to creeks and streams, and improvements to flood control features.

Adaptive Management Objective: Within the first year from the initiation of Preserve management and ongoing in perpetuity, implement signage, monitoring, patrols and enforcement to address policies associated with the urban/wildlands interface within the Preserve (priority 1).

Strategy/Management Action: The RMP will identify appropriate policies and actions to minimize edge effects and encroachment from urban development adjacent to the Preserve. This will include feral and domestic animal restrictions and control, trespassing, illegal intrusions, illegal off-road vehicle use, runoff, and vegetation management. The Preserve Manager will use signage and establish a schedule for patrols and enforcement to make sure restrictions are actively enforced within the Preserve. The frequency of patrols will depend upon the level and type of urban land use surrounding the Preserve.

Monitoring Methods

- **Baseline Monitoring.** Comprehensive vegetation mapping of the Preserve will be completed during baseline surveys. In addition, initial data collection for vegetation statistical sampling and invasive species monitoring will be completed (see Table 7-1). Baseline monitoring will also identify preserve specific threats to natural communities.
- **General Stewardship Monitoring.** Ongoing general stewardship monitoring will be completed as appropriate (e.g., monthly, quarterly) and will include biological surveys to record and/or track

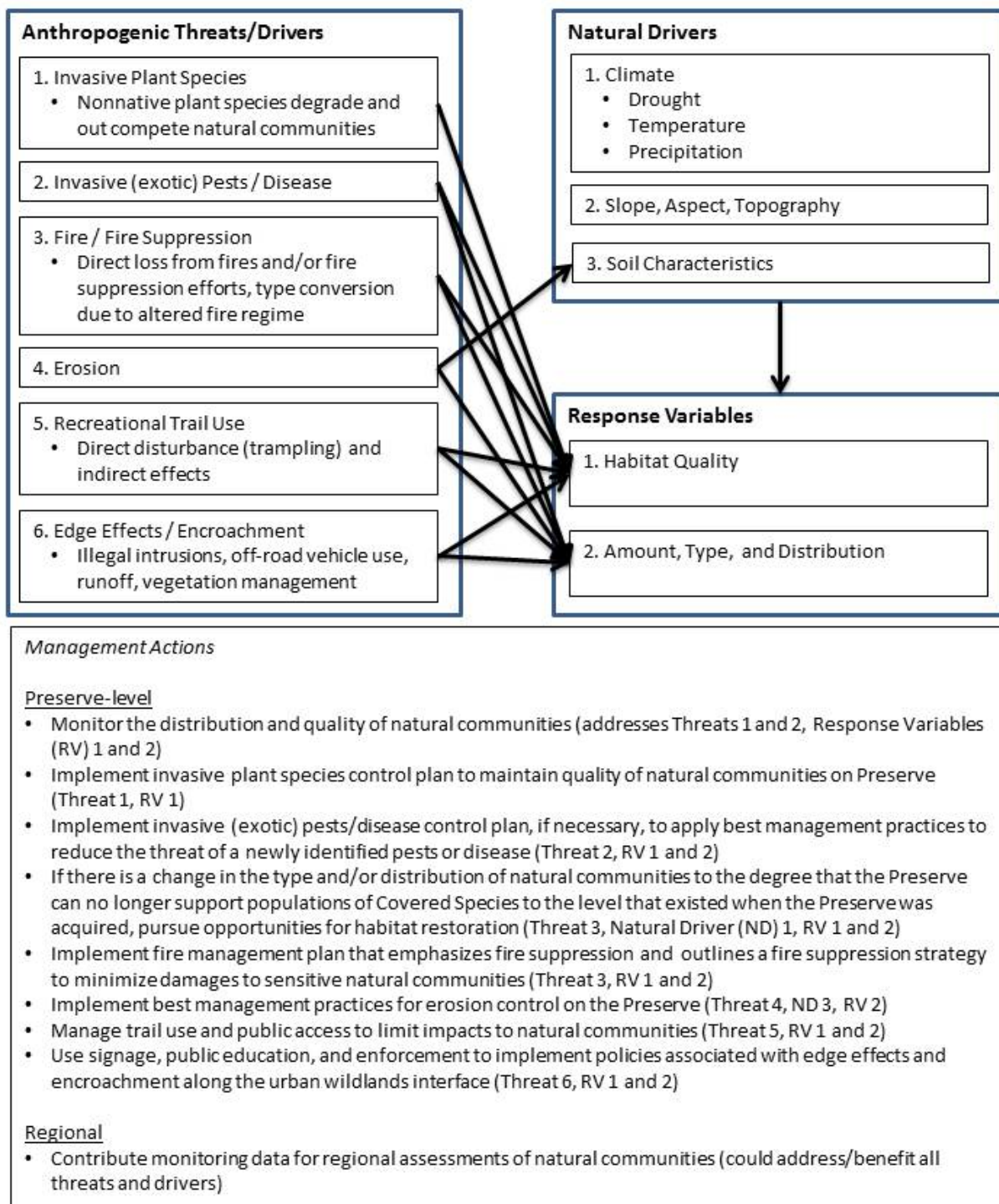
impacts to natural communities, including trail use, erosion, and invasive species. General stewardship monitoring also includes patrols and enforcement actions to ensure illegal off-road vehicle activity is not occurring on the Preserve and edge effects/encroachment policies along the urban/wildlands interface are being adhered to.

- **Effectiveness Monitoring.** Comprehensive vegetation mapping will be completed every 10 years, and monitoring of invasive species every year as part of effectiveness monitoring (using same methods used for baseline monitoring). In addition, vegetation statistical sampling will occur every 4 years and will be part of the effectiveness monitoring. Combined these monitoring efforts will help determine trends in distribution and quality of natural communities over time at the Preserve. Where declining trends are observed, attribute and climatic data will be assessed for potential causal effects. Results that are linked to anthropogenic threats (e.g., invasive plant species, invasive [exotic] pests or disease, fire) will require management. Results from all Preserves will be evaluated at the Plan-level to determine Plan-level status and management priorities.
- **Targeted Monitoring.** Targeted monitoring will be designed and implemented by the Preserve Manager to evaluate management actions, such as invasive plant species control, invasive (exotic) pest/disease control, or habitat restoration. Methods may include quantitative methods (e.g., point-intercept, quadrats) for assessing experimental outcomes. The Preserve Manager may need to get support from Monitoring Biologist and/or other outside specialist to develop an experimental design. Success criteria or targets may include (1) habitat structure, cover, and composition, or (2) nonnative plant species removal success, or (3) number of trees without disease. Where success criteria are not met, modified or alternative management strategies may be implemented.

Conceptual Model

The following is a draft conceptual model that will serve as an initial framework to guide Preserve Managers on adaptive management focused on natural communities. This conceptual model will continue to be adjusted and refined over time.

Natural Communities Conceptual Model for Preserve Management - Example



7.3 Long-Term Management and Monitoring of the Restoration Projects

As part of the conservation strategy, OCTA will provide funding for restoration projects (see Chapter 5, “Conservation Strategy”). For each restoration project, there will be a Restoration Project Sponsor and an underlying Land Management Entity (or an OCTA Preserve Manager for restoration projects occurring on M2 NCCP/HCP Preserves). The Restoration Project Sponsor will be the organization that receives the funding and completes the restoration/conservation actions. The underlying Land Management Entity will be the organization (usually a public or semi-public entity) that owns and manages the land on which the restoration project is located. In some instances, the Implementing and Land Management Entities may be the same.

For each restoration project, the Implementing Entity is responsible for preparation of a site-specific restoration plan. The restoration plans define the specific restoration/conservation actions that will be undertaken and the procedures by which the Restoration Project Sponsor will conduct management and monitoring efforts to ensure that the project meets its success criteria. Typically, these management and monitoring efforts are completed within 5 to 15 years.

Any long-term management of the restoration project(s) (beyond the restoration plan monitoring period needed to evaluate success criteria) will be the responsibility of the underlying Land Management Entity. The Land Management Entity will manage the restoration project location for biological values as part of their overall management activities and responsibilities. However, the Land Management Entity will not be responsible for maintaining and meeting any quantifiable biological or conservation targets. The restoration projects will not result in any additional long-term management or monitoring requirements for the Land Management Entity, beyond those activities outlined in the existing management plan or conservation easement that defines the role for managing the biological values of the restoration project location.

OCTA and Wildlife Agencies, per agreements with the Land Management Entity, will continue to maintain right of access to the restoration projects. As warranted and in consultation with the Wildlife Agencies, OCTA will conduct follow-up monitoring of restoration projects (approximately every 5 to 10 years) to evaluate the success of the restoration projects and apply ‘lessons learned’ to future restoration activities.

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8.1 Introduction

OCTA, as Permittee, has responsibility for Plan Implementation. As described in this chapter, OCTA will use other groups for coordination and to facilitate Plan compliance and implement various aspects of the Plan. Implementation of the conservation strategy, monitoring program, and reporting will require coordinated actions among OCTA, Caltrans, Preserve Managers, Monitoring Biologists, Restoration Project Entities, and the Wildlife Agencies. This chapter describes the overall implementation structure, policies, and guidelines of the Plan, including roles and responsibilities, Plan funding, annual reporting requirements, and procedures for amending the Plan. In addition, this chapter addresses Plan responses to Changed and Unforeseen Circumstances that may occur during the duration of the Plan.

8.2 Roles and Responsibilities

This section outlines the structure for Plan implementation in terms of the roles and responsibilities of OCTA and the other participants.

8.2.1 OCTA

OCTA is responsible for implementing the Plan. OCTA will act as the NCCP/HCP Administrator and be responsible for filling the roles of Preserve Manager and the Monitoring Biologist, either directly with OCTA staff, or by contracting with another entity (e.g., public entities such as Orange County Parks or State Parks, or a private entity). In addition, OCTA is responsible for overseeing covered freeway improvement projects to ensure avoidance and minimization measures are implemented as outlined in the Plan.

8.2.1.1 NCCP/HCP Administrator

The NCCP/HCP Administrator's role is to oversee and coordinate Plan implementation. The NCCP/HCP Administrator will communicate regularly with Preserve Managers regarding the status of Preserve stewardship; the progress on conservation action implementation, monitoring, and management; and new or ongoing issues to be addressed. The NCCP/HCP Administrator will be responsible for contacting the Wildlife Agencies as needed and described in the Plan, and for conducting biannual (twice a year) meetings with the Preserve Managers and Wildlife Agencies to facilitate coordination among the Preserve Areas. The NCCP/HCP Administrator will be responsible for the RMPs and annual work plans prepared by Preserve Managers for each Preserve and ensuring that they contribute to the biological goals and objectives of the Plan, and are implemented properly throughout the year. Finally, the NCCP/HCP Administrator will be responsible for coordinating with other regional management and monitoring programs, submitting monitoring data collected at the OCTA Preserves to regional databases (e.g., CDFW-managed CNDDDB and BIOS databases), preparing the Annual Report demonstrating NCCP/HCP compliance, and hosting an annual public meeting to

report on the status of Plan implementation. The public meeting can be a presentation to the EOC or OCTA Board.

8.2.1.2 Preserve Manager

The Preserve Manager will be responsible for the basic property management and Preserve management addressing the stewardship of the ecological values and, where applicable, recreational uses in each Preserve Area (see Section 7.2.2, “Levels of Preserve Management and Monitoring,” Levels 1 and 2). The Preserve Manager role may be fulfilled by one or multiple entities. The Preserve Manager will report periodically, at least quarterly, to the NCCP/HCP Administrator regarding the status of the Preserve, progress of active management actions and issues that need addressing, and will participate in biannual (twice a year) meetings with other Preserve Managers and the Wildlife Agencies. Preserve Managers are expected to manage their Preserves following the principles and procedures of adaptive management outlined in Section 7.2.7, “Adaptive Management and Monitoring of the Preserves.” They will be responsible for collecting monitoring data directly related to evaluating management activities and Preserve-specific species protection actions (e.g., trail use effects on riparian habitat, cowbird trapping for protection of least Bell’s vireo) and coordinating with the Monitoring Biologist to interpret results of vegetation and Covered Species effectiveness monitoring in relation to management activities.

The Preserve Manager will oversee all activities within the Preserve to ensure that their implementation will avoid or minimize direct and indirect impacts on Covered Species. The Preserve Manager will assess the qualifications of its internal staff or contractors working in the Preserve to ensure they have the qualifications for the particular activity. If a restoration project is undertaken on the Preserve, the Preserve Manager will coordinate with OCTA and Wildlife Agencies to provide authorization for seed collection of covered plant species, if applicable.

8.2.1.3 Monitoring Biologist

The Monitoring Biologist may be a staff member of the Preserve Manager or may be selected as a separate contractor. The NCCP/HCP Administrator will approve the entity selected to fulfill this role. The Monitoring Biologist will be responsible for periodic monitoring of the status of natural communities and Covered Species within the Preserves. The Monitoring Biologist role will be periodic based on the schedule for species and natural community effectiveness monitoring established in the Plan (see Section 7.2.2, “Levels of Preserve Management and Monitoring”). Monitoring data are collected based on accepted species and natural community monitoring methods. The Monitoring Biologist provides the NCCP/HCP Administrator and the Preserve Manager with the monitoring data, monitoring reports, and biological expertise in interpreting results and making recommendations for future Preserve management actions. The Monitoring Biologist role may be fulfilled by one or multiple entities.

8.2.1.4 Restoration Project Entities

For each restoration project for which OCTA provides funding as part of the NCCP/HCP conservation strategy (see Section 5.5, “Restoration Projects”), there will be a Restoration Project Sponsor and an underlying Land Management Entity. The Restoration Project Sponsor will be responsible for implementing the restoration projects as they are described in the approved restoration plans. The Restoration Project Sponsor will also be responsible for completing all appropriate regulatory permitting and environmental documentation required to complete the

project and will abide by all required avoidance and minimization requirements and BMPs. The Restoration Project Sponsor will complete monitoring of the project to ensure performance criteria are met. After performance criteria are met, any long-term management of restoration projects will be the responsibility of the underlying Land Management Entity and may be completed in coordination with the Project Sponsor. The Land Management Entity will manage the restoration project location for biological values as part of its overall management activities and responsibilities. OCTA and Wildlife Agencies will continue to have access to restoration project locations to conduct assessments and qualitative monitoring of restoration project success over time to gain insights and knowledge of restoration strategies.

8.2.1.5 Environmental Oversight Committee

The EOC will continue to serve as the interagency, interorganization, and public forum for decisions and recommendations regarding the selection of new Preserve acquisitions, new restoration projects, and other high-level issues pertaining to Preserve management, monitoring, and public access. The NCCP/HCP Administrator will report regularly to the EOC regarding Preserve status; key stewardship, management, and coordination issues; and implementation of the annual work plans and RMPs. The EOC will address ad hoc NCCP/HCP issues as needed and will provide recommendations to the OCTA Board. It is anticipated that the frequency of EOC meetings during the initial implementation of the Plan will be higher (quarterly) and then become more spaced out as the program becomes more established.

8.2.1.6 OCTA Board of Directors

The OCTA Board will provide the final decision-making authority for all substantial matters involving OCTA commitments in funding, staffing, and allocation of resources. The NCCP/HCP Administrator will coordinate with OCTA staff and the EOC to prepare items for Board consideration following the standard procedures for the Board. Agenda items that will typically come before the Board include, but will not be limited to, review and approval of future restoration project funding, long-term endowments, agreements with third-party entities for Preserve management, and amendments to the Plan.

8.2.1.7 Project Manager of Covered Freeway Improvement Projects

For all covered freeway improvement projects, OCTA will have a Project Manager overseeing the activities undertaken by the Construction Lead. The OCTA Project Manager will be responsible for ensuring all avoidance and minimization measures are completed and documented by the Construction Lead and its contractors following the requirements as set forth by the Plan. The Project Manager will coordinate and oversee the preparation of project-specific environmental documents (CEQA/NEPA) that will be prepared by either OCTA and/or Caltrans, and approved by Caltrans.

8.2.2 Construction Lead

For each individual covered freeway improvement project, OCTA and Caltrans will establish cooperative agreements that define the responsibilities and oversight of each organization. Under the normal design, bid, build process, Caltrans is anticipated to be the Construction Lead. In certain instances, OCTA may be the Construction Lead for select M2 freeway improvement projects. It is anticipated Caltrans will be the Construction Lead for the majority of the M2 freeway improvement

projects. OCTA will work closely with Caltrans during the construction phase to ensure that the measures outlined in the Plan are implemented.

8.2.2.1 Caltrans as Construction Lead

Caltrans, as owner and operator of the freeway system, will most often be responsible for the construction of covered freeway improvement projects. In that capacity as the Construction Lead, Caltrans will be required to follow all applicable avoidance and minimization measures as described in the Plan and will be responsible for completing preactivity surveys and determining the appropriate minimization measures (e.g., flagging sensitive zones and habitats) prior to the start of construction. The OCTA Project Manager for covered freeway improvement projects will work closely with Caltrans to ensure projects conform to the Plan requirements.

For any covered freeway improvement project in which Caltrans is the Construction Lead, Caltrans will implement the project as a Participating Special Entity and OCTA shall issue a project-specific Certificate of Inclusion to Caltrans that describes the authorized take and required avoidance and minimization measures. The take authorization allowed under the permits will be extended to Caltrans. OCTA is ultimately responsible for ensuring compliance by Caltrans with all applicable terms and conditions of these agreements.

8.2.2.2 OCTA as Construction Lead

In situations in which OCTA is the Construction Lead, OCTA will complete the project design and hire a construction contractor to construct the project or contract with one entity to design-build the project. Caltrans will review and approve all plans and specifications to ensure the project is constructed to meet Caltrans requirements. OCTA will have a Project Manager for the covered freeway improvement project that will provide internal oversight of the OCTA design and construction management staff to ensure the project follows the Plan avoidance and minimization measures.

8.2.3 Wildlife Agencies

The Wildlife Agencies will have an active role in the oversight and administration of the Plan. Wildlife Agency responsibilities will include, but will not be limited to the following:

- Review and approve avoidance and minimization measures as appropriate on Covered Activities, including but not limited to review of wildlife crossing design plans, review of monitoring buffer exceptions for nesting birds, and determination of best options for covered plant species mitigation. The Construction Lead for covered freeway improvement projects will submit a project-specific “Biological Resources Avoidance and Minimization Plan” that will address and summarize compliance with each of the avoidance and minimization policies set forth in the Plan to the Wildlife Agencies for review and approval.
- Review and approve future restoration project selection and restoration project design plans and determine whether success criteria have been achieved.
- Review and approve Preserve RMPs, annual work plans, and adaptive management strategies.
- Review and approve Annual Reports.
- Participate on EOC.

- Participate in biannual (twice a year) meetings with OCTA and Preserve Managers.
- Review and approve any proposed changes amending the Plan (clerical and administrative changes, minor amendments, and major amendments).
- Review and approve responses by OCTA to Changed Circumstances.
- Respond to and address Unforeseen Circumstances.
- Monitor plan implementation and permit compliance, including monitoring of preserves and restoration projects,

8.3 Plan Funding

8.3.1 Regulatory Context

Both the NCCPA and ESA require that a conservation plan approved pursuant to the respective state or federal law must assure availability of adequate funding to implement the plan's conservation actions. The NCCPA states that, in approving a natural community conservation plan, CDFW must find, among other conditions, that "[t]he plan contains provisions that ensure adequate funding to carry out the conservation actions identified in the plan" (Fish and Game Code, Section 2820(a)(10)). In addition, the plan must also include an "implementation agreement" that contains "[m]echanisms to ensure adequate funding to carry out the conservation actions identified in the plan" (Section 2820(b)(8)).

Similarly, ESA Section 10 (16 USC 1539) states that, prior to approving an HCP and issuing an incidental take permit, the Secretary of the Interior must find, among other conditions, that "the applicant will ensure that adequate funding for the plan will be provided." The USFWS and NMFS have issued a handbook to assist in the preparation and review of an HCP (*HCP Handbook*), which states that the HCP must include "[m]easures the applicant will undertake to monitor, minimize, and mitigate . . . impacts [of incidental take] . . . [and] the funding that will be made available to undertake such measures" (Chapter 3, Section B.1). Large-scale, regional HCPs, such as the OCTA HCP, should also include ". . . funds for long term needs such as biological monitoring and habitat acquisition programs" and possibly ". . . perpetual funding mechanisms to support long-term management of mitigation lands or for monitoring" (Section B.6).

8.3.2 Financial Capacity of OCTA to Fund the Plan

The primary source of funding for the Plan will derive from the M2 transportation sales tax designed to raise money to improve Orange County's transportation system. As part of the M2 sales tax initiative, at least 5% of the revenues from the freeway program will be set aside for the M2 Environmental Mitigation Program (EMP) revenues. The freeway program comprised 43% of the overall M2 transportation sales tax. These funds will be used for "programmatic mitigation." The development and implementation of the M2 NCCP/HCP will use a portion of this funding source to achieve higher-value environmental benefits such as habitat protection, connectivity, and resource preservation/enhancement in exchange for streamlined project approvals for the M2 freeway projects. The expenditures for key components of the Plan conservation strategy that achieve upfront and comprehensive mitigation (e.g., Preserve acquisitions and funding of restoration projects) will be paid for through M2 EMP revenues. Any costs associated with implementing

avoidance and minimization measures, as described in Section 5.6 “Avoidance and Minimization,” will be funded through the individual freeway project budgets and will not rely on M2 EMP funding.

There are sufficient funds available through the M2 EMP to cover the development and implementation of the Plan. OCTA has projected that EMP revenue will total \$285 million (based on 2016 projections) over the 30-year period. The estimated expenditures for the development and implementation of the Plan (including Preserve acquisitions, near-term and long-term Preserve management and monitoring, funding of restoration projects, program management, and interest payments for EAP) total approximately \$144 million, or approximately one-half of anticipated revenues. It is evident that there is sufficient revenue to implement this Plan. Table 8-1 provides a summary of the expenditures estimated to implement the Plan.

To date, OCTA has not made any other obligations for spending M2 EMP revenues beyond the commitment to implement the Plan. It is anticipated that OCTA will apply a portion of the remaining M2 EMP revenues for mitigation of wetland impacts from M2 freeway improvement projects, which are addressed separately from the Plan. The cost estimates for wetlands mitigation are currently being updated and are anticipated to be updated within the next two years. However, it is important to note that there are sufficient funds to cover both wetland impact mitigation as well as Plan implementation. OCTA will prioritize the funding of Plan implementation and mitigation of wetland impacts before allocating M2 EMP revenues to other actions or activities. OCTA will coordinate with the EOC and the Wildlife Agencies to determine an appropriate approach for allocating the M2 EMP revenues until a permanent, non-wasting endowment is fully funded (see Section 8.3.3, “Administration of Funding for Long-Term Commitments”).

M2 EMP revenues, in excess of the Plan funding requirements, will continue to be overseen by the EOC. The Board approved a set of Guiding Principles in 2015 for use of future revenues for the program. The Guiding Principles were developed by an ad-hoc working group of the EOC. The Board’s adoption of the Guiding Principles recognized OCTA’s responsibility, under the M2 Ordinance, to meet the M2 obligations, maintain an inclusive process, and set guidelines for allocating remaining funds.

Table 8-1. Actual and Estimated Expenditures for NCCP/HCP Plan Development and Implementation

Actions	Actual or Estimate Amount ¹	Amount ¹
1.0 Preserve Acquisition and Management		
1.1 Total Acquisitions		
1.1.1 Acquisitions between 2011 and 2015		
1.1.1.1 Ferber Ranch	\$12,774,300	
1.1.1.2 Hafen	\$1,707,900	
1.1.1.3 Hayashi	\$2,962,700	
1.1.1.4 O'Neill Oaks	\$4,292,500	
1.1.1.5 Saddle Creek South	\$3,183,800	
1.1.1.6 MacPherson	\$2,518,700	
1.1.1.7 Aliso Canyon	\$2,250,100	
Total Acquisitions between 2011 and 2015 ²		\$29,690,000
1.1.2 Remaining Acquisition Fund ³	\$2,548,600	
Total Funding for Acquisitions		\$32,238,600

Actions	Actual or Estimate Amount ¹	Amount ¹
1.2 Start Up Expenditures		
1.2.1 Closing Costs for Acquisition (Appraisals, Site Assessments, etc.)	\$1,104,600	
1.2.2 Baseline Biological Surveys	\$455,000	
1.2.3 Initial Site Improvements (fencing, gates, etc.)	\$714,000	
1.2.4 Preparation of Resource Management Plans	\$280,000	
1.2.5 Cultural Resource Assessment Reports	\$280,000	
1.2.6 Recordation of Conservation Easements	\$70,000	
Total Start Up Expenditures		\$2,903,600
1.3 Total Interim Preserve Management and Monitoring⁴		
1.3.1 Preserve Management and Monitoring (2017-28)	\$514,315/yr	\$9,573,200
1.3.2 Effectiveness Biological Monitoring (2017-28)		
1.3.2.1 Species/Veg Sampling (Every 4 years)	\$350,000/4 yrs	\$1,293,500
1.3.2.2 Complete Vegetation (Every 10 years)	\$50,000/10 yrs	\$59,900
1.3.3 Adaptive Management (2017-28)	\$25,716/yr	\$377,700
1.3.4 Program Management (2017-28)	\$120,000/yr	\$1,753,400
1.3.5 Property Taxes (2017-20)	\$100,000/yr	\$503,500
1.3.6 Changed Circumstances		
1.3.6.1 Minor Response (~every 3 years)	\$25,000/3 yrs	\$124,700
1.3.6.2 Moderate Response (~every 5 years)	\$50,000/5 yrs	\$121,500
1.3.6.3 Major Response (~every 15 years)	\$200,000/15 yrs	\$258,000
Total Interim Preserve Management and Monitoring		\$14,065,400
1.4 Permanent, Non-Wasting Endowment (see Table 8-2)		
Total Permanent, Non-Wasting Endowment		\$34,520,000
2.0 Restoration Projects		
2.1 Round 1		
2.1.1 Agua Chinon/Bee Flat Canyon ⁵	\$1,497,160	
2.1.2 Big Bend	\$87,500	
2.1.3 City Parcel	\$1,500,000	
2.1.4 Fairview Park	\$2,000,000	
2.1.5 UC Irvine Ecological Preserve ⁵	\$359,400	
Total Round 1		\$5,444,060
2.2 Round 2		
2.2.1 Aliso Creek ⁵	\$1,107,100	
2.2.2 Chino Hills State Park	\$193,000	
2.2.3 Harriett Weider Regional Park	\$475,000	
2.2.4 Lower Silverado Canyon ⁵	\$1,414,435	
2.2.5 North Coal Canyon	\$247,500	
2.2.6 West Loma ⁵	\$1,322,800	
2.2.7 Future	\$296,105	
Total Round 2		\$5,055,940

Actions	Actual or Estimate Amount ¹	Amount ¹
2.3 Round 3 (Future)⁶		\$5,000,000
2.4 Round 4 (Future)⁶		\$5,000,000
3.0 Plan Development		
3.1 NCCP/HCP Plan Development		\$2,500,000
4.0 Debt Service		
4.1 Interest expense on the portion of on Early Action Plan (EAP) debt used for EMP⁷		\$37,200,000
TOTAL		\$143,927,600

- ¹ Amounts in first (left) column are actual expenditures, where known, or estimates valued in 2013 dollars. Amounts in second (right) column are sums of actual figures, where known, or sums of estimates adjusted for inflation. Inflation rates used are actual rates for 2014 and 2015; 2% per year for 2016 through 2018; and 2.5% per year for 2019 and thereafter. Totals include both historical costs expended through FY 2015-16 and estimated expenditures to complete tasks as described.
- ² Includes credit for matching funds from National Fish and Wildlife Foundation for Saddle Creek South Preserve.
- ³ The Plan demonstrates that OCTA has met the required acquisition needs with the purchase of the seven Preserves. M2 EMP funds left over from the Board approved Early Action Plan (EAP), will continue to be overseen by the EOC. Any reallocation of those funds will require OCTA Board approval and should adhere to the 2015 Board approved Guiding Principles.
- ⁴ Interim Preserve management will be funded directly by EMP revenues until adequate funds have been accumulated in the permanent, non-wasting endowment. Deposits will be made over a 10- to 12-year period. OCTA may need to utilize annual revenue streams to continue to pay for the management of the Preserve after deposits are completed, if additional time is needed to accrue interest income to fully fund the endowment. Amount shown is higher than the estimate in the September 2014 Draft to reflect expenditures made through June 2016 and 12 years of endowment funding period, instead of 10 years as previously assumed.
- ⁵ Additional document requirements and slight scope modifications resulted in a nominal increase in project cost.
- ⁶ Future restoration includes projects required to fulfill NCCP/HCP goals and objectives, and additional restoration/funding may be needed as part of comprehensive wetlands permitting.
- ⁷ As part of the EAP, OCTA incurs interest expense on debt issued against future M2 EMP revenues to implement conservation actions (Preserve acquisition and funding of restoration project) to provide upfront and comprehensive mitigation.

8.3.3 Administration of Funding for Long-Term Commitments

OCTA will ensure that a non-wasting endowment is established, per the review and approval of the Wildlife Agencies, to provide funding for the permanent Preserve management and monitoring and allowances for changed circumstances. The assumption for this Plan is that OCTA will be responsible for establishing the endowment, with a third party entity or entities managing the endowment in coordination with the Wildlife Agencies and EOC. OCTA will retain an option to manage the endowment itself, or a part, if there is an accompanying financial or administrative benefit for Plan implementation. The following is a summary of endowment funding approach and strategy. Ultimately, the OCTA Board of Directors will make the decision on who will manage the endowment as well as the specific investment policies for this program.

8.3.3.1 Endowment Funding

One or more endowment(s) will be established to cover the annual expenses for all Preserve management and monitoring in perpetuity and program management expenses through the permit

term. An initial estimate of annual expenditures and the endowment amount required to fund these activities is included in Table 8-2. The estimate of the endowment amount is based on an effective spending rate¹ of 2.5% of average endowment value over a specified period. This is a more conservative estimate than is currently assumed by environmental, educational, and other public benefit nonprofit organizations for their permanent endowments, which generally ranges from 3.5% to 5.5%. The estimated endowment amount and proposed schedule of deposits to fund the endowment, discussed below, have been calculated based on long-term, average market return of 5.0% per year, net of fund management fees, and inflation of 2.5% per year, resulting in an effective spending rate of 2.5%. Within 5 to 7 years of Plan approval, the Wildlife Agencies and the EOC will review these assumptions and make a determination of the appropriate spending rate for the Plan, which will be used to determine the ultimate endowment needed to meet this Plan's commitments. In addition, the final endowment funding requirements will be based on a Property Analysis Report (PAR) or PAR-like analysis that will be completed by OCTA within 5 to 7 years of Plan approval. This analysis will itemize and define the long-term obligations at each Preserve using Preserve specific information developed for the Preserve RMPs. It is expected that additional years of interim habitat management will provide a database and sounder basis for estimating the cost of long-term management. The final endowment funding level will be based upon actual negotiated long-term management contracts for each individual Preserve. OCTA will coordinate with the Wildlife Agencies and obtain the Wildlife Agencies' review and approval of the PAR analysis and determination of the permanent endowment funding requirements.

The endowment will cover the following types of expenses in perpetuity:

- Preserve Management – This includes all general Preserve management activities such as access control, enforcement, fencing, maintenance, signage, public outreach, vegetation management, invasive species control, erosion control, and fire management. In addition, this includes periodic and ongoing biological assessments, a comprehensive annual assessment to identify major threats, Preserve-specific biological monitoring above and beyond effectiveness monitoring, ongoing adaptive management, Preserve level data management, and Preserve level annual reporting.
- Adaptive Management – Preserve Managers will be expected and responsible for managing their Preserves following the principles and procedures of adaptive management, as outlined in Section 7.2.7, “Adaptive Management and Monitoring of the Preserves”. A separate budget line-item will be set aside to fund additional and specific adaptive management actions (e.g., monitoring and evaluation of different weed-control methods to protect covered plant species populations on a Preserve) that are above and beyond the general adaptive management steps undertaken by the Preserve Manager. The adaptive management funding will be 5% of the Preserve Management budget.
- Effectiveness Biological Monitoring – Comprehensive biological monitoring (following established protocols) will occur every 4 years for Covered Species and vegetation statistical sampling and every 10 years for comprehensive vegetation mapping updates.
- Changed Circumstances – A separate subfund within the endowment will be established and managed to provide funding for responding to events that meet the triggers of a Changed

¹ Effective spending rate is the percentage of the endowment value (using an average value over a specified period, such as 3 to 5 years) that is made available for activities to be funded. The rate makes allowances for inflation and management expenses.

Circumstance (see Section 8.6.3, “Costs and Timing for Addressing Changed Circumstances”). This subfund will be funded with deposits totaling \$1,330,000 (estimated) plus accumulated investment earnings to generate, at a minimum, revenues to cover a minor response (\$25,000; 2013 dollars, all subject to inflation adjustment) every 3 years, a moderate response (\$50,000; 2013 dollars) every 5 years, and a major response (\$200,000; 2013 dollars) every 15 years.

In addition, OCTA will provide funding for program management activities during the permit term that include, but not limited to, program oversight, coordination of Preserve Managers, program-level data management, participation on regional planning and monitoring, and preparation of the annual report. OCTA will fund program management from the EMP revenue stream while the M2 sales tax initiative is active (through 2041) and establish and manage a separate subfund to continue to fund program management activities through the end of permit term (2051).

Table 8-2. Estimate of Funding Requirements for Permanent Endowment

Annual Expenditures	Annual Average ¹
Preserve Management	
Seven acquired OCTA Preserves	\$514,315
Adaptive Management	
Specific and additional adaptive management actions	\$25,716
Effectiveness Biological Monitoring	
Covered Species / Vegetation Sampling (\$350,000 every 4 years)	\$87,500
Comprehensive Vegetation Updates (\$50,000 every 10 years)	\$5,000
Program Management	
Program management and coordination (through permit term) ⁵	\$120,000
Changed Circumstances	
Minor Response (\$25,000 approximately every 3 years)	\$8,333
Moderate Response (\$50,000 approximately every 5 years)	\$10,000
Major Response (\$200,000 approximately every 15 years)	\$13,333
Total Average Annual Expenditures	\$784,197
	Deposits to Endowment Fund to Generate Required Revenue ²
Deposits to Endowment Subfunds	
Preserve Management ³	\$23,880,000
Effectiveness Biological Monitoring ⁴	\$4,030,000
Program Management ⁵	\$5,280,000
Changed Circumstances ⁶	\$1,330,000
Total Endowment Deposits Required (estimated)	\$34,520,000

¹ Amounts in 2013 dollars, except for deposits to endowment, which are in current dollars. Amounts to be expended will be adjusted for inflation. Amounts may not sum to total as shown due to rounding.

² Amounts (rounded) represent total deposits to the endowment fund for the management, monitoring, and actions in response to Changed Circumstances for the Preserves managed under the Plan. Deposits will be made over a 10- to 12-year period, with possibly 1 to 3 years of interest accumulation before funding expenditures. Together with accumulated interest, the endowment at completion is anticipated to total \$40.6 million in current (approximately 2028) dollars. Calculations were based on an effective spending rate of 2.5%, rather than 1.5% assumed in the September 2014 Draft Plan. A review by the EOC of effective

Annual Expenditures	Annual Average ¹
spending rates of endowments for environmental mitigation indicated that 2.5% is a conservative estimate. The higher effective spending rate reduced the deposits to endowment from \$56.3 million shown in the 2014 Draft Plan. Actual terms of the deposit schedule may change, subject to market conditions and the action of the OCTA Board.	
3	Preserve Management, or operating, subfund is applied to annual expenditures on Preserve management and adaptive management.
4	Effectiveness Biological Monitoring subfund is applied to effectiveness biological monitoring actions for Covered Species and vegetation statistical sampling (every 4 years) and comprehensive vegetation mapping updates (every 10 years).
5	Program Management subfund is intended to provide funding to staff program oversight and coordination between the time that the M2 sales tax initiative is closed (2041) and before the end of the permit term (2051). Before the M2 sales tax initiative is closed, OCTA will fund program management using annual appropriations from the M2 EMP revenue stream. OCTA will establish and manage a subfund to continue funding program management from 2041 to 2051. Deposits to Project Management subfund as shown in this table are based on a conservative assumption that project management costs would be funded in perpetuity; however, this will be reviewed and may be modified during the endowment funding, or establishment, period.
6	Changed Circumstances subfund is applied to responses to events that meet the triggers of Changed Circumstances, which may occur at irregular intervals.

For the initial years of Plan implementation, during which time the non-wasting endowment is being fully funded over a period of up to 15 years, OCTA will fund Plan implementation, including Preserve management and monitoring, using annual appropriations from the M2 EMP revenue stream. OCTA will make deposits to the endowment using funds from the annual M2 EMP revenue stream over a 10- to 12-year period subsequent to Plan approval and it may also take an additional 1 to 3 years of interest accumulation to generate sufficient revenues before the ‘hand-off’ to the endowment as the source of funding for long-term Preserve management and monitoring. Except for the mitigation of potential wetland impacts and meeting the outstanding commitments within this Plan, OCTA will prioritize the funding of the Plan endowment before allocating M2 EMP revenue to other actions or activities. OCTA will disburse funds on a timely basis to meet the Preserve management expenses of the Preserve Managers and other program expenses. OCTA will, most likely, contract with local management entities and biological firms for Preserve management and biological monitoring services.

Once OCTA has established a permanent, non-wasting endowment and the endowment has been reviewed and approved by the Wildlife Agencies, the endowment will be deemed as adequate funding to carry out the obligations under the Plan, and the Wildlife Agencies will not require additional funding from OCTA.

8.3.3.2 Endowment Management

Management of an endowment to fund maintenance of the Preserve in perpetuity will occur in two phases: first, as it is being established through annual deposits and investment returns; and second, after completion of the permanent endowment sufficient to fund maintenance activities in perpetuity. The endowment manager during the funding phase may continue as manager of the permanent endowment, or a new manager, or managers, may be selected at the end of the funding phase. All endowment managers will be selected in conformance with California Government Code Sec. 65965-65968. OCTA would qualify as an endowment manager, because it owns the Preserve lands to be maintained. However, it is likely that an outside endowment manager would be selected

for both phases, because OCTA's principal agency mission is not ownership or management of conservation resources.

During the funding phase, when the endowment is being established:

- Deposits to the endowment will be made as expenditures by M2 EMP, and the endowment manager will hold the funds in trust for the benefit of M2 EMP preserve lands.
- The endowment is intended to achieve a target value over a period of 10 to 12 years, where the final endowment target value will be determined during the first 5 to 7 years, based on final estimates of annual management and monitoring costs for all preserve sites and on planned effective spending rate(s) for permanent endowment(s).
- No disbursements for habitat management or monitoring activities will be made from the endowment during the funding phase. These activities will be funded separately by M2 EMP during this phase.
- Upon achieving the target endowment value or targeted funding date, permanent endowment(s) will be established and managed by one or more organizations. The organization selected for the management of the endowment during the funding phase may also become a permanent endowment manager through a separate selection process.
- The endowment funding manager will provide annual reports pursuant to Government Code §65966(e).
- The endowment funding manager will provide periodic status updates to the EOC, sub-committees of the Board, and the Board. This may be on a quarterly basis or on an as-needed basis.

Also during the endowment funding phase, permanent land managers will be identified and final estimates of management, monitoring, and other ongoing costs developed, with review and approval of the Wildlife Agencies. OCTA may continue as the owner and/or land manager for a portion of the Preserve. However, due to considerations described above, it is more likely that the Preserve lands would be transferred to non-OCTA entities and outside land managers selected.

Upon completion of the permanent endowment, that is, after final endowment amount has been determined and the accumulation of deposits by OCTA and investment earnings is sufficient to fund ongoing Preserve management and monitoring activities in perpetuity, one or more permanent endowment managers will be identified, with review and approval of the Wildlife Agencies.

If OCTA chooses to retain responsibility for management of a portion of the Preserve and the associated endowment, it has a track record of managing endowment funds, including those for transit and commuter rail operations, and has a fully functioning treasury with appropriate investment policies and fund management experience. OCTA's management of the endowment will follow the safeguards and audit features applied to the M2 program including, but not limited to the following:

- All spending will be subject to an annual independent audit.
- Spending decisions will be annually reviewed and certified by an independent Taxpayer Oversight Committee (TOC).
- The endowment will be subject to public review at least every 10 years and an assessment of progress in delivery, public support, and changed circumstances. Any significant proposed

changes to the endowment will be approved by the TOC, EOC, and OCTA Board. The Wildlife Agencies will be consulted on changes to the endowment prior to its presentation to the TOC and OCTA Board..

- All entities receiving funds will report annually on expenditures and progress in implementing projects.
- At any time, at its discretion, the Taxpayer Oversight Committee may conduct independent reviews or audits of the spending of endowment funds.

OCTA's endowment will be governed by the Uniform Prudent Management of Institutional Funds Act. Changes to the use of the M2 funds that deviates from commitment to the Orange County voters will require approval by the TOC, OCTA Board, and/or Orange County voters. OCTA's endowment funds are held in separate and distinct funds. Each fund is legally protected from the other funds. OCTA utilizes fund accounting for the recording of these assets. Furthermore, the EOC was established pursuant to the M2 Ordinance No. 3 to make recommendations to the OCTA Board on the allocation of net revenues for the EMP. Changes to the use of M2 funds related to the EMP will also require recommendations by the EOC.

8.4 Annual Reporting Requirements

OCTA will prepare an Annual Report summarizing activities over the reporting year (January 1 to December 31). Annual reporting will involve report submittal to the Wildlife Agencies by March 1 of each calendar year (or other date as agreed upon by OCTA and the Wildlife Agencies). A public meeting on the report will be held within 60 days of the report submittal or in conjunction with EOC meetings. The Annual Report will include, but not be limited to, the following:

- Description and location of Covered Activities completed, including a summary of avoidance and minimization measures undertaken for each Covered Activity and any onsite restoration that is required to offset temporary impacts.
- Summary of any Minor Amendments for covered freeway improvement projects in which the project has changed but that would result in an equivalent level of the type and amount of project effects (and would stay within the overall cap of project effects).
- Summary of total acres of natural habitat types affected by covered freeway improvement projects and an accounting of the Plan-to-date habitat types impacts in comparison with the impact caps approved by the Plan.
- For covered plant species only, accounting in ledger-type format of credits and debits.
- Summary of any impacts exceeding 0.10 acre to natural habitat resulting from Covered Preserve management activities and an accounting of Plan-to-date natural habitat impacts in comparison with the 13-acre cap approved by the Plan.
- Summary of the status of Preserve management and monitoring activities, including any actions taken through adaptive management and/or as a response to Changed Circumstances;
- Summary of the status of OCTA-funded restoration projects, including the results of monitoring activities and any remedial actions taken to achieve success criteria.

- Summary of Plan funding, including endowment budgets. This should include the amount of earnings, amount spent or obligated, and amount of inflation, though this may not have to be adjusted annually.
- Any revisions/amendments to the Plan, Permits, or IA.

8.5 Amending the Plan

8.5.1 Processing Plan Changes

The information necessary to document proposed changes to the Plan will be presented to the Wildlife Agencies in the form of an addendum to the Plan. The addendum will state the need for the change, the proposed change, and, based on the type of change, specific information and findings to justify the change(s). While the addendum will be prepared as a separate document, the addendum may also be incorporated as an element of any required CEQA or NEPA document circulated for public review and comment for the proposed action. OCTA will coordinate with the Wildlife Agencies to reach a consensus of the Plan changes prior to going out for CEQA and NEPA public review. Three types of changes to the Plan may occur: clerical or administrative changes, minor Plan amendments, or major Plan amendments. An Annual Report on the Plan's implementation will document all Plan changes and amendments for the previous calendar year, and include the supporting addenda. Most changes to the Plan are expected to be Minor Amendments, although some Major Amendments may be necessary.

8.5.2 Minor Modifications to the Plan

Either OCTA or the Wildlife Agencies may propose minor modifications to the Plan by providing notice to the other parties. Usually these minor modifications will include clerical and/or administrative edits and updates to the Plan, such as typographical corrections and minor editing that do not affect conservation commitments. These modifications may also consist of vegetation mapping and species occurrence updates, and adaptive management changes made pursuant to monitoring results and discussions with the Wildlife Agencies. These types of modifications would not be considered amendments.

Management and monitoring within the Preserve Areas may identify new practices that can improve habitat conditions and/or Covered Species' status. Changes to management (and monitoring) practices will be proposed and discussed in the Annual Report. Because these changes would be expected to enhance habitat conditions and/or Covered Species' status, OCTA anticipates that they will be processed as administrative changes. Changes to the list of invasive plant species maintained by the Cal-IPC, or an equivalent organization or agency, are expected to occur over time. Changes to the list will be reported in the Annual Report.

These non-substantive changes to the NCCP/HCP may be made by OCTA on its own initiative or in response to a written request submitted by a Wildlife Agency and will not require any amendment to the NCCP/HCP, Permits, or Implementing Agreement. All proposed clerical or administrative changes will be circulated in writing among the parties by the party proposing the change. If no party objects to the proposed clerical or administrative change within 30 days of receipt, the change will be deemed accepted. If a party objects to a proposed clerical or administrative change, the proposing party may elect to propose the change as a minor or major amendment to the Plan. Each

Annual Report will include a summary of all clerical and administrative changes made to the NCCP/HCP during the preceding calendar year.

8.5.3 Minor Amendments

The Plan may, under certain circumstances, be modified without amending the Permits, provided such amendments are minor in nature, the effects on the Covered Species involved and the levels of take resulting from the amendment are not greater than those described in the Plan and provided for by the Permits, and the action is otherwise consistent with the Plan, IA, and associated Permits, and will not result in new or greater environmental effects beyond those analyzed under NEPA and CEQA for the Plan as originally approved. Minor amendments will not alter the terms of the Section 10(a)(1)(B) Permit and/or NCCPA Permit.

Examples of actions that may require Minor Amendments to the Plan include, but are not limited to:

- Change in the location of a covered freeway improvement project provided that the revised project location is within the Permit Area, changes do not exceed the caps for impacts on habitat types, result in an increased level of take for Covered Species, or result in new environmental impacts that were not addressed in the Plan and the EIR/EIS. OCTA will be required to address the project changes and demonstrate that the changes are consistent with these criteria.
- The addition of a covered freeway improvement project as a Covered Activity that meets the criteria included in Section 3.1.2, "Other Minor Freeway Improvement Projects". Potential additional projects must be consistent with the scope of the covered freeway projects, occur within the Permit Area, and cannot exceed the acreage impact caps established for the Plan. These projects also cannot result in additional take of Covered Species, or be significantly different or have greater impacts to the environment than what was analyzed within the EIR/EIS for the NCCP/HCP, as determined by the Wildlife Agencies.
- Change to cap of 500 individuals of each covered plant species to not more than 1,000 individuals if OCTA can demonstrate to the Wildlife Agencies that mitigation achieved through the Plan conservation actions or through project-specific biological superior alternative(s) provides a biological benefit that is greater than the anticipated impacts. The relative biological benefit of impacts and conservation/restoration will depend not only on the number of individuals impacted or conserved, but also on factors such as long-term sustainability of the occurrences, importance for maintaining connectivity and contiguity between other occurrences in the area, and other factors that may make the occurrences in question biologically valuable or unique (see Section 5.6.2.2, "Covered Plant Species Policy").

OCTA will submit in writing to the Wildlife Agencies a description of the proposed Minor Amendment in the form of an addendum with the following subject items addressed:

- An explanation why the Minor Amendment is necessary or desirable.
- An explanation of why OCTA believes the effects of the proposal are not significantly different from those described in the original Plan and would not result in greater impacts on the environment, including the Covered Species and their habitats, or levels of take beyond those analyzed in connection with the Plan and the Permits.
- An analysis of the environmental impacts of the proposed change.

OCTA may propose a Minor Amendment to the NCCP/HCP Plan by providing a written submission to the Wildlife Agencies. The Wildlife Agencies will use their reasonable efforts to respond to proposed Minor Amendments within 60 days of receipt of such submission by either approving or denying the Minor Amendment or by notifying the OCTA that the proposed Minor Amendment must be processed as a Permit Amendment. Proposed Minor Amendments will become effective upon the Wildlife Agencies' written approval. The Wildlife Agencies will not approve Minor Amendments to the Plan if they determine that such Minor Amendments will result in adverse effects on the environment that are new or significantly different from those analyzed in connection with the original Plan or may result in additional take that was not analyzed in connection with the original Plan.

8.5.4 Major Amendments

Major Amendments to the Plan will be required if a proposed action were to include but not be limited to any of the following:

- Increased level of take of a Covered Species. For the three covered plant species, this impact would include any cumulative take above 1,000 individuals.
- Addition of a Covered Species.
- Addition or substantial modification to Covered Activities associated with Preserve management that could reduce conservation commitments in the Plan.
- Addition of a covered freeway improvement project that does not meet the criteria included in Section 3.1.2, "Other Minor Freeway Improvement Projects", which would require additional conservation to offset impacts.
- Addition of operation and maintenance of constructed freeway projects as a Covered Activity.
- Change in the location of a covered freeway improvement project that is outside of the Permit Area, results in impacts that exceed caps to habitat type(s), and/or results in new environmental impacts that were not addressed in the Plan and the EIR/EIS.
- Increased impacts associated with covered freeway projects that result in the caps for habitat type(s) to be exceeded. Adjustments to the caps can be made based on an analysis of conservation achieved under the Plan and if there is a determination, in consultation with the Wildlife Agencies, that there are excess credits to warrant the caps on a specific habitat to be increased.
- Increased permanent impacts within Preserves that result in the cap of 13 acres of impact on natural habitat to be exceeded.
- Addition of a Preserve or other conservation actions that contribute to the conservation credits under the Plan.

Major Amendments to the Plan will require detailed analyses of the anticipated effects of the proposed action on habitats and Covered Species, sensitive habitats and species not addressed in the Plan, and additional conservation, if warranted, to be provided through the Major Amendment process. Major Amendments will be processed as Permit Amendments in accordance with all applicable federal and state statutory and regulatory requirements, including NEPA and CEQA. The Wildlife Agencies will provide technical assistance to OCTA during the amendment process. All

Major Amendments to the Plan will be memorialized through an addendum to the Plan and a Permit Amendment and will be documented in the Annual Report.

8.6 Regulatory Assurances, Changed Circumstances, and Unforeseen Circumstances

8.6.1 Regulatory Assurances

ESA regulations and provisions of the NCCPA provide for regulatory assurances to parties covered by approved HCPs or NCCPs concerning their obligations. Specifically, these assurances are intended to provide a degree of certainty regarding the overall costs associated with species mitigation and other conservation measures, and add durability and reliability to agreements reached between Permittee and the Wildlife Agencies. As such, under the federal no surprises rule, if Unforeseen Circumstances occur that adversely affect species covered by an HCP the USFWS will not require additional land, water, or financial compensation or impose additional restrictions on the use of land, water, or other natural resources beyond that provided for under the HCP, without the consent of the Permittee. Similarly, under the NCCPA, additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources shall not be required without the consent of plan participants.

The regulatory assurances provided under the ESA and the NCCPA do not prohibit or restrain USFWS, CDFW, or any other public agency from taking additional actions to protect or conserve species covered by an NCCP or HCP. The state and federal agencies may use the variety of tools at their disposal and take actions to reduce the effects of other stressors to ensure that the needs of species affected by unforeseen events are adequately addressed.

8.6.1.1 Regulatory Assurances under the Endangered Species Act—The No Surprises Rule

No Surprises Rule 50 CFR 17.22(b)(5)(iii)A and 17.32(b)(5)(iii)(A) provides that once an incidental take permit has been issued pursuant to an HCP, and its terms and conditions are being fully implemented, the USFWS “will not require the commitment of additional land, water, or financial compensation or additional restrictions on the use of land, water or other natural resources beyond the level otherwise agreed upon for the species covered by the conservation plan without the consent of the Permittee.” If the status of a species addressed under an HCP unexpectedly declines, the primary obligation for undertaking additional conservation measures rests with the federal government, other government agencies, or other non-federal landowners who have not yet developed HCPs. The preamble to the No Surprises Rule provides the following explanation.

Once an HCP permit has been issued and its terms and conditions are being fully complied with, the Permittee may remain secure regarding the agreed upon cost of conservation and mitigation. If the status of a species addressed under an HCP unexpectedly worsens because of unforeseen circumstances, the primary obligation for implementing additional conservation measures would be the responsibility of the Federal government, other government agencies, and other non-Federal landowners who have not yet developed an HCP (63 FR 8867).

However, in the event of Unforeseen Circumstances, USFWS may require additional measures beyond those provided under the Plan provided they are limited to modifications in conserved

natural community areas or to the Preserve RMPs for the affected species or to the Plan's operating conservation program for the affected species and maintain the original terms of the conservation plan to the maximum extent practicable. These measures may not involve additional financial commitments or resource restrictions beyond those provided under the Plan without the consent of the Permittee (50 CFR 17.22(b)(5)(iii)(B) and 17.32(b)(5)(iii)(B)).

The assurances provided by the No Surprises Rule are not absolute and are tempered by other regulatory provisions of the ESA. The Permit Revocation Rule moderates the scope of the No Surprises Rule, providing that in instances where the survival and recovery of a species covered by an HCP is threatened, USFWS may revoke the HCP permit (50 CFR 17.22(b)(8)).

8.6.1.2 Regulatory Assurances under the NCCPA

Under the NCCPA, CDFW provides assurances to Permittees commensurate with the long-term conservation assurances and associated implementation measures that will be implemented under the Plan.² In its determination of the level and term of the assurances to be afforded a Permittee, CDFW takes into account the conditions specific to the NCCP, including such factors as the level and quality of information regarding Covered Species and natural communities, the sufficiency and use of the best available scientific information in the analysis of impacts on these resources, reliability of mitigation strategies, and appropriateness of monitoring techniques, including the use of centralized data to evaluate the effectiveness of the NCCP; the adequacy of funding assurances; the range of foreseeable circumstances that are addressed by the plan; and the size and duration of the plan.³

The assurances provided under the NCCPA will, at a minimum, ensure that if there are unforeseen circumstances, no additional financial obligations or restrictions on the use of resources will be required of the Permittee without its consent. Specifically, the NCCPA directs that,

[i]f there are unforeseen circumstances, additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources shall not be required without the consent of plan participants for a period of time specified in the implementation agreement, unless [CDFW] determines that the plan is not being implemented consistent with the substantive terms of the implementation agreement (California Fish and Game Code 2829(f)(2)).

Like the provision in the ESA regulations, however, the NCCPA requires that CDFW suspend or revoke a Permit, in whole or in part, if the continued take of a Covered Species would jeopardize its continued existence.

8.6.2 Changed Circumstances

Natural habitats are inherently subject to fluctuations, and many vegetation communities in southern California are adapted to cyclical events such as wildfires, floods, droughts, and species' population eruptions. Many of these fluctuations will be monitored and addressed through the adaptive management plans developed for the Preserve Area. However, some events or the scale of events may exceed the level of change that can be addressed through adaptive management

² California Fish and Game Code 2820(f) states "The department may provide assurances for plan participants commensurate with long-term conservation assurances and associated implementation measures pursuant to the approved plan."

³ CDFW bases its determination of the level of assurances on multiple factors. See California Fish and Game Code 2820(f).

responses. Changes greater than those that will be addressed through adaptive management are defined as “Changed Circumstances” and “Unforeseen Circumstances.”

Changed Circumstances are defined (50 CFR 17.3) as those events that may affect a species or geographic area covered by this Plan that can reasonably be foreseen by OCTA and the Wildlife Agencies during planning and development of the Plan. Changed Circumstances for this Plan include the following reasonably foreseeable events: flood; fire; extended period of reduced precipitation; invasion by exotic species or disease; toxic spills, vandalism, encroachment, and other illegal human activity; and listing of non-Covered Species. Natural events, such as flood, fire, drought, invasive species, and disease that could initiate Changed Circumstance under this Plan would most likely be of regional concern for some or all of the other conservation plans within this Plan Area, and responses would likely be implemented in coordination with other NCCP/HCP Permittees. OCTA’s responses would be implemented to complement responses by other NCCP/HCP Permittees, although OCTA may have specific actions that need to be performed on their Preserves.

The potential for climate change to affect Preserve lands must be taken into account. The World Meteorological Organization (WMO) stated “[t]he decade 2001–2010 was also the warmest on record. Temperatures over the decade averaged 0.46°C above the 1961–1990 mean, 0.21°C warmer than the previous record decade 1991–2000. In turn, 1991–2000 was warmer than previous decades, consistent with a long-term warming trend.” (WMO 2010). The California Energy Commission’s (CEC’s) Public Interest Energy Research Program reports that climate change will have significant societal impacts including effects on the water supply, flood risk, levee vulnerability, air quality, agriculture, and human health (Bonfils et al 2007). In addition to societal impacts, California’s vulnerability to climate change and its associated changes in temperature and precipitation will affect water resources, the health of citizens, and natural ecosystems effects of climate change on ecosystems and species in the Plan Area are difficult to quantify at this time, it is clear that climate change has the potential to increase the frequency and severity of four of the Changed Circumstances outlined in the Plan (fire, invasive species, drought, and flood). The Changed Circumstances affected by climate change, and their associated risk assessments, are discussed below.

Events that meet the Changed Circumstance threshold will be addressed through monitoring and the steps identified below in Sections 8.6.2.1 through 8.6.2.6. This will ensure that OCTA has guidelines for responding to and reporting on Changed Circumstances.

The following outline describes how Changed Circumstances will be addressed should they occur:

- The Preserve Manager will coordinate with the NCCP/HCP Administrator, which will notify the Wildlife Agencies in writing within 30 days that a Changed Circumstance has occurred.
- An assessment and, if necessary, a draft remediation plan will be prepared to determine the severity of an event and its impacts and the appropriate response. The draft remediation plan, timeline, and cost estimate determine if environmental compliance (CEQA/NEPA) is required. The Preserve Manager will prepare the assessment and draft remediation plan in coordination with the NCCP/HCP Administrator.
- The assessment and draft remediation plan will be provided to the Wildlife Agencies for review and approval. The Wildlife Agencies will use their reasonable efforts to provide their concurrence or nonconcurrence within 30 days from receipt of the draft plan, including any specific recommendations to modify the plan. If the Wildlife Agencies do not provide comments

or state an objection to OCTA adopting the plan within 30 days of receiving the plan, it will be considered approved.

- The approved remediation plan will be used by the Preserve Manager to implement the identified adaptive management activities, and if necessary, to use the funds allocated for Changed Circumstances. All required environmental compliance will be completed before actions are implemented; if an emergency response is required then the Preserve Manager will follow up with all required post-action documentation. A summary report will be prepared by the Preserve Manager on the Changed Circumstance event/condition, actions implemented, results of the actions, and any recommendations for future activities. The NCCP/HCP Administrator will make a reasonable effort to submit a post-response summary to the Wildlife Agencies within 60 days of completion of the response.

8.6.2.1 Flooding

Definition. A Changed Circumstance flood event will be defined for a particular floodplain or river valley as a flood greater than the 50-year flood level and less than the 100-year flood level, as defined by the Federal Emergency Management Agency (FEMA) and causing permanent impacts on 10–50% of one or more conserved vegetation communities within the Preserve Area. The determination of permanent loss will be made in consultation with the Wildlife Agencies and may be based on whether the Preserve Manager and Wildlife Agencies conclude that the area cannot be restored within 5 years of the event. FEMA has developed flood zone maps that designate flood hazard areas. A 100-year flood area identifies the elevations that have a 1% chance of being inundated by flood in a given year. These designations may not be applicable to or present within all Preserve habitat areas for which OCTA and Preserve Managers have made a commitment to manage for the benefit of Covered Species. Flood events that exceed the local area’s flood-protection level will require OCTA or the Preserve Manager to determine if a response to the Changed Circumstance is required and within their capability to accomplish to address the situation.

Risk Assessment. OCTA expects streams, rivers, and floodplains within the Plan Area to flood periodically and to recover naturally from a flood event. Climate change may affect the periodicity and severity of flooding in the future. Predicting the potential for future flooding events, particularly in southern California, is difficult because of its inherent highly variable and localized weather (particularly rainfall). Due to the difficulty in making predictions, the effects of climate change on flooding events cannot be reasonably predicted with the best available scientific information currently available. The severity of a flood event above the design flood stage will increase the likelihood of impacts on conserved habitat.

Flooding in riparian areas is generally considered a periodic and desirable event. Flooding can result in the establishment of new primary and secondary channels and abandonment of other channels. It may also result in redistribution of wetland and riparian communities in the floodplain and multiple age classes of vegetation patches within the floodplain. The primary stressors associated with flooding are 1) the potential for substantial and adverse colonization by nonnative invasive plant species after a significant flood event; and 2) the potential for erosion or downcutting to result in ongoing habitat loss and degradation.

Preventive Measures and Responses. The Preserve Manager will use reasonable efforts to prepare and submit to OCTA and the Wildlife Agencies a flood response plan and may initiate responses within 60 days of determining that a flooding Changed Circumstance has occurred following the outline included above. Based on that report and discussions with OCTA and the Wildlife Agencies,

the Preserve Manager will implement and maintain responses in addition to standard practices for flood protection as needed for meeting FEMA or local zoning requirements. The possible responses to Changed Circumstances for flooding include, but are not limited to, the following:

- Recontour the area to minimize future erosion risks.
- Install erosion-control structures.
- Restore stream channels in a manner that restores habitat lost to erosion or downcutting and reduces the potential for such impacts to occur in the future.
- If determined appropriate by the Preserve Manager, allow the site to restore passively (primarily wetlands).
- Actively revegetate the site with appropriate plant species.
- Implement an altered monitoring regime (more frequent, different methods) to evaluate the response of Covered Species and their habitats to the flood event.

8.6.2.2 Fire

Definition. A Changed Circumstance fire event will be defined as one that exceeds the ability of the Preserve Manager's standard staff/equipment to control and occurs over the same area(s) more frequently than the expected recovery interval. Exceeding the ability of the Preserve Manager means that the available fire-management resources (as described/listed in the RMP) cannot contain or control the fire and additional firefighting resources are required to control and contain the fire. The effects of fire frequency may vary by proximity to the coast, elevation and aspect, time of year, and other factors. Based on the fire history of Orange County and experience on similar preserves, for this Plan, the repeated frequencies triggering Changed Circumstances is three fires within a 50-year span on the same area of a Preserve. If four fires occur within a 50-year time span, this would be considered an Unforeseen Circumstance.

Risk Assessment. Fires can result from natural sources such as lightning strikes and from human activities (e.g., campfires, trash/brush burning, vandalism, arson). Many vegetation communities in southern California have evolved from, or even depend on, natural fire events to maintain conditions favorable to their persistence. Montane (coniferous) and chaparral communities generally have evolved and adapted to longer intervals between natural fires than sage scrub and grassland communities. Too frequent fire intervals can lead to disruption of natural regeneration cycles, including loss of mature (reproducing age) native plants and seed beds, which causes shifts to more fire-tolerant native vegetation communities or the expansion of nonnative, invasive species that can greatly disrupt the natural habitats. Preserves that are part of larger natural landscapes/preserve systems may be less likely to experience human-caused fire events. Areas that are adjacent to the urban fringe are potentially more likely to experience human-caused fire events.

Recent reviews of literature on wildfire effects on southern California shrublands suggest that there are no definitive fire frequency intervals that characterize the "natural" fire frequency interval (Diffendorfer 2008, Farm and Home Advisor's Office 2007, Keeley 1995, Moritz et al. 2004, The Chaparral Institute 2012). These reviews strongly suggest that the frequency/interval of fires is more important than the severity and size of fires in determining long-term community health and resilience. There appears to be a general acknowledgement that fires in sage scrub and chaparral that are more frequent than 30–50 years are likely to cause a loss of typical dominant species and conversion to mixed vegetation communities with higher components of nonnative species. Sage

scrub vegetation appears to tolerate more frequent fires than chaparral vegetation, but fires that are more frequent than 2–10 years in sage scrub and 10–30 years in chaparral have shown extirpation of many native species and conversion to nonnative-dominated communities.

Climate change may exacerbate the size and intensity of fires in the future. Climate change models indicate that southern California may show appreciable warming, which, combined with little change in precipitation (as noted above), could increase fire events above the historical condition. However, as with the risk assessment for flooding, it is difficult to predict the specific effects from climate change.

After many natural fire events, vegetation communities would be expected to recover naturally. However, dry conditions and excessive fuel buildup or fires that occur too frequently may result in fire damage that requires remedial actions, particularly to minimize erosion and nonnative invasive species.

Preventive Measures and Responses. The Preserve Manager will use reasonable efforts to prepare and submit to OCTA and the Wildlife Agencies a fire response plan within 60 days of a Changed Circumstance fire event following the outline included above. Based on that report and discussions with OCTA and the Wildlife Agencies, the Preserve Manager will implement and maintain responses in addition to standard Preserve fire protection practices. Preserves managed by other entities have or will develop fire management elements in their RMPs. If a Changed Circumstance fire event occurs in a Preserve, a qualified individual will assess the area to determine specific actions to be implemented. Possible responses to a Changed Circumstance fire may involve the following:

- Revise standard fire prevention procedures by the land management entities on Preserves.
- Collaborate with local fire agencies to assess and revise specific fire-related practices in Preserve Areas (fire breaks, vegetation management, etc.).
- Revise Preserve management as outlined in the RMP regarding public access, use, and fire information.
- Install temporary erosion control features.
- Increase invasive (particularly fire-facilitating) species control and native plant reseeding or planting.
- Revise vegetation monitoring in potential fire-prone areas and post-fire areas.
- Implementing an altered monitoring regime (more frequent, different methods) to evaluate the response of Covered Species and their habitats to the fire event.

8.6.2.3 Extended Periods of Reduced Precipitation

Definition. A Changed Circumstance due to reduced precipitation (drought) is an event that involves 2 consecutive years of annual precipitation that is less than one standard deviation from an established mean over the previous 20 years.

Risk Assessment. Annual rainfall is variable and not controlled by human activity. Drought cycles are cyclical and a natural event in southern California to which the vegetation communities and species have adapted. Extended periods of reduced precipitation (more than 2 consecutive years) may cause natural communities to sustain significant decreases in plant cover and diversity and subsequently

to losses of animal species. Covered Species may be at greater risk than other species if their habitat needs or population numbers are already compromised.

Climate change will affect precipitation, but the changes to southern California may not be as substantial as other areas. As described in the previous sections, climate models are not accurate for localized areas. The effects of climate change on reduced precipitation in the Plan Area cannot be definitively predicted based on current best available scientific information.

Preventive Measures and Responses. OCTA and Preserve Managers have no control over the duration or severity of reduced precipitation. The Preserve Managers will use reasonable efforts to prepare and submit to OCTA and the Wildlife Agencies a drought response plan and may initiate responses within 60 days, following the outline included above, of determining that an extended period of reduced precipitation Changed Circumstance has occurred. Based on that report and discussions with OCTA and the Wildlife Agencies, the Preserve Manager will implement and maintain responses in addition to standard Preserve management practices. Possible actions that may be taken in response to reduced precipitation include the following:

- Revise standards and practices for establishing revegetation sites to maximize planting survival during periods of reduced water availability.
- Collaborate with other conservation area managers to assess regional habitat and Covered Species conditions.
- Implement vegetation reduction (e.g., biomass thinning of nonsensitive/non-Covered Species habitat, particularly nonnative species) to conserve available water.
- Provide limited, temporary irrigation to highly vulnerable areas (e.g., active restoration sites) in the Preserve, subject to water availability.
- Revise the methods for monitoring of vegetation conditions and Covered Species' status to identify areas and species that may require additional management.
- Implement an altered monitoring regime (more frequent, different methods) to evaluate the response of Covered Species and their habitats to a drought event.
- Reduce public access of or close trails to protect habitat.

8.6.2.4 Invasive Nonnative (Exotic) Species or Diseases

Definition. A Changed Circumstance event due to the presence of an invasive nonnative species is the introduction of an invasive species within a Preserve that has either: 1) not previously been known in the Plan Area and has been noxious invasive elsewhere, or 2) is a particularly noxious invasive variety of a nonnative species that continues to expand in areal extent or percent cover despite targeted resistant to typical control measures. The Plan does not monitor for diseases, but a disease Changed Circumstance event is when a federal, state, or local agency declares a disease condition that could threaten the status of a Covered Species.

Risk Assessment. Invasive nonnative species are those that are not indigenous to the Plan Area and have the potential to increase in numbers and/or coverage such that they threaten the continued viability of conserved habitats and/or Covered Species. Many invasive nonnative species presently occur in Preserves and pose little threat to Covered Species. Often, these species reach temporary, but problematic, levels after some disturbance such as drought, excessive precipitation, or fire; or as a result of importation by humans.

Climate change could alter habitat conditions and favor some invasive, nonnative species and diseases over native species. As noted previously, the effects of climate change on habitat conditions in the Plan Area cannot be definitively predicted based on current best available scientific information. However, based on monitoring data and information from other conservation managers and specialists, OCTA or the Preserve Manager will determine if a response is required.

Preventive Measures and Responses. The Preserve RMPs will address invasive species monitoring and control. The Preserve Manager will use reasonable efforts to prepare and submit to OCTA and the Wildlife Agencies an invasive species/disease response plan and may initiate responses within 60 days, following the outline included above, of determining that a Changed Circumstance has occurred. Based on that report and discussions with OCTA and the Wildlife Agencies, the Preserve Manager will implement and maintain responses in addition to standard Preserve invasive species/disease control practices. If a Changed Circumstance event for invasive species or disease is determined by the Preserve Manager to have occurred in a Preserve Area, the Preserve Manager will have a qualified individual (e.g., biologist or pest control specialist) assess the condition to propose specific actions that are appropriate to be implemented. Possible responses to a Changed Circumstance invasive species or disease may involve the following:

- Increase control measures or removal and monitoring of the problem species or location.
- Erect a fence around the perimeter of the infested area.
- Revise specific elements of the RMP to better address overall nonnative species monitoring and management.
- Collaborate with other conservation area managers to assess and implement new control techniques.
- Implement an altered monitoring regime (more frequent, different methods) to evaluate the response of Covered Species and their habitats to invasive species or disease.

8.6.2.5 Toxic Spills, Dumping, Vandalism, and Other Illegal Human Activity

Definition. Preserve Managers and OCTA staff may transport, store, and use legal but potentially dangerous materials as part of routine Preserve management operations, and are prepared to address minor spills. Most containers for pesticides, cleaners, and spare gas cans are 10 gallons or less, and an accidental spill of a container generally would involve less than 10 gallons. Based on the size of the Preserves and experience with similar preserves, this Plan defines a Changed Circumstance for a toxic material (as defined by local, state, or federal regulations) spill as an incident that involves any potentially toxic material that is over 10 gallons or 200 square feet and up to 25 gallons or 500 square feet. Unauthorized dumping is often associated with isolated, individual actions (throwing out trash, trash bags, pieces of furniture, etc.) that affect small areas, from 5 to 50 square feet. This Plan defines a Changed Circumstance for unauthorized dumping as an incident that exceeds 50 square feet and up to 500 square feet.

Risk Assessment. Preserve Areas are mostly not close to urban areas or roads that could be used to transport hazardous materials or that increase the potential for unauthorized dumping and vandalism and could sustain damage that potentially affects Covered Species. This is unlike the preserve lands in other plans, many of which are adjacent to developed areas or major roads and potentially subject to spills by municipal or industrial activities and transport vehicles.

Preserve Area staff may store and use materials (i.e., pesticides, cleaners, and fuel for maintenance equipment) in small containers (less than 10 gallons) that could accidentally be spilled. Most spills that could affect Preserve Area activities would be expected to result from Preserve staff activities, be small, and contained and cleaned-up by staff. For example, OCTA's standard emergency spill procedures identify spills of less than 10 gallons to be "small events" that can be handled by staff with standard spill response kits. Some spills from Preserve Area accidents could exceed 10 gallons (and up to 200 square feet) that could be handled by reprioritizing Preserve Area staff and resources. Spills greater than 25 gallons or 500 square feet would be unexpected/unlikely and would not be within the Preserve Area staff's abilities to safely and successfully contain and clean up.

Climate change is not expected to have a predictable effect on toxic spills or unauthorized dumping or vandalism.

Preventive Measures and Responses. The Preserve Manager will use reasonable efforts to prepare and submit to OCTA and the Wildlife Agencies an illegal dumping response plan and may initiate responses within 60 days, following the outline included above, of determining that a Changed Circumstance has occurred. Based on that report and discussions with OCTA and the Wildlife Agencies, the Preserve Manager will implement and maintain responses in addition to standard spill control practices. Toxic spills will be responded to immediately. If a Changed Circumstance event occurs within a Preserve, a qualified individual (e.g., Hazardous Material Spill Specialist) will assess the area to propose specific actions to be implemented. Dumped material will be assessed for hazardous materials before cleanup. Possible responses to a Changed Circumstance related to illegal human activities may involve the following:

- Immediately, upon notification of a spill, employ all required hazardous spill precautions, particularly to contain the materials.
- Notify appropriate authorities per hazardous spill reporting requirements and request assistance if the response exceeds OCTA or Preserve Manager capabilities (contact lists to be maintained by OCTA Operations and Maintenance/Dispatcher and Preserve Managers).
- Determine if continued unauthorized access is allowing illegal activities to occur on Preserves managed for Covered Species and, where determined by OCTA or the Preserve Manager, install appropriate barriers or increased monitoring.
- Review and revise storage and use of toxic/hazardous materials at the Preserve Areas.
- Notify Wildlife Agencies and other appropriate regulatory agencies if spills, dumping, or vandalism may violate federal, state, or local regulations.
- Notify local enforcement agencies of repeated illegal activities.
- Remove all unauthorized dumped materials.
- If determined appropriate, prosecute and seek remediation from responsible parties.
- Implement an altered monitoring regime (more frequent, different methods) to evaluate the response of Covered Species and their habitats to toxic spills, dumping, vandalism, or other illegal human activities.

8.6.2.6 Future Listing and Designation of Critical Habitat of Non-Covered Species

Definition. The future listings of non-Covered Species and designation of critical habitat for non-covered listed species are reasonably foreseeable during the term of the Permit and are a Changed Circumstance. The new listing of a species by USFWS or CDFW that is not a Covered Species under the Plan and associated take permits or the designation or revision of critical habitat within the Permit Area covered by the Plan by USFWS will be considered Changed Circumstances.

In the event a non-Covered Species is newly listed or if new critical habitat is designated within the Permit Area covered by the Plan for a non-Covered Species, OCTA will coordinate with one or both of the Wildlife Agencies as appropriate, to identify actions that may cause take, jeopardy, or adverse modification of critical habitat and will initiate those responsive measures, if any, identified by the Wildlife Agencies as necessary to avoid such take, jeopardy, or adverse modification. Those measures will be followed until and unless OCTA's Permit is amended to include coverage for the newly listed species or the Wildlife Agencies notify OCTA that such measures are no longer required to avoid take, jeopardy, or adverse modification. OCTA will obtain appropriate federal and/or state permits to allow take of newly listed animal species prior to impacts occurring. The Major Amendment process for adding a new species to the Covered Species list for this Plan is discussed in Section 8.5.4, "Major Amendments" of this Plan.

8.6.3 Costs and Timing for Addressing Changed Circumstances

As described previously, OCTA will assess the conditions for which Changed Circumstances are being invoked. Funding for addressing Changed Circumstances will be allocated from a separate Changed Circumstance endowment as outlined below. These funds can be used to address flooding, fire, drought, invasive nonnative species, and toxic spills or illegal human activity, but not for future listing of non-Covered Species or designation of critical habitat for non-Covered Species.

1. A separate Changed Circumstances endowment subfund will be established to fund responses to events that meet the requirements (triggers) of a Changed Circumstance.
2. The Changed Circumstance endowment subfund will be generally managed as a non-wasting endowment, but the option will exist to use a portion of the principal if situations warrant. Funding to respond to Changed Circumstance events should come from the accumulated interest in the account and should not cut into principal. If, however, the situation warrants that a portion of the principal be used to address a Changed Circumstance event, OCTA and the Wildlife Agencies can agree to take this step.
3. By definition, Changed Circumstance events are expected to occur infrequently. If the balance in the Changed Circumstance subfund ever reaches two times the original principal, adjusted for inflation, then any subsequent revenue from interest will be put back into the Preserve Management endowment that could be used for additional adaptive management, habitat restoration, or other Preserve management activities.
4. The Changed Circumstance budget will be managed as a budget for all Preserves combined.
5. The Changed Circumstance subfund will be managed as a non-wasting endowment and is expected to be able to function in perpetuity. If, however, it ever occurs that the balance of the Changed Circumstance endowment is depleted, then any future Changed Circumstance event in

this situation would be treated as an Unforeseen Circumstance. OCTA will not be responsible for providing additional funds to address Changed Circumstance beyond the funding of the initial endowment principal.

OCTA or the Preserve Managers will estimate the time and costs to address a Changed Circumstance event in the Preserve. Costs to restore, repair, and/or monitor the involved area are discussed below:

Minor Damages. Minor damages are those costing less than \$25,000. It is anticipated that repairs and restoration will be initiated and the primary work completed within 6 months of the incident. Examples of minor damage are as follows:

- Damage to fencing, barriers, and other facilities that may protect Covered Species and their habitats.
- Damage or impacts on small patches (less than 5 acres) of conserved vegetation communities.

Moderate Damages. Moderate damages are those costing \$25,000–\$49,999. It is anticipated that repairs and restoration will be initiated and the primary work completed within 9 months of the incident. Examples of moderate damage are as follows:

- Damage to roads and other facilities that may protect Covered Species.
- Damage to small patches (less than 5 acres) of conserved vegetation communities supporting Covered Species and requiring special studies or species collections for onsite reestablishment.

Major Damages. Major damages are those costing \$50,000 or more. OCTA will implement Plan responses to these events as soon as possible, but note that such responses may require study and trigger the need for regulatory permits before repairs and/or restoration can be initiated.

The frequency and degree to which funding is required to address Changed Circumstance events is variable and difficult to predict. Based on experience on preserves of a similar size and complexity, the Changed Circumstance endowment will be established with \$2,320,000 to generate adequate revenue to fund:

- Minor Event - \$25,000 every 3 years.
- Moderate Event - \$50,000 every 5 years.
- Major Event - \$200,000 every 15 years.

8.6.4 Unforeseen Circumstances

USFWS defines Unforeseen Circumstances as those changes in circumstances that affect a species or geographic area covered by an HCP that could not reasonably have been anticipated by the plan participants during the development of the HCP, and that result in a substantial and adverse change in the status of a Covered Species (50 CFR 17.3). Similarly, Unforeseen Circumstances are defined in the NCCPA as changes affecting one or more species, habitat, natural community, or the geographic area covered by an HCP that could not reasonably have been anticipated at the time of plan development, and that result in a substantial adverse change in the status of one or more Covered Species (California Fish and Game Code 2805(k)).

Unforeseen Circumstances include future conditions that are not reasonably foreseeable and that are either not defined as Changed Circumstances or that exceed the definitions developed for

Changed Circumstances, particularly in terms or severity or extent (e.g., flood or fire affecting species continued existence).

8.6.4.1 Planned Response in the Event of Unforeseen Circumstances

Unforeseen Circumstances will require immediate consultation and discussion between the Wildlife Agencies and OCTA. Pursuant to the federal no surprises rule at 50 CFR 17.22(b)(5)(iii)(C) and 17.32(b)(5)(iii)(C), USFWS bears the burden of demonstrating that Unforeseen Circumstances exist using the best available scientific and commercial data available and considering certain specific factors including, but not limited to:

- The size of the current range of the affected species.
- The percentage of range adversely affected by the Plan.
- The percentage of the range conserved by the Plan.
- The ecological significance of that portion of the range affected by the Plan.
- The level of knowledge about the affected species and the degree of specificity of the species' conservation program under the Plan.
- Whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the affected species in the wild.

Any findings of Unforeseen Circumstances must be clearly documented and based upon reliable technical information regarding the status and habitat requirements of the affected species. It is anticipated that CDFW will make unforeseen circumstances findings under the NCCPA based on the best scientific evidence available after considering any responses submitted by OCTA. Except where there is substantial threat of imminent, significant adverse impacts on a Covered Species, the Wildlife Agencies will provide OCTA at least 60 calendar days written notice of a proposed finding of Unforeseen Circumstances, during which time the Wildlife Agencies will meet with OCTA to discuss the proposed finding. This will provide OCTA with an opportunity to submit information to rebut the proposed finding, and consider any proposed changes to the Preserve RMP(s) and/or covered freeway project design.

If the Wildlife Agencies make a finding of Unforeseen Circumstances in accordance with the regulations and procedures described above and determine that additional conservation measures are warranted, such additional conservation measures will conform to the maximum extent possible to the original terms of this Plan. Additional conservation measures will be limited to those that would not require additional financial compensation, land or land restrictions, or water or water restrictions beyond those required by the Plan at the time of issuance of the take permits without the consent of OCTA.

8.7 Permit Duration and Extension

OCTA is seeking take authorizations from the state and federal Wildlife Agencies with terms of 40 years. The terms of the take authorizations issued under the Plan would begin from the date of their issuance following the requirements to maintain rough proportionality between conservation measures and time and extent of impacts (see Section 5.8.2, "Maintaining Rough Proportionality"). Prior to expiration of the take permits, the OCTA may apply to the Wildlife Agencies to renew them.

The permits may be renewed in accordance with applicable federal and state laws and regulations in effect at the time of the application for renewal. OCTA will initiate the Permit renewal process prior to the expiration of the initial 40-year period with ample time to allow for the review and processing of the Permit renewal application.

The proposed 40-year term is necessary to achieve the overall Plan goals. Many of the key elements of the Plan will require substantial commitments of funding and an extended period of time to fully realize. The duration of the permits must be sufficient to allow for proper sequencing and effective implementation of the actions contemplated by the Plan. Covered freeway improvement projects are funded through the M2 sales tax initiative that runs from 2006 to 2041. A Permit term of 40 years provides an appropriate time frame in which to carry out the Covered Activities that will be authorized under the Plan, including adaptive management strategies, and will maximize the benefits of the Plan to Covered Species and their habitats.

8.7.1 Dispute Resolution

OCTA will strive at all times to work in good faith with the Wildlife Agencies to reach mutual agreement on key implementation tasks such as adaptive management, monitoring, and conservation actions. If disagreements arise that cannot be resolved easily, OCTA will follow the “meet and confer” dispute resolution process outlined in the Implementing Agreement, and if necessary, the “elevation of dispute” process outlined in the Implementing Agreement (Appendix B).

8.7.2 Permit Suspension or Revocation

8.7.2.1 Suspension of the Federal Permit

Under certain circumstances defined by federal regulation, USFWS may suspend, in whole or in part, the incidental take permit. However, except where USFWS determines that emergency action is necessary to avoid irreparable harm to a Covered Species, OCTA anticipates that USFWS will not suspend an authorization without first attempting to resolve the issue through the dispute resolution process set forth in the IA, and identifying the facts or action or inaction that may warrant the suspension and providing the OCTA a reasonable opportunity to implement appropriate responsive actions.

8.7.2.2 Reinstatement of Suspended Federal Permit

If USFWS suspends the federal Permit, OCTA intends that as soon as possible USFWS will meet and confer with OCTA to discuss what measures, if any, are available to redress the reasons for suspension.

8.7.2.3 Revocation of the Federal Permit

USFWS may revoke the federal permit in accordance with applicable regulations governing revocation. Those regulations are currently found at 50 CFR 13.28(a)(1) - (4), 17.22 (b)(8), and 17.32(b)(8).

8.7.2.4 Suspension or Revocation of the State Permit

The NCCPA requires that the IA include specific terms and conditions that, if violated, result in suspension or revocation of the Section 2835 take permit. Such terms and conditions must include suspension or revocation of the Permit if the Plan participants fail to provide adequate funding to implement the Plan, do not maintain proportionality between impacts on habitats or Covered Species and conservation measures, adopt or approve changes to the Plan that are not consistent with the objectives and requirements of the approved Plan without concurrence of the Wildlife Agencies, or allow the level of take to exceed the Permit limits (Fish and Game Code 2820(b)(3)). CDFW also must suspend or revoke a Section 2835 take permit if continued take would jeopardize a species (Fish and Game Code 2820(c)).

If the Permittee violates the terms and conditions of the state Permit, or if necessary to avoid jeopardizing the continued existence of a Covered Species, CDFW may suspend or revoke the Permit in whole or in part. However, unless immediate revocation is necessary to avoid the likelihood of jeopardy to a Covered Species or to address rough proportionality (see below), CDFW will not suspend or revoke the state Permit without first attempting to resolve any disagreements regarding the implementation or interpretation of the Plan in accordance with the informal dispute resolution process provided in the IA, and notifying the OCTA of the action or inaction that may warrant the suspension or revocation and providing the OCTA with a reasonable opportunity to take appropriate responsive action.

8.7.2.5 Failure to Maintain Rough Proportionality

The NCCPA requires revocation of a Section 2835 take permit, in whole or in part, if the Plan participants do not maintain rough proportionality between impacts on habitats or Covered Species and conservation measures and do not, within 45 days, remedy such condition or develop a plan with CDFW to provide a remedy (Fish and Game Code 2820(c)).

For the purpose of maintaining rough proportionality, OCTA will ensure that a minimum 2:1 ratio for direct impacts will be maintained for each vegetation community, with the exception of grassland, which will be maintained at a minimum 1:1 ratio. Thus, for each acre of chaparral, riparian vegetation, scrub, and woodland that is directly affected, at least 2 acres will have been conserved or restored before the impacts take place. For each acre of grassland that is directly affected, at least 1 acre will have been conserved or restored before the impacts take place. If OCTA has not conserved or restored enough grassland habitat to offset grassland impacts, it can offset grassland impacts with “out-of-kind” habitat at a 2:1 ratio. If CDFW determines, after conferring with USFWS and OCTA, that rough proportionality is not being maintained, OCTA and CDFW will meet and confer and, within 45 days of CDFW’s determination, agree on adjustments to the implementation schedule to expeditiously regain rough proportionality. Adjustments to the implementation schedule may include any of a variety of commitments or adjustments to Plan implementation designed to regain rough proportionality, including advancing or accelerating plans to acquire, establish a long-term protection mechanism (e.g., conservation easement), restore, or enhance lands of the appropriate land cover type. OCTA will implement all actions set forth in the agreed-upon adjusted implementation schedule. As an alternative to the agreement, OCTA may regain rough proportionality within 45 days by implementing the actions according to the existing implementation schedule.

8.7.2.6 State Permit Suspension and Revocation Steps

In the event that such circumstances for Permit revocation or suspension were to arise under the Plan, CDFW will work with OCTA to obviate the need for Permit revocation or suspension. CDFW will engage in the following process prior to taking any steps to revoke the Plan Permit.

- In the event of a failure to maintain rough proportionality, OCTA will work with CDFW to remedy the situation as described in Section 5.8.2, “Maintaining Rough Proportionality”, and in accordance with the IA. Note that the Plan monitoring program is designed to identify such issues and that OCTA must report such issues in the annual report.
- For other situations that could result in Permit revocation or suspension or if rough proportionality cannot be regained through schedule adjustments, OCTA and CDFW will determine, through the adaptive management process, whether other changes can be made to the Plan’s conservation strategy to remedy the situation.
- CDFW will determine whether CDFW or the federal fish and wildlife agency or other state and federal agencies can undertake actions that would remedy the situation. It is recognized that the Wildlife Agencies have available a wide array of authorities and resources that can be used to provide additional protection for the species, as do other state and federal agencies.
- OCTA and CDFW will determine whether there are additional voluntary conservation actions that OCTA could undertake to remedy the situation.

CDFW would begin the revocation or suspension process only if no solutions are found and it is determined that the continuation of an OCTA Covered Activity would result in jeopardy to a species or violate any of the terms and conditions subject to Permit revocation or suspension as identified in the IA.

8.7.3 Public Input

Public input is fundamental to ensuring the success of and continuing support for the Plan throughout implementation. The NCCPA requires that the IA provide for periodic reporting to the public on the progress of NCCP implementation. EOC meetings will be open to the public, and public comments will be solicited and heard at each meeting. In addition, the public can contact OCTA staff to comment on various aspects of Plan implementation. All data and reports associated with the monitoring program for this Plan will be available to the public, with the exception of reports documenting surveys on private lands considered for acquisition or conservation easements not yet acquired by OCTA. Monitoring reports will also be posted electronically on OCTA’s M2 website.

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Chapter 9

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