CALIFORNIA
DEPARTMENT OF FISH AND WILDLIFE

FINDINGS OF FACT

under the
CALIFORNIA ENVIRONMENTAL QUALITY ACT
and the
NATURAL COMMUNITY CONSERVATION PLANNING ACT

AND

NATURAL COMMUNITY CONSERVATION PLAN

PERMIT
(2835-2017-001-05)

for the

Orange County Transportation Authority
Natural Community Conservation Plan

June 2017

FINDINGS AND NCCP PERMIT

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1.0 INTRODUCTION

This document sets forth findings and the approval of the California Department of Fish and Wildlife (CDFW) for the Orange County Transportation Authority (OCTA) Measure M2 Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP). In approving the OCTA NCCP/HCP as provided for in the California Natural Community Conservation Planning Act (NCCPA), Fish and Game Code Sections 2800–2835[1], CDFW is acting as a responsible agency under the California Environmental Quality Act (CEQA), Public Resources Code Section 21000 *et seq*. Unless otherwise noted in this document, capitalized terms have the same definitions as in the OCTA NCCP/HCP.

1.1 The Natural Community Conservation Planning Act

The NCCPA provides for the preparation and implementation of large-scale natural resource conservation plans as an alternative to reviewing impacts of urban development on a project-by-project and species-by-species basis. A Natural Community Conservation Plan (NCCP) must provide for "the protection of habitat, natural communities, and species diversity on a landscape or ecosystem level" (Section 2820(a)(3)), while allowing "compatible and appropriate economic development, growth, and other human uses" (Section 2805(h)). In authorizing the NCCPA, the Legislature declared, in part, that an NCCP provides one option for ensuring appropriate mitigation that is roughly proportional to impacts on fish and wildlife, and promotes the conservation of broad-based natural communities and species diversity (Section 2801(d)). When it approves an NCCP, CDFW may authorize the "take" of species whose conservation and management is provided for in the NCCP, including species listed as endangered, threatened, or candidate under the California Endangered Species Act (CESA), Section 2050 *et seq*., or species designated as fully protected and included in Sections 3511, 4700, 5050, and 5515.

The NCCPA was originally enacted in 1991[2] and later amended in 1993[3], 1994[4], 1996[5], and 2000.[6] The NCCPA was repealed and replaced in 2002 by Senate Bill (SB) 107[7], which codified a number of CDFW's administrative standards and practices for NCCP development and implementation, and added some new requirements. It was amended again in 2003[8] and in 2011[9]. With the revisions, many of the substantive standards and mandatory elements for an NCCP formerly contained in guidelines prepared by CDFW are now found in Section 2820. In 2011, changes were made to Sections 2805 and 2835 to allow for the take of fully protected species included as covered species in an NCCP.

[1]All section references are to the Fish and Game Code, unless otherwise indicated.
[2]Statutes 1991, chapter 765, section 2, page 3424 (A.B. 2172).
[3]Statutes 1993, chapter 708, section 1, page 4034 (S.B. 755).
[4]Statutes 1994, chapter 220, section 1, page 1778 (S.B. 1352).
[5]Statutes 1996, chapter 593, sections 1 and 2, page 2702 (A.B. 3446).
[6]Statutes 2000, chapter 87, sections 1-3, page 1207 (S.B. 1679).
[7]Statutes 2002, chapter 4, sections 1 and 2, page 81 (S.B. 107). Minor housekeeping changes were subsequently enacted as part of S.B. 2052 (Stats. 2002, ch. 133, §§ 1 and 2, page 568).
[8]Statutes 2003, chapter 61, section 1, page 95 (S.B. 572).
[9]Statutes 2011, chapter 596, section 2, page 89 (S.B. 618).

1.2. Orange County Transportation Authority Natural Community Conservation Plan/Habitat Conservation Plan

The purpose of the OCTA NCCP/HCP is to provide an effective framework to protect native biological diversity, habitat for native species, natural communities, and local ecosystems throughout Orange County (County; i.e., the Plan Area), while improving and streamlining the environmental permitting process for impacts of Covered Activities on sensitive, threatened, and endangered species and their habitats (ICF 2016). The OCTA NCCP/HCP is also intended to complement existing conservation planning efforts of the County of Orange Central and Coastal NCCP/HCP (Central/Coastal NCCP/HCP) and the Orange County Southern Subregion HCP (Southern Orange HCP), and to complement other existing large blocks of protected land in the County that contribute to and function in large part, though not necessarily exclusively, for the protection of biological resources.

The OCTA NCCP/HCP has been prepared as an NCCP pursuant to the NCCPA of 2003, and as an HCP pursuant to Section 10(a)(1)(B) of the federal Endangered Species Act (ESA). Upon approval of the OCTA NCCP/HCP, the United States Fish and Wildlife Service (USFWS) and CDFW (collectively, the Wildlife Agencies) authorize the take of certain listed species and other non-listed species (collectively the Covered Species), subject to the OCTA NCCP/HCP terms of coverage. Except as otherwise noted, all references to tables, figures, and text sections pertain to those in the OCTA NCCP/HCP.

Covered Activities

OCTA prepared the OCTA NCCP/HCP and will be the only entity permitted under the OCTA NCCP/HCP. OCTA is the County's primary transportation agency, formed in 1991 through the consolidation of seven transportation agencies.

In 1990, County voters approved Measure M, a half-cent local transportation sales tax. Measure M was approved for 20 years and since its inception, more than $4 billion have been spent on transportation improvement projects throughout the County. In 2006, County voters approved the renewal of the Measure M Transportation Investment Plan, which is now referred to as M2. The planning goals outlined under M2 included additional freeway improvement projects within 13 freeway segments located throughout the County. At least 5 percent, which based on 2016 projections is roughly $285 million, of the M2 generated revenue will be allocated to mitigate the environmental impacts associated with these freeway improvements under the OCTA M2 Environmental Mitigation Program (EMP). The goals of the EMP are to engage in comprehensive mitigation to provide higher-value environmental benefits such as habitat protection, wildlife corridors/linkages, and resource preservation, in exchange for a streamlined project review and permitting process for the freeway program as a whole. Absent a coordinating role led by the Wildlife Agencies to ensure conservation was targeted to achieve broader and regional conservation goals consistent with an NCCP/HCP, lands acquired and restored through this program may not have provided cumulative benefits to conservation efforts already existing within the Plan Area.

Covered Activities are defined in the OCTA NCCP/HCP to include all habitat or ground-disturbing impacts resulting from the M2 transportation planning and project implementation process (Chapters 1 and 3). These include the following freeway improvement projects within 13 existing freeway segments, as defined by the OCTA NCCP/HCP (Figure 3–1):

- Project A: Interstate 5 (I–5) improvements between State Route 55 (SR–55) and "Orange Crush" area (SR–57).
- Project B: I–5 improvements from SR–55 to El Toro "Y" area.
- Project C: I–5 improvements – north and south portions between the El Toro interchange and Avenida Pico.
- Project D: I–5 local interchange improvements.
- Project E: SR–22 access improvement.
- Project F: SR–55 improvements between I–405 and SR–22.
- Project G: SR–57 northbound between Orangewood Avenue and Lambert Road – general purpose lane improvements.
- Project H: 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 from SR–55 to I–605.
- Project L: I–405 improvements between SR–55 and I–5.
- Project M: I–605 freeway access improvements.

The Covered Activities are confined to existing freeways and could include lane additions, interchange improvements, and associated facility upgrades. The freeway improvement projects serve a public need, are considered compatible development, are not growth-inducing, and are considered a covered action when implemented by OCTA in conformance with the OCTA NCCP/HCP, Implementing Agreement (IA), and this NCCP Permit.

In addition to the freeway improvement projects outlined above, additional future minor freeway capital improvement projects may be eligible for coverage under the OCTA NCCP/HCP provided that the projects 1) occur within the Plan Area; 2) do not result in exceedance of the acreage impact caps established for the OCTA NCCP/HCP; 3) do not result in additional take of Covered Species, and 4) do not result in significantly different or greater impacts to the environment than analyzed in the National Environmental Policy Act (NEPA)/CEQA document for the OCTA NCCP/HCP, as determined by the Wildlife Agencies (Section 3.1.2 and IA Section 6.2).

Additional Covered Activities are associated with the ongoing maintenance, habitat management, restoration, monitoring, and responses to changed circumstances within the OCTA NCCP/HCP Preserves (Section 5.4.2) that might affect Covered Species and/or their habitats (Section 3.1.3). Most of these effects are expected to be temporary and of limited severity, but may result in take of Covered Species. This NCCP Permit will cover Preserve activities carried out by OCTA staff, the Preserve Managers, the Monitoring Biologists, other Preserve personnel, and their contractors consistent with the OCTA NCCP/HCP. All Covered Activities will be designed to avoid or minimize take of Covered Species (Section 5.6).

The OCTA NCCP/HCP addresses the 13 discrete freeway improvement projects listed above and future eligible minor capital improvement projects proposed by OCTA through its M2 transportation planning and project implementation process. OCTA projects that are not funded by M2 sales tax revenue will not be considered for coverage under the OCTA NCCP/HCP. For example, Covered Activities do not include the construction of new freeways. Future projects and/or activities not anticipated during the OCTA NCCP/HCP planning process, or that increase take beyond that analyzed and permitted under the approved NCCP/HCP, are subject to the amendment process for take coverage (Section 8.5). During development of the OCTA NCCP/HCP, several projects and activities were considered but rejected for coverage. Take coverage for these projects would require separate consultation with the Wildlife Agencies and

include, but are not limited to: (1) flood protection; (2) flood protection facility operation and maintenance; (3) utility construction and maintenance, including cell phone towers; (4) road operation and maintenance (excluding approved roads and trails for land management and recreation within Preserves); and (5) emergency activities beyond those described in the NCCP/HCP.

To estimate both direct and indirect impacts of the Covered Activities to vegetation communities, the direct and indirect effect footprints were overlain with each natural community/land cover type. Vegetation communities and land-cover types are shown in Figure 2–6 of the OCTA NCCP/HCP, and Table 2–4 provides the acreage amounts for each natural community in the Plan Area. The major natural communities and land-cover types include: chaparral, coniferous forest, grassland, riparian, scrub, open water, wet meadows/marsh, woodland, agriculture, barren, and developed/disturbed lands.

The Covered Activities are estimated to directly impact 115.7 acres of natural habitat and indirectly impact an additional 484.4 acres (using a 300-foot distance from the edge of the direct effect footprint) of natural habitat (Table 4–5). As stated in Table 4–5, the amount of direct impact 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 reasonable acreage caps. Therefore, 141 acres of direct impacts to covered habitats will be allowed under the OCTA NCCP/HCP. This adjustment is a worst-case scenario estimate and direct impacts are expected to be closer to 115.7 acres. Some adjustments or revisions to the freeway improvement projects may occur as a result of planning factors that will be addressed through Section 8.5 *Amending the Plan*.

Preserve management and monitoring and provisions for limited public access can result in a maximum of an additional 13 acres of impacts to natural communities. These impacts could occur from new trails, establishment of firebreaks or access roads, and construction of recreation and/or management facilities.

Species distribution models were developed for the OCTA NCCP/HCP to assist in the quantification of the impacts of Covered Activities on species as well as habitat types. To quantify species impacts, project footprints were overlain with species distribution models in GIS (Chapter 4). Direct and indirect impacts to Covered Species are quantified in Table 4–6 and will be discussed in further detail below. These impacts will be avoided, minimized, and/or mitigated pursuant to the conservation strategy and protection policies set forth in the OCTA NCCP/HCP (Chapters 5–7).

Conservation Strategy

The foundation of the OCTA NCCP/HCP conservation strategy (Chapter 5) is to conserve lands that complement and enhance currently protected lands in the Plan Area. Currently protected lands[10] include lands that comprise the Central/Coastal NCCP/HCP Reserve; Southern Orange County HCP Reserve; lands owned by Audubon, CDFW, State Parks, and the U.S. Forest Service (USFS); mitigation lands protected by conservation easements (e.g., lands dedicated to the Nature Conservancy adjacent to the Central Reserve); and open space lands owned by local jurisdictions that are designated and managed for the benefit of natural resources (e.g. the City of Irvine's non-reserve open space and the City of San Juan Capistrano's Northwest Open Space lands).

[10] The term "currently protected lands" does not include the OCTA Preserves.

The conservation strategy was initiated through a landscape level conservation assessment conducted by the Conservation Biology Institute (CBI 2009), an independent group that provides scientific expertise to support the conservation and recovery of biological diversity. The CBI assessment identified 11 core habitat areas and four existing or potentially viable linkages that include both protected and unprotected natural lands (Figure 2–8). An additional and more refined analysis identified individual parcels of unprotected natural lands within the larger core areas. These parcels were designated "priority conservation areas" based on their position on the interior or edge of the core areas and proximity to protected lands. The priority conservation areas were defined as unprotected lands for which acquisition would be a "no regrets" decision, based on their contribution to the regional reserve system. A more detailed discussion of the conservation assessment is included in Appendix C.5. This landscape-level conservation assessment facilitates the goals of the M2 EMP by identifying important parcels of land that support the Covered Species and/or important wildlife movement corridors. OCTA's conservation of unprotected lands within these priority conservation areas to satisfy mitigation obligations under their NCCP/HCP helps achieve the goal to improve on the broader conservation strategy in the region.

To guide the development of the OCTA NCCP/HCP conservation strategy and serve as a benchmark for its conservation analysis, quantifiable biological targets were developed based on the type and level of potential impacts of the Covered Activities. Targets were developed for natural communities and Covered Species based on direct and indirect impacts (Table 5–1). According to Table 5–1, all natural community types are substantially above their targeted conservation except for grassland. The negative conservation balance for grassland is offset based on the following considerations: 1) direct and indirect effects on grassland will generally occur for small patches of disturbed, predominantly nonnative grassland along freeway edges that have low biological value; 2) conservation of grassland is occurring within large, intact areas of protected natural habitat that have a high biological value; 3) Preserve acquisitions include large patches of native grassland; and 4) the OCTA NCCP/HCP results in conservation of other sensitive habitats, including scrub, riparian, and woodlands, that exceed the conservation targets.

The OCTA NCCP/HCP also contains a broader set of biological goals and objectives at the landscape, natural community, and species level that describe how the conservation actions (i.e. acquisition and restoration) would occur within areas important for regional conservation purposes. All of these goals are consistent with Section 2820 *et seq*. A few of these goals include:

- Enhancing landscape connectivity between currently protected large blocks of habitat.
- Protecting and enhancing natural and semi-natural landscapes important to maintain wildlife movement within the Plan Area.
- Conserving lands across a range of environmental gradients and contiguous to other protected areas to allow for shifting species distributions in response to catastrophic events.
- Protecting and enhancing habitat in geographically distinct areas across the Plan Area to conserve species and genetic diversity.
- Acquiring, restoring, and/or enhancing natural communities to promote native biodiversity.

The OCTA NCCP/HCP establishes biological targets, goals, and objectives as part of the conservation strategy (Chapter 5). To date, OCTA has purchased seven properties (i.e., Preserves) for conservation, which fulfill many of the obligations defined by the conservation strategy. These acquisitions were approved through Conservation Assurance letters issued by the Wildlife Agencies to OCTA on December 29, 2010 and August 4, 2011. Together the Preserves total

1,296 acres (Table 5–2), are located in the priority conservation areas (CBI 2009), have been identified as having high conservation value by the Wildlife Agencies, and are known to support many of the Covered Species (Bonterra Psomas 2013a, 2013b, 2014, 2015). This is a conservation-to-impact ratio well above what is typically required for development projects in southern California. In addition, the habitat impacted by the freeway improvement projects is of somewhat marginal quality to the Covered Species as it occurs along existing freeways and is subjected to indirect edge effects such as noise, air pollution, light, and invasion by nonnative species. Conversely, the 1,296 acres that have been acquired and conserved by OCTA include 1,232.5 acres of high quality habitats that are subjected to minimal edge effects, mostly associated with single-family homes and/or trails (see Figures 5–2 through 5–8). In addition, OCTA has committed to managing the Preserves in perpetuity with funding provided through an endowment (Section 8.3). Lastly, OCTA has funded 11 restoration projects that benefit protected lands owned and managed by Plan Area partnering entities, as approved through Conservation Assurance letters issued by the Wildlife Agencies to OCTA on December 29, 2010 and March 12, 2012. These restoration projects benefit many of the Covered Species and improve local wildlife movement corridors (Section 5.5).

Consistent with Fish and Game Code Section 2820(a)(8), the OCTA NCCP/HCP also contains detailed guidelines for monitoring and adaptive management of the Preserves (Chapter 7). Adaptive management and monitoring of the Preserves will be implemented to 1) ensure that OCTA is in compliance with NCCP/HCP requirements, 2) assess the status and trend of Covered Species and natural communities, 3) measure the effectiveness of conservation and management actions, and 4) provide information to guide and refine management actions to benefit Covered Species and improve the health and stewardship of the Preserves. OCTA has committed to establishing an endowment that will fund adaptive management and monitoring of the Preserves, in perpetuity (Section 8.3).

The permit term for the OCTA NCCP/HCP is 40 years from the date of NCCP Permit issuance. Throughout the permit term, OCTA will monitor the implementation of the OCTA NCCP/HCP and report to the Wildlife Agencies on an annual basis. Prior to expiration of the NCCP Permit, OCTA may apply to renew or amend the OCTA NCCP/HCP and its associated permits and authorizations. Implementation of the OCTA NCCP/HCP will be funded through existing financial management policies and programs maintained by OCTA as defined in Section 12.0 of the IA.

1.3 Implementing Agreement

CDFW plans to execute an NCCP/HCP IA with the USFWS and OCTA, concurrently with its issuance of this NCCP Permit. The IA is designed to ensure the implementation of the OCTA NCCP/HCP, to bind each party to the terms of the OCTA NCCP/HCP, and to provide remedies and recourse for failure to adhere to the terms of the OCTA NCCP/HCP. This NCCP Permit specifically applies to the OCTA NCCP/HCP as implemented pursuant to the IA.

CDFW finds that the OCTA NCCP/HCP and IA provide the necessary assurances that the OCTA NCCP/HCP will be carried out by OCTA. By accepting the NCCP Permit, OCTA is bound to fully implement the provisions of the OCTA NCCP/HCP in accordance with the IA and this NCCP Permit.

2.0 ADMINISTRATIVE RECORD OF PROCEEDINGS

For purposes of these findings, the administrative record of proceedings for CDFW's discretionary issuance of this NCCP Permit consists, at a minimum, of the following documents, except where privileges prevent their disclosure.

- Any NCCP/HCP related materials prepared by OCTA and submitted to CDFW.
- Any staff reports and related documents prepared by CDFW with respect to its compliance with CEQA and with respect to the issuance of an NCCP Permit for the NCCP/HCP.
- Any written testimony or documents submitted by any person to CDFW relevant to these findings and CDFW's discretionary actions with respect to the NCCP/HCP.
- Any notices issued to comply with CEQA, the NCCPA, or with any other law relevant to and governing the processing and approval of this NCCP Permit by CDFW.
- Any written comments received by CDFW in response to, or in connection with, environmental documents prepared for this project.
- All written evidence or correspondence submitted to, or transferred from, CDFW with respect to compliance with CEQA and with respect to the NCCP/HCP.
- Any proposed decisions or findings related to the NCCP/HCP submitted to CDFW by its staff, OCTA, NCCP/HCP supporters and opponents, or other persons.
- The documentation of the final decision by CDFW, including all documents cited or relied on in these findings adopted pursuant to CEQA and the NCCPA.
- The documentation of the final decision by USFWS associated with Biological Opinion Number # FWS-OR-10B0242-17F0759 (June 1, 2017), including all documents adopted or approved pursuant to NEPA and the ESA.
- Any other written materials relevant to CDFW's compliance with CEQA or CDFW's decision on the merits with respect to the NCCP Permit for the NCCP/HCP, including any draft environmental documents that were released for public review, and copies of studies or other documents relied upon in any environmental document prepared for the project and either made available to the public during a public review period or included in CDFW's files on the NCCP/HCP, and all non-privileged internal agency communications, including staff notes and memoranda related to the NCCP/HCP or compliance with CEQA.
- Matters of common knowledge to CDFW, including but not limited to federal, state, and local laws and regulations.
- Any other materials required to be in CDFW's administrative record of proceedings by Public Resources Code Section 21167.6(e).

The custodian of the documents comprising the administrative record of proceedings is CDFW, located at 1700 Ninth Street, 2nd Floor, Sacramento, California 95811. All related inquiries should be directed to the Habitat Conservation Planning Branch at (916) 653-4875.

CDFW has relied on all of the documents listed in this section in exercising its independent judgment and reaching its decision with respect to the OCTA NCCP/HCP, even if every document was not formally presented to CDFW or its staff as part of the CDFW files generated in connection with the NCCP/HCP. Without exception, any documents set forth above not found in CDFW's files for the OCTA NCCP/HCP fall into one of two categories. The first category includes documents that reflect prior planning or legislative decisions of which CDFW was aware when approving the OCTA NCCP/HCP (ee *City of Santa Cruz v. Local Agency Formation Comm.* (1978) 76 Cal.App.3d 381, 391–392; *Dominey v. Department of Personnel Administration* (1988) 205 Cal.App.3d 729, 738, fn. 6). The second category includes other

documents that influence the expert advice of CDFW staff, which then provided advice to the decision-makers at CDFW with respect to the NCCP Permit for the OCTA NCCP/HCP. For that reason, such documents form part of the underlying factual basis for CDFW's decision related to the OCTA NCCP/HCP (see Public Resources Code, Section 21167.6(e)(10); *Browning-Ferris Industries v. City Council of City of San Jose* (1986) 181 Cal.App.3d 852, 866; *Stanislaus Audubon Society, Inc. v. County of Stanislaus* (1995) 33 Cal.App.4th 144, 153, 155).

FINDINGS OF FACT

3.0 FINDINGS UNDER CEQA

3.1 Environmental Documents

OCTA is the CEQA lead agency for purposes of the OCTA NCCP/HCP and has completed environmental review and approval of the NCCP/HCP (see generally Public Resources Code Section 21067; California Code of Regulations, Title 14, Section 15367). OCTA analyzed the environmental effects of implementing the NCCP/HCP.

Pursuant to CEQA, Public Resources Code Section 21000 *et seq*., and California Code of Regulations, Title 14, Section 15000 *et seq*. (CEQA Guidelines), OCTA determined that an Environmental Impact Report (EIR) consisting of a Draft EIR, a Final EIR and appendices would be prepared for the proposed project (i.e., the OCTA NCCP/HCP). CDFW concurs with that determination.

OCTA as lead agency prepared an NCCP/HCP that it approved on November 29, 2016 and a Final EIR and Environmental Impact Statement (EIS) that it certified on November 29, 2016. Specifically, OCTA prepared: OCTA NCCP/HCP and associated Appendices A–I and OCTA M2 Final EIR/EIS Volumes I and II. The State Clearinghouse Number for the EIR/EIS is SCH No. 2010121008. In analyzing and approving the NCCP/HCP and certifying the EIR/EIS, OCTA "consider(ed) the effects, both individual and collective, of all activities involved in a (the) project" (Public Resources Code, Section 21002.1(d)).

OCTA issued a Notice of Preparation (NOP), which was circulated to responsible agencies and interested groups and individuals for review and comment on December 3, 2010. The NOP was published in several regional newspapers, including the *Excelsior*, *Nguoi Viet*, and *The Orange County Register*. In addition, a public scoping meeting was held on December 15, 2010 with verbal and written comments being accepted. By the close of the scoping period, six letters representing comments from six organizations had been received.

In order to comply with CEQA, OCTA filed a Notice of Availability (NOA) with the State Clearinghouse upon completion of the Draft EIR/EIS. OCTA distributed the NOA and the Draft EIR/EIS to interested agencies, organizations, and individuals for review and comment and made the Draft EIR/EIS available for review at public libraries. The public review period was November 6, 2014 through February 6, 2015. OCTA also held two public hearings during the review period, one on November 30, 2014 in the City of Orange and the other on December 3, 2014 in Rancho Santa Margarita. Due to the large geographic range of the proposed project, two public hearings were held to maximize the opportunity for public participation. Written comments were accepted at both public meetings. CDFW staff attended both public meetings and reviewed the Draft EIR.

OCTA received 37 written comments on the Draft EIR/EIS. Responses to comments were prepared by OCTA and changes made to the Draft EIR/EIS. The responses to comments, changes to the Draft EIR/EIS, and additional information were published in the Final EIR/EIS, dated November 2016. CEQA Guidelines Section 15088.5 requires a lead agency to recirculate an EIR for further review and comment when significant new information is added to the EIR after public notice is given of the availability of the Draft EIR but before certification. OCTA determined that the Final EIR/EIS did not contain significant new information and that recirculation of the EIR/EIS was not required. CDFW reviewed the Final EIR/EIS.

At all public meetings during the preparation of the NCCP/HCP, OCTA staff and its consultants provided information about the proposed project, the potential environmental impacts, and the CEQA review process. At each meeting, members of the public had the opportunity to ask questions, provide written comments, and express their concerns and interests for the proposed project.

CDFW has prepared these findings to comply with CEQA. CDFW is a responsible agency under CEQA with respect to the OCTA NCCP/HCP because of its authority under the NCCPA (see generally Public Resources Code Sections 21002.1(d) and 21069; CEQA Guidelines Section15381; see also California Code of Regulations, Title 14 Section 783.3(a)). CDFW accordingly makes the findings, which appear in Section 3.5 below, under CEQA as part of its discretionary decision to approve the OCTA NCCP/HCP and authorize take of species whose conservation and management are provided for in the OCTA NCCP/HCP.

These findings pertain to the proposed project and the EIR/EIS prepared for the proposed project (SCH No. 2010121008). The Draft EIR/EIS, the Final EIR/EIS, and all appendices comprise the EIR/EIS referenced in these findings. The purpose of the joint EIR/EIS is to evaluate the potential for environmental effects from the adoption and implementation of the OCTA NCCP/HCP and the issuance of take permits for species pursuant to the NCCPA. The joint EIR/EIS also evaluates the potential for environmental effects of the issuance of take authorizations pursuant to Section 10(a)(1)(B) of the Federal ESA.

3.2 CEQA Findings Requirement

CEQA requires public agencies to adopt certain findings before approving a project for which an EIR was prepared. The findings that appear below are intended to comply with the CEQA mandate that no public agency shall approve or carry out a project for which an EIR has been certified that identifies one or more significant effects thereof unless the agency makes one or more of the following findings: 1) changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant effects on the environment; 2) those changes or alterations are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency; or 3) economic, legal, social, technological, or other considerations, including considerations for the provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or alternatives identified in the EIR (Public Resources Code Section 21081(a); CEQA Guidelines Section 15091(a)). These findings are also intended to comply with the requirement that each finding made by CDFW be supported by substantial evidence in the administrative record and be accompanied by a brief explanation of the rationale for each finding (CEQA Guidelines Section 15091(a) and (b)). To that end, these findings provide the written, specific reasons supporting CDFW's decisions under CEQA as they relate to the approval of the OCTA NCCP/HCP under the NCCPA.

Because CDFW adopts these findings as a responsible agency, the scope of these findings and CDFW's analysis under CEQA are more limited than that of the lead agency (Public Resources Code Section 21167.2; CEQA Guidelines Section 15096(f)–(h)). In its capacity as a responsible agency, CDFW is also bound by the legal presumption that the EIR certified by OCTA fully complies with CEQA (Public Resources Code Sections 21167.2 and 21167.3; *City of Redding v. Shasta County Local Agency Formation Com* (1989), 209 Cal.App.3d 1169, 1178–1181; *Laurel Heights Improvement Association v. Regents of the University of California* (1993), 6 Cal.4th 1112, 1130; see also CEQA Guidelines Section 15231). In fact, CDFW is bound by the presumption of adequacy, except in extremely narrow circumstances (Public Resources Code Section 21167.2; CEQA Guidelines Section 15096(e) and (f)). CDFW concludes such circumstances do not exist in the present case based on substantial evidence in its administrative record for the NCCP Permit.

3.3 Scope of CEQA Findings

CDFW is a responsible agency under CEQA for purposes of approving the OCTA NCCP/HCP because of its authority under the NCCPA and the lead agency's prior actions with respect to the project. As a responsible agency, CDFW's CEQA obligations are more limited than those of the lead agency (CEQA Guidelines Section 15096(g)(1)). CDFW, in particular, is "responsible for considering only the effects of those activities involved in [the] project which it is required by law to carry out or approve" (Public Resources Code Section 21002.1(d)). Thus, while CDFW must "consider the environmental effects" of the OCTA NCCP/HCP as disclosed in the environmental documents described above, CDFW "has responsibility for mitigating or avoiding only the direct or indirect environmental effects of those parts of the project which it decides to carry out, finance, or approve" (CEQA Guidelines Section 15096(f) and (g)(1)). Accordingly, because CDFW's exercise of discretion is limited to approval of the OCTA NCCP/HCP and associated take authorizations, CDFW is responsible for considering only the environmental effects that fall within its authority under the NCCPA.

CDFW's more limited obligations as a responsible agency affect the scope of, but not the obligation to adopt, findings required by CEQA. Findings are required by each public agency that approves a "project for which an environmental impact report has been certified which identifies one or more significant effects on the environment…" (Public Resources Code Section 21081(a); CEQA Guidelines Section 15091(a); see also Public Resources Code Section 21068 ("significant effect on the environment" defined); CEQA Guidelines Section15382 (same)). Because OCTA certified the EIR in approving the OCTA NCCP/HCP, the obligation to adopt findings under CEQA necessarily applies to CDFW as a responsible agency (CEQA Guidelines Section 15096(h); *Resource Defense Fund v. Local Agency Formation Comm. of Santa Cruz County* (1987) 191 Cal.App.3d 886, 896–898).

The specific provision of the CEQA Guidelines addressing the responsible agency findings obligation is Section 15096(h). That section provides, in pertinent part, that a "responsible agency shall make the findings required by Section 15091 for each significant effect of the project and shall make the findings in Section 15093 if necessary" (CEQA Guidelines Section 15096(h)). The scope of this charge in the guidelines is governed by statutory language concerning the extent of responsible agency decision making authority under CEQA. As noted above, the controlling statute provides that a "responsible agency shall be responsible for considering only the effects of those activities involved in a project which it is required by law to carry out or approve" (Public Resources Code Section 21002.1(d)). The same section underscores that the more limited scope of review for responsible agencies necessarily "applies only to decisions by a public agency to carry out or approve a project…" (*Ibid.*).

3.4 Legal Effect of the CEQA Findings

These findings are not merely informational. To the extent CDFW relies on implementation of particular measures to make a necessary finding under the NCCPA, those measures constitute a binding set of obligations that take effect when CDFW issues the NCCP Permit for the OCTA NCCP/HCP. CDFW believes that all mitigation and conservation measures that it has relied on for purposes of its findings are separately required under the OCTA NCCP/HCP or the IA, or are express conditions of this NCCP Permit. Consequently, CDFW does not anticipate that as a practical matter these findings alone will increase obligations of those operating under authority of this NCCP Permit.

3.5 CEQA Findings Regarding Potentially Significant Environmental Effects

OCTA's Final EIR/EIS for the OCTA NCCP/HCP analyzed the following impacts: Agriculture; Air Quality and Greenhouse Gases; Biological Resources; Cultural Resources; Geology, Soils, and Seismicity; Hazards and Hazardous Materials; Hydrology and Water Quality; Land Use; Noise; Socioeconomics and Environmental Justice; Transportation and Circulation; and the cumulative impacts associated with the overall NCCP/HCP. Issues deemed to be not significant and not selected for detailed analysis included: Aesthetics and Visual Resources, Energy Resources, Mineral Resources, Population and Displacement, Public Services, and Utilities and Service Systems.

The Final EIR/EIS identified several potentially significant environmental impacts that could result due to implementation of the OCTA NCCP/HCP. OCTA concluded as the CEQA lead agency for the project that these significant impacts could be mitigated to a level below significance through the implementation of mitigation measures. OCTA determined in the EIR/EIS that implementation of the OCTA NCCP/HCP would result in less than significant impacts to the following categories: Agriculture; Air Quality and Greenhouse Gases; Biological Resources; Geology, Soils, and Seismicity; Hydrology and Water Quality; Land Use; Socioeconomics and Environmental Justice; and Transportation and Circulation. Potentially significant impacts to Cultural Resources, Hazards and Hazardous Materials, and Noise will be reduced to a less-than-significant level through implementation of mitigation measures identified in the EIR/EIS.

The EIR/EIS reiterates some of the information found in the OCTA NCCP/HCP and incorporates by reference the conservation, avoidance, minimization, and mitigation measures included with the OCTA NCCP/HCP. The OCTA NCCP/HCP discusses in detail specific incidental take minimization measures designed to avoid the actual mortality or injury of Covered Species individuals (Chapter 5). Avoidance and minimization measures required in the OCTA NCCP/HCP include, but are not limited to: 1) planning surveys; 2) pre-construction surveys; 3) construction monitoring; 4) specific conditions on the covered freeway improvement projects; and 5) species-specific take avoidance and minimization measures (Section 5.6). The primary means of mitigating impacts and conserving Covered Species and natural communities is by implementing the conservation strategy as outlined the OCTA NCCP/HCP (Chapter 5). The primary elements of the conservation strategy include Preserve acquisitions and the funding of restoration projects that benefit conserved in the Plan Area. Vegetation communities or land cover types that provide habitat for Covered Species that will be lost to Covered Activities will be mitigated by conserving and managing the same or higher value communities within the Preserves. OCTA has already acquired seven properties that total 1,296 acres, of which 1,232 acres are natural habitat (Table 5–2). OCTA has also funded 11 restoration projects totaling

approximately 357 acres of natural lands (Table 5–5). Management measures will be implemented at the property, Preserve, species, and natural community levels. These management measures address the processes, threats, and disturbances that affect habitats and species. Management measures will be periodically evaluated to ensure their effectiveness through an Adaptive Management Program (Chapter 7). These measures will benefit Covered Species, non-Covered Species, and a range of natural vegetation communities.

The following section presents CDFW's responsible agency findings with respect to the potentially significant environmental effects authorized by CDFW pursuant to the NCCP Permit issued to the Permittee under the NCCPA. The NCCP Permit includes 12 of the 13 listed and non-listed species (referred to collectively as Covered Species) in the OCTA NCCP/HCP (Table 1–1) and the EIR/EIS; mountain lion is not a Covered Species for the NCCP Permit (Section 5.3 of this Permit and Findings). The take of Covered Species is allowed upon NCCP Permit issuance per Section 5.0 of this Permit and Findings.

CEQA Findings

The impacts to Covered Species are addressed in the OCTA NCCP/HCP (Chapter 4) and the Final EIR/EIS (Section 4.4). Mitigation measures for the Covered Activities are also identified in the OCTA NCCP/HCP (Chapters 5–7) and the Final EIR/EIS (Section 4.4).

As required by the NCCPA, the OCTA NCCP/HCP must conserve native biological diversity, habitats for native species, natural communities, and local ecosystems. This conservation will cover a broad range of natural resources, including native species that are common or rare. The OCTA NCCP addresses 12 listed and non-listed Covered Species including three plant and nine wildlife species. The OCTA HCP addresses one additional species, the mountain lion, which is not covered under the NCCP or this NCCP Permit. Appendix C.4 provides a detailed description of the Covered Species selection criteria, methods, and evaluation results.

For purposes of the impacts analysis and subsequent mitigation, a species occurrence was defined as a point location where that particular species had been detected. All point locations were recorded between 1990 and 2012. Typically, when a species is noted in the field (i.e. an occurrence), a population value is also recorded. For example, the location of the species is often represented as a single point or polygon and then a count or estimate of the number of individuals is ascribed to the point/polygon. There are many records in the California Natural Diversity Data Base (CNDDB) where the number of individuals was not recorded. These occurrences were assigned a population value of one although there may have been more individuals present. Because of this inconsistency, both occurrence data and the number of individuals are provided in the following Covered Species impact analyses.

Covered Plant Species

Impact 3.5.1 Approval of the NCCP/HCP authorized under the NCCP Permit could result in potentially significant adverse impacts on the Covered Plant Species. These species include: intermediate mariposa lily (*Calochortus weedii* var. *intermedius*), many-stemmed dudleya (*Dudleya multicaulis*), and southern tarplant (*Centromadia parryi* spp. *australis*).

Finding 3.5.1 CDFW finds that conservation measures required in the OCTA NCCP/HCP for the avoidance, minimization, and/or mitigation of the

potentially significant impacts of the NCCP/HCP on Covered Plant Species reduce the adverse impacts to **below a level of significance** (Public Resources Code, Section 21081(a)(1); CEQA Guidelines, Section15091(a)(1)).

Intermediate mariposa lily

Baseline: Intermediate mariposa lily is a California endemic with occurrences in Orange, Riverside, Los Angeles, and San Bernardino counties. A total of 329 occurrences, 23,966 individuals, and 55,623 acres of predicted suitable habitat have been documented in the Plan Area, with189 (57 percent) occurrences and 18,035 (75 percent) individuals, and 47,065 acres of predicted suitable habitat (84.6 percent) currently protected.

Impacts: Based on the predicted suitable habitat model, approximately 7.2 acres of intermediate mariposa lily habitat could be directly impacted and 28.1 acres indirectly impacted by the Covered Activities; however, there are no known occurrences of intermediate mariposa lily in the area of direct or indirect effect (Table 4–6). Of the 7.2 acres of direct impact to predicted suitable habitat, 3.3 acres are associated with Preserve management but take coverage under the OCTA NCCP/HCP is only allowed for management activities that will result in an overall benefit to the species.

Mitigation/Conservation: OCTA will implement avoidance and minimization measures associated with Covered Activities, including the Covered Plant Species Policy (Section 5.6.2.2). This policy will ensure any actual impacts to intermediate mariposa lily are properly addressed by evaluating impacts based on project-specific field surveys. The policy also sets forth mitigation of impacts using credits determined through field surveys of Preserves and actions taken to enhance, restore, and/or create populations of intermediate mariposa lily as part of the restoration projects approved for funding by OCTA. This policy will require OCTA to maintain a ledger-type accounting system to track credits and debits. In addition, cumulative impacts to intermediate mariposa lily from the Covered Activities will be capped at 500 individuals. Mitigation and conservation will also consist of adaptive management of approximately 315 acres of intermediate mariposa lily predicted suitable habitat that supports at least 93 occurrences and 597 individuals. This results in a total conservation of 47,381 acres (85.2 percent) of predicted suitable habitat, supporting 282 (86 percent) occurrences and 18,632 (78 percent) individuals within the Plan Area (Table 6–4).

Intermediate mariposa lily occurs on the Ferber Ranch, Hafen, O'Neill Oaks, Saddle Creek South, MacPherson, and Aliso Canyon Preserves. To ensure the long-term viability/persistence of intermediate mariposa lily within these Preserves, the draft Resource Management Plans (RMPs) for Ferber Ranch, Hafen, O'Neill Oaks, Saddle Creek South, and MacPherson Preserves (ICF 2015a–e) include the species-specific management directives below (Table 7–1 and Section 7.2.8.1). These management directives will also be included in the Aliso Canyon Preserve RMP (Section 7.2.8.1).

- Conduct baseline surveys to identify and map the species (already completed).
- Conduct effectiveness monitoring to determine status and threats.
- Collect covariate data on composition and cover of associated native and nonnative vegetation, and potential threats such as erosion, trail use, and fuel management activities.
- Map the perimeter of the population or suitable habitat.
- Share data with other regional Preserve Managers to help decipher regional trends.

- Conduct general stewardship monitoring at specified intervals to record and/or track impacts on intermediate mariposa lily from vegetation management along access roads, trail use, and other potential disturbances.
- Implement specific management actions where baseline surveys indicate intermediate mariposa lily populations are directly or indirectly impacted by anthropogenic threats including modifications to vegetation management activities along access roads, invasive plant control, public access, and trail use.
- Implement targeted monitoring to assess potential conflicts with vegetation management along access roads within five years of RMP adoption.
- Protect intermediate mariposa lily populations by fencing, signage, and/or trail closures or realignment where impacts are detected.
- Restore/expand intermediate mariposa lily populations where monitoring indicates declines due to fire, disturbance, or other factors.
- Develop a restoration plan for intermediate mariposa lily that specifies propagule source, augmentation methods, monitoring methods, and success criteria. This would include targeted monitoring to determine success of restoration/expansion efforts.

Discussion: Intermediate mariposa lily has a broad distribution in the eastern, central, and southern portions of the Plan Area (Figure 6–8). Additional occurrences likely exist in the Plan Area and may be documented during the permit term. Approximately 84.6 percent of predicted suitable habitat, 57 percent of known occurrences and 75 percent of known individuals are currently protected within the Plan Area. Implementation of the OCTA NCCP/HCP will result in the conservation of an additional 315 acres of suitable habitat, 93 occurrences and 597 individuals, which increases conservation of known occurrences in the Plan Area to 86 percent and individuals to 78 percent. This conservation along with 1) implementation of the avoidance and minimization measures, including the Covered Plant Species Policy, 2) preservation and management of 315 acres of predicted suitable habitat, and 3) species-specific management directives, will reduce impacts that may occur to intermediate mariposa lily as a result of implementation of the OCTA NCCP/HCP to a level that is **less than significant**.

Many-stemmed dudleya

Baseline: Many-stemmed dudleya is a California endemic with occurrences in Orange, Riverside, Los Angeles, San Diego, and San Bernardino counties. A total of 225 occurrences, 58,948 individuals, and 91,237 acres of predicted suitable habitat have been documented in the Plan Area, with 189 (84 percent) occurrences and 44,097 (75 percent) individuals, and 67,788 acres (74.3 percent) of predicted suitable habitat currently protected (Table 6–5).

Impacts: Based on the predicted suitable habitat model, approximately 19.3 acres of multi-stemmed dudleya habitat could be directly impacted and 83.7 acres indirectly impacted by the Covered Activities; however, there are no known occurrences of many-stemmed dudleya in the area of direct or indirect impact (Table 4–6). Of the 19.3 acres of direct impact to predicted suitable habitat, 8.2 acres are associated with Preserve management but take coverage under the OCTA NCCP/HCP is only allowed for management activities that will result in an overall benefit to the species.

Mitigation/Conservation: OCTA will implement avoidance and minimization measures associated with Covered Activities, including the Covered Plant Species Policy (Section 5.6.2.2). This policy will ensure any actual impacts to multi-stemmed dudleya are properly addressed by evaluating impacts based on project-specific field surveys. The policy also sets forth mitigation of

impacts using credits determined through field surveys of Preserves and actions taken to enhance, restore, and/or create populations of multi-stemmed dudleya as part of the restoration projects approved for funding by OCTA. This policy will require OCTA to maintain a ledger-type accounting system to track credits and debits. In addition, cumulative impacts to multi-stemmed dudleya from the Covered Activities will be capped at 500 individuals. Mitigation and conservation will also consist of adaptive management of approximately 777 acres of many-stemmed dudleya predicted suitable habitat that supports at least four occurrences and 60 individuals. This will result in a total conservation of 68,565 acres (75.2 percent) of predicted suitable habitat, supporting 193 (86 percent of occurrences) and 44,157 (75 percent) of individuals within the Plan Area (Table 6-5). Lastly, to ensure that the NCCP/HCP 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.

Many-stemmed dudleya occurs on the Aliso Canyon Preserve and predicted suitable habitat is present on all of the other Preserves. To ensure the long-term viability/persistence of many-stemmed dudleya within the Preserves, the draft RMPs for Ferber Ranch, Hafen, O'Neill Oaks, Saddle Creek South, and MacPherson (ICF 2015a–e) include species-specific management directives (Table 7–1 and Section 7.2.8.1). The RMPs for Hayashi and Aliso Canyon Preserves will also include these species-specific management directives (Section 7.2.8.1).

- Conduct baseline surveys to identify and map the species (already completed).
- Conduct effectiveness monitoring to determine status and threats.
- Collect covariate data on composition and cover of associated native and nonnative vegetation, and potential threats such as erosion, trail use, and fuel management activities.
- Map the perimeter of the population or suitable habitat.
- Share data with other regional Preserve Managers to help decipher regional trends.
- Conduct general stewardship monitoring at specified intervals to record and/or track impacts on many-stemmed dudleya from vegetation management along access roads, trail use, and other potential disturbances.
- Implement specific management actions where baseline surveys indicate many-stemmed dudleya populations are directly or indirectly impacted by anthropogenic threats including modifications to vegetation management activities along access roads, invasive plant control, public access, and trail use management.
- Implement targeted monitoring to assess potential conflicts with vegetation management along access roads within five years of RMP adoption.
- Protect many-stemmed dudleya populations by fencing, signage, and/or trail closures or realignment where impacts are detected.
- Restore/expand many-stemmed dudleya populations where monitoring indicates declines due to fire, disturbance, or other factors.
- Develop a restoration plan for many-stemmed dudleya that specifies propagule source, augmentation methods, monitoring methods, and success criteria. This would include targeted monitoring to determine success of restoration/expansion efforts.

Discussion: Many-stemmed dudleya has a broad distribution on currently protected lands in the eastern, central, and southern portions of the Plan Area (Figure 6–9). These currently protected lands support approximately 84 percent of the known occurrences and 75 percent of the known individuals in the Plan Area. Implementation of the OCTA NCCP/HCP will result in the

conservation of an additional four occurrences and 60 individuals, contributing to the species' overall conservation within the Plan Area. This conservation along with 1) implementation of the avoidance and minimization measures, including the Covered Plant Species Policy, 2) preservation and management of 777 acres of suitable habitat, and 3) species-specific management directives, will reduce impacts that may occur to many-stemmed dudleya as a result of implementation of the OCTA NCCP/HCP to a level that is **less than significant**.

Southern tarplant

Baseline: Southern tarplant is known from Santa Barbara County southward to Baja California, Mexico, and may also occur on Santa Catalina Island. A total of 42 occurrences, 63,448 individuals, and 5,963 acres of predicted suitable habitat have been documented in the Plan Area, with 32 (76 percent) occurrences, 55,864 (88 percent) individuals, and 3,708 acres of predicted suitable habitat (62 percent) currently protected (Table 6–6).

Impacts: Based on the predicted suitable habitat model, approximately 9.3 acres of southern tarplant habitat could be directly impacted and 35.3 acres indirectly impacted by the Covered Activities; however, there are no known occurrences of southern tarplant in the area of direct or indirect effect (Table 4–6). Of the 9.3 acres of direct impact to predicted suitable habitat, 0.1 acre is associated with Preserve management.

Mitigation/Conservation: OCTA will implement avoidance and minimization measures associated with Covered Activities, including the Covered Plant Species Policy (Section 5.6.2.2). This policy will ensure any actual impacts to southern tarplant are properly addressed by evaluating impacts based on project-specific field surveys. The policy also sets forth mitigation of impacts using credits determined through field surveys of Preserves and actions taken to enhance, restore, and/or create populations of southern tarplant as part of the restoration projects approved for funding by OCTA. This policy will require OCTA to maintain a ledger-type accounting system to track credits and debits. In addition, cumulative impacts to southern tarplant from the Covered Activities will be capped at 500 individuals. Mitigation and conservation will also consist of adaptive management of approximately 9.3 acres of southern tarplant predicted suitable habitat. In addition, OCTA has approved funding for the Harriet Weider Regional Park and Fairview Park restoration projects (Section 5.5), which include a total of 31.2 acres of predicted suitable southern tarplant habitat. Southern tarplant was known to occur in the vicinity of the Fairview Park restoration project, and natural recruitment of the species into the restoration site has been documented during annual monitoring (Endemic Environmental Services 2013). Although the Fairview Park project did not include specific measures to promote expansion of southern tarplant, general site enhancement through nonnative species removal activities facilitated natural recruitment into the site (Endemic Environmental Services 2013). Southern tarplant is also expected to colonize the Harriet Weider site due to adjacent source populations and because locally collected seed stock has been incorporated into the restoration plant palette. OCTA will complete rare plant surveys in order to document whether southern tarplant has successfully established at this site.

If southern tarplant is found on any of the OCTA NCCP/HCP Preserves, then the RMPs will be revised to include species-specific management directives to ensure the long-term viability/persistence of the species within the Preserves (Section 7.2.8.1).

Discussion: Southern tarplant has a broad distribution on currently protected lands in the central, western, and southern portions of the Plan Area (Figure 6–11). These currently conserved lands

support approximately 76 percent of the known occurrences, 88 percent of the known individuals, and 62 percent of the predicted suitable habitat in the Plan Area. Additional occurrences likely exist in the Plan Area and may be documented during the permit term. Implementation of the OCTA NCCP/HCP will result in restoration of suitable habitat, which has already facilitated expansion of the species (Endemic Environmental Services 2013), contributing to the species' overall conservation within the Plan Area. This conservation along with 1) implementation of the avoidance and minimization measures, including the Covered Plant Species Policy, 2) preservation and management of 9.3 acres of suitable habitat, and 3) species-specific management directives, will reduce impacts that may occur to southern tarplant as a result of implementation of the OCTA NCCP/HCP to a level that is **less than significant**.

Summary of CEQA Findings for Covered Plant Species

CDFW finds that issuance of this NCCP Permit could result in significant impacts on these Covered Plant Species from implementation of the Covered Activities associated with the OCTA NCCP/HCP; however, CDFW also finds that all impacts on these species and their habitat associated with CDFW's issuance of this NCCP Permit will be avoided or mitigated to below a level of significance under CEQA through adherence to, and implementation of, the OCTA NCCP/HCP. CDFW's findings under CEQA with respect to these species are consistent with the findings of the lead agency on the same subject (see Final EIR/EIS Section 4.4). CDFW's findings are based on the overall conservation strategy, species-specific minimization and avoidance measures, monitoring and adaptive management program, and species-specific biological goals and objectives (OCTA NCCP/HCP Chapters 5, 6, and 7).

Covered Wildlife Species

Impact 3.5.2 Approval of the OCTA NCCP/HCP authorized under the NCCP Permit could result in potentially significant adverse impacts on the Covered Wildlife Species: arroyo chub (*Gila orcutti*), coast horned lizard (*Phrynosoma blainvillii*), orange-throated whiptail (*Aspidoscelis hyperythra*), western pond turtle (*Emys marmorata* [syn. *Actinemys marmorata*]), cactus wren (*Campylorhynchus brunneicapillus*), coastal California gnatcatcher (*Polioptila californica californica*), least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*), and bobcat (*Lynx rufus*).

Finding 3.5.2 CDFW finds that conservation measures required in the OCTA NCCP/HCP for the avoidance, minimization, and/or mitigation of the potentially significant impacts of the NCCP/HCP on Covered Wildlife Species will be reduced to **below a level of significance** (Public Resources Code, Section 21081(a)(1); CEQA Guidelines, Section15091(a)(1)).

Arroyo chub

Baseline: Arroyo chub is rare in the Plan Area. There are 51 known occurrences, 345 individuals, and 69 acres of predicted suitable habitat in the Plan Area. All of these occurrences/individuals, and 50 acres of predicted suitable habitat (73 percent) are currently protected (Table 6–7). Surveys conducted in 2013 by CDFW detected individuals in San Juan Creek/Bell Canyon and individuals in Hot Springs Creek/Caspers Wilderness Park, which is within the San Juan Creek watershed (Benjamin et al. 2016). Additionally, Audubon has been monitoring the arroyo chub

population in Bell Canyon in some form since 2003 (Scott Gibson, Assistant Director of Research and Education, personal communication, May 20, 2016). For years 2011–2015, Mr. Gibson has observed 100+ individuals at two sites in Bell Canyon including adults and juveniles. Within the past five years, arroyo chub have also been documented in Trabuco Creek in O'Neill Regional Park (Russ Barabe, CDFW Environmental Scientist, personal communication, September 17, 2015), but the total number of individuals is unknown.

Impacts: Based on the predicted suitable habitat model, approximately 0.1 acre of arroyo chub habitat could be directly impacted and 1.9 acres indirectly impacted by the Covered Activities; however, there are no known occurrences of arroyo chub in the area of direct effect (Table 4–6). One occurrence in the Santa Ana River may be indirectly impacted by covered freeway improvement Project J (Figure 4–7). No direct habitat impacts are expected due to Preserve management.

Mitigation/Conservation: OCTA will implement avoidance and minimization measures associated with Covered Activities, including the Aquatic Resources and Species Policy (Section 5.6.2.1). This policy requires the construction lead to retain a qualified biologist during any covered freeway improvement project that could impact potential arroyo chub habitat to determine if the species might be present. If the species is present, then avoidance and minimization measures will be drafted that adhere to accepted NOAA Fisheries Service and CDFW protocols. In addition, mitigation and conservation will consist of adaptive management of approximately 0.1 acre of arroyo chub predicted suitable habitat. OCTA will also implement a restoration project focused on improving habitat conditions for an existing population of arroyo chub in the Plan Area. Potential projects include actions to improve water quality in a subwatershed known to support arroyo chub (e.g., Bell Canyon), removal or modification of check dams to facilitate fish passage (e.g., along San Juan Creek on USFS lands), and/or nonnative fish removal. Impacts will also be partially offset through the restoration of 13 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 limited benefit for conservation of arroyo chub.

Discussion: Although arroyo chub has a limited distribution within the Plan Area, all known occurrences and 73 percent of predicted suitable habitat are currently protected. Implementation of the OCTA NCCP/HCP will result in restoration of suitable habitat, which is expected to facilitate expansion of the species, contributing to the species' overall conservation within the Plan Area. This habitat restoration along with implementation of the avoidance and minimization measures, including the Aquatic Resources and Species Policy will reduce impacts that may occur to arroyo chub as a result of implementation of the OCTA NCCP/HCP to a level that is **less than significant**.

Coast horned lizard

Baseline: Coast horned lizard is well distributed throughout the Plan Area and is known to occur in most of the core habitat areas identified by CBI (2009). A total of 25 occurrences, 165 individuals, and 96,100 acres of predicted suitable habitat have been documented in the Plan Area. Of these, 24 (96 percent) occurrences, 164 (99 percent) individuals, and 76,797 (80 percent) of predicted suitable habitat, are currently protected (Table 6–8).

Impacts: Based on the predicted suitable habitat model, approximately 69 acres of coast horned lizard habitat could be directly impacted and 184.2 acres indirectly impacted by the Covered Activities; however, there are no known occurrences of coast horned lizard in the area of direct or indirect effect (Table 4–6). Of the 69 acres of direct impact to predicted suitable habitat, 5.6 acres are associated with Preserve management but take coverage under the OCTA NCCP/HCP is only allowed for management activities that will result in an overall benefit to the species.

Mitigation/Conservation: In addition to the avoidance measures associated with Covered Activities (Section 5.6), mitigation and conservation will consist of adaptive management of approximately 529.8 acres of coast horned lizard predicted suitable habitat that supports at least one additional (4 percent) occurrence, resulting in a total conservation of all known occurrences and individuals within the Plan Area (Table 6–8). OCTA has also funded 10 restoration projects that include a total of 140.8 acres of coast horned lizard predicted suitable habitat (Table 5–5). Coast horned lizard has been documented at the Bee Flat/Agua Chinon restoration sites managed by the Irvine Ranch Conservancy (IRC) under contract with County Parks (IRC 2015b).

Coast horned lizard occurs on the MacPherson Preserve, and although not documented during baseline surveys of the O'Neill Oaks Preserve, CNDDB data includes one occurrence/three individuals present in the early 1990s at this site. To ensure the long-term viability/persistence of coast horned lizard on the MacPherson Preserve, the draft RMP (ICF 2015e) includes the below species-specific management directives (Table 7–1 and Section 7.2.8.4). If the species is detected on any of the remaining Preserves, then the RMPs will be revised to include these management directives.

- Conduct baseline surveys to identify and map the species (already completed).
- Conduct effectiveness monitoring surveys.
- Collect covariate data on vegetation composition and cover, invasive plants, and other threats.
- Conduct general stewardship monitoring to record and/or track impacts from trail use, illegal off-road vehicle activity, vegetation management along access roads, and other potential disturbance activity.
- Evaluate the need to implement targeted monitoring to assess potential conflicts with vegetation management along roads and/or with public access and recreational trail use.
- Implement specific management actions where surveys indicate anthropogenic threats in or adjacent to suitable habitat.
- Protect individuals and habitat by fencing, signage, or possibly, trail closures or realignment, as appropriate.

Discussion: Coast horned lizard has a broad distribution on currently protected lands throughout the Plan Area with approximately 96 percent of known occurrences and 99 percent of known individuals currently protected. Implementation of the OCTA NCCP/HCP will result in the conservation of an additional occurrence and the restoration of 140.8 acres of suitable habitat for the species, resulting in the overall conservation of 77,327 acres of predicted suitable habitat (81 percent). This conservation along with implementation of the avoidance and minimization measures, preservation and adaptive management of 529.8 acres of suitable habitat, and species-specific management directives will reduce impacts that may occur to coast horned lizard as a result of implementation of the OCTA NCCP/HCP to a level that is **less than significant**.

Orange-throated whiptail

Baseline: The orange-throated whiptail is well distributed throughout the Plan Area and is known to occur in most of the core habitat areas identified by CBI (2009). A total of 40 occurrences, 182 individuals, and 23,469 acres of predicted suitable habitat have been documented in the Plan Area. Of these, 33 (83 percent) occurrences, 175 (96 percent) individuals, and 16,579 (71 percent) are currently protected (Table 6–9). It is expected that additional occurrences will be documented in the Preserves and Plan Area over the permit term.

Impacts: Based on the predicted suitable habitat model, approximately 45.6 acres of orange-throated whiptail habitat could be directly impacted and 110.7 acres indirectly impacted by the Covered Activities; however, there are no known occurrences of orange-throated whiptail in the area of direct effect (Table 4–6). It is anticipated that two occurrences may be indirectly impacted by the covered freeway improvement Project J (Figure 4–9). Of the 45.6 acres of direct impact to predicted suitable habitat, only 0.5 acre is associated with Preserve management, but take coverage under the OCTA NCCP/HCP is only allowed for management activities that will result in an overall benefit to the species.

Mitigation/Conservation: In addition to the avoidance measures associated with Covered Activities, mitigation and conservation will consist of adaptive management of approximately 52.1 acres of orange-throated whiptail predicted suitable habitat that supports at least six (15 percent) occurrences and six (three percent) individuals. This will result in a total conservation of 98 percent of occurrences and all but one individual within the Plan Area. OCTA has also funded 10 restoration projects that include a total of 140.8 acres of orange-throated whiptail suitable habitat. In addition, individual orange-throated whiptails have been observed at the Bee Flat/Agua Chinon restoration sites (IRC 2015b).

Orange-throated whiptail occurs on the Ferber Ranch, O'Neill Oaks, and MacPherson Preserves. To ensure the long-term viability/persistence of orange-throated whiptail on Ferber Ranch, O'Neill Oaks, and MacPherson Preserves, the draft RMPs (ICF 2015a, 2015c, 2015e) include the below species-specific management directives (Table 7–1 and Section 7.2.8.4). These management directives will also be incorporated into the RMPs for any of the remaining Preserves should the species be detected.

- Conduct baseline surveys to identify and map the species (already completed).
- Conduct effectiveness monitoring surveys.
- Collect covariate data on vegetation composition and cover, invasive plants and other threats.
- Conduct general stewardship monitoring to record and/or track impacts from trail use, illegal off-road vehicle activity, vegetation management along access roads, and other potential disturbance activity.
- Evaluate the need to implement targeted monitoring to assess potential conflicts with vegetation management along roads and/or with public access and recreational trail use.
- Implement specific management actions where surveys indicate anthropogenic threats in or adjacent to suitable habitat.
- Protect individuals and habitat by fencing, signage, or possibly trail closures or realignment, as appropriate.

Discussion: Orange-throated whiptail has a broad distribution on currently protected lands throughout the Plan Area with approximately 83 percent of known occurrences and 96 percent of

known individuals currently protected. Implementation of the OCTA NCCP/HCP will result in the conservation of an additional six occurrences and six individuals and the restoration of 140.8 acres of predicted suitable habitat, a portion of which is known to support the species. This conservation along with implementation of the avoidance and minimization measures, preservation and management of 52.1 acres of predicted suitable habitat, and species-specific management directives will reduce impacts that may occur to coast horned lizard as a result of implementation of the OCTA NCCP/HCP to a level that is **less than significant**.

Western pond turtle

Baseline: Western pond turtle is patchily distributed and somewhat rare within the Plan Area. According to the OCTA NCCP/HCP, 12 occurrences, 54 individuals, and 5,963 acres of predicted suitable habitat have been documented in the Plan Area (Figure 6–15 and Table 6–10). Nine (75 percent) of the occurrences, 39 (72 percent) of the individuals, and 4,962 acres (83 percent) of the predicted suitable habitat are currently protected (Table 6–10). Presumed breeding sites documented in the southern portion of the County include San Juan Creek, a stock pond in upper Cristianitos Canyon, and Jerome's Lake in upper Gabino Canyon (USFWS 2007a). Based on a more recent U.S. Geological Survey (USGS) study (Fisher et al. 2013), western pond turtle was found in the following Plan Area locations: Santa Ana River, San Juan/Oso/Trabuco creeks, Aliso Creek, San Diego Creek, and Shady Canyon Pond. The Fisher et al. (2013) report discusses the genetic relatedness of individuals from these locations but does not provide details regarding breeding status or population demographics. Shady Canyon Pond is not one of the 12 occurrences listed in CNDDB. This may be due to the fact that it is not a historic location but a mitigation site that was created in 2001 and stocked with 27 translocated adult turtles taken from Bommer Canyon and the Sand Canyon Reservoir. By 2007, Shady Canyon Pond supported 94 individual western pond turtles (Harmsworth Associates 2007). In 2014, the population had declined to 74 individuals (Harmsworth Associates 2014). This population is located on currently protected land and although not a requirement of the OCTA NCCP/HCP, it may be an important source population for future reintroduction efforts in the Plan Area (Fisher et al. 2013; IRC 2013; Harmsworth Associates 2014d). According to IRC (2015a), western pond turtles have also been observed in lower Silverado Creek with a known breeding population occurring in neighboring Ladd Canyon in 2005. This occurrence is located on protected lands. Portions of Aliso Creek occupied by western pond turtle are also located on currently protected lands including the 55-acre Aliso Creek restoration project, while other occupied areas of the creek are not currently protected (Figure 6–15).

Impacts: Based on the predicted suitable habitat model, Covered Activities may directly impact 3.2 acres of aquatic and 51.7 acres of upland habitat and indirectly impact 16.5 acres of aquatic and 283.8 acres of upland habitat (Table 4–6). It is anticipated that one occurrence may be directly impacted and one occurrence indirectly impacted as a result of the covered freeway improvement Projects C and G (Figure 4–10), respectively; however, no direct take of individuals is authorized by this NCCP Permit. Of the 3.2 acres of aquatic and 51.7 acres of upland predicted suitable habitats directly impacted by the Covered Activities, only 0.1 acre and 5.9 acres, respectively, are associated with Preserve management, although take coverage under the OCTA NCCP/HCP is only allowed for management activities that will result in an overall benefit to the species.

Mitigation/Conservation: OCTA will implement avoidance and minimization measures associated with Covered Activities, including the Aquatic Resources and Species Policy (Section 5.6.2.1). This policy requires the construction lead to conduct pre-construction surveys for western pond turtle to determine their presence or absence within the construction footprint. If the

species is present, then a pond turtle avoidance and minimization plan will be submitted to CDFW for review and approval prior to initiation of construction. This plan will identify occupied habitat and appropriate buffers that will be avoided to the maximum extent practicable. In addition, mitigation and conservation for western pond turtle will consist of adaptive management of approximately 9.9 acres of aquatic and 561.2 acres of upland predicted suitable habitat (Table 6–10). OCTA has also funded the restoration of 22.1 acres of riparian habitat and 88.3 acres of upland habitat known to support 6 occurrences/7 individuals of western pond turtle. The Aliso Creek restoration project (55 acres) has focused on the removal of arundo and other nonnative plant species creating additional aestivation, foraging, and basking habitat for the species. This site is known to support pond turtle occurrences (Ostensen and Associates 2012). Restoration along Carbon Canyon Creek on the Hayashi Preserve may also benefit pond turtle by facilitating dispersal of a known occurrence upstream of the Preserve. Lastly, restoration of the 53-acre City Parcel may also benefit the western pond turtle as 2.6 acres of predicted aquatic and 10.4 acres of predicted upland habitat occur on site (Table 5–5).

Discussion: Although western pond turtle has a limited distribution within the Plan Area, 75 percent of the known occurrences are currently protected. Implementation of the OCTA NCCP/HCP will result in the restoration of 22.1 acres of aquatic and 88.3 acres of upland habitat for the species. This restoration along with implementation of the avoidance and minimization measures, including the Aquatic Resources and Species Policy, preservation and management of 9.9 acres of aquatic and 561.2 acres of upland predicted suitable habitat will reduce impacts that may occur to western pond turtle as a result of implementation of the OCTA NCCP/HCP to a level that is **less than significant**.

Cactus wren

Baseline: The cactus wren occurs throughout the Plan Area including most of the core habitat areas identified by CBI (2009); however, there has been a significant decline in the number of occurrences/individuals since the mid-1990s. Since 1990, 80 occurrences, 558 individuals, and 55,651 acres of predicted suitable habitat have been documented in the Plan Area. Of these, 40 (50 percent) occurrences, 475 (85 percent) individuals, and 42,885 acres (77 percent) of predicted suitable habitat are located on currently protected lands (Table 6–11).

In 2012, Preston and Kamada (2013) observed at least 448 cactus wrens and between 152 and 157 territories at 35 Central/Coastal NCCP/HCP Reserve sites and three non-Reserve sites. Of the 448 birds, 128 (28.6 percent) were nestlings or juveniles and 320 (71.4 percent) were adults. A total of 156 wrens and 36 territories were present within the Coastal Reserve, including 76 (48.7 percent) nestlings or juveniles and 80 (51.3 percent) adults. A total of 287 wrens and approximately 115 territories were documented in the Central Reserve, including 52 (18.1 percent) nestlings or juveniles and 235 (81.9 percent) adults. Recent data are not available for protected lands in the southern portion of the Plan Area but cactus wren are known to occur in O'Neill Regional Park, Audubon Starr Ranch, and on lands owned by Rancho Mission Viejo (CNDDB 2016). Due to numerous cactus scrub restoration efforts currently being implemented (NCC 2014, 2015), additional land conservation efforts associated with Non-traditional Section 6 grant funding, and improved fire management techniques in the Plan Area, it is expected that population numbers will increase and could potentially stabilize during the permit term.

Impacts: Based on the predicted suitable habitat model, approximately 12.4 acres of cactus wren habitat could be directly impacted and 85.2 acres indirectly impacted by the Covered Activities; however, there are no known occurrences of cactus wren in the area of direct effect (Table 4–6). It is anticipated that two occurrences may be indirectly impacted as a result of the covered

freeway improvement Projects C2 and L (Figure 4–11). Of the 12.4 acres of direct impact, 2.7 acres are associated with Preserve management, but take coverage under the OCTA NCCP/HCP is only allowed for management activities that will result in an overall benefit to the species.

Mitigation/Conservation: OCTA will implement avoidance and minimization measures associated with Covered Activities, including the Nesting Birds Policy (Section 5.6.3). This policy requires construction to occur outside the bird breeding season to the maximum extent practicable. If the construction lead determines that avoidance of the bird breeding season is not feasible, then weekly surveys for nesting birds will be conducted to ensure that appropriate avoidance and minimization measures are implemented. In addition, mitigation and conservation will consist of adaptive management of approximately 254.7 acres of cactus wren predicted suitable habitat that supports at least 26 occurrences and 26 individuals (Table 6–11). OCTA has also funded two restoration projects that include a total of 14.5 acres of cactus wren predicted suitable habitat that are known to support four occurrences and 19 individuals (Tables 5–5 and 6–11).

Cactus wren occurs on the Ferber Ranch, Hafen, O'Neill Oaks, and Saddle Creek South Preserves. The draft RMPs for these Preserves include the following species-specific management directives to ensure the long-term viability/persistence of cactus wren (ICF 2015a–d; Table 7–1 and Section 7.2.8.5):

- Conduct baseline surveys to identify and map the species and its habitat in the Preserve (already completed).
- Conduct effectiveness monitoring to determine population status and threats, and collect covariate data on threats.
- Map and inventory cactus patches in the Preserves within two years of RMP adoption.
- Conduct general stewardship monitoring to record and/or track impacts on cactus scrub habitat from trail use, vegetation management along access roads, and other potential disturbance activity.
- Implement specific management actions where surveys indicate anthropogenic threats in or adjacent to suitable habitat or where surveys show a decline in populations or habitat;
- Evaluate the need to implement targeted monitoring to identify significant impacts on bird populations or habitat from invasive animal species (e.g. cowbirds), vegetation management along roads, or from public access and recreational trail use.
- Protect suitable habitat by fencing, signage, and/or, possibly trail closures or realignment, as appropriate.
- Include strategies to minimize direct impacts on cactus scrub habitat in the Fire Management Plan.

Discussion: Approximately 50 percent of known cactus wren occurrences, 85 percent of known individuals, and 77 percent of predicted suitable habitat are currently protected in the Plan Area. Implementation of the OCTA NCCP/HCP will result in the conservation of an additional 26 occurrences, 26 individuals, and 254.7 acres of predicted suitable habitat, resulting in a total conservation of 66 (83 percent) of the occurrences, 501 (90 percent) of the individuals, and 43,140 acres (78 percent) of the predicted suitable habitat within the Plan Area. In addition, implementation will result in the restoration of 14.5 acres of suitable habitat for the species. This conservation along with implementation of the avoidance and minimization measures, including the Nesting Birds Policy (Section 5.6.3), preservation and management of 254.7 acres of suitable habitat, and species-specific management directives will reduce impacts that may occur to cactus wren as a result of implementation of the OCTA NCCP/HCP to a level that is **less than significant**.

California gnatcatcher

Baseline: The California gnatcatcher is well distributed throughout the Plan Area and is known to occur in most of the core habitat areas identified by CBI (2009). There are 1,828 occurrences, 3,419 individuals, and 65,607 acres of predicted suitable habitat documented in the Plan Area. Of these, 1,208 (66 percent) occurrences, 2,259 (66 percent) individuals, and 51,129 acres (78 percent) of predicted suitable habitat are currently protected (Table 6–12).

The most recent comprehensive California gnatcatcher occupancy survey data for the Plan Area is from 2011, when the Natural Communities Coalition (NCC; formerly known as the Nature Reserve of Orange County) participated in an occupancy study conducted by the USFWS across San Diego and Orange counties (Leatherman BioConsulting 2012). California gnatcatchers were detected at a total of 34 plots across the Central/Coastal NCCP/HCP Reserve. The distribution of California gnatcatchers was highly skewed toward the Coastal Reserve where 24 of the 34 occupied plots were located. This appeared to be the result of the 2007 fires that burned approximately 75 percent of the Central Reserve. Due to numerous restoration efforts currently being implemented (NCC 2014, 2015), additional land conservation efforts associated with Non-traditional Section 6 grant funding, and improved fire management techniques in the Plan Area, it is expected that population numbers will increase and could potentially stabilize during the permit term.

Impacts: Based on the predicted suitable habitat model, Covered Activities may result in direct impacts to approximately 14.8 acres and indirect impacts to 96 acres of California gnatcatcher habitat (Table 4–6). It is also anticipated that two occurrences may be directly impacted and five occurrences indirectly impacted as a result of the covered freeway improvement Projects G, J, and C2 (Figure 4–12). Of the 14.8 acres of direct impact, 4.5 acres are associated with Preserve management, but take coverage under the OCTA NCCP/HCP is only allowed for management activities that will result in an overall benefit to the species.

Mitigation/Conservation: OCTA will implement avoidance and minimization measures associated with Covered Activities, including the Nesting Birds Policy (Section 5.6.3). This policy requires construction to occur outside the bird breeding season to the maximum extent practicable. If the construction lead determines that avoidance of the bird breeding season is not feasible, then weekly surveys for nesting birds will be conducted to ensure that appropriate avoidance and minimization measures are implemented. In addition, mitigation and conservation will consist of adaptive management of approximately 422.1 acres of California gnatcatcher predicted suitable habitat that supports at least 15 occurrences and 26 individuals (Table 6–12). OCTA has also funded 9 restoration projects that include a total of 140.8 acres of California gnatcatcher predicted suitable habitat that supports 13 occurrences and 21 individuals (Tables 5–5 and 6–12).

California gnatcatcher occurs on the Aliso Canyon, Ferber Ranch, O'Neill Oaks, and Saddle Creek South Preserves. To ensure the long-term viability/persistence of California gnatcatcher on these Preserves, the draft RMPs include the following species-specific management directives (ICF 2015a, 2015c–d; Table 7–1 and Section 7.2.8.6). The Aliso Canyon Preserve RMP will also include these management directives (Section 7.2.8.6).

- Baseline surveys to identify and map the species and its habitat in the Preserve (already completed).

- Conduct effectiveness monitoring to determine population status and threats, and collect covariate data on threats.
- Conduct general stewardship monitoring to record and/or track impacts on coastal sage scrub habitat from trail use, vegetation management along access roads, and other potential disturbance activity.
- Implement specific management actions where surveys indicate anthropogenic threats in or adjacent to suitable habitat or where surveys show a decline in populations or habitat.
- Evaluate the need to implement targeted monitoring to identify significant impacts on bird populations or habitat from invasive animal species (e.g. cowbirds), vegetation management along roads, or from public access and recreational trail use.
- Protect suitable habitat by fencing, signage, and/or possibly trail closures or realignment, as appropriate.
- Include strategies to minimize direct impacts on coastal sage scrub habitat in the Fire Management Plan.

Discussion: California gnatcatcher has a broad distribution on currently protected lands throughout the Plan Area with approximately 66 percent of known occurrences and individuals currently protected, and 78 percent of predicted suitable habitat currently protected. Implementation of the OCTA NCCP/HCP will conserve an additional 15 occurrences, 26 individuals, and 422.1 acres of predicted suitable habitat, resulting in a total conservation of 67 percent of occurrences and individuals and 79 percent of predicted suitable habitat within the Plan Area. Implementation of the plan will also ensure the restoration of 140.8 acres of predicted suitable habitat for the species. This conservation along with implementation of the avoidance and minimization measures, including the Nesting Birds Policy (Section 5.6.3), and species-specific management directives will reduce impacts that may occur to California gnatcatcher as a result of implementation of the OCTA NCCP/HCP to a level that is **less than significant**.

Least Bell's vireo

Baseline: The least Bell's vireo is found throughout the Plan Area and occurs in most of the core habitat areas identified by CBI (2009). There are 413 occurrences, 874 individuals, and 4,466 acres of predicted suitable habitat documented in the Plan Area. Of these, 258 (63 percent) occurrences, 576 (66 percent) individuals, and 3,224 acres (72 percent) of predicted suitable habitat are currently protected (Table 6–13). Currently, it is anticipated that any drainage with suitable habitat in the Plan Area supports least Bell's vireo (Paul Galvin, Harmsworth Associates, personal communication, September 15, 2015). Although a current Plan Area-wide population assessment has not been conducted for this species, confirmed least Bell's vireo occurrences include the majority of San Diego Creek, Rattlesnake Reservoir, Siphon Reservoir, Irvine Lake, Peter's Canyon, Trabuco Creek, San Joaquin Marsh, Sand Canyon, Aliso Creek, San Juan Creek, Gobernadora Creek, lower Arroyo Trabuco, Chiquita Creek, lower Cristianitos Creek, and in Prima Deshecha (Paul Galvin, Harmsworth Associates, personal communication, September 15, 2015; USFWS 2007a). Between 2000 and 2006, between 27 and 34 least Bell's vireo pairs and between three and five unpaired males were documented within the southern portion of the Plan Area (USFWS 2007a).

Impacts: Based on the predicted suitable habitat model, Covered Activities may result in direct impacts to approximately five acres and indirect impacts to 55.2 acres of least Bell's vireo habitat (Table 4–6). It is also anticipated that four occurrences may be directly impacted and 10 occurrences indirectly impacted as a result of the covered freeway improvement Projects J and L

(Figure 4–13), although direct take of individuals is not authorized under this NCCP Permit. Of the five acres of direct impact, only 0.1 acre is associated with Preserve management.

Mitigation/Conservation: OCTA will implement avoidance and minimization measures associated with Covered Activities, including the Nesting Birds Policy (Section 5.6.3). This policy requires construction to occur outside the bird breeding season to the maximum extent practicable. If the construction lead determines that avoidance of the bird breeding season is not feasible, then weekly surveys for nesting birds will be conducted to ensure that appropriate avoidance and minimization measures are implemented. In addition, mitigation and conservation will consist of adaptive management of approximately 8.7 acres of least Bell's vireo predicted suitable habitat (Table 6–13). OCTA has approved funding for nine restoration projects that support 110.4 acres of predicted suitable least Bell's vireo habitat (Table 5–5). The Aliso Creek and City Parcel restoration sites are known to be occupied by least Bell's vireo (Ostensen and Associates 2010, 2012, 2015). Therefore, restoration of riparian habitat at these two sites is expected to increase the availability of suitable foraging and nesting habitat as well as migratory stop-over habitat. It will also improve habitat connectivity in the Plan Area for this species. The remaining seven restoration sites also support predicted suitable least Bell's vireo habitat and allow for the possible expansion of the species within the Plan Area.

If least Bell's vireo is found on any of the OCTA Preserves, then the specific RMPs will be revised to include species-specific management directives to ensure the long-term viability/persistence of the species in the Preserves (Table 7–1 and Section 7.2.8.7).

Discussion: Least Bell's vireo has a broad distribution on currently protected lands throughout the Plan Area with approximately 63 percent of known occurrences, 66 percent of known individuals, and 72 percent of predicted suitable habitat currently protected. Implementation of the OCTA NCCP/HCP will result in the restoration of 110.4 acres of predicted suitable habitat for the species. This conservation along with implementation of the avoidance and minimization measures, including the Nesting Birds Policy (NCCP/HCP Section 5.6.3), and the preservation and management of 8.7 acres of suitable habitat will reduce impacts that may occur to least Bell's vireo as a result of implementation of the OCTA NCCP/HCP to a level that is **less than significant**.

Southwestern willow flycatcher

Baseline: The southwestern willow flycatcher is somewhat rare in the Plan Area with a total of nine occurrences and 15 individuals; all of these, and 72 percent of the predicted suitable habitat are currently protected (Table 6–14). The Plan Area falls within the Coastal California Recovery Unit (RU) as identified in the Southwestern Willow Flycatcher Recovery Plan (USFWS 2002). At the time of publication, this RU included 186 territories. Documented breeding locations in the Plan Area included San Diego Creek-Laguna Lakes and San Juan Creek-Canada Gobernadora. A more recent range-wide population estimate for the southwestern willow flycatcher was compiled by USGS (Durst et al. 2008) and included all known flycatcher breeding sites reported between 1993 and 2007. As of 2007, there were only 120 territories present in the Coastal California RU and the two sites in the Plan Area were reported as extirpated (i.e., did not support breeding pairs in 2007). However, based on information provided by USGS Western Ecological Research Center, a pair of southwestern willow flycatchers had persisted at the San Juan Creek-Canada Gobernadora location until 2009 (Scarlett Howell, Ecologist, personal communication, May 12, 2015). This is the last confirmed record for breeding southwestern willow flycatcher in the Plan Area.

Impacts: Based on the predicted suitable habitat model, Covered Activities may result in direct impacts to approximately 5.2 acres and indirect impacts to 60.5 acres of southwestern willow flycatcher habitat; however, there are no known occurrences of southwestern willow flycatcher in the area of direct or indirect effect (Table 4–6) and direct take of individuals is not anticipated under this NCCP Permit. Of the 5.2 acres of direct impact, only 0.1 acre is associated with Preserve management.

Mitigation/Conservation: OCTA will implement avoidance and minimization measures associated with Covered Activities, including the Nesting Birds Policy (Section 5.6.3). This policy requires construction to occur outside the bird breeding season to the maximum extent practicable. If the construction lead determines that avoidance of the bird breeding season is not feasible, then weekly surveys for nesting birds will be conducted to ensure that appropriate avoidance and minimization measures are implemented. In addition, mitigation and conservation will consist of adaptive management of approximately 8.7 acres of southwestern willow flycatcher predicted suitable habitat (Table 6–14). OCTA has approved funding for nine restoration projects that support 110.4 acres of predicted suitable southwestern willow flycatcher habitat (Table 5–5). The Aliso Creek restoration site has three known/historical occurrences of southwestern willow flycatcher; however, it is unknown whether these were breeding or transient individuals. The restoration of riparian habitat along Aliso Creek is expected to increase the availability of suitable foraging, nesting, and stop-over habitat for this species and improve habitat connectivity in the Plan Area.

If southwestern willow flycatcher is found on any of the OCTA Preserves, then the specific RMPs will be revised to include management tasks to ensure the long-term viability of the species in the Preserves (Table 7–1 and Section 7.2.8.7).

Discussion: Southwestern willow flycatcher is rare within the Plan Area but all known/historical occurrences are currently protected. No known occurrences will be impacted as a result of implementation of the OCTA NCCP/HCP; however, OCTA has committed to the restoration of 110.4 acres of predicted suitable habitat for the species. This conservation along with implementation of the avoidance and minimization measures, including the Nesting Birds Policy (Section 5.6.3), and the preservation and management of 8.7 acres of suitable habitat will reduce impacts that may occur to southwestern willow flycatcher as a result of implementation of the OCTA NCCP/HCP to a level that is **less than significant**.

Bobcat

Baseline: Bobcat occurs throughout the Plan Area and has been documented in most of the core habitat areas identified by CBI (2009). A total of 189,607 acres of modeled suitable habitat occurs in the Plan Area, with 149,554 acres (79 percent) currently protected. Implementation of the OCTA NCCP/HCP will result in the conservation of an additional 1,232.5 (<1 percent) acres and the restoration of 311.7 acres of predicted suitable habitat within the Plan Area (Table 6–15). The bobcat has been documented on the Ferber Ranch, O'Neill Oaks, and Hayashi Preserves (ICF 2015a, 2015c; OCTA unpublished data) as well as the Bee Flat/Agua Chinon restoration site (IRC 2015b). Numerous studies on bobcat have been conducted in the Plan Area and vicinity (Tigas et al. 2002; Riley et al. 2003; Lyren et al. 2006, 2008a, 2008b; Ordeñana et al. 2010; Ruell et al. 2012; Tracey et al. 2013; Alonso et al. 2014). In general, these studies have documented bobcat persistence throughout the Central/Coastal NCCP/HCP Reserve and vicinity but do not provide an overall population estimate for the Reserve or the Plan Area.

Impacts: Implementation of the OCTA NCCP/HCP could result in direct impacts to approximately 58.9 acres of bobcat predicted suitable habitat and indirect impacts to 246 acres as a result of the Covered Activities (Table 4–6). Of the 58.9 acres of direct impact, 13 acres are associated with Preserve management but take coverage under the OCTA NCCP/HCP is only allowed for management activities that will result in an overall benefit to the species.

Mitigation/Conservation: OCTA will implement avoidance and minimization measures associated with Covered Activities, including the Wildlife Crossing Policy (NCCP/HCP Section 5.6.2.3). This policy requires that project-specific biological surveys be completed prior to final design, 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 (e.g., culverts, underpasses, pipes) function as wildlife crossings. If it is determined, in collaboration with the 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, then 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.

In addition, mitigation and conservation will consist of adaptive management of approximately 1,232.5 acres of bobcat predicted suitable habitat that supports known occurrences of the species on the Ferber Ranch, O'Neill Oaks, and Hayashi Preserves (Table 6–15); and the restoration of 311.7 acres of predicted suitable habitat at eight of the restoration sites (Table 5–5). To ensure the long-term viability/persistence of bobcat on the Preserves, the following species-specific management directives are included in the draft RMPs for Ferber Ranch and O'Neill Oaks Preserves (IRC 2015a, 2015c; Table 7–1 and Section 7.2.8.8). The RMP for the remaining Preserves will also include these management directives (Section 7.2.8.8).

- Use ongoing photo monitoring to document bobcat presence.
- Conduct effectiveness monitoring to assess wildlife movement and connectivity.
- Coordinate results with researchers conducting regional wildlife movement assessments as well as other regional land managers (e.g., NCC and IRC) to evaluate the role of the Preserve in facilitating large mammal presence and movement.
- Conduct general stewardship monitoring at specified intervals to record and/or track impacts on natural habitat used by bobcat from trail use, vegetation management, and other potential disturbance activities.
- Inventory and map existing fencing as part of baseline surveys (already completed) and identify future fencing needs and modifications.
- Ensure that all installed fencing is in good condition and wildlife friendly, thereby improving wildlife movement while retaining access control functions.
- Install no-hunting signs, implement patrols and enforcement measures to ensure hunting does not occur.
- Evaluate wildlife movement monitoring data in conjunction with public access and recreation uses to determine whether these uses should be limited or prohibited to minimize human-wildlife interactions.

- Implement targeted monitoring (e.g., camera traps) to determine effectiveness of trail closures in enhancing bobcat use.

Discussion: Bobcat has a broad distribution on currently protected lands throughout the Plan Area including those lands conserved under the OCTA NCCP/HCP; approximately 79 percent of modeled suitable habitat is currently protected within the Plan Area. Implementation of the OCTA NCCP/HCP will result in the restoration of an additional 311.7 acres of predicted suitable bobcat habitat throughout the Plan Area. This restoration along with implementation of the avoidance and minimization measures, including the Wildlife Crossing Policy (Section 5.6.2.3), preservation and management of 1,232.5 acres of predicted suitable habitat, and species-specific management directives, will reduce impacts that may occur to bobcat as a result of implementation of the OCTA NCCP/HCP to a level that is **less than significant**.

Summary of CEQA Findings for Covered Wildlife Species

CDFW finds that issuance of this NCCP Permit could result in significant impacts on the Covered Wildlife Species from implementation of the Covered Activities proposed in the OCTA NCCP/HCP. CDFW also finds that all impacts on these species and their habitats that could result from CDFW's issuance of the NCCP Permit will be avoided and/or mitigated to below a level of significance under CEQA through adherence to, and implementation of, the OCTA NCCP/HCP. CDFW's findings under CEQA with respect to these species are consistent with the findings of the lead agency on the same subject. CDFW's findings for Covered Wildlife Species are based on the overall conservation strategy, species-specific biological objectives, avoidance and minimization measures, and the adaptive management and monitoring program (OCTA NCCP/HCP Chapters 5–7).

3.6 Mitigation, Monitoring, and Reporting Program

Every agency that makes CEQA findings must adopt a Mitigation, Monitoring, and Reporting Program (MMRP) to ensure that the mitigation measures required as conditions of approval are carried out (CEQA Guidelines, Section 15097(d)). The MMRP document serves the needs of CDFW to ensure that the OCTA NCCP/HCP, especially the components designed to avoid, minimize, and mitigate potentially significant impacts, are properly implemented in compliance with the conditions of approval. After reviewing the MMRP prepared by OCTA as part of the OCTA NCCP/HCP (EIR/EIS Chapter 5 and Appendix E), and determining that this document meets CDFW's needs with respect to implementation of the OCTA NCCP/HCP, CDFW is adopting the MMRP prepared by OCTA as its own MMRP.

3.7 Alternatives

Where a lead agency has determined that, even after the adoption of all feasible mitigation measures, a project as proposed will still cause one or more significant environmental effects that cannot be substantially lessened or avoided, the lead agency, prior to approving the project as mitigated, must first determine whether, with respect to such impacts, there remain any project alternatives that are both environmentally superior and feasible within the meaning of CEQA (see, e.g., *Citizens for Quality Growth v. City of Mt. Shasta (1988) 198 Cal.App.3d 433,445*).

CDFW faces a similar obligation as a responsible agency under CEQA (CEQA Guidelines, Section 15096(g)). As noted above, however, when considering alternatives and mitigation measures, CDFW "has responsibility for mitigating or avoiding only the direct or indirect environmental effects of those parts of the project which it decides to carry out, finance, or

approve" (*Id*., Section 15096(g)(1)). Those effects in the present case are limited to the environmental effects authorized by CDFW under NCCPA for the OCTA NCCP/HCP. In that regard, and consistent with CEQA Guidelines, issuance of the NCCP Permit is prohibited if there are "any feasible alternative or feasible mitigation measures within CDFW's powers that would substantially lessen or avoid any *significant* effect" associated with that decision (*Id*., Section 15096(g)(2) (emphasis added)).

As demonstrated above in Section 3.5, no significant environmental effects that fall within the responsibility and jurisdiction of CDFW remain unmitigated. That is to say, all potentially significant impacts associated with CDFW's authorization of the OCTA NCCP/HCP are mitigated to below a level of significance under CEQA, so no project alternatives are analyzed by CDFW (e.g., *Laurel Hills Homeowners Assoc. v. City Council* (1978) 83 Cal. App. 3d 515, 520-521). In adopting findings under CEQA, agencies need not consider the feasibility of project alternatives if they adopt mitigation measures that "substantially lessen or avoid" a project's significant adverse impacts (*Laurel Heights Improvement Assoc. v. Regents of the University of California* (1988) 47 Cal.3d 376, 400-403; an EIR must contain meaningful discussion of both project alternatives and mitigation measures).

3.8 Statement of Overriding Considerations

CDFW's approval of the OCTA NCCP/HCP will not result in any adverse environmental impacts that remain significant and unavoidable. CDFW is not adopting a Statement of Overriding Considerations under CEQA.

4.0 FINDINGS UNDER NCCPA

All NCCPs must contain certain substantive elements identified in current or former sections of the NCCPA.

4.1 NCCPA of 2003 and NCCP Findings

The OCTA NCCP/HCP must be completed, approved, and implemented pursuant to the NCCPA and CDFW must evaluate the adequacy of the NCCP by reference to the statute. The following sections describe how the OCTA NCCP/HCP was developed consistent with the Planning Agreement requirements as specified in Section 2810.

Finding 4.1.1 **CDFW finds that the NCCP/HCP has been developed consistent with the process identified in the Planning Agreement as per Section 2820(a)(1).**

Section 2820(a)(1) requires that the NCCP/HCP be developed consistent with the Planning Agreement. The Planning Agreement for the OCTA NCCP/HCP was signed by OCTA on January 21, 2010; Caltrans on November 10, 2009; the USFWS on November 16, 2009; and CDFW on November 26, 2009.

The terms of the Planning Agreement were implemented as per the roles and responsibilities assigned to the respective parties; however, Caltrans is not a co-permittee as originally stipulated. Instead, Caltrans is a Participating Special Entity, and will be covered as a third party under the

OCTA NCCP/HCP and as stipulated in IA Section 7.0. As sole permittee, OCTA controls the funding for the covered freeway improvement projects and either hires, or acts as, the construction lead that will oversee all construction-related activities and has the authority to immediately stop work if impacts exceed those authorized under the NCCP/HCP. Furthermore, consistent with its role under M2, OCTA remains responsible for monitoring project construction to ensure that impacts occur in accordance with the NCCP/HCP, for reporting to the Wildlife Agencies, and enacting any compensatory measures should any impacts exceed what has been authorized. Caltrans is responsible for implementing avoidance and minimization measures as described in Section 5.6 of the OCTA NCCP/HCP. OCTA will also have a project manager on site at all times during project construction who will liaise with the Caltrans construction manager.

Caltrans contributed to the planning process through participation on the Environmental Oversight Committee (EOC). The EOC is comprised of 12 members representing OCTA, Caltrans, federal and state resource agencies (including CDFW and USFWS), and various public interest groups. The EOC has had extensive input into the development of the covered freeway improvement projects, the selection of restoration projects, and the selection of the acquisitions that served to compensate for impacts from the Covered Activities. To date, Caltrans has continued to participate on the EOC (i.e., NCCP/HCP development), and through its role on the EOC will help to oversee implementation of the NCCP/HCP. Additionally, although Caltrans is not a co-permittee under the NCCP/HCP, this has not affected either the Planning Goals or the Preliminary Conservation Objectives identified in the Planning Agreement. Caltrans' role and its responsibilities as a Participating Special Entity are consistent with the process identified in the Planning Agreement.

Therefore, CDFW finds that the OCTA NCCP/HCP has been developed consistent with the process identified in the Planning Agreement entered into pursuant to Section 2810 (Section 2820(a)(1)).

The Planning Agreement shall be binding upon CDFW, other participating federal, state, and local agencies, and participating private landowners (Section 2810(b)(1).

Section 6.0 of the Planning Agreement states that "the Parties intend that this Planning Agreement will fulfill the NCCPA requirements pertaining to planning agreements and will establish a mutually agreeable process for preparing the Plan that fulfills the requirements of the NCCPA and FESA." The Parties that signed the Planning Agreement were CDFW, USFWS, OCTA, and Caltrans. By signing the Planning Agreement, all signatories are bound to the terms and conditions of the Planning Agreement.

Therefore, CDFW finds that the OCTA NCCP/HCP was developed consistent with the Planning Agreement such that upon signing the Planning Agreement it is binding upon CDFW, USFWS, and OCTA.

The Planning Agreement identifies the geographic scope (Section 2810(b)(2)) and participating parties.

Section 4.0 of the Planning Agreement identifies the initial parties involved in the NCCP/HCP: OCTA, Caltrans, USFWS, and CDFW. The NCCP/HCP, through IA Section 3.31, identifies the Permittee as OCTA.

Section 4.1 and Exhibit A of the Planning Agreement define the geographic scope of the NCCP/HCP as Orange County. The geographic scope has remained consistent through all of the planning stages including the final NCCP/HCP.

Therefore, CDFW finds that the OCTA NCCP/HCP was developed consistent with the Planning Agreement process regarding the geographic scope of the NCCP/HCP and the participating parties.

The Planning Agreement identifies the natural communities and species (Section 2810(b)(3)).

Section 5.1.1 and Exhibit B of the Planning Agreement identify the endangered, threatened, proposed, candidate, and other species known or reasonably expected to be found in the natural communities covered by the OCTA NCCP/HCP, and to be initially addressed by the NCCP/HCP. The participating partners developed the preliminary list, which included 22 plant and animal species in eight habitat types. These species and communities constituted the broadest list of those to be evaluated for coverage under the NCCP/HCP. All of these species were evaluated for coverage under the NCCP/HCP, and based on the covered species selection criteria discussed in Appendix C.4 of the NCCP/HCP; this list was reviewed and refined down to the final list of 13 species for the HCP and 12 species for the NCCP.

Therefore, CDFW finds that the NCCP/HCP has been developed consistent with the Planning Agreement process to identify natural communities and species in those communities, including endangered, threatened, proposed, and candidate plants and animals.

The Planning Agreement identifies preliminary conservation objectives for the planning area (Section 2810(b)(4)).

Section 5.0 of the Planning Agreement states that the preliminary conservation objectives the Parties intend to achieve through the NCCP/HCP are:

- Provide for the protection of species, natural communities, and ecosystems on a landscape level.
- Protect threatened, endangered, or other special status plant and animal species.
- Identify and designate biologically sensitive habitat areas.
- Reduce the need to list additional species.
- Set forth species-specific goals and objectives.
- Set forth specific habitat-based goals and objectives expressed in terms of amount, quality, and connectivity of habitat.
- Provide meaningful comprehensive mitigation for impacts to Covered Species and the natural communities and ecosystems that support the Covered Species.
- Provide for habitat connectivity to ensure reserves maintain their biological functions and values.
- Preserve and provide for the protection and recovery of Covered Species and associated natural communities and ecosystems that occur within the Planning Area.
- Preserve the diversity of fish, wildlife, plant, and natural communities in the Planning Area through the preservation and/or restoration of habitat.
- Implement an adaptive management and monitoring program to respond to changing ecological conditions.

- Avoid, minimize, and/or mitigate the take of Covered Species, and in the case of the federal ESA, the loss of covered plant species.

These objectives were reiterated in Chapters 5 through 7 of the OCTA NCCP/HCP and implementation of the NCCP/HCP will ensure these objectives are achieved.

Therefore, CDFW finds that the OCTA NCCP/HCP has been developed consistent with the Planning Agreement process to identify preliminary conservation objectives for the planning area.

The Planning Agreement establishes a process for the collection of data, information, and independent scientific input to meet scientifically sound principles for the conservation of species, reserve design, and adaptive management (Section 2810(b)(5)).

Sections 6.2 and 6.3 of the Planning Agreement specify that data collection for preparation of the NCCP/HCP be prioritized and that it include independent scientific input. It also requires that the NCCP/HCP be based on the best available scientific information, that it provides a process for filling data gaps discovered during development of the NCCP/HCP, and contains guidelines for creation of an independent team of science advisors.

The Planning Agreement states that data collection was to be prioritized to provide 1) information on sound conservation strategies for the species and natural communities covered by the NCCP/HCP; 2) reserve design principles that address the needs of species, and the landscapes, ecosystems, and ecological processes in the Plan Area; 3) management principles and conservation goals that shape the adaptive management program; and 4) fill data gaps in order to better evaluate potential threats and stressors to the Covered Species. Scientific experts in various fields of ecology and conservation biology provided independent scientific input and analysis to assist in development of the OCTA NCCP/HCP and the data collection methodology. Because a majority of the remaining undeveloped land left in the Plan Area was currently protected as USFS lands, lands enrolled in the Central/Coastal NCCP/HCP Reserve, conserved lands under the Southern Orange HCP, or lands identified for development, a comprehensive land cover map of the Plan Area already existed as did comprehensive species accounts for the 22 proposed covered species. Data layers useful for conservation planning were then produced, including updated information on topography, hydrology, soils, and species occurrences. Using these raw data layers, knowledge of the habitat needs of the proposed covered species, and scientific expertise, the consultant team developed habitat suitability models for those 12 species that were on the final list for inclusion in the NCCP as Covered Species. These models reflected the best scientific information available at the time (i.e., prior to 2012) on the needs of the selected Covered Species and were used extensively during NCCP development to assess potential impacts and to guide critical tasks such as identifying biological goals and objectives and designing the preserve acquisition strategy.

The Science Advisory Panel was facilitated by Dr. Matt Rahn (San Diego State University) and was composed of Dr. Rahn, Dr. Peter Bowler (University of California, Irvine), Dr. Kristine Preston (Nature Reserve of Orange County and U.S. Geological Survey), Trish Smith (M.S., The Nature Conservancy), and Bruce DiGennaro (Facilitator). The members of the Science Advisory Panel have extensive experience in the design of wildlife, habitat, and ecosystem monitoring programs; open space conservation; the sensitive habitats that occur within the Plan Area; the impacts of nonnative invasive species on threatened and endangered species; and the development of appropriate management and mitigation programs. Dr. Preston and Ms. Smith both have extensive experience in the management and monitoring of coastal sage scrub species

including the California gnatcatcher and the cactus wren, especially within the Plan Area. The Science Advisory Panel convened once during development of the OCTA NCCP/HCP and provided written guidance on a broad range of issues. The panel directly commented on the conservation strategy for the Covered Species, the reserve design, what data gaps existed and how to fill them, and monitoring and adaptive management plans. The panel also provided input on which species should be covered and why, what mapping should be done, the NCCP/HCP permit term, the geographic extent of the NCCP/HCP, Covered Activities, and the Preserve Area Adaptive Management and Monitoring strategy.

Much of the baseline information gathering and mapping of the sensitive biological resources within the Plan Area were already underway when the Science Advisory Panel was formed and this information was used by the panel members during their analysis. Members of the Science Advisory Panel were familiar with conservation planning principles, the natural communities and sensitive species in the Plan Area, and had no affiliation to either OCTA or the Wildlife Agencies. They provided an objective assessment of the 1) process for selecting the Covered Species, 2) Covered Species accounts, 3) natural community profiles, 4) predicted species' distribution models and current occupancy data for the Covered Species, 5) NCCP/HCP conservation goals, and 6) the overall conservation strategy. The Science Advisory Panel issued their final report in July of 2011 (Rahn et al. 2011), which states that

> "*The OCTA is to be praised for its use of M2 funding to purchase ecologically significant additions to and linkages between existing reserves, and to create meaningful restoration projects that enhance the ecological condition of preserved sites. This is an enlightened amelioration strategy, and goes far beyond that which could be accomplished by merely mitigating roadway improvement impacts within existing easements*."

As mentioned previously, CBI was also hired to conduct a formal assessment of the natural habitats in the Plan Area in order to identify core habitat areas and linkages where OCTA could target its acquisitions. The objectives of the assessment were to: 1) develop an objective, science-based process to focus decision-making on regional conservation priorities; 2) use existing data and apply NCCP tenets of conservation planning; 3) map the distribution of conservation values of undeveloped lands in the Plan Area, including both protected and unprotected lands; 4) identify components of a regional reserve network, focusing on adding to existing reserve areas to expand large core habitat areas with habitat linkages between them to enhance their persistence; 5) develop specific conservation objectives to maximize conservation values for each core and linkage area; and 6) 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 (CBI 2009).

CBI was also consulted extensively on the development of the adaptive management program (Chapter 7). CBI provided guidance on NCCP/HCP goals and objectives, which were developed at the landscape-level, natural community-level, and species-level. Based on CBI recommendations, Preserve-level objectives will meet adaptive management guidelines set forth in Atkinson et al. (2004) and refined in later documents (e.g., Hierl et al. 2007; Lewison and Deutschman 2014).

Therefore, CDFW finds that the OCTA NCCP/HCP has been developed consistent with the Planning Agreement process for the collection of data and independent guidance to meet scientifically sound principles for the conservation of species.

The Planning Agreement requires coordination with federal wildlife agencies with respect to the federal Endangered Species Act (2810(b)(6)).

Section 4.5 of the Planning Agreement states that the NCCPA requires coordination with USFWS regarding the federal ESA. The EOC working group representatives, consultants, and the Wildlife Agencies held frequent meetings to address project coordination and technical issues during the preparation of the NCCP/HCP (Section 1.4.2). Wildlife Agency staff also provided review and guidance on a number of key elements of the NCCP/HCP including compliance with federal ESA and the NCCPA.

Therefore, CDFW finds that the OCTA NCCP/HCP has been developed consistent with the Planning Agreement process requiring coordination with federal wildlife agencies with respect to the federal ESA.

The Planning Agreement encourages concurrent planning for wetlands and waters of the United States (Section 2810(b)(7)).

Section 2.5 of the Planning Agreement states that the Parties agree to work together to explore the feasibility of undertaking concurrent but separate planning regarding Clean Water Act and/or Fish and Game Code section 1600 *et seq.* authorizations. The NCCP/HCP provides a summary of all applicable state and federal laws including the federal and state wetland laws and regulations (Chapter 1.3.5). According to the NCCP/HCP, EOC working group representatives, consultants, and the Wildlife Agencies held frequent meetings to address project coordination and technical issues during the preparation of the NCCP/HCP (Section 1.4.2). The EOC working group included a representative from the U.S. Army Corps of Engineers (ACOE) and CDFW staff familiar with the Lake and Streambed Alteration Program. The Section 404 permitting process is expected to be streamlined substantially as a result of the NCCP/HCP due to pre-NCCP/HCP coordination with the Los Angeles District of the ACOE (Section 1.3.5). Appendix E of the NCCP/HCP outlines the process for submittal of project-level Notifications pursuant to Fish and Game Code section 1600 *et seq.* and the issuance of individual Lake and Streambed Alteration Agreements for the covered freeway improvement projects.

Therefore, CDFW finds that the OCTA NCCP/HCP has been developed consistent with the Planning Agreement process that encourages concurrent planning for wetlands and waters of the United States.

The Planning Agreement establishes a process for interim project review (Section 2810(b)(8)).

Section 6.6 of the Planning Agreement outlined a process for Wildlife Agency review of M2 covered freeway improvement projects initiated prior to NCCP/HCP approval. The purposes of the interim project review process were to ensure that these discretionary projects did not undermine the conservation strategy of the NCCP/HCP and to provide an opportunity for agency coordination. OCTA was required to notify the Wildlife Agencies about proposed projects or activities requiring their discretionary approval that had the potential to adversely impact Covered Species and natural communities within the Plan Area. These projects had approved environmental documents or environmental documents in preparation that would precede the approval of the NCCP/HCP. These environmental documents acknowledged the biological goals of the NCCP/HCP and provided mitigation consistent with the NCCP/HCP conservation strategy. Some covered freeway improvement projects were constructed prior to NCCP/HCP approval

(e.g. Westbound 91 Widening Project). These interim projects were reviewed by the Wildlife Agencies and no direct take of listed or candidate species due to project implementation was authorized pursuant to applicable state and federal laws. CDFW review and approval followed the interim planning process as identified in the Planning Agreement.

Therefore, CFDW finds that the OCTA NCCP/HCP was developed consistent with the Planning Agreement requirement for an interim review process.

The Planning Agreement establishes a process for public participation (Section 2810(b)(9)).

Section 6.4 of the Planning Agreement stipulated that the preparation of the NCCP/HCP be an open and transparent process with an emphasis on obtaining input from a variety of public and private interests. The planning process was to utilize the EOC and the public outreach plan established under M2, as well as publication of notices and draft documents to provide opportunities for thorough public participation.

The EOC was formed in 2007, following approval by the OCTA Board of Directors. The EOC makes recommendations on the allocation of environmental freeway mitigation funds and will monitor the implementation of the NCCP/HCP. Composed of 12 members, the EOC has been meeting on a monthly basis to advance implementation of key M2 projects, including the EMP. The group has been responsible for the oversight and review of the 5-year M2 Early Action Plan to evaluate, select, and fund preserve acquisitions and restoration projects. The EOC continues to meet monthly to discuss issues related to the OCTA NCCP/HCP. All meetings are open to the public, and at each meeting, members of the public are given the opportunity to express opinions or provide recommendations or comments to the EOC. Since its inception in 2007, the EOC has met more than 80 times and has provided significant input on the development of the NCCP/HCP.

In addition to the monthly meetings, OCTA distributed a letter package in December 2008 to a list of 800 local governments, landowners, property managers, conservation organizations, and community groups to inform the public on the purpose of the mitigation programs and build an inventory of potential conservation sites. As a result, OCTA collected additional property information on more than 50 Plan Area properties, with approximately 58,000 acres being evaluated for acquisition and restoration.

In April 2009, the public was invited to present their property proposals before the EOC at a public workshop. The invitation letter was sent to the same 800 stakeholders. A total of 24 proposals were presented to the EOC during the public workshop and at EOC meetings.

In 2015, OCTA held three workshops on public access of the Preserves and invited representatives from interested user groups (i.e., equestrian, mountain biking, and hiking), other local land management entities (i.e., County Parks, local Audubon Society, IRC, and Center for Natural Lands Management), and the Wildlife Agencies. These workshops provided a forum for user groups to discuss their preferred access routes into and through the Preserves, and the types and duration of access that would be allowed in each of the Preserves. These workshops also gave OCTA an opportunity to educate the user groups on the management and monitoring requirements of the NCCP/HCP for each of the Preserves.

Pursuant to Fish and Game Code Section 2815, all draft documents and materials were made available to the public in a timely manner, EOC meetings were held regularly, and interested

organizations and individuals were engaged through public workshop events. OCTA has also provided public access to many of the documents related to the development of the NCCP/HCP through their website: http://www.octa.net/Measure-M/Environmental/Freeway-Mitigation/Conservation-Plan/. This includes all materials presented at the public workshops, CEQA-related documents, minutes from the EOC meetings, and the acquisition properties list.

Therefore, CDFW finds that the OCTA NCCP/HCP was developed consistent with the Planning Agreement with regard to public participation.

The Planning Agreement requires that draft documents associated with the NCCP/HCP that are being considered for adoption be available for review and comment 60 Days prior to adoption (Section 2810(b)(9), pursuant to Section 2815)).

Section 6.4.5 of the Planning Agreement stated that the public will be given the opportunity to review and comment on the NCCP/HCP prior to its adoption. A Notice of Preparation (NOP) for an EIR/EIS was released on December 3, 2010 and comments were accepted until January 10, 2011. The NOP was published in several regional newspapers, including the *Excelsior*, *Nguoi Viet*, and *The Orange County Register*. In addition, a public scoping meeting was held on December 15, 2010 with verbal and written comments being received. By the close of the scoping period, six letters representing comments from six organizations had been received. The Draft NCCP/HCP (including a draft of the IA as an appendix) and the Draft EIR/EIS for the NCCP/HCP were released on November 6, 2014. The review period was 90 days, from November 7, 2014 through February 6, 2015. OCTA held two public meetings to receive public comment on the NCCP/HCP and Draft EIR/EIS: one on November 30, 2014 in the City of Orange and the other on December 3, 2014 in Rancho Santa Margarita. During the review period, a total of 37 comments were received from various interested parties. The Final NCCP/HCP and EIR/EIS were approved in November 2016.

Therefore, CDFW finds that the OCTA NCCP/HCP was developed consistent with the Planning Agreement regarding review of draft documents.

Finding 4.1.2 **CDFW finds that the NCCP/HCP integrates adaptive management strategies that are periodically evaluated and modified based on information from the monitoring program and other sources, which will assist in the conservation of Covered Species and ecosystems within the Plan Area (Section 2820(a)(2)).**

Chapter 7 *Management and Monitoring* describes the adaptive management and monitoring requirements of the OCTA NCCP/HCP.

Section 2805(a) of the Fish and Game Code defines adaptive management as the use of the results of new information gathered through a monitoring program and other sources to adjust management strategies and practices to assist in providing for the conservation of Covered Species. In general, adaptive management involves the annual reevaluation of Preserve management activities based on Covered Species' and natural community responses to previous management actions. Adaptive management is a key component of any conservation plan and provides a strategy to deal with the changes and variability of natural systems. OCTA has committed to a comprehensive, funded, adaptive management program to ensure that the Covered Species and natural communities on the Preserves persist in perpetuity (Chapter 7). Through adaptive management, the conservation strategy of the NCCP/HCP will be adjusted on an annual

basis to ensure that the most up-to-date information is utilized in achieving the biological goals and objectives (Section 7.2.7).

A basic framework for adaptive management has been included in the OCTA NCCP/HCP and 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) (Section 7.2.7). Noteworthy is that OCTA consulted with CBI, an independent group that provides scientific expertise to support the conservation and recovery of biological diversity, to refine the adaptive management program. The adaptive management program will include setup, planning, and action phases (see Section 7.2 and Figure 7–1); however, details concerning how the actual feedback loop will be structured and how management and monitoring will be prioritized will be developed in synchrony with the NCCP/HCP monitoring program (see Finding 4.1.7) and individual Preserve RMPs. An RMP will be developed for each acquisition parcel (i.e., Preserve) during the first two years of NCCP/HCP implementation (Section 7.2.4). The NCCP/HCP requires that each Preserve have an RMP that includes an adaptive management component (Section 7.2.4). The RMPs will be reviewed and revised once every five years, or as warranted, to address adaptive management and monitoring changes relevant to the Covered Species and their associated habitats. The adaptive management program is designed to ensure that the biological goals and objectives for Covered Species and their associated habitats are met (Chapter 5).

OCTA is responsible for implementing the monitoring and adaptive management program. These responsibilities include, but are not limited to, designing the integrated adaptive management and monitoring programs, gathering data, maintaining databases, identifying the need to modify the monitoring program, defining implementation changes and determining how to make changes, developing annual work plans, regularly reporting to the EOC (Section 8.2.1.5), and annually reporting to the Wildlife Agencies (Section 8.2.3). OCTA will be advised by and coordinate with the Wildlife Agencies, other land management entities in the Plan Area, the EOC, and the public. OCTA is also obligated to coordinate monitoring efforts with other regional conservation/monitoring programs such as NCC and the San Diego Management and Monitoring Program (SDMMP; Section 7.2.3.3).

Additional responsibilities include prioritizing NCCP/HCP components, disseminating information, developing annual and long-term work plans, and facilitating input from the public and outside scientists. Preserve managers, who will be in charge of day-to-day activities within the Preserves, will contribute to annual work plans and formulate adaptive management recommendations for the NCCP/HCP as a whole in collaboration with other Preserve managers and OCTA (Chapter 7).

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 trends of conserved resources, 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 the Preserves. The monitoring and adaptive management program consists of three main components: 1) monitoring; 2) management; and 3) evaluation (Section 7.2.7.4). Baseline surveys of the Preserves have already been conducted (Bonterra Psomas 2013a; 2013b; 2014; 2015); and the results of these surveys will provide the foundation for future assessments of status and trends, as well as threats and stressors, to the Covered Species and vegetation communities (i.e. effectiveness monitoring).

The baseline biological surveys were conducted in 2012 on the Ferber Ranch, Hafen, O'Neill, Saddle Creek South, and Hayashi Preserves (Bonterra Psomas 2013a, 2013b); on the MacPherson

Preserve in 2014 (Bonterra Psomas 2014); and on the Aliso Canyon Preserve in 2015 (Bonterra Psomas 2015; Section 5.4.2). OCTA will update these surveys every four years. Results from these surveys coupled with the other Plan Area monitoring efforts such as those conducted by NCC, IRC, and County Parks will provide population estimates for some of the Covered Species at both the Preserve and Plan Area level. Population trends observed at the Preserve level can be compared to trends seen across the Plan Area and vicinity. Management actions will be based on thresholds identified in the RMPs, and can be modified if these thresholds are triggered. For example, if a species shows a population decline at the Preserve level but not across the Plan Area, then a management action could be implemented such as habitat restoration or closure of a particular area to the public.

In southern California, a standardized California gnatcatcher survey across multiple jurisdictions has not been implemented in the entire 25+ year history of the NCCP program. In 2016, California gnatcatcher surveys were conducted across six counties in the South Coast Region, including the Plan Area. This effort was organized by USFWS and USGS and funded by multiple agencies. Survey design, protocols, survey sites, and results can be viewed on the SDMMP website: http://portal.sdmmp.com/. OCTA participated in the surveys, which will provide information on California gnatcatcher occupancy across the region. Results of this monitoring effort will also provide valuable information on whether the open space design is functioning for California gnatcatcher as originally intended when regional planning efforts were initiated in the early 1990s. Vegetation and threat covariate data were also collected to better understand California gnatcatcher habitat relationships and management needs across protected lands in southern California. Results of this study will be used by OCTA to adjust management strategies for the Preserves to benefit California gnatcatcher.

Lastly, adaptive management decisions will also be influenced by studies undertaken in the Plan Area funded by NCC, the ESA Section 6 grant program, CDFW's Local Assistance Grant (LAG) program, and graduate student studies from local universities such as University of California, Irvine (UCI). For example, NCC recently studied the effects of recreation on species covered under the Central/Coastal NCCP/HCP (Patten 2017). The results of this study will be used to adjust management strategies for the OCTA NCCP/HCP Preserves to balance recreational uses/needs with Covered Species conservation/recovery. Other examples of previously implemented or ongoing projects in the Plan Area that will inform OCTA NCCP/HCP Preserve management include cactus scrub restoration, cactus wren translocation studies, aerial weed surveys, rare plant monitoring, nonnative plant removal/habitat restoration studies, and presence/absence surveys of Covered Species such as cactus wren, California gnatcatcher, western pond turtle, and arroyo chub. Future NCC projects relevant to OCTA Preserve management include herpetological surveys, the preparation of a rare plant management plan, and preparation of coastal sage scrub and oak woodland monitoring protocols.

Adaptive management revisions will be made consistent with the NCCP/HCP's Clerical and Administrative Changes (Section 8.5.2) where required. OCTA is required to maintain a complete administrative record of all NCCP/HCP revisions resulting from the adaptive management program (IA Section 9.0).

Therefore, CDFW finds that the OCTA NCCP/HCP integrates adaptive management strategies that are periodically evaluated and modified based on information from the monitoring program and other sources, which will assist in the conservation of Covered Species and ecosystems within the Plan Area.

Finding 4.1.3 **CDFW finds that the NCCP/HCP provides for the protection of habitat, natural communities, and species diversity on a landscape or ecosystem level 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 (Section 2820(a)(3)).**

The OCTA NCCP/HCP is a multiple-species conservation plan that will function on a landscape/ecosystem level. A key component of the OCTA NCCP/HCP conservation strategy is the creation and in-perpetuity management of previously unprotected lands that are adjacent to or in the immediate vicinity of the large, connected system of currently protected lands within the Plan Area (Chapter 5). As stated previously, approximately 41 percent (209,351 acres) of the Plan Area is undeveloped, natural habitat, of which 156,819 acres (75 percent) is protected in some form, either through existing conservation easements, zoned as open space, or in public ownership with the expectation that it will remain as open space. The OCTA NCCP/HCP conservation strategy involved an analysis of the entire Plan Area on a landscape and ecosystem level to identify high-priority habitat areas to conserve that would further strengthen and connect these currently protected lands (Chapter 6; CBI 2009).

In 2000, the Friends of Harbors, Beaches, and Parks began the Green Vision Project aimed at mapping all of the non-protected lands in the Plan Area that could be targeted for acquisition. The organization published the first Green Vision Map in 2008 and has updated the map on an annual basis since then. Currently, the map includes parcel-level data (http://www.fhbp.org/projects/green-visionhtml).

As an initial planning step, OCTA funded CBI to conduct a conservation assessment of the non-protected areas identified on the Green Vision Map. The objectives of the assessment were to: 1) develop an objective, science-based process to focus decision-making on regional conservation priorities; 2) use existing data and apply NCCP tenets of conservation planning; 3) map the distribution of conservation values of undeveloped lands in the Plan Area, including both protected and unprotected lands; 4) identify components of a regional reserve network, focusing on adding to existing reserve areas to expand large core habitat areas with habitat linkages between them to enhance their function; 5) develop specific conservation objectives to maximize conservation values for each core and linkage area; and 6) 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 across the Plan Area (CBI 2009).

Using the Green Vision Map as the base, CBI (2009) identified 11 core habitat areas and four existing or potentially viable linkages that included both protected and unprotected natural lands (Figure 2–8). The designation of core habitat areas was based on conservation values, with a focus on areas of high landscape integrity, high biodiversity, large patch size, and to some degree, shape. An additional and more refined analysis identified individual parcels of unprotected natural lands within the larger core areas. These parcels were designated “priority conservation areas” based on their positions on the interior or edge of the core area and proximity to protected lands. The priority conservation areas were defined as unprotected lands for which acquisition would be a “no regrets” decision, based on their contribution to the regional reserve system (Appendix C.5). Only properties located in the core habitat or linkage areas were considered for acquisition by OCTA.

The Wildlife Agencies, in partnership with other members of the EOC, grouped the core area and linkage parcels into high, medium, and low acquisition priority for the protection of habitat, natural communities, and species diversity based on a biological evaluation that included presence of Covered Species, natural communities, ability to provide local or regional wildlife movement, and proximity to currently protected lands. These ranking recommendations were then presented to the OCTA Board for approval (Section 5.4). The properties that were eventually acquired by OCTA include: Ferber Ranch, Hafen, Hayashi, O'Neill, Saddle Creek South, MacPherson, and Aliso Canyon (Figures 5–1 and 6–1). All of these properties had been identified as high acquisition priorities.

All of the OCTA acquisitions were approved by the Wildlife Agencies through assurance letters (as previously noted) and monthly EOC coordination meetings. The Preserves will be permanently conserved by recordation of conservation easements (Section 7.2.4.1), and their long-term management will be funded by an endowment (Section 8.3.3). The Preserves are described in Section 5.4.2 of the NCCP/HCP and are summarized below, starting with the northernmost and continuing to the southernmost Preserve. The Preserves are shown in relation to the core habitat areas and linkages in Figure 6–1, and in relation to currently protected lands in Figure 6–3.

The Hayashi Preserve (299 acres) is located in the Chino Hills core habitat area and is adjacent to Chino Hills State Park, in the northern portion of the Plan Area. The Hayashi Preserve was identified as a priority conservation area due to high/very high landscape integrity and biodiversity. It supports chaparral, grassland, riparian, coast live oak, and California walnut woodland vegetation communities. Western pond turtle and bobcat have been observed on site (Section 5.4.2.4 and Figure 5–5; Bonterra Psomas 2013b).

The MacPherson Preserve (204 acres) is located in the Silverado-Modjeska area in the Northern Foothills core habitat area, in the eastern-central portion of the Plan Area. It was identified as a priority conservation area because of the diversity of habitat types found on the property, including southern mixed chaparral, coastal sage scrub, oak woodland, grassland, cliff/rock, and riparian. The MacPherson property occurs within the boundaries of the Cleveland National Forest (460,000 acres) and the Irvine Ranch Open Space (50,000 acres). Undeveloped land on the property is contiguous with larger areas of open space in the Santa Ana Mountains. Wildlife movement is relatively unhindered to the east of the property, with no major roads or development in that direction. The relatively undeveloped nature of the landscape is highly conducive to regional wildlife movement (Bonterra Psomas 2014). During biological surveys conducted in 2014, the following Covered Species were identified on the Preserve: intermediate mariposa lily, coast horned lizard, and orange-throated whiptail. The property also contains suitable habitat for many-stemmed dudleya, California gnatcatcher, bobcat, and mountain lion (Section 5.4.2.5 and Figure 5–6).

The four Preserves in the Trabuco Canyon area—Ferber Ranch, Hafen, O'Neill Oaks, and Saddle Creek South Preserves (each described separately below)—are located primarily in the Northern Foothills core habitat area (Section 6.2; Figures 6–2a and 6–4a). The Northern Foothills is a medium-sized core area 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 California gnatcatcher, cactus wren, and intermediate mariposa lily. The preservation and management of these four 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 Saddle Creek South Preserve (83 acres) is located at the western base of the Santa Ana Mountains in the Northern Foothills core habitat area, in the southeastern portion of the Plan Area in close proximity to the Saddle Creek South, Ferber Ranch, and O'Neill Oaks Preserves. It is adjacent to the 23-acre Live Oak Preserve, a Transportation Corridor Agency (TCA) mitigation parcel, and the 307-acre Saddle Creek North Preserve, owned and managed by The Conservation Fund. The Preserve lies between the Cleveland National Forest and Live Oak Canyon and its preservation protects wildlife movement between these two areas. A portion of the Preserve is designated critical habitat for the California gnatcatcher (Section 2.4.2.4; USFWS 2007b). Covered Species observed on site include intermediate mariposa lily and cactus wren (Section 5.4.2.7 and Figure 5–8; Bonterra Psomas 2013a).

The Hafen Preserve (48 acres) is located in Trabuco Canyon and is within the Northern Foothill core habitat area, also in the southeastern portion of the Plan Area. It is in close proximity to and due west of Ferber Ranch Preserve and the conserved, but presently undesignated, CDFW-owned Hafen property. It is also in close proximity to and east of the Saddle Creek South Preserve. The Hafen Preserve is 1,200 feet in elevation and supports a diversity of habitat types including chaparral, coastal sage scrub, riparian, and woodland. Cactus wren and intermediate mariposa lily have been identified on site (Bonterra Psomas 2013a). A majority of the site has been designated critical habitat for the California gnatcatcher, a designation based in part on the need to provide a low elevation corridor to facilitate regional movement by this species (Section 5.4.2.3 and Figure 5–4).

Ferber Ranch (396 acres) is located within a priority conservation area of the Northern Foothill and Santa Ana Mountains core habitat areas and is immediately adjacent to the CDFW-owned and managed Hafen property. It is also in close proximity to the Saddle Creek South, Hafen, and O'Neill Oaks Preserves. High quality upland and riparian habitats are found on Ferber Ranch including coastal sage scrub, chaparral, native grassland, riparian, and woodland (Figure 5–3). These habitats support many of the Covered Species including California gnatcatcher, cactus wren, orange-throated whiptail, intermediate mariposa lily, and bobcat (Bonterra Psomas 2013a). Although not an NCCP-covered species, the mountain lion has been documented using the site (OCTA unpublished data). This rich biodiversity may be attributed to the large amount of undeveloped land within and adjacent to the site, highly variable topography, relatively low disturbance, and connectivity to the Cleveland National Forest/Santa Ana Mountains and other protected lands within the Central/Coastal NCCP/HCP Central Reserve. Wildlife corridors have also been identified on the Preserve that facilitate wildlife movement between Trabuco Creek and the Cleveland National Forest (Section 5.4.2.2; County 1991).

The O'Neill Oaks Preserve (116 acres) is located in Trabuco Canyon and within the Northern Foothills core habitat area, also in the southeastern portion of the Plan Area and in close proximity to the Saddle Creek South, Hafen, and Ferber Ranch Preserves. It is adjacent to the 4,000-acre O'Neill Regional Park, which is County-owned and managed as open space. A portion of O'Neill Oaks Preserve is designated critical habitat for the California gnatcatcher, which has been documented on site (Bonterra Psomas 2013a). Other Covered Species documented on O'Neill include intermediate mariposa lily, orange-throated whiptail, cactus wren, and bobcat (Bonterra Psomas 2013a). Although not an NCCP-covered species, a mountain lion has been documented using the site (OCTA unpublished data). A wildlife movement corridor runs along the western edge of the property connecting the Cleveland National Forest through Trabuco Creek to protected lands in southern Orange County (Section 5.4.2.6 and Figure 5–7).

The Aliso Canyon Preserve (151 acres) is the most recent OCTA acquisition and was purchased in May 2015. It is located adjacent to the Aliso and Woods Canyon Wilderness Park (3,880 acres) in the San Joaquin Hills core habitat area, in the southwestern portion of the Plan Area. The Aliso Canyon Preserve was one of the last remaining privately owned parcels west of Aliso and Woods Canyon. It provides an important linkage between City of Laguna Beach conservation easement lands (165+ acres) and the Aliso and Woods Canyon Wilderness Park. This coastal property supports southern mixed chaparral, coastal sage scrub, cactus scrub, grassland, and cliff/rock habitats. Covered Species that occur on the property include intermediate mariposa lily, many-stemmed dudleya, and California gnatcatcher (Bonterra Psomas 2015; Section 5.4.2.1 and Figure 5–2).

In addition to land acquisition, OCTA has funded 11 restoration projects that benefit currently protected lands throughout the Plan Area and can be considered "equivalent conservation measures" under Fish and Game Code Section 2820(a)(3). These projects are described in Section 5.5.3 and Table 5–4 of the NCCP/HCP, shown on Figure 5–1, and include:

1. Agua Chinon/Bee Flat Canyon - 90.1 acres of chaparral, coastal sage scrub, grassland, elderberry scrub, oak woodland, and riparian restoration on lands owned by County Parks and managed by IRC.
2. Big Bend - 3.7 acres of coastal sage scrub and riparian woodland restoration owned by the City of Laguna Beach and managed by County Parks. The restoration is being conducted by the Laguna Canyon Foundation to enhance wildlife connectivity in the coastal portion of the Plan Area. The Big Bend parcel 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.
3. City Parcel - 53 acres of coastal sage scrub and riparian restoration within and adjacent to Trabuco Creek on land owned and managed by the City of San Juan Capistrano. The project will strengthen the Trabuco Creek Wildlife Linkage, which provides vital connections between the Central-Coastal NCCP/HCP and Southern Subregion HCP reserve systems.
4. Fairview Park - 23 acres of coastal sage scrub, grassland, riparian, and wetland restoration owned and managed by the City of Costa Mesa. The restoration will provide increased connectivity with the County's 90-acre Talbert Nature Preserve.
5. UCI Ecological Reserve - 8.5 acres of cactus scrub by NCC. This restoration site is located within the Central/Coastal NCCP/HCP Coastal Reserve and is a critical site for maintaining California gnatcatcher and cactus wren populations, and serves as a source of dispersing individuals for other areas.
6. Aliso Creek - 55 acres of coastal sage scrub, grassland, and riparian restoration on lands owned and managed by County Parks. This restoration project is being implemented by the Laguna Canyon Foundation to enhance a key movement area for wildlife that connects several large public open space areas. The site supports regionally significant populations of Covered Species such as least Bell's vireo and western pond turtle.
7. Chino Hills State Park - 19.5 acres of cactus scrub and riparian restoration on lands owned and managed CDPR. This restoration site provides habitat for cactus wren and least Bell's vireo.
8. Harriett Weider Regional Park - 8.2 acres of coastal sage scrub, grassland, and riparian restoration on land partially owned and managed by County Parks and the City of Huntington Beach.. The restoration will enhance an existing wildlife corridor and

connectivity to other protected areas in the coastal zone such as the CDFW-owned and managed Bolsa Chica Ecological Reserve.

9. Lower Silverado Canyon - 28.4 acres of coastal sage scrub and riparian restoration on lands owned by County Parks and managed by IRC. The restoration will improve connectivity with the Cleveland National Forest and Santiago Canyon.
10. North Coal Canyon - 5.5 acres of coastal sage scrub habitat within a key wildlife connectivity area owned and managed by the CDPR. The restoration is expected to improve wildlife movement under SR–91 by making habitat on the north side more attractive to wildlife; and
11. West Loma - 62.5 acres of coastal sage scrub, grassland, and riparian restoration on lands owned by County Parks and managed by IRC. The project also includes fence alignment around a key wildlife corridor in the vicinity of SR–241. With fencing improvement and nearby restored habitat, the crossing is expected to become more attractive to wildlife and improve connectivity, effectively increasing the area of available riparian and upland habitat for wildlife.

In summary, OCTA has performed mitigation/conservation actions in advance of NCCP Permit issuance to offset the anticipated impacts from the Covered Activities. The OCTA NCCP/HCP conservation strategy includes the acquisition of previously non-protected properties that are linked or in close proximity to currently protected lands, resulting in protection of habitat, natural communities, and species diversity on a landscape or ecosystem level. Biological diversity is enhanced at the landscape level because land that could have been lost to development has been conserved and will be managed for the benefit of multiple species, including both listed and non-listed species, which are often overlooked by other types of regulating mechanisms such as CEQA. For example, the bobcat has no formal state or federal designation and although recent studies have shown that it is negatively affected by habitat fragmentation (Lee et al. 2012; Poessel et al. 2014), bobcat-specific mitigation is not required under CEQA. Based on predicted habitat modeling all 1,232.5 acres of natural vegetation that has been conserved by OCTA is potential habitat for this species. Other non-listed species that the OCTA NCCP/HCP conservation strategy will benefit due to their presence on the Preserves or within the restoration project areas include California Species of Special concern such as the yellow warbler (*Dendroica petechia*), yellow-breasted chat (*Icteria virens*), northern harrier (*Circus cyaneus*), western spadefoot toad (*Spea hammondii*), as well as chaparral nolina (*Nolina cismontana*) (Bonterra Psomas 2013a, 2013b, 2014, 2015).

Fish and Game Code Section 2802 states that "NCCP planning promotes multispecies and multihabitat management and conservation by ensuring *appropriate mitigation that is roughly proportional* to impacts associated with the Covered Activities" (emphasis added). For the OCTA NCCP/HCP, impacts associated with the Covered Activities are to habitats already subjected to some form of edge effects, and in general, are of low quality. The 1,232.5 acres conserved by OCTA is high quality habitat that supports a diverse assemblage of natural landscapes and populations of Covered Species. The roughly proportional requirement cited above provides guidance on reasonable expectations for the design, size, and function of the OCTA NCCP/HCP Preserves. As identified through an independent assessment (CBI 2009), these targeted acquisitions support high quality vegetation communities that provide refugia habitat, local stepping stone/linkage habitat, and expand existing core habitat areas, which are an extremely valuable contribution to maintaining sustainable populations of the Covered Species within the Plan Area. Additionally, the 11 funded restoration projects complement the acquisition efforts

by improving the ecological integrity and biological function of protected lands within the Plan Area.

Therefore, CDFW finds that the OCTA NCCP/HCP provides for the protection of habitat, natural communities, and species diversity on a landscape or ecosystem level through the creation and long-term management of habitat reserves or other measures that provide equivalent conservation of Covered Species appropriate for land and aquatic habitats within the Plan Area.

Finding 4.1.4.A **CDFW finds that the development of reserve systems and conservation measures in the Plan Area provides, as needed for the conservation of species: conservation, restoration, and management of representative natural and semi-natural landscapes to maintain the ecological integrity of large habitat blocks, ecosystem function, and biological diversity (Section 2820(a)(4)(A)).**

The OCTA NCCP/HCP conservation strategy of land acquisition and habitat restoration provides for the conservation of species by filling in "conservation gaps" in the Plan Area. This has been accomplished through acquisition of previously non-protected land adjacent to or in the immediate vicinity of large currently protected habitat blocks. An important consideration in the CBI (2009) conservation analysis was landscape integrity, or the "intactness" of the landscape. CBI's analysis considered land uses and cover types (including different vegetation communities, agricultural uses, and development types), as well as road types and associated impact buffers. Intact habitats maintain ecological processes, enhance resilience to disturbance events, accommodate long-term ecosystem adaptation, and allow for the movement of wide-ranging animals such as mountain lion and mule deer. The Science Advisors Report (Rahn et al. 2011) states that the OCTA NCCP/HCP conservation strategy of purchasing inholdings and expanding conserved areas, emphasizing linkage and connectivity, and raising ecological conditions through restoration is "innately valid". They go on to say that "this approach has regional benefits that extend well beyond the actual impact area for the (Covered Activities) and that preserving additional habitat outweighs limited restoration efforts or those of mitigating isolated impacts." CBI's (2009) report further strengthened the OCTA NCCP/HCP conservation strategy by identifying lands within the Plan Area that are priority conservation areas, which provided an ecological basis of where OCTA should target their acquisition efforts.

Of the undeveloped, natural habitat in the Plan Area, 75 percent (156,819 acres) is protected in some form, either through existing conservation easements, by zoning as open space, or in public ownership with the expectation that it will remain as open space. The OCTA NCCP/HCP conservation strategy has resulted in an additional 1,296 acres of conservation and 357 acres of habitat restoration within the Plan Area (described under Finding 4.1.3 above and Chapter 5). These areas collectively provide for the conservation, restoration, and management of representative natural communities and landscapes present within the Plan Area. Table 6–3 in the NCCP/HCP provides the acreages of the eight major natural communities present in the Plan Area including chaparral, coniferous forest, grassland, riparian, scrub, water, wet meadow/marsh, and woodland. These communities support diverse assemblages of species, and are all represented on the currently protected lands within the Plan Area. In addition, all of the communities, except for coniferous forest, are also represented on the OCTA Preserves and/or the 11 restoration areas (Tables 5–3 and 5–5), including key components of these communities such as cactus scrub and native grassland patches. Therefore, conservation of representative natural communities in the Plan Area on currently protected lands, OCTA Preserves, and the restoration sites collectively provides for the conservation of species by maintaining biological diversity in the Plan Area.

The MacPherson Preserve is located in the Santa Ana Mountains core habitat area, which according to CBI (2009) constitutes the largest block of high integrity habitat in the Plan Area (Figure 6–1). This core area functions as the "backbone" of the regional reserve system due to its size, location, level of existing conservation, and connectivity to other core areas both within and outside the Plan Area (CBI 2009). The Ferber Ranch, Hafen, O'Neill, and Saddle Creek South Preserves are all 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. By conserving more land in these two core areas, the OCTA NCCP/HCP helps to ensure they continue to have high habitat integrity by reducing the direct and indirect effects of urbanization. Ecosystem function is enhanced through protection of larger blocks of habitat, which reduces edge effects. Urbanization not only converts natural lands to development, but supporting infrastructure often further fragments surrounding open space areas. As mentioned above, the OCTA NCCP/HCP properties will reduce fragmentation by linking larger blocks of natural lands to each other, which ensures that gene flow remains viable. This also helps to maintain the ecological integrity and ecosystem function of the large habitat blocks. This is especially important for species such as the cactus wren and bobcat.

Ferber Ranch Preserve supports wildlife movement along Trabuco Creek. Trabuco Creek connects to habitat in the Cleveland National Forest, which extends beyond the boundaries of the Plan Area to the south and east. Larger mammals such as bobcat and mountain lion use the creek habitat for movement (Section 5.4.2.2). Wildlife cameras installed by OCTA have captured both species using the property (OCTA unpublished data). The Ferber Ranch Preserve was zoned for 188 residential units and was one of the largest landholdings within the Foothill/Trabuco Specific Plan area. Acquisition and protection of the Ferber Ranch Preserve will help ensure that Trabuco Creek continues to function as a wildlife movement corridor and reduce the amount of habitat fragmentation in this important core habitat area.

Some of the Preserves will also function as stepping stone habitat for animal dispersal, which helps maintain genetic flow between core habitat areas. The four properties acquired in Trabuco Canyon (Ferber Ranch, Hafen, O'Neill Oaks, and Saddle Creek South,) fill a habitat gap for the cactus wren by conserving approximately 255 acres of potentially suitable habitat and approximately 26 known use areas between the Central/Coastal NCCP/HCP Central Reserve and lands protected under the Southern Orange HCP. Previous cactus scrub restoration efforts by NCC have shown that line of site connections between isolated populations of cactus wren are important for dispersal and gene flow for this species (Rahn et al. 2011). The Trabuco Canyon Preserves may provide an important stepping stone linkage not only for cactus wren, but also for other species that use the natural landscapes these Preserves support such as mountain lion and bobcat. As the Science Advisor Report (Rahn et al. 2011) stated, "stepping stones link habitat allowing meta-population communication that would be restricted were expansion of a reserve the sole consideration". They go on to say that linkages are not just migration corridors, but they are connectors that assist in the sustenance of biodiversity, even if only for organisms that can fly. Lastly, by conserving properties that support a diversity of landforms, numerous species that depend on these habitats are also conserved.

The 299-acre Hayashi Preserve is immediately adjacent to the 14,173-acre Chino Hills State Park and was zoned for low-density residential housing. Conserving the Hayashi Preserve will help maintain and potentially improve the ecological integrity and biological function of the State Park by 1) protecting wildlife migration and connectivity between the Puente Hills to the northwest, the Chino Creek/Prado Reservoir in San Bernardino County to the east, and the Santa Ana Mountains to the south, 2) supporting species that are declining in this portion of the Plan Area such as western pond turtle and least Bell's vireo, and 3) buffering the park from edge effects and

urbanization. The Hayashi Preserve supports western pond turtle habitat that has been degraded due to previous land use practices, including cattle grazing. OCTA has committed to active restoration of the wetland/riparian habitats that occur along Carbon Canyon Creek. OCTA has fenced the entire Hayashi Preserve to prevent stray cattle from further degrading the riparian habitats and has committed to restoring the riparian vegetation as part of the long-term management activities. This effort will improve habitat for western pond turtle as well as improve function of the creek habitat for wildlife movement. Currently, Carbon Canyon Creek flows from open space lands in Riverside County to open space lands in southeastern Los Angeles County. By conserving the Hayashi Preserve, OCTA has ensured the land will retain its ecological integrity and ecosystem function, and ensure this portion of Carbon Canyon Creek can continue to support wildlife movement.

The MacPherson and Aliso Canyon Preserves also maintain the ecological integrity of large habitat blocks, as they are directly adjacent to large blocks of currently protected lands in the coastal and central portions of the Plan Area, respectively. As such, they will help to provide buffering from urban edge effects. The Aliso Canyon Preserve is located in the western portion of the Plan Area and falls within the 18,000-acre Central/Coastal NCCP/HCP Coastal Reserve. The Aliso Canyon Preserve will help ensure that habitat connectivity on a local scale will be maintained in this portion of the coastal zone. The Aliso Canyon Preserve is adjacent to the County-owned Aliso and Woods Canyon Wilderness Park, which includes a portion of Aliso Creek. Species such as the California gnatcatcher, which has been documented on the Aliso Canyon Preserve, south and north of the Preserve, and in the Aliso and Woods Canyon Wilderness Park, could potentially use Aliso Creek as a movement corridor for dispersal to the east. Although not identified in the CBI (2009) report as an important linkage, Aliso Creek supports natural habitat between the Central and Coastal reserves.

Ecosystem function and increased biological diversity will also be maintained and improved by the restoration projects described in the OCTA NCCP/HCP, which help create larger, more complex and diverse habitat areas to attract a diversity of species. Riparian restoration projects in particular will improve the ecosystem function of riparian zones as wildlife movement and habitat connectivity corridors, as well as areas of high biodiversity (Section 5.5).

The West Loma restoration project is located within an important local wildlife movement corridor within the Santa Ana watershed (Section 5.5.3.11). It includes the restoration of 62.5 acres of grassland, coastal sage scrub, and riparian habitats and the realignment of wildlife fencing adjacent to SR–241. Wildlife mortality has been documented along this portion of SR–241 due to gaps in the existing fence alignment; larger species are crossing the road at-grade versus using the existing undercrossing. Therefore, with fencing improvements and the restoration of habitat along the wildlife corridor, the undercrossing is expected to become more functional and attractive to larger mammal species such as deer, bobcat, and mountain lion.

The North Coal Canyon restoration project will facilitate wildlife movement between the Plan Area and adjacent open space in Riverside and San Bernardino counties (Section 5.5.3.10). The restoration site is within 200 feet of the Santa Ana River channel and is a vital link between the surrounding Puente-Chino Hills, the Cleveland National Forest, and the Santa Ana Mountains. The North Coal Canyon restoration project is expected to improve wildlife movement under SR–91 by making the habitat north of the highway more attractive to wildlife.

The 53-acre City Parcel, which is located in the Trabuco and San Juan Creek linkages, includes 13 acres of riparian and 40 acres of coastal sage scrub restoration (Section 5.5.3.3). Restoration began in 2011 and has included the removal of over 100,000 nonnative plants, 25,000 pounds of

illegally dumped concrete, 2,000 pounds of trash and compassionate removal of three homeless encampments (Ostensen and Associates 2015). The main nonnative plant species removed were artichoke thistle, arundo, and mustard; these species do not support a diversity of wildlife. Therefore, habitat restoration on the City Parcel will contribute to the improved ecological function of the Trabuco Creek and San Juan Creek linkages by restoring native habitats that support a wide-range of sensitive species including orange-throated whiptail, western pond turtle, California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, and bobcat, as these Covered Species are known to occur within or in the vicinity of these linkages (Ostensen and Associates 2010, 2015).

The Aliso Creek restoration project is located in the San Juan Creek 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 11 acres of riparian habitat and 44 acres of coastal sage scrub/upland 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 (Ostensen and Associates 2012). The restoration plan includes specific actions to benefit and improve western pond turtle habitat. This restoration project will improve the ecological function of the watershed by removing nonnative arundo and replanting with native riparian species. This will improve the creek's ability to support wildlife movement. By protecting and restoring natural landscapes near the coast, numerous sensitive species have a greater chance of maintaining genetic diversity across their ranges, which includes lands outside the Plan Area.

Therefore, CDFW finds that the acquisition of the OCTA Preserves and conservation measures in the form of habitat restoration within the Plan Area provides, as needed, for the conservation of species, conservation, restoration, and management of representative natural and seminatural landscapes to maintain the ecological integrity of the larger existing habitat blocks, ecosystem function, and biological diversity.

Finding 4.1.4.B **CDFW finds that the development of reserve systems and conservation measures in the Plan Area provides, as needed for the conservation of species: the establishment of one or more reserves or other measures that provide equivalent conservation of Covered Species within the Plan Area and linkages between them and adjacent habitat areas outside the OCTA NCCP/HCP Plan Area (Section 2820(a)(4)(B)).**

Successful conservation of sensitive species requires the protection of large, inter-connected blocks of habitat to reduce the risk of local extirpation and maintain the genetic connectivity of populations (Soule and Simberloff 1986; Beier and Loe 1992). This is particularly important for species that are dependent on metapopulation dynamics (i.e., species regionally maintained through permanent source populations that are periodically interconnected through the irregular establishment of intervening satellite populations), have dispersal constraints, or that naturally occur at low densities.

As discussed previously in Finding 4.1.4.A, the Preserves are linked to each other or to other areas of currently protected land within the Plan Area, either directly (adjacent) or indirectly (via stepping stone linkages). Also, as discussed under Finding 4.1.4.A, several restoration projects will improve habitat linkages by restoring riparian habitat (such as at the Aliso Creek and City Parcel sites) and improving wildlife crossings (such as at the North Coal Canyon and West Loma

sites). All of the Preserves and restoration areas are embedded in a large network of currently protected lands in the Plan Area. The Preserves also provide linkages between currently protected lands within the Plan Area and adjacent habitat areas outside of the Plan Area. Some linkages within this network are more vulnerable than others.

CBI (2009) focused their evaluation on connectivity *between* core habitat areas, focusing on areas critical to maintaining or enhancing connectivity, thus contributing to the long-term persistence of key species and habitats in the Plan Area. Using these criteria, four existing or potentially viable core linkages were identified within the Plan Area: Coal Canyon, Irvine, Trabuco Creek, and San Juan Creek (Figure 2–8). OCTA focused on funding restoration projects in the Coal Canyon, Trabuco Creek, and San Juan Creek linkages because the Irvine Linkage is already mostly protected and improvements to this linkage have been planned for by the Irvine Wildlife Corridor Plan (City of Irvine 2012; Cotton/Bridges Associates and EcoSystems Restoration Associates 2004).

The Coal Canyon linkage, a SR–91 wildlife undercrossing, is the only viable connection between the Santa Ana Mountains and the Chino Hills and is critical to maintaining movement for wide-ranging species between these two core habitat areas (CBI 2009). This linkage is protected and will remain so in perpetuity; however, use of the linkage by wildlife may be inhibited by a lack of vegetation, as well as high noise levels from the highway. In an effort to improve this linkage, OCTA funded the North Coal Canyon restoration project, which will enhance and restore coastal sage scrub/Riversidian alluvial fan sage scrub on the north side of SR–91 in an effort to make it more attractive to wildlife use and movement (Section 5.5.3.10).

The Trabuco Creek Linkage offers a second connection between the San Joaquin Hills and Northern Foothills core areas. This linkage extends from the southern end of the San Joaquin Hills through the Salt Creek corridor, crosses I–5 at Trabuco Creek, and continues through County-conserved lands into the Northern Foothills. Approximately 60 percent of this linkage is protected and key acquisitions would be required in the vicinity of the City of San Juan Capistrano to complete/protect this corridor (CBI 2009). The linkage maintains high biological/landscape integrity as native vegetation covers 74 percent of the area. In an effort to improve the biological functions of this linkage, OCTA funded restoration of the 53-acre City Parcel, which includes 13 acres of riparian and 40 acres of coastal sage scrub restoration. Restoration began in 2011 and has included the removal of over 100,000 nonnative plants, 25,000 pounds of illegally dumped concrete, 2,000 pounds of trash and compassionate removal of three homeless encampments (Ostensen and Associates 2015). The main nonnative plant species that have been removed include artichoke thistle, arundo, and mustard, species which do not support a diversity of wildlife. Habitat restoration on the City Parcel will contribute to the improved ecological function of the Trabuco Creek Linkage, especially for orange-throated whiptail, western pond turtle, California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, and bobcat. All of these Covered Species are known to occur within or in the vicinity of this linkage.

The San Juan Creek Linkage is a potential viable connection between the San Joaquin Hills and the Southern Foothills core area via Trabuco and San Juan creeks. The southward portion of the connection includes drainages, slopes, and ridgelines, although movement across portions of the linkage may be constrained by topography. An estimated 53 percent of this linkage is currently protected, with 72 percent cover of native vegetation (CBI 2009). Biological function of this corridor would also be improved by the City Parcel restoration efforts.

As stated previously, the Aliso Canyon Preserve is located in the San Joaquin Hills core habitat area. The Aliso Canyon Preserve is adjacent to County Parks–owned open space that includes a portion of Aliso Creek. Species such as the California gnatcatcher, which has been documented on both the Aliso Canyon Preserve and the County-owned lands, could potentially use Aliso Creek as a movement corridor. Although not identified in the CBI (2009) report as an important linkage, Aliso Creek supports wildlife movement habitat for species within the Coastal Reserve. As previously discussed, OCTA has funded the restoration of 55 acres of Aliso Creek that is within the vicinity of the Aliso Canyon Preserve. This restoration project will improve the ecological function of the watershed by removing nonnative arundo and replanting with native riparian species. The restoration project also includes the restoration of 44 acres of coastal sage scrub/upland habitats. These habitats buffer the riparian vegetation and improve the creek's ability to support wildlife movement. By protecting and restoring more natural landscapes in the coastal portion of the Plan Area, sensitive species such as intermediate mariposa lily, many-stemmed dudleya, cactus wren, California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, western pond turtle, and bobcat have a greater chance of maintaining genetic diversity across their ranges.

In summary, four critical linkages for wildlife movement were identified within the Plan Area and although the majority of them are already protected, urban development hinders actual use by many wildlife species. Acquisition opportunities in these linkages were limited but OCTA funded restoration of key areas within three of the linkages to improve biological function and potential use by wildlife. Enhancement of these existing linkages helps to maintain connectivity between currently protected lands and OCTA Preserves/restoration areas within the Plan Area. The Preserves/restoration areas are also linked to adjacent habitat areas outside the Plan Area. They are embedded within the current system of protected lands within and outside the Plan Area, including the Cleveland National Forest, CDPR lands, lands protected under the Central/Coastal NCCP/HCP and Southern Orange HCP, and lands protected by non-profit organizations such as Audubon and the Conservation Fund. The protected lands in the northeastern portion of the Plan Area are linked to adjacent habitat in southeastern Los Angeles County and southwestern San Bernardino County via Chino Hills State Park and the Puente-Chino Hills Wildlife Corridor. The protected lands in the eastern portion of the Plan Area extend east into western Riverside County, continuing via the Cleveland National Forest and into lands protected under the Western Riverside County Multiple Species Habitat Conservation Plan. The protected lands in the southern portion of the Plan Area are linked to adjacent habitat in northwestern San Diego County on the Marine Corps Base Camp Pendleton, which is connected further south to lands protected under the County of San Diego Multiple Habitat Conservation Program and Multiple Species Conservation Program (Figure 2–8).

Therefore, CDFW finds that the acquisition of Preserves and conservation measures in the form of habitat restoration within the Plan Area provides, as needed, for the conservation of species, the establishment of one or more reserves or 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.

Finding 4.1.4.C **CDFW finds that the development of reserve systems and conservation measures in the Plan Area provides, as needed for the conservation of species: the protection and maintenance of habitat areas large enough to support sustainable populations of Covered Species (Section 2820(a)(4)(C)).**

The distribution of currently protected lands in the Plan Area is a critical consideration when assessing how well the OCTA NCCP/HCP provides for the protection and maintenance of habitat, natural communities, and species diversity on a landscape or ecosystem level; hence the importance of the CBI (2009) analysis and OCTA's commitment to purchase lands identified by the Wildlife Agencies as high priority acquisitions. The OCTA NCCP/HCP Preserves and funded restoration projects, in concert with already-protected lands across the Plan Area, provide for local conservation of the Covered Species by: 1) protecting significant amounts of currently unprotected lands in areas that functionally expand existing reserves; 2) protecting and/or enhancing existing occurrences of the Covered Species; 3) allowing for the creation, enhancement, and restoration of native habitats; 4) allowing for easier, more cost-effective management and monitoring; and 5) conserving and restoring habitat and species connectivity.

As previously mentioned, approximately 75 percent (156,819 acres) of the undeveloped land in the Plan Area has some form of protection. In addition, numerous management efforts on these lands have been undertaken or funded by NCC, IRC, County Parks, CDPR, the Wildlife Agencies, USDA, Audubon, and other stakeholders that contribute to ensuring sustainable populations of the Covered Species. These management efforts include species surveys/ monitoring, habitat restoration or enhancement, cactus salvage and restoration projects, translocation studies, recreational use studies, wildlife movement monitoring, and genetics studies.

To conserve sustainable populations of the Covered Species in the Plan Area, a conservation strategy was developed for each species (Sections 5.3 and 6.4). These strategies were based on modeled suitable habitat protected in the Plan Area and modeled suitable habitat conserved by the OCTA NCCP/HCP (Table 1). In addition, OCTA funded the restoration of 357 acres to benefit Covered Species occurring on the currently protected lands. For the covered plant and aquatic species, additional conservation measures were developed that will be implemented at the project level to provide direct benefit to support or expand populations of these species.

Table 1. The amount of modeled suitable habitat (acres) impacted and conserved by the OCTA NCCP/HCP in the Plan Area for each of the 12 NCCP Covered Species.

	Modeled Suitable Habitat (acres) in Plan Area				
Covered Species	Total	Currently Protected	OCTA Preserves	OCTA and Currently Protected	OCTA Restoration on Protected
Intermediate mariposa lily	55,623	47,065	315.7	47,380.7	0.0
Many-stemmed dudleya	91,237	67,788	776.9	68,564.9	0.0
Southern tarplant	5,963	3,708	9.3	3,717.3	31.2
Arroyo chub	69	50.0	0.1	50.1	13
Coast horned lizard	96,100	76,797	529.8	77,326.8	140.7
Orange-throated whiptail	23,469	16,579	52.1	16,631.1	140.7

	Modeled Suitable Habitat (acres) in Plan Area				
Covered Species	Total	Currently Protected	OCTA Preserves	OCTA and Currently Protected	OCTA Restoration on Protected
Western pond turtle	5,963	4,962	9.9	4,971.9	22.1
Cactus wren	55,651	42,885	254.7	43,139.7	14.4
California gnatcatcher	65,607	51,129	422.1	51,551.1	141.6
Least Bell's vireo	4,466	3,224	8.7	3,232.7	110.6
Southwestern willow flycatcher	4,807	3,471	8.7	3,479.7	110.6
Bobcat	189,607	149,554	1,232.4	150,786.4	311.9

As stated in Fish and Game Code Section 2820(a)(4)(C), the Plan Area must contain conserved habitat areas large enough to support sustainable populations of the 12 NCCP Covered Species. The NCCPA does not define sustainable population. In addition, while the size of a habitat area is an important factor in predicting the sustainability of a species, it is acknowledged that other factors, such as edge effects, can reduce the effective size of such habitat areas. The types and quantities of indirect edge effects vary considerably, making the area of effect difficult to quantify. However, the urban/wildland interface extends along many protected areas in the Plan Area, and much of the protected lands are already subjected to some type of edge effect.

For the purpose of this NCCP Permit, CDFW defines a sustainable population as a population with adequate individuals and habitat area to replace itself over time, taking into account fluctuations in abundance and environmental variability. Each Covered Species is discussed below in regard to how a sustainable population was determined and how much habitat is needed for such a population within the Plan Area based on the best available scientific information (e.g., population trend data, evidence of reproduction and/or immigration, genetic studies).

Intermediate mariposa lily was first observed in 1901 by LeRoy Abrams on the O'Neill Oaks Preserve. Since then it was documented as extant in 1982, 1991, 2000, 2004, and 2012 (CNDDB, Occurrence #10). In 2012, this population included 221 individuals (Bonterra Psomas 2013a). Therefore, based on these consistent past observations, the population has been viable for the past 100 years and is now conserved under the OCTA NCCP/HCP. To ensure the long-term viability/persistence of intermediate mariposa lily on the O'Neill Oaks Preserve, the RMP includes species-specific management directives (see Finding 3.5.1). The RMP also includes management tasks to ensure the 48.9 acres of intermediate mariposa lily predicted suitable habitat on O'Neill Oaks Preserve (Table 5–3) continues to function for the benefit of this species.

Including the 93 occurrences on OCTA Preserves, there are a total of 189 occurrences totaling 18,035 individuals of intermediate mariposa lily on protected lands within the Plan Area (Table 6–4 and Figure 6–8). Based on the 221 individuals at the O'Neill Oaks Preserve occurring on 48.9 acres of predicted suitable habitat, the 18,035 individuals would require approximately 39,905 acres of suitable habitat. Over 47,000 acres of predicted suitable intermediate mariposa

lily habitat occurs on protected lands in the Plan Area (Table 6–4). The occupied lands include contiguous habitat patches in the Southern Foothills, San Joaquin Hills, and Northern Foothills core habitat areas. There are 102 occurrences of this species recorded with five miles of the four Trabuco Canyon Preserves, which support at least 76 occurrences. The OCTA NCCP/HCP will benefit the intermediate mariposa lily by protecting habitat connectivity, supporting populations of pollinator species, providing opportunities for dispersal of pollinator species and seeds, and maintaining genetic exchange between occurrences.

Therefore, CDFW finds that the development of reserve systems and conservation measures in the Plan Area protects and maintains habitat areas that are large enough to support sustainable populations of intermediate mariposa lily.

Many-stemmed dudleya has been monitored on lands protected by the Southern Orange HCP for several years (GLA 2015). Several populations have persisted or even expanded on these protected lands. For example, in 2015, at least six of the 14 populations monitored (currently ranging from 50 to 680 individuals) have either maintained their original estimated population sizes or have increased since 1995, when the original population estimates were obtained (GLA 2014, GLA 2015). This indicates that these populations are capable of self-replacement, they have been viable for at least 20 years, and there are large enough habitat areas conserved to support expanding populations of this species.

Including the occurrences monitored by GLA, there are 189 occurrences comprised of 44,097 individuals located on protected lands within the Plan Area (Table 6–5). Based on the GLA (2015) surveys, the 1,848 many-stemmed dudleya individuals occupied approximately six acres. Therefore, the 44,097 individuals would require approximately 145 acres. Currently, there are 67,788 acres of predicted suitable habitat existing on protected lands within the Plan Area (Table 6–5). All of the OCTA Preserves support predicted suitable habitat for many-stemmed dudleya and recent surveys at Aliso Canyon documented 60 individuals. The RMP for this Preserve will include species-specific management directives including habitat protection and enhancement to benefit the species. The Aliso Canyon Preserve is adjacent to the Ailso and Woods Canyon Wilderness Park, which is also occupied by many-stemmed dudleya. The park is part of the Central/Coastal NCCP/HCP Reserve. In addition, the conservation of 394 acres of predicted suitable habitat occurring with the four Trabuco Canyon Preserves will help maintain potential landscaped-level connectivity between the many-stemmed dudleya populations in the Central/Coastal NCCP/HCP Central Reserve to the north and the Southern Orange HCP lands to the south.

Therefore, CDFW finds that the development of reserve systems and conservation measures in the Plan Area protects and maintains habitat areas that are large enough to support sustainable populations of many-stemmed dudleya.

Southern tarplant has been monitored from 1999 through 2011 on the Lower Mesa of the Bolsa Chica Ecological Reserve (Recon 2011). This population is considered one of the largest in California and has ranged in size from 3,400 to 8,000 individuals and historically occupied 110 acres of non-native grassland in the Lower Mesa (Recon 2011). These monitoring efforts have shown that the population is capable of self-replacement through seed set and expansion, and that a large enough area of suitable habitat has been conserved to support expansion of this population.

There are 32 occurrences totaling 55,864 individuals located on protected lands within the Plan Area (Table 6–6), including the individuals monitored at Bolsa Chica. Based on 3,400 individuals occupying 110 acres, the 55,864 individuals would require approximately 1,802 acres. Currently, 3,708 acres of predicted suitable southern tarplant habitat is located on protected lands in the Plan Area (Table 6–6). Currently protected lands support viable populations of southern tarplant and under the OCTA NCCP/HCP natural recruitment of the species has occurred at the Fairview Park restoration site. In addition, the Harriet Weider Regional Park restoration project includes specific measures to establish the species at the site through seeding with locally collected stock.

Therefore, CDFW finds that the development of reserve systems and conservation measures in the Plan area protects and maintains habitat areas that are large enough to support sustainable populations of southern tarplant.

Arroyo chub populations from across the species' native range were recently sampled to determine population structure and genetic diversity using microsatellite data analyses (Benjamin et al. 2016). Arroyo chub were sampled from six watersheds, including five outside the Plan Area and San Juan Creek, which is located in the southern portion of the Plan Area. In 2013, CDFW staff conducted the field surveys for this genetics study and detected individuals in San Juan Creek/Bell Canyon and individuals in Hot Springs Creek/Caspers Wilderness Park, which is within the San Juan Creek watershed. Overall, the study determined that individuals sampled in the six watersheds represent genetically distinct populations that exhibit average or high genetic diversity in comparison to other freshwater fish species. Based on the genetic analysis, the individuals from these two sites form one genetic population.

According to John O'Brien, CDFW Fisheries Biologist, other than the recent genetic analysis, the current status of the arroyo chub across its native range is unknown (personal communication, May 20, 2016; phone conversation). Most of the sites still supporting chub have not been monitored on a regular basis and basic demographic data are lacking. Basic ecological requirements such as pool size, depth, or carrying capacity are also unknown. What has been documented in the literature, however, is that in areas where arroyo chub was used as bait, populations rapidly expanded, likely due to the species being physiologically adapted to survive hypoxic (oxygen-poor) conditions and wide temperature fluctuations, and their ability to breed continuously from February to August (as reported in Benjamin et al. 2016). Mr. O'Brien attributes the arroyo chub's ability to persist at some of its historic locations to its ability to adapt to variable pool conditions. However, where arroyo chub persist, nonnative fish species, barriers to movement such as check dams, and the prolonged drought threaten its recovery.

The property that supports the Bell Creek-Starr Ranch arroyo chub population has been protected and managed by Audubon since 1973. Arroyo chub were first officially documented on the property in the early/mid-1980s by Dr. Allan Schoenherr (Scott Gibson, Assistant Director of Research and Education, personal communication, May 20, 2016). Mr. Gibson began informal monitoring of the arroyo chub population in 2004, and in 2011, he began implementing the USGS (2006) monitoring protocol for South Coast Ecoregion Rivers, Streams, and Creeks.

Since 2011, Mr. Gibson has annually verified that arroyo chub have successfully bred in two stretches of Bell Creek through visual observation and dipnet capture of fry. For years 2011–2015, he observed 100+ individuals at each of the two sites including both adults and juveniles. Due to variation in annual rainfall between years 2011–2015, these two stretches have expanded and contracted in size. The year 2014 represents the driest year on record in terms of surface flow during Mr. Gibson's protocol survey efforts, and the two stretches supporting arroyo chub were only approximately 330 and 500 feet in length. However, these two stretches still had

successfully breeding arroyo chub. Mr. Gibson attributes this to the fact that these stretches have a perennial water source, are shaded, have good flow, and are protected from nonnative invasive species due to man-made and natural barriers, as well as limited surface flow, preventing movement upstream from the San Juan Creek mainstem. Based on Mr. Gibson's monitoring efforts, it appears that as long as this portion of Bell Creek continues to have areas with perennial flow, arroyo chub will continue to be self-sustaining on the Starr Ranch property. Currently, urban run-off from an adjacent housing area/golf course likely augments perennial flow in Bell Creek despite diversion pumps, even during the recent extreme drought years (e.g., 2014). Even with new ornamental watering restrictions, this flow is anticipated to continue into the future due to maintenance of the golf course.

The Hot Springs/San Juan Creek site that was sampled as part of the Benjamin et al. (2016) genetics study is also located in the Plan Area on protected lands owned and managed by the USFS. Currently, USFS is working with Caltrans to implement the removal of 13 check dams along San Juan Creek occupied by arroyo chub (Kirsten Winters, USFS Ecologist, personal communication, December 21, 2015). As mentioned previously in Finding 3.5.2, OCTA will also implement a restoration project focused on improving habitat conditions for an existing population of arroyo chub in the Plan Area. Potential projects include actions to improve water quality in a subwatershed known to support arroyo chub (e.g., Bell Canyon), removal or modification of additional check dams to facilitate fish passage (e.g., along San Juan Creek on USFS lands), and/or nonnative fish removal (Section 6.4.4).

There are 51 occurrences totaling 345 individuals within the Plan Area (Table 6–7), and all of them occur on protected lands (approximately 50 acres).

Therefore, CDFW finds that the development of reserve systems and conservation measures in the Plan Area protects and maintains habitat areas that are large enough to support sustainable populations of arroyo chub.

Coast horned lizard was detected in the Central/Coastal NCCP/HCP Reserve at Agua Chinon, San Joaquin Hills, and Limestone Canyon, and outside the Reserve at Weir Canyon and Audubon's Starr Ranch (Fisher 2000). A total of 107 individuals were captured across all of the sites with 74 captured in Limestone Canyon. Fisher (2000) cautions, however, that the survey effort was not equal across all of the sites and that the highest proportional rate of coast horned lizards was actually at Agua Chinon. The relative capture rate, which is based on the average number of captures per 1,000 sample nights per array across an entire site, was 33.3 for Agua Chinon and 16.9 for Limestone Canyon. Fisher (2000) concluded that Agua Chinon could produce individuals at nearly twice the rate of Limestone Canyon.

In a radio-telemetry study conducted on this species in southern California, coast horned lizard had a mean home range of about 25 acres (Fisher et al. 2002). In a more recent study in the southern San Joaquin Valley, horned lizard had an average home range of about 12 acres (Hult and Germano 2015). This study also documented that home ranges of different individuals can overlap. Using the higher home range estimate of 25 acres, the projected Limestone Canyon population would require approximately 3,750 acres; less if home range overlap is considered. Limestone Canyon is 5,500 acres in size (http://letsgooutside.org/about). Suitable habitat for coast horned lizard is mapped within Limestone Canyon and on adjacent protected lands, including the MacPherson Preserve (Figure C.3–5). Therefore, this portion of the Plan Area includes conserved habitat that is large enough to support sustainable populations of coast horned lizard. In addition, a mark-recapture study of horned lizards on the 2,500-acre Arena Plains Unit of the Merced National Wildlife Refuge estimated a population of approximately 550 individuals (Gerson

2011). This population was considered vigorous, based on a nearly equal number of males and females, a complex age structure, and new individuals being recruited on a yearly basis. Assuming the home range size of 12 acres, this self-replacing population would need 6,600 acres of suitable habitat. Overall, the Plan Area supports 76,797 acres of protected predicted habitat, much of which is in large and/or connected habitat blocks (Table 6–8). Although the predicted habitat model did include sandy soil types as a factor, the acreage may still be overestimated; nevertheless, based on this analysis, CDFW believes there is more than enough suitable habitat in the Plan Area to support sustainable populations of coast horned lizard.

Therefore, CDFW finds that the development of reserve systems and conservation measures in the Plan area protects and maintains habitat areas that are large enough to support sustainable populations of coast horned lizard.

Orange-throated whiptail was the fourth most common lizard recorded in a monitoring study of reptiles and amphibians in the NCCP/HCP Central/Coastal Reserve (Fisher 2000). Fisher (2000) surveyed 10 sites in the Reserve and three sites outside the Reserve and found the orange-throated whiptail at all of the sites except two within the Coastal Reserve. The highest densities were found at Peter's Canyon, with 162 individual captures, although a slightly more current study found the highest density of 48 at Agua Chinon (Backlin 2003). The home range for males is approximately 0.07 acre and approximately 0.15 acre for females (Zeiner et. al. 1988). Assuming half of the Peter's Canyon population is male and half is female, this population would require 268 acres of habitat. According to the OC Parks' website for Peter's Canyon, the park consists of 340 acres of coastal sage scrub, riparian, freshwater marsh, and grassland habitats, the majority of which is mapped as suitable habitat (Figure 6–14). A study in southern California documented the density of orange-throated whiptail lizard at four to16 per acre (Brattstrom 2000). Using this information, it is possible that Peter's Canyon has the potential to support more than 1,000 individuals. The activity data for the orange-throated whiptail indicate that there is good evidence of reproduction and recruitment at most of the sites where they have been documented, and that it does not appear to be at risk of extinction in the NCCP/HCP Central/Coastal Reserve (Fisher 2000).

Of the 23,469 acres of predicted habitat in the Plan Area, 16,579 acres (71 percent) is on protected lands (Table 6–9). The largest and most contiguous block occurs in the southeastern portion of the Plan Area, comprising approximately 5,000 acres or more, nearly all of which is protected (Figure 6–14). Using the average home range documented in Zeiner et al. (1988), this predicted protected habitat block could support approximately 3,000 individuals, or using the density cited by Brattstrom (2000), this habitat block could support at least 20,000 individuals.

Therefore, CDFW finds that the development of reserve systems and conservation measures in the Plan Area protects and maintains habitat areas that are large enough to support sustainable populations of orange-throated whiptail.

Western pond turtle genetic analysis across its historic range has revealed that two distinct genetic clusters/clades are present: a northern group and a southern group (Spinks and Schaffer 2005; Spinks et al. 2010, 2014; Fisher et al. 2013). To further refine the genetic relationships between pond turtles in southern California, Fisher et al. (2013) acquired tissue from 580 pond turtles across 514 sites from Ventura south to Baja California. This research confirmed the genetic distinctions between the northern and southern clades but also determined "natural breaks" in the populations, which "most likely represent differences at or near a 'species level' within the taxa". Fisher et al. (2013) goes on to say that these "species" should be maintained as separate units in management so that priorities for management and recovery could be developed. Based on Fisher

et al. (2013), the Plan Area contains four management units/populations: 1) San Diego Creek/San Joaquin Marsh, 2) Shady Canyon Turtle Pond, 3) Ladd Canyon/Aliso Creek, and 4) San Juan/Oso/Trabuco. The first three sites and portions of the fourth have some form of land protection that ensures the areas will not be directly impacted by urban development.

The current status of the western pond turtle within the Plan Area is unknown other than the genetic analysis cited above. Although the Shady Canyon Turtle Pond has been monitored consistently since 2001, the other sites have had no formal monitoring. Shady Canyon Turtle Pond was established in 2001 as mitigation for impacts associated with regulatory permits including a CDFW Lake and Streambed Alteration Agreement (Harmsworth and Associates 2007). Shady Canyon Turtle Pond is located on protected land in the Coastal Reserve portion of the Central/Coastal NCCP/HCP Reserve. A total of 27 pond turtles (two females, 14 males, and 11 juveniles) captured from Bommer Canyon and the Sand Canyon Reservoir were released into the Shady Canyon Turtle Pond in June 2001. According to the long-term management plan for the site, the pond turtles quickly adapted to the new pond and since their introduction have bred successfully every year resulting in a rapid increase in the number of individuals (Harmsworth and Associates 2007). By 2007, the population size had increased to 94 individuals. The most recent monitoring report from 2014 reported 74 pond turtles present including 23 females, 18 males, and 33 juveniles (Harmsworth and Associates 2014d). Although the population has decreased in size since its peak in 2007, reproduction is still occurring and overall, the population has increased and stabilized since 2001. Long-term management of the site is expected to continue under the Central/Coastal NCCP/HCP, and the population is expected to persist and continue to be self-sustaining.

In addition, approximately 4,962 acres of predicted suitable western pond turtle aquatic habitat occurs on protected lands in the Plan Area (Table 6–10). Although much of this habitat is currently unoccupied, it may provide areas appropriate for future reintroduction efforts, although reintroduction is not a requirement of the OCTA NCCP/HCP. However, successful reintroduction of the species has been achieved on protected lands in San Diego County (Chris Brown, USGS; personal communication, April 27, 2016).

Therefore, CDFW finds that the development of reserve systems and conservation measures in the Plan Area protects and maintains habitat areas that are large enough to support sustainable populations of western pond turtle.

Cactus wren studies conducted by USGS examined the genetic structure of individuals across coastal southern California (Barr et al. 2013; Barr et al. 2015). These studies determined that there are two populations within the Plan Area: the Central Orange County population and the Coastal Orange County population. Barr et al. (2013) estimated effective population sizes (i.e., number of individuals in a population who contribute offspring to the next generation) ranging up to 284 in the Central population and up to 36 in the Coastal population. These numbers are relatively similar to other cactus wren monitoring efforts conducted in 2012, which estimated 115 territories (assuming one pair per territory, it would equal 230 adults) in the Central Reserve (D. Kamada personal communication, August 24, 2014) and 36 territories (72 adults) in the Coastal Reserve (Preston and Kamada 2013). Given that a territory averages 3.2 acres (Shuford and Gardali, eds. 2008), and assuming one pair per territory, approximately 493 acres of suitable habitat would be necessary to support the 154 territories documented throughout the NCCP/HCP Central/Coastal Reserve in 2012 (considered baseline for purposes of this NCCP Permit). The Central Reserve cactus wren population of 115 territories would require approximately 368 acres, and the Coastal Reserve population of 36 territories would require approximately 115.2 acres, which together total 483.2 acres (Table 2).

Table 2. The number of cactus wren territories and the amount of predicted suitable cactus wren habitat in the Central/Coastal NCCP/HCP Reserve in 2012 (taken from Preston and Kamada 2013).

Site	Cactus Wren Territories	Habitat Needed to Sustain Territories (3.2 ac per territory)	Mapped Suitable Habitat
Central Reserve	115	368 ac	683 ac
Coastal Reserve	36	115.2 ac	987 ac
Total	151	483.2 ac	1,670 ac

In 2008, Leatherman BioConsulting (2009) estimated that 683 acres of suitable cactus wren habitat remained in the NCCP/HCP Central Reserve after the large 2007 Windy Ridge and Santiago Fires. In 2007, Mitrovitch and Hamilton (2007) estimated that 987 acres of suitable cactus wren habitat were present in the Coastal Reserve. These two estimates total 1,670 acres, which greatly exceeds the 493 acres required based on average territory size, for the 154 cactus wren territories documented in 2012. The Leatherman BioConsulting (2009) and Mitrovitch and Hamilton (2007) studies took into account the quality of the habitat as well as the size of the habitat patch, such that only habitat patches considered suitable to support cactus wren were mapped.

More recently, in 2012, a CDFW Local Assistance Grant (LAG) was awarded to NCC to coordinate a vegetation map update for areas protected within the NCCP/HCP Central/Coastal Reserve and other natural lands surrounding the Reserve (i.e., non-Reserve open space). The total area mapped was 85,000 acres, which included 831.1 acres of *Opuntia littoralis* Alliance (prickly-pear cactus scrub). According to the report (AIS 2015), additional stands of cactus were mapped and included within the *Eriogonum fasciculatum* Alliance (980.3 acres) and the *Artemisia californica-Eriogonum fasciculatum* Alliance (9,274.5 acres). Although the entire 10,000+ acres of these other two alliances are not expected to be suitable for nesting cactus wren, some unquantified portion of these *Eriogonum* alliances are expected to be suitable, as only a small portion of the territory needs to include cacti; for example, researchers have found nesting wrens in relict stands of cactus as small as 0.2 acre (Unitt 2008).

The areas of suitable cactus scrub habitat are on lands currently protected under the Central/Coastal NCCP/HCP, non-reserve public open space lands that have permanent dedications as a result of CEQA mitigation measures to remain open space (e.g., Quail Hill) or lands that are protected by conservation easements dedicated to The Nature Conservancy (Section 2.3.2). An additional 255 acres of modeled suitable habitat is conserved on the OCTA NCCP/HCP Preserves (Table 6–11). In addition, breeding cactus wrens have been documented on the four Trabuco Canyon Preserves. The conservation of these four Preserves adds to the protection of an important block of cactus scrub habitat that improves the linkage between the NCCP/HCP Central Reserve and protected lands within the Southern Orange HCP. The recent USGS genetics study mentioned above determined that the central Orange County genetic cluster might be the most robust with regard to enduring stochastic processes (Barr et al. 2013). The authors of this study stated that efforts to limit further habitat fragmentation in this area should help retain genetic exchange among the existing aggregations. By conserving and managing 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 (Section 6.4.8).

Cactus wren dispersal between protected occupied patches of cactus scrub habitat has been documented in both the NCCP/HCP Coastal and Central reserve populations of the species (Preston and Kamada 2012; Barr et al. 2013). The majority of the protected cactus wren-occupied habitat areas are either contiguous with other protected lands, or within close enough proximity to allow for dispersal between patches of suitable habitat. For example, resightings of a banded cactus wren in the Coastal population confirmed that this individual dispersed approximately five miles from its natal area (Preston and Kamada 2012) and genetic analysis has shown that Central Reserve fledglings are more likely dispersing beyond their natal territories than populations sampled in San Diego, Los Angeles, and Ventura counties (Barr et al. 2013).

Although these cactus wren populations are small, there is evidence that they are capable of self-replacement. For example, monitoring results demonstrate effective reproduction in both populations, with 78 to 93.5 percent of pairs producing offspring, with an average number of fledglings per breeding pair per year of 2.7±0.5 (Preston and Kamada 2012). In addition, Barr et al. (2013) stated that the Central population is the largest and "may be the most robust to stochastic processes". While the effective population size of the Coastal population is much smaller, it has a similar level of genetic diversity (allelic richness) as the Central population (Barr et al., 2015). 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 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, and Caltrans, has funded approximately 45 acres of cactus scrub restoration, mostly in the Coastal Reserve (NCC 2014, 2015). OCTA has also funded the restoration of 14 acres of cactus scrub habitat including 8.5 acres in the Coastal Reserve and 6.0 acres in Chino Hills State Park. At least two of the NCCP/HCP restoration sites are already being used by cactus wrens, including the OCTA-funded coastal site (NCC 2014; Land IQ 2014). Finally, NCC has conducted translocations of cactus wrens from the Central population to the Coastal population, which have resulted in offspring between translocated and resident birds (Kamada and Mitrovitch 2015). This may help increase genetic diversity in the Coastal 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).

In addition, of the 55,651 acres of predicted suitable cactus wren habitat in the Plan Area, 42,885 acres (77 percent) occur on protected lands. Although this is likely an overestimate, results are more conservative than those for a model recently developed by the USGS (Barr et al. 2015).

Therefore, CDFW finds that the development of reserve systems and conservation measures in the Plan Area protects and maintains habitat areas that are large enough to support sustainable populations of coastal cactus wren.

California gnatcatcher individual relatedness patterns and population genetic structure among aggregations throughout the U.S. range (which includes portions of Ventura, Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties) were identified by USGS and presented in a data summary report prepared for CDFW (Vandergast et al. 2014). A total of 268 individuals from across this region were genotyped and determined to form a single genetic cluster (i.e., genetic population). The one genetic cluster was comprised of four statistically distinguishable populations including 1) Palos Verdes, western Los Angeles County; 2) Coyote Hills, northern Los Angeles County; 3) Ventura County; and 4) all other individuals from the

eastern Los Angeles Basin through southern San Diego County, including all individuals sampled in San Bernardino, Orange, and Riverside counties. Vandergast et al. (2014) further stated that "gnatcatchers are able to move among most patches of suitable habitat given the current (or recent) 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."

Range-wide population estimates for California gnatcatcher have not been revised since the early 1990s. The USFWS (1993) estimated 757 territories present in the Plan Area in 1993, while CNDDB data collected from 1990-2012 indicated 1,828 territories were present in the Plan Area (Table 6–12). The most recent comprehensive territory survey effort conducted in the Plan Area was between 1999 and 2004 in the Central/Coastal NCCP/HCP Reserve, for which 1999 had the maximum number of estimated California gnatcatcher territories: 717 +/- 338 in the Central Reserve and 518 +/- 256 in the Coastal Reserve (Hamilton 2004). Over the next 5 years, the number of territories varied significantly and was the lowest in 2004 with 490 +/- 204 territories in the Central Reserve and 430 +/-226 in the Coastal Reserve.

California gnatcatcher territory size is highly variable depending on distance from the coast (Mock 2004). Territories close to the coast can be as small as 0.5 acre with more inland locations as large as 22 acres. For the purpose of this analysis, the following assumptions were made: 1) in light of the recent genetics analysis, there is one California gnatcatcher population present in the Plan Area; 2) based on the most recent comprehensive territory survey effort, the population is comprised of 1,829 territories (1,055 + 774); 3) there is one pair per territory; and 4) the average territory size is 10 acres. Based on these assumptions, approximately, 18,290 acres of suitable habitat would be necessary to support the California gnatcatcher population documented in the Plan Area in 1999. Currently, a total of 52,421 acres of predicted/modeled very high/high quality California gnatcatcher habitat occurs in the Plan Area, of which 41,076 acres (78 percent) is conserved within the currently protected lands. An additional 6,320 acres of moderate quality modeled habitat is also protected in the Plan Area and although it may not provide live-in habitat, it likely provides movement/dispersal habitat for this species.

In addition, of the 52,421 acres of very high/high predicted suitable California gnatcatcher habitat in the Plan Area, 41,076 acres (78 percent) occur on protected lands (Table 6–12).

Therefore, CDFW finds that the development of reserve systems and conservation measures in the Plan Area protects and maintains habitat areas that are large enough to support sustainable populations of California gnatcatcher.

Least Bell's vireo range-wide population estimates have not been revised since the mid-2000s. The USFWS (2006) estimated 180 territories in Orange and Los Angeles counties for years 2001–2005, while CNDDB data collected from 1990-2012, indicated 413 territories were present in the Plan Area (Table 6–13). Plan Area surveys for least Bell's vireo conducted between 2012 and 2014 documented 29 territories in Irvine Regional Park (SAWA 2012), 46 territories in the Santiago Creek sub-watershed (SAWA 2012), 65 territories in the Santa Ana River (SAWA 2012), 25 territories in the vicinity of Rattlesnake Reservoir (Harmsworth Associates 2014a, 2014b,), and 24 territories within and adjacent to San Diego Creek (Harmsworth Associates 2014c).

Based on the recent survey results, we are assuming that a *minimum* of five least Bell's vireo populations are present in the Plan Area and together they total 189 territories. Given that a

territory averages 4.0 acres (Kus 2002), and assuming one pair per territory, approximately 756 acres of suitable habitat would be necessary to support the five populations documented in the Plan Area in years 2012 and 2014. Additionally, a total of 1,652 acres would be required to support all 413 territories documented in CNDDB. A total of 4,466 acres of predicted/modeled suitable least Bell's vireo habitat occurs in the Plan Area, of which 3,224 acres (72 percent) is conserved within the currently protected lands. This greatly exceeds what is necessary to support the five populations documented in 2012 and 2014.

More recently, in 2012, a CDFW NCCP Local Assistance Grant was awarded to NCC to coordinate a vegetation map update for areas protected within the NCCP/HCP Central/Coastal Reserve and other natural lands surrounding the Reserve (i.e., non-Reserve open space). The total area mapped was 85,000 acres, which included 2,282 acres of least Bell's vireo suitable habitat (e.g., *Salix* Alliances) which are on lands already protected under the Central/Coastal NCCP/HCP (2,282 acres). An additional nine acres of modeled suitable habitat are conserved on the OCTA NCCP/HCP Preserves. OCTA has also funded the restoration of 110 acres of riparian habitat at nine separate locations throughout the Plan Area. All of the restoration sites are within currently protected lands (e.g., Aliso and Wood Canyons Wilderness Park) and two of the restoration sites are occupied by least Bell's vireo. Restoration of riparian habitat at these two sites is expected to increase the availability of suitable foraging and nesting habitat as well as migratory stop-over habitat for the species. The restoration projects are also expected to improve habitat connectivity in the Plan Area for least Bell's vireo by restoring habitat in key movement corridors such as Trabuco, Aliso, and Carbon Canyon creeks.

The majority of the protected least Bell's vireo-occupied habitat is either within or contiguous with other protected lands, or within close enough proximity to allow for dispersal between patches of suitable habitat. Although no recent banding data exists for the Plan Area, vireos are likely dispersing between and among the protected habitat patches. Since the species was listed in 1986, population numbers across its historic range have increased 10-fold from just 291 territories to 2,968 territories by 2005 (USFWS 2006). This upward trend has also been observed in portions of the Plan Area where such data are available (SAWA 2012) and supports the theory that individuals are dispersing between currently conserved habitat patches and colonizing newly restored suitable habitat patches in the Plan Area.

In addition, of the 4,466 acres of predicted suitable least Bell's vireo habitat in the Plan Area, 3,224 (72 percent) occur on protected lands (Table 6–13).

Therefore, CDFW finds that the development of reserve systems and conservation measures in the Plan Area protects and maintains habitat areas that are large enough to support sustainable populations of least Bell's vireo.

Southwestern willow flycatcher individuals within the Plan Area are part of the Coastal California Recovery Unit (RU) as identified in the Southwestern Willow Flycatcher Recovery Plan (USFWS 2002). At the time of publication, this RU included 186 territories. Documented breeding locations in the Plan Area included San Diego Creek-Laguna Lakes and San Juan Creek-Canada Gobernadora. A more recent range-wide population estimate for the southwestern willow flycatcher was compiled by USGS (Durst et al. 2008) and included all known flycatcher breeding sites reported between 1993 and 2007. As of 2007, there were only 120 territories present in the Coastal California RU and the two sites in the Plan Area were reported as extirpated (i.e., did not support breeding pairs in 2007). However, based on information provided by the USGS Western Ecological Research Center, a pair of southwestern willow flycatchers had persisted at the San Juan Creek-Canada Gobernadora location until 2009 (Scarlett Howell,

Ecologist, personal communication, May 12, 2015). This is the last confirmed record for breeding southwestern willow flycatcher in the Plan Area.

The Recovery Plan (USFWS 2002) states that "a metapopulation is a group of spatially disjunct local willow flycatcher populations connected to each other by immigration and emigration". The Plan goes on to say that incidence function analysis showed that southwestern willow flycatcher metapopulations are most stable where many connected sites and/or large populations exist (e.g., Coastal California, Gila, Rio Grande Recovery Units). The model results predicted greatest stability when sites can be established less than 9 miles apart, each with between 10 and 25 territories. Once a threshold of approximately 25 territories is reached for a given site, the benefit of increasing the number of birds diminishes. Instead, metapopulation persistence (stability) is more likely to increase by adding more sites rather than adding more territories to existing sites.

Using the Recovery Plan guidance of 25 territories representing a viable population, and given that a territory averages between 0.5 and 1.2 acres (USFWS 2002), approximately 12.5 to 30 acres of suitable habitat would be necessary to support a viable population of southwestern willow flycatcher. A total of 4,807 acres of predicted/modeled suitable habitat occurs in the Plan Area, of which 3,471 acres (72 percent) is conserved within the currently protected lands. This is likely an overestimation of suitable habitat for this species, as the model predicting suitable habitat was based on the plant species assemblages (e.g., willow riparian woodland) and did not incorporate slow-moving or still surface water and/or saturated soil presence (which has been shown to be present at or near all breeding sites during wet or non-drought years (USFWS 2002)). Using the updated vegetation mapping for the NCCP/HCP Central/Coastal Reserve (AIS 2015), which includes the historic San Diego Creek location, 1,506.1 acres of *Salix* sp. and Perennial Stream Channel Alliances are present in the NCCP/HCP Central/Coastal planning area. Also, according to Paul Galvin, Plan Area expert on southwestern willow flycatcher, based on the historic distribution of the species, he concurs that there is a great deal of extant potential habitat still present in the Central/Coastal NCCP/HCP planning 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 (personal communication, April 21, 2016). Suitable habitat is also still present in and around the San Juan Creek-Canada Gobernardora location, which is protected as part of the Southern Orange HCP.

Although there is not currently a breeding population of southwestern willow flycatcher in the Plan Area, the species was present in low numbers up until the mid-2000s and suitable conserved habitat is still available for recolonization. In addition, of the 4,807 acres of predicted suitable southwestern willow flycatcher habitat in the Plan Area, 3,471 (72 percent) occur on protected lands (Table 6–14).

Therefore, CDFW finds that there are large enough areas of protected habitat in the Plan Area to support sustainable populations of southwestern willow flycatcher.

Bobcat has been the focus of numerous studies conducted in southern California (Tigas et al. 2002; Riley et al. 2003; Lyren et al. 2006, 2008a; 2008b; Ordeñana et al. 2010; Lee 2012, Ruell et al. 2012; Tracey et al. 2013; Alonso et al. 2015). Several of these studies focused on sites in the Central/Coastal NCCP/HCP Reserve and areas adjacent to the Reserve. These sites include the San Joaquin Hills in the Coastal Reserve, portions of the Central Reserve, and the North Irvine Ranch lands, which are adjacent to the Central Reserve.

Alonso et al. (2015) found that the density of bobcats in the San Joaquin Hills was between 0.37 to 0.62 bobcats per 250 acres, with an abundance ranging from 36 to 60 individuals. This study used a mean bobcat home range of 2,176 acres. Based on this information, a population of 60 individuals would need approximately 130,500 acres of habitat assuming that female and male home ranges are of similar size. Lyren (2006), however, found that male bobcats using the North/Central Irvine Ranch lands had home ranges that were about twice the size of females, with males using 511 to 3,307 acres, and females using 331 to 1,134 acres. Territory sizes for the Lyren (2006) study averaged 1,909 acres for males (which was similar to the Alonso et al. (2015) average of 2,176 acres), and 732 acres for females. Therefore, assuming that half of the 60 individuals are female, and using the average home ranges presented in Lyren (2006), the population would need closer to 79,230 acres. Lyren (2006) also showed that bobcat territories often overlap, sometimes with as many as four individuals using overlapping territories. Therefore, this population may only need one quarter of the 79,230 acres, or 19,800 acres, which is the approximate combined area of all protected lands in the Alonso et al (2015) Coastal Reserve study area (19,621 acres per CPAD data from BIOS), and much of this protected land is in several large, interconnected blocks. There are 149,554 acres of modeled protected habitat for bobcat in the Plan Area (Figure 6–22), of which approximately 25 percent (37,500 acres) is within the Coastal Reserve. Therefore, the protected habitat in the San Joaquin Hills area of the Plan Area is large enough to sustain a population of bobcats that includes 36 to 60 individuals. In addition, Lee (2012) did not find any genetic evidence of inbreeding in this or other Plan Area populations, which may be due to individuals migrating into the area from other populations (Lee 2012; Ruell 2012), which further supports the continued viability of this population.

Lyren (2006) studied the bobcat population in the North/Central Irvine Ranch (NIR) area and concluded the following:

> *"The NIR, taken in isolation, is likely too small to permanently support resident populations of large carnivores with long-term viability. When viewed in a regional perspective, the NIR lies at the northern end of what has been identified as a critical connectivity zone (the El Toro linkage) between the Laguna Coast Wilderness and the Santa Ana Mountains that includes the Cleveland National Forest (Penrod et al., 2001). Core habitat blocks within the NIR therefore appear to serve as critical components of a network of wildlands in the region."*

This network of wildlands within the Plan Area includes the Central Reserve, the Cleveland National Forest, and other preserved lands including the OCTA Preserves and wildlife corridor restoration projects as described in Finding 4.1.3. Portions of these lands are directly connected to wildlands in the Santa Ana Mountains outside the Plan Area and in neighboring Los Angeles, San Bernardino, Riverside and San Diego counties (see Finding 4.4.1B). In addition, of the 189,607 acres of predicted suitable bobcat habitat in the Plan Area, 149,554 (79 percent) occur on protected lands (Table 6–15).

Therefore, CDFW finds that the development of reserve systems and conservation measures in the Plan Area provides, as needed for the conservation of species, protection and maintenance of habitat areas that are large enough to support sustainable populations of bobcat.

Finding 4.1.4.D **CDFW finds that the development of reserve systems and conservation measures in the Plan Area provides, as needed for the conservation of species: a range of environmental gradients and high habitat diversity**

to provide for shifting species distributions due to changed circumstances (Section 2820(a)(4)(D)).

The Plan Area is located adjacent to the Pacific Ocean and 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 United States (Stein et al. 2000). This is due to the diversity of geologic substrates, topographic features, climatic regimes, soil types, and other physical factors.

Since the Plan Area is large and varied, the need to include a range of environmental gradients and a diversity of habitats within the Preserves was an important consideration in determining which properties to acquire. Among the valuable components of the CBI (2009) report was an assessment of different habitat types, areas, and elevations that were already conserved or under threat of development. With respect to elevation, the report noted that 88 percent of the Santa Ana Mountains core habitat area, which includes the Cleveland National Forest, was already conserved and was characterized by both medium and high elevation vegetation communities and species. Therefore, additional conservation of such higher elevation lands was not considered a priority compared to other identified needs and contributions that could be made under OCTA's land acquisition commitments. Instead, the conservation strategy focused on acquiring properties between sea level and 1,500 feet elevation and funding restoration projects across a range of environmental gradients. Habitat diversity was also a key biological criterion used in the selection of the Preserves (Section 5.4.1).

Natural landscapes that support the majority of the Covered Species tend to fall below 2,000 feet elevation (Section 6.2). Because an important biological criterion for Preserve selection was the presence of Covered Species, higher elevation properties tended to rank lower during the initial EOC ranking exercise. Approximately 66.3 acres are conserved by the OCTA NCCP/HCP between sea level and 500 feet, 244.5 acres between 500 and 1,000 feet, 864.5 acres between 1,000 and 1,500 feet elevation, and 57.2 acres between 1,500 and 2,000 feet elevation (Table 6–2). The restoration projects also span different elevation gradients with 156.7 acres below 500 feet, 83.7 acres between 500 and 1,000 feet, 92.7 acres between 1,000 and 1,500 feet, and 24.3 acres between 1,500 and 2,000 feet elevation (Table 6–2).

The Preserves and the 11 restoration sites support a diversity of natural communities and natural landscapes representative of those present within the Plan Area, as discussed above in Finding 4.1.4.A; the Preserves and restoration sites also support populations of the Covered Species and/or support predicted suitable habitat for most of the Covered Species (Table 6–1). The vegetation communities present on the Preserves are considered high quality because they 1) tend to have high species diversity and low cover of nonnative invasive species, 2) in the past were not subjected to high levels of human use, 3) do not contain much linear infrastructure except for dirt access roads, and 4) are adjacent to or in close proximity to large blocks of natural habitat.

Therefore, the development of reserve systems and conservation measures in the plan area provides, as needed for the conservation of species, a range of environmental gradients and high habitat diversity to provide for shifting species distributions due to changed circumstances.

Finding 4.1.4.E **CDFW finds that the development of reserve systems and conservation measures in the Plan Area provides, as needed for the conservation of species: for sustaining the effective movement and interchange of organisms between habitat areas in a manner that maintains the**

ecological integrity of the habitat areas within the Plan Area (Section 2820(a)(4)(E)).

As discussed in Finding 4.1.4.A, the CBI (2009) conservation analysis focused on "intactness" and identified priorities for maintaining and improving ecological integrity by filling gaps in the network of currently protected lands; the Science Advisors validated this approach (Rahn et al. 2011). As discussed in Finding 4.1.4.A, the OCTA Preserves are either adjacent to currently protected lands, or in close enough proximity to currently protected lands, to act as stepping stone linkages for effective movement and interchange of organisms between habitat areas, a mechanism also validated by the Science Advisors (Rahn et al. 2011). As discussed in Finding 4.1.4.B, existing linkages in the Plan Area have limited opportunities for additional conservation and restoration, but OCTA has funded restoration projects within three of the linkages to help maintain effective movement and interchange of organisms. As discussed in Finding 4.1.4.A, several of these restoration projects were specifically designed to maintain or improve wildlife movement (e.g., West Loma, North Coal Canyon).

Therefore, the development of reserve systems and conservation measures in the Plan Area provides, as needed for the conservation of species, for sustaining the effective movement and interchange of organisms between habitat areas in a manner that maintains the ecological integrity of the habitat areas within the Plan Area.

Finding 4.1.5 **CDFW finds that the NCCP/HCP identifies activities, and any restriction on those activities, allowed within the reserve areas that are compatible with the conservation of species, habitats, natural communities, and their associated ecological functions (Section 2820(a)(5)).**

Section 3.1.3, *Covered Activities within the NCCP/HCP Preserves,* identifies activities that are covered and allowed on the Preserves: 1) recreational facilities and maintenance; 2) management activities (vegetation management, fire management, on-site vehicle use, relocation of covered species, demolition or removal of structures or roads, control of introduced predators, control of rodents); 3) habitat enhancement and restoration; 4) species surveys, monitoring and research; and 5) responses to changed circumstances. These activities are further described in Chapters 7 and 8.

The covered activities within the Preserves are expected to have a net benefit on all Covered Species; however, some conservation activities may have temporary or permanent adverse impacts on Covered Species and/or their habitats (Section 4.3.2). It is anticipated that approximately 13 acres (0.01 percent) of permanent impacts to native vegetation may occur within the Preserves as a result of new facilities, fire management activities, and trail creation/maintenance. In addition, management activities that are designed to benefit one or several Covered Species may have the effect of harming another set of Covered Species. The Preserves are large and diverse enough, however, to ensure that the net effect of all management activities will be beneficial across the system. Any impacts resulting from management activities within the Preserves are considered minimal and fully mitigated. It is anticipated that these activities will be compatible with the Conservation Goals and Objectives of the NCCP/HCP (Chapter 5).

Allowed uses are activities that may occur in the Preserves, as they generally do not result in negative impacts to the natural resource values being conserved (Section 7.2.5.5), but they are not

covered activities under this Permit. Allowed uses within the Preserves include 1) recreation, 2) public infrastructure, and 3) public services. Recreation is considered a "compatible use" within Preserves, such that it is allowed on a case-by-case basis to minimize disturbance from low-intensity recreation activities (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 permit (Section 3.2.1). Limited impacts on natural resources from new trails, interpretative structures, staging areas, and kiosks are allowed within the habitat impact caps established by the NCCP/HCP and are considered Covered Activities, as noted above as "recreational facilities and maintenance." Public infrastructure includes construction, replacement, or maintenance of electrical transmission lines, gas pipelines, water lines, sewer lines, or other linear facilities that generally result in minor temporary impacts to natural habitats. All temporary impacts will require restoration. Public services such as law enforcement, fire control, and actions by other agencies when responding to natural disasters are also allowed in the Preserves but are not considered a Covered Activity. Therefore, any impacts to native habitats as a result of these activities would have to be addressed by OCTA. Although considered a management activity, lawful pesticide use under the guidance of licensed pest control advisors qualified under the Department of Pesticide Regulations is also allowed in the Preserves (Section 7.2.5.1).

The OCTA NCCP/HCP prohibits certain land uses in the Preserves, such as general development; agriculture; recreational activities (other than limited trails) that require conversion of native habitat; camping; mineral extractions; landfill; hunting; or other activities that could affect areas within the Preserves or other adjacent protected lands (Section 7.2.5.5 *Prohibited Uses*).

Therefore, the OCTA NCCP/HCP identifies activities, and any restriction on those activities, allowed within the reserve areas that are compatible with the conservation of species, habitats, natural communities, and their associated ecological functions.

Finding 4.1.6 **CDFW finds that the NCCP/HCP contains specific conservation measures that meet the biological needs of Covered Species and that are based upon the best available scientific information regarding the status of Covered Species and the impacts of permitted activities on those species (Section 2820(a)(6)).**

The overall conservation strategy for covered plant species focuses on the conservation and long-term management of regionally significant Preserves that meet the ecological needs of the Covered Species, the restoration of predicted suitable habitat, the avoidance and/or minimization of impacts, and the mitigation of unavoidable impacts. As stated previously, the Preserves support high quality habitat and are located in core habitat conservation areas that are priority areas for conservation (CBI 2009).

As presented in Table 1 of this NCCP Permit, the Preserves support:

- 315.7 acres of predicted suitable habitat for, and 597 individuals of, intermediate mariposa lily (Section 6.4.1).
- 776.9 acres of predicted suitable habitat for, and 60 individuals of, many-stemmed dudleya (Section 6.4.2).
- 9.3 acres of predicted suitable habitat for southern tarplant (Section 6.4.3).

To ensure the continued viability/persistence of the covered plant species on the various Preserves, species-specific management directives have been or will be incorporated into the RMPs (ICF 2015a-e; Section 7.2.8).

To ensure that the NCCP/HCP 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 within the 10 years from NCCP/HCP 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 (Section 6.4.2).

For southern tarplant, habitat restoration at Fairview Park has facilitated natural recruitment of the species into the site. Southern tarplant is also expected to colonize the Harriett Weider restoration site as locally collected seed has been incorporated into the restoration plant palette (Section 6.4.3).

Sufficient numbers of intermediate mariposa lily currently exist on the Preserves such that additional conservation measures are not required under the NCCP/HCP other than the implementation of species-specific management directives as identified in the Preserve RMPs.

OCTA will minimize direct take of the three covered plant species when implementing the covered freeway improvement projects, although some direct loss of potentially suitable habitat for all three species is anticipated. OCTA will implement a Covered Plant Species Policy (Section 5.6.2.2) that includes the evaluation of impacts based on project-specific field surveys. The policy also sets forth mitigation for impacts using credits determined through field surveys of the Preserves and actions taken to enhance, restore, and create populations of covered plant species as part of the funded restoration projects.

The conservation strategy for covered wildlife species focuses on the establishment and long-term management of Preserves that support Covered Species and their associated habitats, the restoration of 357 acres of currently protected lands that support Covered Species, and avoidance and/or minimization of impacts, particularly breeding season restrictions and buffers (Section 5.6). As stated previously, the Preserves support high-quality habitat and are located in core habitat conservation areas that are of high conservation priority (CBI 2009).

As presented in Table 1 of this NCCP Permit, the Preserves support:

- 0.1 acre of predicted suitable habitat for arroyo chub (Table 6–7).
- 529.8 acres of predicted suitable habitat for, and one individual of, coast horned lizard (Table 6–8).
- 52.1 acres of predicted suitable habitat for, and six individuals of, orange-throated whiptail (Table 6–9).
- 9.9 acres of predicted suitable habitat for western pond turtle (Table 6–10).

- 254.7 acres of predicted suitable habitat for, and 26 individuals of, coastal cactus wren (Table 6–11).
- 422.1 acres of predicted suitable habitat for, and 15 individuals of, California gnatcatcher (Table 6–12).
- 8.7 acres of predicted suitable habitat for least Bell's vireo (Table 6–13).
- 8.7 acres of predicted suitable habitat for southwestern willow flycatcher (Table 6–14).
- 1,232.5 acres of predicted suitable habitat for the bobcat (Table 6–15).

To ensure the continued viability/persistence of the covered animal species on the various Preserves, species-specific management directives have been or will be incorporated into the RMPs (ICF 2015a-e; Section 7.2.8).

Direct take of all nine animal species is not anticipated, although some direct loss of occupied habitat is expected to occur for western pond turtle, California gnatcatcher, and least Bell's vireo (Section 4.3.2). Prior to and during construction of the covered freeway improvement projects, OCTA will implement the following measures in order to avoid and/or minimize direct and indirect impacts to all 12 NCCP Covered Species: 1) conduct pre-construction biological surveys; 2) delineate and avoid, to the maximum extent practicable, environmentally sensitive areas; 3) restore areas of temporary impact; 4) control invasive species; 5) remove trash and other personnel-generated debris; 6) educate on-site personnel regarding presence of on-site sensitive natural resources; and 7) monitor all construction activities in or adjacent to the environmentally sensitive areas (Section 5.6.1).

Species-specific protection measures and policies for the two aquatic species, arroyo chub and western pond turtle, will also be implemented per the Aquatic Resources and Species Policy (Section 5.6.2.1). This policy requires construction activities be restricted during the rainy season (15 October through 1 June) or conducted when the area is dry and/or lacks flowing or standing water; however, construction activities in flood control structures (e.g., concrete-lined channels) cannot be restricted. To minimize impacts to arroyo chub, a qualified biologist will conduct pre-construction presence/absence surveys for all projects occurring in potential habitat for this species. If arroyo chub is found on the project site, then the qualified biologist will identify appropriate methods to capture, handle, exclude, and/or relocate this species. All fish exclusion activities will adhere to accepted NOAA Fisheries Service and CDFW protocols and be closely coordinated with the Wildlife Agencies. To minimize impacts to western pond turtle, a qualified biologist will conduct pre-construction presence/absence surveys for all projects occurring in appropriate habitats for the species. If western pond turtle is found within the construction footprint, the occupied habitat and appropriate buffer, as determined by the biologist, will be avoided to the maximum extent practicable. If avoidance is not possible and the individuals do not passively relocate to areas outside the project area, then either the biologist may relocate the individuals to suitable habitat at least 300 feet from the work area or the turtles can be held in captivity until project completion. If western pond turtles are found during the pre-construction surveys, the Wildlife Agencies will be immediately notified and any relocation activities will be coordinated with appropriate agency staff.

Collectively, the conservation strategy will provide for the conservation of, and mitigate for impacts to, Covered Species within the Plan Area (Chapter 5). The conservation strategy is based on the best scientific data available at the time of the OCTA NCCP/HCP's preparation. The primary source of information for land cover and vegetation mapping within the Plan Area was the USFS (2009). Other sources of biological data and information include CNDDB, USFWS

database containing confirmed species points for plant and wildlife species, USFS database containing confirmed species points for plant and animal species on USFS land, occurrence information collected by IRC, results of local studies and survey efforts (e.g., USGS, NCC, and IRC), consultation with biological experts, Preserve baseline surveys (Bonterra Psomas 2013a, 2013b, 2014, 2015), and input from the Scientific Advisor Panel (Rahn et al. 2011). Biological experts consulted during NCCP/HCP planning included Dr. Matt Rahn, San Diego State University; Berry Nerhus, Endemic Environmental Services; Mark Dodero, Recon; Dr. Kristine Preston, USGS; John O'Brien, CDFW; Dr. Winston Vickers, U.C. Davis; Dr. Robert Fisher, USGS; and Michael O'Connell, IRC. During the development of species-specific conservation measures, species experts from the Wildlife Agencies were also consulted, including Jonathan Snyder, USFWS; Cara Allen, CDFW; Christine Beck, CDFW; Russ Barabe, CDFW; and David Mayer, CDFW. Lastly, species distribution models were also used during the development of the conservation strategy (Section 2.4.2.2). The models were used to identify the amount of impact and the concomitant mitigation.

In general, the conservation approach for the OCTA NCCP/HCP was to build upon the currently protected lands in the Plan Area through acquisition of unprotected natural habitat known to include the modeled predicted suitable habitat for Covered Species as well as the Covered Species themselves. Therefore, input from species experts familiar with the Plan Area, the CBI (2009) report, and the subsequent EOC ranking process were the primary means used for the selection of the Preserves and restoration projects, an approach that was supported by the Wildlife Agencies and the Science Advisors (Rahn et al. 2011).

Therefore, the OCTA NCCP/HCP contains specific conservation measures that meet the biological needs of Covered Species and are based upon the best available scientific information regarding the status of Covered Species and the impacts of permitted activities on those species.

Finding 4.1.7 **CDFW finds that the NCCP/HCP contains a monitoring program (Section 2820(a)(7)).**

Chapter 7 of the NCCP/HCP describes the monitoring program in detail. The purposes of the program are to ensure compliance with the NCCP/HCP; to assess the status of Covered Species; and to evaluate the effects of management actions such that the conservation strategy, including the biological goals and objectives, are achieved. Adaptive management and monitoring are integrated into one cohesive program where monitoring will inform management actions to continually improve outcomes for covered and other native species and natural vegetation communities.

The monitoring program focuses on two primary components: compliance monitoring and effectiveness monitoring.

Compliance Monitoring tracks the status of NCCP/HCP implementation to ensure that all requirements of the NCCP/HCP are being met. Compliance monitoring verifies that OCTA is carrying out the terms of the NCCP/HCP, permits, and IA. OCTA will track compliance monitoring internally and provide results to the Wildlife Agencies, who will ensure that OCTA remains in compliance with the permits, IA, and NCCP/HCP. As defined by the NCCP/HCP, compliance monitoring will include: tracking impacts on natural resources resulting from Covered Activities to ensure that the amount of impacts that ultimately occur under the NCCP/HCP stays below the amount of impacts estimated and authorized during NCCP/HCP

development; oversight of Preserve management and monitoring; and tracking and facilitating the implementation of the restoration projects.

Effectiveness Monitoring assesses the biological success of the NCCP/HCP. Specifically, it evaluates the implementation and success of the conservation strategy described in Chapter 5. Effectiveness monitoring includes monitoring the effects of the management activities. OCTA will collaborate with the Preserve managers, monitoring biologists, Wildlife Agencies, science advisors, and the EOC on the design of the monitoring and management program for the Preserves. OCTA will ultimately be responsible, however, for implementing and reporting on the results of the effectiveness monitoring. Effectiveness monitoring assesses status and trends, as well as threats and stressors, and requires biological expertise.

The essential elements of the monitoring and adaptive management program have been organized into three main phases: inventory, targeted studies, and long-term monitoring/adaptive management. In general, activities in the inventory phase will occur during the first two years of NCCP/HCP implementation and thereafter if additional lands are acquired. Most targeted studies will be concentrated in the first five years of NCCP/HCP implementation, but they will likely continue throughout implementation as management uncertainties are identified and resolved. Activities in the long-term monitoring phase will begin on each site after the inventory phase is complete. Results of the monitoring activities will be provided to the Wildlife Agencies in the annual reports.

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 the Preserves but will contribute monitoring data collected on the Preserves in a format that can be integrated with regional monitoring databases as appropriate. OCTA will also participate in regional monitoring efforts such as the 2016 California gnatcatcher effort mentioned previously and stay informed of regional monitoring projects/issues through coordination with other management/monitoring entities (e.g., NCC, SDMMP, and Western Riverside Resources Conservation Authority). For example, OCTA staff regularly participate in the County of Orange Area Safety Taskforce (COAST) meetings, convened by Orange County Fire Authority, which is a broad, informal group of agencies and organizations who are affected by wildland fire in the Plan Area.

Therefore, CDFW finds that the OCTA NCCP/HCP contains a monitoring program.

Finding 4.1.8 **CDFW finds that the NCCP/HCP contains an adaptive management program (Section 2820(a)(8)).**

The adaptive management components of the OCTA NCCP/HCP are described in Chapter 7 *Management and Monitoring*.

The OCTA NCCP/HCP contains an adaptive management program for which the acquisition of data through long-term monitoring is essential. Adaptive management allows the conservation strategy of the NCCP/HCP to be adjusted throughout the permit term, ensuring that the most up-to-date information is utilized to achieve the biological goals and objectives. Adaptive management framework guidelines are provided in Section 7.2.7.3 of the NCCP/HCP. These guidelines will be used by the Preserve managers as the basis for developing new, or modifying existing, management actions within each of the Preserves. The guidelines focus on goals and objectives and monitoring guidelines developed for each of the 12 NCCP Covered Species. These

monitoring and management guidelines will be further refined in the individual RMPs that will be prepared for each Preserve. Currently, OCTA has prepared draft RMPs for the following Preserves: Ferber Ranch, Hafen, O'Neill Oaks, Saddle Creek South, and MacPherson (ICF 2015a–e). These draft RMPs outline specific goals, measurable objectives, timelines, and thresholds for initiating actions to ensure the perpetual conservation of habitats and Covered Species across the Preserves. RMPs for Aliso Canyon and Hayashi will also include these items.

Biological monitoring of the Preserves will serve to measure the efficacy of the overall conservation approach, support informed adaptive management decisions, and assist in defining and modifying biological goals. Effectiveness monitoring will be implemented to evaluate the success of management activities to address specific habitat and Covered Species objectives across the Preserves. The results of these monitoring efforts will be used by OCTA and the Wildlife Agencies to determine if the Conditions of Coverage are sufficient for conserving and managing the resources and if modifications or new management (and monitoring) efforts are warranted. Adaptive management recommendations will be provided during the annual reporting process (Section 8.4), as necessary, to improve the effectiveness of the NCCP/HCP. Currently, OCTA has sole management responsibility for the Preserves. Thus, any adaptive management deemed necessary within the Preserves shall be initiated and carried out by the individual Preserve managers in coordination with OCTA.

Therefore, CDFW finds that the OCTA NCCP/HCP contains an adaptive management program.

Finding 4.1.9 **CDFW finds that the NCCP/HCP includes a timeframe and process by which reserves or other conservation measures are to be implemented, including the obligations of landowners and plan signatories, and the consequences of the failure to acquire lands in a timely manner (Section 2820(a)(9)).**

As part of its conservation strategy and commitments pursuant to the NCCP/HCP, OCTA has acquired and assured management of Preserves totaling 1,296 acres and funded 11 restoration projects that benefit protected lands prior to NCCP Permit issuance. Therefore, unlike most NCCP permittees, OCTA has assembled and ensured the long-term management of Preserves well in advance of impacts associated with the Covered Activities. The OCTA NCCP/HCP recognizes that OCTA has already fulfilled many of the NCCP/HCP obligations. Additional conservation strategy obligations and the timeline for completion of these obligations are also recognized in the OCTA NCCP/HCP (Section 7.2.4). These obligations include 1) within two years of NCCP permit issuance, conservation easements will be recorded for each Preserve; and 2) within two years of NCCP Permit issuance or within two years of Preserve acquisition, an RMP will be prepared and approved for each Preserve (Section 7.2.4). Currently, draft RMPs have been circulated for agency and public review for five of the Preserves: Ferber Ranch, Hafen, Saddle Creek South, O'Neill Oaks, and MacPherson (ICF 2015a–e). Section 16.2 of the IA establishes a process for NCCP Permit suspension if OCTA does not fulfill the conservation strategy obligations of the NCCP/HCP.

As described in Section 5.8.1 *Tracking Impacts* and Appendix F *Impact Tracking Template* of the NCCP/HCP, OCTA will be responsible for tracking impacts to natural resources resulting from the Covered Activities to ensure that the amount of impacts that ultimately occur under the NCCP/HCP stays below the impact caps established in the Plan. OCTA will track impacts to 1) habitat types resulting from the covered freeway improvement projects; 2) covered plant species resulting from all Covered Activities; and 3) habitat types resulting from management activities within the Preserves. Appendix F provides detailed datasheets and a data collection protocol. All impacts will be tracked in an Excel-type spreadsheet.

Furthermore, the annual report will provide an analysis of whether the upland or wetland habitat credits currently available will be sufficient to satisfy the projected mitigation obligation requirements for the next two years, based on the estimated impacts from Covered Activities for that period. If, based on this analysis, the available credits would potentially be reduced to below the estimated credit/acreage need, OCTA will acquire additional habitat acreage to add to the Preserves to meet that commitment, fund additional restoration or enhancement activities, or provide a biologically superior alternative that is acceptable to the Wildlife Agencies.

Therefore, CDFW finds that the OCTA NCCP/HCP includes a timeframe and process by which the reserves or other conservation measures are to be implemented, including the obligations of NCCP/HCP signatories, and consequences of the failure to acquire lands in a timely manner.

Finding 4.1.10 **CDFW finds that the NCCP/HCP contains provisions that ensure adequate funding to carry out the conservation actions identified in the NCCP/HCP (Section 2820(a)(10)).**

As described in Section 8.3 and shown on Table 8–1 of the NCCP/HCP, implementation of the OCTA NCCP/HCP will be funded through 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 five percent, which based on 2016 projections, is roughly $285 million, of the M2 generated revenue will be allocated to mitigate the environmental impacts associated with the covered freeway improvements under the OCTA M2 EMP. The EMP will be used to fund the conservation actions identified in the NCCP/HCP. The estimated expenditures for the development and implementation of the NCCP/HCP (including Preserve acquisitions, near-term and long-term Preserve management and monitoring, funding of restoration projects, program management, and interest of EMP) totals approximately $144 million over the 40-year permit term (Table 8–1). Therefore, there are sufficient funds available through the M2 EMP to cover the development and implementation of the OCTA NCCP/HCP.

Section 12.1 of the IA states that within six months of NCCP Permit issuance OCTA shall establish and manage a non-wasting endowment to fund interim Preserve management and monitoring, currently estimated at $14 million, and for no other purpose. OCTA is required to fully fund the final non-wasting endowment within 15 years of NCCP Permit issuance. 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 five years of NCCP Permit issuance, and will be reviewed and approved by the Wildlife Agencies. The analysis will itemize and define the long-term obligations for each Preserve, using Preserve-specific information developed for each of the RMPs. The NCCP/HCP gives an initial estimate of the non-wasting endowment as approximately $34.5 million. Management of the NPPC/HCP endowment will follow the safeguards and audit features applied to the M2 program, which include generally accepted accounting practices. As such, OCTA has the capacity to effectively manage endowments for mitigation properties, to obtain reasonable rates of return, and to ensure accountability on a property-by-property basis. Alternatively, OCTA may use third parties approved by the Wildlife Agencies to hold and manage the endowment.

Therefore, CDFW finds that the OCTA NCCP/HCP contains provisions that ensure adequate funding to carry out the conservation actions identified in the NCCP/HCP.

4.2 Findings Regarding the IA

Finding 4.2.1 **CDFW finds that the IA contains provisions defining species coverage, including conditions of coverage (2820(b)(1)).**

Exhibit B of the IA identifies 12 species proposed for coverage under this NCCP Permit. The Covered Species includes both listed and non-listed species. Take of the Covered Species is authorized contingent on OCTA implementing the NCCP/HCP as stipulated in Section 8 of the IA. This includes, but is not limited to, administering the NCCP/HCP, using agreed upon avoidance and minimization measures, assembling and managing the Preserves, providing funding so that management of the Preserves will be assured in perpetuity, and reporting regularly to the Wildlife Agencies (IA Section 8.1.1). The IA also specifies that OCTA must comply with the terms and conditions of species coverage detailed in the NCCP/HCP, the IA, and this NCCP Permit, to avoid, minimize, and mitigate impacts on Covered Species and their habitats (IA Section 8.1).

Therefore, CDFW finds that the IA contains provisions defining species coverage, including conditions of coverage.

Finding 4.2.2 **CDFW finds that the IA contains provisions for establishing the long-term protection of any habitat reserve or other measures that provide equivalent conservation of Covered Species (2820(b)(2)).**

Section 4.2 of the IA establishes the long-term protection of the Preserves. It states that OCTA may either acquire a Preserve through fee title or by conservation easement. To date, all Preserves have been acquired through fee title and a conservation easement will be recorded over each Preserve within two years of NCCP Permit issuance (Section 7.2.4.1). All fee title acquisitions will include appropriate legal restrictions, approved in writing by the Wildlife Agencies that ensure that the acquired lands are protected in perpetuity for Covered Species and their habitats. Any future land acquisitions shall follow the process described in Section 8.5.4 of the NCCP/HCP and adhere to the principles and priorities set forth for preserve design, and for species population and habitat preservation and enhancement.

Therefore, CDFW finds that the IA contains provisions for establishing the long-term protection of any habitat reserve or other measures that provide equivalent conservation of Covered Species.

Finding 4.2.3 **CDFW finds that the IA contains specific terms and conditions, which, if violated, would result in the suspension or revocation of the NCCP Permit, in whole or in part. CDFW further finds that the IA includes a provision requiring notification to the NCCP/HCP participant of a specified period of time to cure any default prior to suspension or revocation of the NCCP Permit in whole or in part (2820(b)(3)).**

Section 16.3 of the IA contains the basic provisions for dispute resolution. OCTA and the Wildlife Agencies agree to first work together informally at the staff level to resolve differences. If that is unsuccessful, either or both of the Wildlife Agencies will notify OCTA in writing of the alleged non-compliance with, or violation of, the NCCP Permit, NCCP/HCP, and/or IA; the basis for contending that the non-compliance or violations has occurred; and proposed remedies to correct the non-compliance. The notified parties will have 30 days to respond. Within 10 days after such response was provided or was due, a representative from each Party will meet and

negotiate in good faith toward a solution, or will establish a specific process and timetable to see such a solution. If any issues cannot be resolved through these negotiations, the Parties may consider non-binding mediation and other alternative dispute resolution processes.

Section 16.2 of the IA contains the provisions for suspending the NCCP Permit, in whole or in part, for a material violation of the NCCP Permit or material breach of the IA by OCTA. This notice may be given only after attempting the resolution process outlined above, requesting OCTA to take action when the action is reasonable and warranted, providing OCTA written notice as to the issue, and giving OCTA the opportunity to demonstrate why the suspension is not warranted or to take acceptable steps to resolve it. If this process is unsuccessful in producing a mutually satisfactory solution, CDFW may suspend the NCCP Permit. Within 15 days of that action, CDFW will confer with OCTA and will identify reasonable, sufficient remedies to resolve the issue. Within 45 days of receiving notice from CDFW, OCTA shall either satisfy CDFW that they are in compliance with the state NCCP Permit or reach an agreement with CDFW to expeditiously obtain compliance.

Following this 45-day period, CDFW may suspend, but shall not revoke, the state NCCP Permit until such time as the review process set forth in Section 16.2 of the IA has been completed, provided the process has been invoked by OCTA.

Section 16.2.2 of the IA contains an exception to the resolution and suspension processes. If CDFW determines that OCTA has failed to maintain rough proportionality as required by Section 16.2.2 of the IA and Section 5.8.2 of the NCCP/HCP and the situation has not been resolved or an agreement has not been entered into to resolve the issue within 45 days of written notice of the breach, CDFW shall suspend the NCCP Permit in accordance with Fish and Game Code Section 2820(c).

Therefore, CDFW finds that the IA contains specific terms and conditions, which, if violated, would result in the suspension or revocation of the permit, in whole or in part. CDFW also finds that the IA includes a provision requiring notification to the NCCP/HCP participant of a specified period of time to cure any default prior to suspension or revocation of the NCCP Permit in whole or in part.

Finding 4.2.3A **CDFW finds that the IA specifies the action CDFW shall take if the participant fails to provide adequate funding (2820(b)(3)(A)).**

Section 12 of the IA requires OCTA to ensure that implementation of the NCCP/HCP is adequately funded through and beyond the NCCP/HCP permit term.

In the event there is inadequate funding to implement the NCCP/HCP, the Wildlife Agencies under Section 12.2 of the IA will assess the impact of the funding deficiency on the scope and validity of the permits. Unless the Wildlife Agencies revoke the permits pursuant to Section 16 of the IA, the Parties agree that they will meet and confer to cooperatively develop a strategy to address the funding shortfall, and to undertake all practicable efforts to maintain the level of conservation and take authorization afforded by the Permits until the funding situation can be remedied.

Therefore, the IA specifies the action CDFW shall take if the participant fails to provide adequate funding.

Finding 4.2.3B **CDFW finds that the IA specifies the action CDFW shall take if the participant fails to maintain rough proportionality between impacts on habitat or Covered Species and conservation measures (2820(b)(3)(B)).**

For purposes of the NCCP/HCP, rough step proportionality shall be determined pursuant to Section 16.2.2 of the IA and Section 5.8.2 of the NCCP/HCP. If at any time CDFW provides written notification that rough proportionality has not been met, then OCTA will either: (1) regain rough proportionality within 45 days; or (2) enter into an agreement with CDFW within 45 days to expeditiously regain rough proportionality. The agreement may include any of a variety of commitments or adjustments to the NCCP/HCP designed to regain rough proportionality, including but not limited to, a plan to acquire, restore, or enhance lands of appropriate vegetation or land-cover type in a timely manner.

In the event that CDFW has determined that OCTA has failed to meet the rough proportionality standard provided in Section 16.2 of the IA, and if OCTA failed to cure the default or has failed to enter into an agreement to do so within 45 days of the written notice of such determination, CDFW shall suspend the NCCP Permit in whole or in part in accordance with Fish and Game Code Section 2820(c).

Therefore, CFDW finds that the IA specifies the action CDFW shall take if the participant fails to maintain rough proportionality between impacts on habitat or Covered Species and conservation measures.

Finding 4.2.3C **CDFW finds that the IA specifies the action CDFW shall take if the NCCP/HCP 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 NCCP/HCP (2820(b)(3)(C)).**

Section 8 of the IA specifies the obligations of the parties to correctly implement the NCCP/HCP and notes that both the IA and NCCP/HCP are necessary for this process. The NCCP/HCP is a plan and the IA is the contract that requires the provisions of the plan to be carried out, as agreed by all parties. Additionally, the NCCP/HCP is expressly incorporated into the IA in Section 17.1. Section 8.1 of the IA requires OCTA to perform all obligations under the NCCP/HCP, the IA, and the permits issued by the Wildlife Agencies.

Adoption, amendment, or approval of any plan or project that is inconsistent with the objectives and requirements of the NCCP/HCP is a potential violation of the provisions of the NCCP/HCP and, by incorporation, the IA (IA Section 16.2.3). If this occurs, the Wildlife Agencies would meet and confer with OCTA to discuss the issue. If there was no immediate resolution, all parties would enter into the dispute resolution process discussed above. Potentially, failure to resolve the issue could conclude with suspension or revocation of the state and/or federal permits, pursuant to the procedures in Section 16 of the IA.

Therefore, CDFW finds that the IA specifies the action CDFW shall take if the NCCP/HCP 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 NCCP/HCP.

Finding 4.2.3D **CDFW finds that the IA specifies the action CDFW shall take if the level of take exceeds that authorized by the NCCP Permit (2820(b)(3)(D)).**

The amount of take for each Covered Species and habitat type authorized under the NCCP/HCP is defined in Chapter 4 of the NCCP/HCP. Furthermore, Section 10 of the IA outlines the compliance monitoring responsibility of OCTA to ensure that the amount of take in any given year of NCCP/HCP implementation is reported to the Wildlife Agencies. If CDFW determines, after conferring with OCTA, that take is occurring above levels authorized by the NCCP Permit, CDFW at its discretion may suspend or revoke the NCCP Permit, in whole or in part, pursuant to the procedures in Section 16.2 of the IA and Section 8.7.2.4 of the NCCP/HCP. Section 16.2 of the IA contains the provisions for suspending or revoking the NCCP Permit, in whole or in part, for a material violation of the NCCP Permit or material breach of the IA by OCTA. This notice may be given only after attempting the resolution process described in Section 16.3 of the IA, requesting OCTA to take action when the action is reasonable and warranted and after providing written notices as to the issue and giving OCTA the opportunity to demonstrate why the suspension is not warranted or to take acceptable steps to resolve it.

Therefore, CDFW finds that the IA specifies the action CDFW shall take if the level of take exceeds that authorized by the NCCP Permit.

Finding 4.2.4 **CDFW finds that the IA contains provisions specifying procedures for amendment of the NCCP/HCP and the IA (2820(b)(4)).**

Section 15 of the IA contains provisions and specifies procedures for amending the NCCP/HCP, the IA, and the permits issued by the Wildlife Agencies. The NCCP/HCP may be amended in accordance with Sections 15.1.1 and 15.1.2 of the IA. The IA Section 15.2 specifies procedures for amending the IA.

Therefore, CDFW finds that the IA contains provisions specifying procedures for amendment of the NCCP/HCP and the IA.

Finding 4.2.5 **CDFW finds that the IA contains provisions ensuring implementation of the monitoring program and adaptive management program (2820(b)(5)).**

Section 9 of the IA requires OCTA to monitor and use an adaptive management process (also described in Chapter 7 of the NCCP/HCP) to inform and refine the NCCP/HCP to best achieve the goals of the conservation strategy. Monitoring and adaptive management will be done collaboratively with the Wildlife Agencies and include guidance from independent science advisors and the EOC. Any major changes in the adaptive management program must be approved by the Wildlife Agencies prior to implementation under Section 9.2 of the IA. Section 10 of the IA requires OCTA to report to the Wildlife Agencies on OCTA NCCP/HCP implementation and the results of the monitoring of Preserves in accordance with the program described in Chapter 7 of the NCCP/HCP. In conjunction with the dispute resolution and NCCP Permit suspension/revocation processes in IA Section16, the IA contains mechanisms to ensure the monitoring and adaptive management programs are implemented.

Therefore, CDFW finds that the IA contains provisions ensuring implementation of the monitoring program and adaptive management program.

Finding 4.2.6 **CDFW finds that the IA contains provisions for oversight of NCCP/HCP implementation for purposes of assessing mitigation performance, funding, and habitat protection measures (2820(b)(6)).**

Oversight of the implementation of the NCCP/HCP is provided by the Wildlife Agencies. The role of the Wildlife Agencies is to 1) oversee implementation of the NCCP/HCP and the monitoring and adaptive management program including the development and implementation of the RMPs, 2) collaborate with OCTA in developing studies and plans, 3) track compliance with rough proportionality between take and conservation, and 4) monitor the level of take being authorized (IA Sections 5, 7, 8, 9, and 10). Specific Wildlife Agency approval is required for, but not limited to, RMPs, site restoration plans, conservation easements, and land acquisitions. OCTA will also prepare and submit to the Wildlife Agencies an annual report that summarizes activities over the previous year in regards to implementation of the Covered Activities, adaptive management of the Preserves, and progress of the restoration projects (Section 8.4; IA Section 10.1). The annual report is a means for assessing progress of mitigation performance, funding, and habitat protection measures.

Section 10.2 of the IA specifies that the Wildlife Agencies may independently conduct inspections and monitoring of any Covered Activity site including any of the Preserves as well as the covered freeway improvement project sites. CDFW may also inspect data or records required by the IA, the OCTA NCCP/HCP, or the NCCP Permit to ensure compliance with NCCP Permit conditions, which includes mitigation, funding, and habitat protection requirements. Together with monitoring of the funding stream and the dispute resolution and NCCP Permit suspension/revocation processes in IA Section16, these measures, specified in the IA, provide adequate opportunity to detect problems with implementing the conservation strategy as planned and to carry out corrective actions.

Therefore, CDFW finds that the IA contains provisions for oversight of NCCP/HCP implementation for purposes of assessing mitigation performance, funding, and habitat protection measures.

Finding 4.2.7 **CDFW finds that the IA contains provisions for periodic reporting to the Wildlife Agencies and the public for purposes of information and evaluation of NCCP/HCP progress (2820(b)(7)).**

Section 10 of the IA contains requirements for annual reporting to the Wildlife Agencies. Section 10.1.1 also requires OCTA to submit within 30 days of being requested by the Wildlife Agencies, any additional information in its possession or control related to implementation of the NCCP/HCP for the purpose of assessing whether the terms and conditions of the permits, including the NCCP/HCP, are being fully implemented.

The primary reporting mechanism to the Wildlife Agencies will be the annual report (Section 8.4 and IA Section 10). The first annual report shall be prepared by OCTA and submitted to the Wildlife Agencies no later than March 15 (or date agreed to by OCTA and the Wildlife Agencies) following the first full calendar year of NCCP/HCP implementation. The second annual report and each annual report thereafter shall be prepared by OCTA and submitted to the Wildlife Agencies by March 15 or a date agreed to by the Parties, as described in Section 10 of the IA. The annual reports will document Permit compliance and include: the types, amounts, and locations of impacts; conservation actions; management actions; restoration/creation activities; and monitoring results. Annual reports will be submitted to the designated representatives of the

Wildlife Agencies, and other interested parties, and will be available to the public and posted on OCTA's NCCP/HCP web site. OCTA will also distribute these reports to the EOC and science advisors, as appropriate, for their review. A detailed list of the items covered in the reports is found in Section 10.1 of the IA.

In addition to the annual reports, Chapter 7 of the NCCP/HCP requires OCTA to create and maintain a database that will track all aspects of compliance with the permits, IA, and NCCP/HCP. These reporting requirements are incorporated by reference into the IA under Section 17.1 of the IA. The database will contain data on impacts, land acquisition, the status of each conservation action, legal documents, species occupancy requirements, and the efficacy of conservation measures in meeting the biological goals and objectives, restoration, and creation activities. This information will be made available to the Wildlife Agencies on request. The Wildlife Agencies may also request other information from OCTA to verify compliance with the NCCP/HCP and the Wildlife Agencies' decision documents (e.g., CEQA and NEPA mitigation measures).

Therefore, CDFW finds that the IA contains provisions for periodic reporting to the Wildlife Agencies and the public for purposes of information and evaluation of NCCP/HCP progress.

Finding 4.2.8 **CDFW finds that the IA contains mechanisms to ensure adequate funding to carry out the conservation actions identified in the NCCP/HCP (2820(b)(8)).**

Section 12 of the IA requires OCTA to ensure that all conservation, mitigation, monitoring, and reporting measures are adequately funded and that certain monitoring, reporting, and adaptive management measures are adequately funded in perpetuity. Development and implementation of the OCTA NCCP/HCP will be funded through the M2 transportation sales tax designed to raise money to improve Orange County's transportation system. At least 5 percent, which based on 2016 projections is roughly $285 million, of the M2 generated revenue will be allocated to mitigate the environmental impacts associated with the covered freeway improvement projects under the OCTA M2 EMP. The estimated expenditures for the development and implementation of the NCCP/HCP (including Preserve acquisitions, near-term and long-term Preserve management and monitoring, funding of restoration projects, program management, and interest of EMP) totals approximately $160 million over the 40-year permit term.

Section 12.1 of the IA states that within six months of NCCP Permit issuance OCTA shall establish and manage a non-wasting endowment to fund interim Preserve management and monitoring, currently estimated at $14 million, and for no other purpose. OCTA is required to fully fund the final non-wasting endowment within 15 years of NCCP Permit issuance. 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 five years of NCCP Permit issuance, and will be reviewed and approved by the Wildlife Agencies. This analysis will itemize and define the long-term obligation for each Preserve using Preserve-specific information developed for each of the RMPs. The NCCP/HCP gives an initial estimate of the non-wasting endowment as approximately $34.5 million. Management of the NPPC/HCP endowment will follow the safeguards and audit features applied to the M2 program, which include generally accepted accounting practices. As such, OCTA has the capacity to effectively manage endowments for mitigation properties, to obtain reasonable rates of return, and to ensure accountability on a property-by-property basis. Alternatively, OCTA may use third parties approved by the Wildlife

Agencies to hold and manage the endowment. The non-wasting endowment will ensure adequate funding for the conservation actions required by the OCTA NCCP/HCP.

Therefore, CDFW finds that the IA contains mechanisms to ensure adequate funding to carry out the conservation actions identified in the OCTA NCCP/HCP.

Finding 4.2.9 **CDFW finds that the IA contains provisions to ensure that implementation of mitigation and conservation measures on an NCCP/HCP basis is roughly proportional in time and extent to the impact on habitat or Covered Species authorized under the NCCP/HCP. CDFW further finds that these provisions identify the conservation measures, including assembly of reserves where appropriate and implementation of monitoring and management activities, that will be maintained or carried out in rough proportion to the impact on habitat or Covered Species and the measurements that will be used to determine if this is occurring (2820(b)(9)).**

Section 8 of the IA specifies the obligations of the parties to correctly implement the NCCP/HCP and notes that both the IA and NCCP/HCP are necessary for this process. The NCCP/HCP is a plan and the IA is the contract that requires the provisions of the plan to be carried out as agreed. Additionally, the NCCP/HCP is incorporated into the IA in Section 17.1. Section 8.1 of the IA requires OCTA to perform all obligations under the NCCP/HCP, the IA, and the permits issued by the Wildlife Agencies.

OCTA has implemented advanced mitigation and is required to acquire, conserve, and restore adequate resources within the Preserves and the restoration project sites to offset the majority of impacts anticipated to occur over the 40-year permit term from the implementation of Covered Activities. OCTA has purchased seven properties for conservation that 1) total 1,296 acres (1,232.5 acres of natural communities), 2) were identified as priority conservation areas by CBI (2009) and high priority conservation areas by the Wildlife Agencies, and 3) are known to support many of the Covered Species. This is a conservation-to-impact ratio well above mitigation ratios typically required for development projects in southern California. For example, typical mitigation ratios include 0.5:1 for nonnative grassland and chaparral, 1:1 to 3:1 for coastal sage scrub and oak woodland, and 1:1 to 4:1 for riparian habitats. The OCTA NCCP/HCP substantially exceeds these ratios for all proposed impacts (Table 3; data taken from Tables 4–5, 5–1 and 5–3 of the NCCP/HCP). In addition, the habitat impacted by the Covered Activities associated with the covered freeway improvement projects is of somewhat marginal quality for the Covered Species as it occurs along existing freeways and is subjected to indirect edge effects such as noise, air pollution, light, and invasion by nonnative species. Therefore, the habitat conserved is also of higher quality than that impacted.

Table 3. The amount of impacted and conserved vegetation communities as a result of OCTA NCCP/HCP implementation (data taken from OCTA NCCP/HCP Tables 4–5, 5–1, and 5–3).

Vegetation Communities	Impacted (acres)	Conserved (acres)	Conservation-to-Impact Ratio
Chaparral	10.9	562	51.6:1
Grassland	108.9	74	0.7:1
Riparian	5.2	18.3	3.5:1
Scrub	12.8	261	20:1
Woodland	13.3	316	24:1

For purposes of the NCCP/HCP, rough proportionality is required pursuant to Section 16.2.2 of the IA and Section 5.8.2 of the NCCP/HCP as incorporated by IA Section 17.1. IA Section 10 and the NCCP/HCP require annual reporting and monitoring requirements to track actual impacts against estimates provided in the NCCP/HCP. As such, the IA and NCCP/HCP provide for a stay-ahead commitment to ensure that the available conservation will be sufficient to meet the expected mitigation requirements.

Therefore, CDFW finds that the IA contains provisions to ensure that implementation of mitigation and conservation measures on an NCCP/HCP basis is roughly proportional in time and extent to the impact on habitat or Covered Species authorized under the NCCP/HCP. These provisions identify the conservation measures, including assembly of reserves where appropriate and implementation of monitoring and management activities, that will be maintained or carried out in rough proportion to the impact on habitat or Covered Species and the measurements that will be used to determine if this is occurring.

4.3 Findings Regarding Provisions for Permit Suspension or Revocation

Finding 4.3 **CDFW finds that the IA contains provisions for suspension or revocation of the NCCP Permit, in whole or in part, if the NCCP/HCP participant does not maintain proportionality between take and conservation measures specified in the IA and does not either cure the default with 45 days or enter into an Agreement with CDFW within 45 days to expeditiously cure the default (2820(c)).**

See Finding 4.2.3B.

4.4 Findings Regarding Public Review of Monitoring Program Data and Reports

Finding 4.4 **CDFW finds that any data and reports associated with the monitoring program shall be available for public review and that the entity managing the NCCP/HCP shall also conduct public workshops annually to provide information and evaluate progress toward attaining the conservation objectives of the NCCP/HCP (2820(d)).**

All data and reports associated with the monitoring program for the NCCP/HCP 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 (Section 8.7.3). Currently fact sheets for each Preserve are posted on OCTA's website on the EMP overview page (http://www.octa.net/Measure-M/Environmental/Freeway-Mitigation/Overview/). Future monitoring and annual reports will also be posted on this website. The EOC, which will track implementation of the NCCP/HCP and provide guidance to OCTA, meets monthly and is open to the public. The EOC meetings provide the same function as the previously mentioned public workshops.

As stated in Findings 4.2.6 and 4.2.7 above, the first annual report shall be prepared by OCTA and submitted to the Wildlife Agencies no later than March 15 (or date agreed to by OCTA and the Wildlife Agencies) following the first full calendar year of NCCP/HCP implementation and shall include all applicable activities and results from the Effective Date to the end of the first full calendar year. The annual report shall be made available to the public and a public meeting on the report will be held within 90 days of the report submittal. The annual report will summarize the

previous calendar year's monitoring results, impacts (by project and cumulatively) to Covered Species and habitats, mitigation measures implemented, and an assessment of the rough-proportionality standard. The full contents of the annual report and submittal process are detailed in Section 8.4 of the NCCP/HCP and Section 10.1 of the IA. In additions, the NCCP/HCP reporting and public review requirements are incorporated into and enforceable through the IA Section 17.1.

Therefore, CDFW finds that any data and reports associated with the monitoring program shall be available for public review and the entity managing the NCCP/HCP shall also conduct public workshops annually to provide information and evaluate progress toward attaining the conservation objectives of the NCCP/HCP.

4.5 Findings Regarding Review of Subsequent Projects

Finding 4.5 **CDFW finds that the NCCP/HCP participant that is the lead agency or responsible agency shall incorporate in the review of any subsequent project in the Plan Area the feasible mitigation measures and alternatives related to the biological impacts on Covered Species and their habitat developed in the program EIR (2820(e)).**

OCTA is a regional public-facility provider mandated to serve the transportation needs of Orange County. OCTA's actions are governed by a number of environmental programs, state and federal regulations, and legislative mandates designed to ensure protection of environmental quality while allowing OCTA to meet its transportation obligations. While OCTA does possess authority to establish its rights-of-way and to perform necessary actions to construct and maintain its transportation facilities, it does not have the authority to affect zoning or land use designations as do local jurisdictions such as the County or incorporated cities. Therefore, the OCTA NCCP/HCP does not authorize additional habitat loss beyond that identified herein for their covered freeway improvement projects and as allowed for on the acquired Preserves, and does not provide for the transfer of take to third party participants. The OCTA NCCP/HCP also does not impose new regulations on local, state, federal, or independent land-use agencies, private citizens, or other parties of interest within the Plan Area. Activities covered by the NCCP/HCP are limited to those conducted by OCTA or their authorized contractors, as described in Section 5.6 of the NCCP/HCP. This includes Caltrans, which will implement certain covered freeway improvement projects as a Participating Special Entity through a Certificate of Inclusion issued by OCTA describing the authorized take and required avoidance and minimization measures (Section 8.2.2.1; IA Section 2.1).

The EIR/EIS for the OCTA NCCP/HCP addressed impacts to Covered and non-Covered Species by essentially incorporating the elements of the NCCP/HCP conservation strategy as mitigation measures for impacts under CEQA. Covered Activities that occur after NCCP/HCP implementation must therefore be consistent with the EIR/EIS mitigation measures as well as the NCCP/HCP itself. The EIR/EIS summarizes the NCCP/HCP conservation strategy in Section 4.4.2.2. Additionally, in the discussion of impacts and mitigation for each species, the EIR/EIS includes brief summaries of the relevant parts of the conservation strategy for that species.

Covered Activities are also subject to individual project environmental review and the associated CEQA process. Project-specific minimization and mitigation measures (Section 5.6) will be outlined within the CEQA document based on project-specific biological surveys that are required for each project. OCTA will also complete a report for each project that will include: a

definition of project area, including project footprint, extent of construction, and extent of ongoing maintenance activities; a description of the project, including maps; the results of the biological surveys; evidence of compliance with avoidance and minimization measures; a quantification of anticipated direct and indirect impacts on NCCP/HCP land-cover types, Covered Species habitat, and other NCCP/HCP resources; and proposed conservation measures. This report will be used to support the CEQA document and will be made available to the Wildlife Agencies.

Therefore, CDFW finds that the NCCP/HCP participant that is the lead agency or responsible agency (i.e., OCTA) shall incorporate in the review of any subsequent project in the Plan Area the feasible mitigation measures and alternatives related to the biological impacts on Covered Species and their habitat developed in the program EIR.

4.6 Findings To Provide Assurances To OCTA NCCP/HCP Participants

Finding 4.6 **CDFW finds that the level of assurances provided to OCTA is commensurate with long-term conservation assurances and associated implementation measures pursuant to the approved NCCP/HCP (2820(f)).**

Through Section 13.2 of the IA, CDFW provides assurances to OCTA that as long as OCTA is properly implementing the IA, the NCCP/HCP, and the NCCP Permit, CDFW will not seek to impose on OCTA, for purposes of compliance with the NCCPA, any avoidance, minimization, mitigation, or conservation measures or requirements regarding the impacts of Covered Activities on Covered Species within the Plan Area beyond those required by the IA, the NCCP/HCP, and the NCCP Permit. As part of its conservation strategy and commitments pursuant to the NCCP/HCP, OCTA has carried out advanced mitigation for the Covered Activities by acquiring and assuring management of Preserves totaling 1,296 acres and funding 11 restoration projects on 357 acres to benefit protected lands prior to NCCP Permit issuance. To date, all Preserves have been acquired through fee title and a conservation easement will be recorded over each Preserve within two years of permit issuance.

Therefore, and for the reasons more fully described in Findings 4.6.1A through 4.6.1H and Finding 4.6.2, CDFW finds that the level of assurances provided to OCTA is commensurate with long-term conservation assurances and associated implementation measures pursuant to the approved NCCP/HCP.

Finding 4.6.1A **CDFW finds that the level of and time limits for assurances specified in the IA were based on the level of knowledge of the status of the Covered Species and natural communities (2820(f)(1)(A)).**

The status of the Covered Species and natural communities, as well as development of the conservation strategy, was based on the best scientific data available at the time of the NCCP/HCP's preparation. Numerous data sources, recent studies and survey reports, and consultation with regional experts were used to evaluate the status of Covered Species and natural communities. The primary source of information for land cover and vegetation mapping within the Plan Area was the USFS (2009). Other sources of biological data and information included CNDDB, USFWS database containing confirmed species points for plant and wildlife species, USFS database containing confirmed species points for plant and animal species on USFS land, occurrence information collected by IRC, results of local studies and survey efforts (e.g., USGS,

NCC, and IRC), consultation with biological experts, Preserve baseline surveys (Bonterra Psomas 2013a,013b, 2014, 2015), and input from the Scientific Advisor Panel (Rahn et al. 2011). Biological experts consulted during NCCP/HCP planning included Dr. Matt Rahn, San Diego State University; Berry Nerhus, Endemic Environmental Services; Mark Dodero, Recon; Dr. Kristine Preston, USGS; John O'Brien, CDFW; Dr. Winston Vickers, U.C. Davis; Dr. Robert Fisher, USGS; and Michael O'Connell, IRC. During the development of species-specific conservation measures, species experts from the Wildlife Agencies were also consulted, including Jonathan Snyder, USFWS; Cara Allen, CDFW; Christine Beck, CDFW; Russ Barabe, CDFW; and David Mayer, CDFW.

In addition, species distribution models were used during the development of the conservation strategy (Section 2.4.2.2). Species distribution models have been a major component of many NCCP/HCP planning efforts in California (e.g., San Diego MSCP). 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:

- 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 analyses 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., CNDDB). Species distribution models, used in parallel with field data for known species occurrences, guide conservation planning analysis and decisions.

Therefore, CDFW finds that the level of and time limits for assurances specified in the IA were based on the level of knowledge of the status of the Covered Species and natural communities.

Finding 4.6.1B **CDFW finds that the level of and time limits for assurances specified in the IA were based on the adequacy of analysis of the impact of take on Covered Species (2820(f)(1)(B)).**

Implementation of Covered Activities pursuant to the NCCP/HCP may result in take of some Covered Species and their habitat (Chapter 4). The major direct effects to Covered Species will result from habitat loss associated with Covered Activities. Because the NCCP/HCP utilizes a habitat-based approach, the determination of direct and indirect effects on Covered Species is based on the habitat removed or disturbed for each species. To the extent feasible, based on the best available data and species habitat models (Appendix C.3), the level of take for each proposed Covered Species has been described and quantified in Table 4–6 of the NCCP/HCP. Estimated levels of take were quantified on the basis of anticipated impacts to habitat assumed to be suitable for each species. These estimates are likely to be inflated because 1) the scale of vegetation data available may not recognize specific microhabitat conditions (e.g., cactus scrub patch size) required by a species, 2) not all suitable habitat is occupied by the subject species, and 3) the habitat value and baseline conditions at the locations of the covered freeway improvement projects were often suboptimal to support populations of the covered wildlife species.

The take analysis considered the following: 1) CNDDB, USFS, and USFWS datasets; 2) presence of predicted suitable habitat based on vegetation data and other factors such as slope; 3) proximity of known occurrences to the limits of the Covered Activities; 4) regional context of the species and habitat distribution; and 5) life-history characteristics of the species. Acreages of vegetation communities were calculated using GIS-mapped vegetation data within the limits of the Covered Activities. Each species was associated with the appropriate GIS-mapped vegetation communities based on the habitat preferences identified under the individual species accounts and the habitat model developed for each species. The area of potential habitat for each species was then calculated as the total of its associated GIS-mapped vegetation communities occurring within the limits of the Covered Activities.

Given the level of analysis of take described above, there is enough known about the potential impacts to each of the Covered Species and the natural communities to warrant providing long-term assurances to the NCCP/HCP participants.

Therefore, CDFW finds that the level of and time limits for assurances specified in the IA were based on the adequacy of analysis of the impact of take on Covered Species.

Finding 4.6.1C **CDFW finds that the level of, and time limits for assurances specified in the IA were based on the use of the best available science to make assessments about the impacts of take, the reliability of mitigation strategies, and the appropriateness of monitoring techniques (2820(f)(1)(C)).**

As described in Findings 4.6.1A and 4.6.1B, the best available scientific information was used to develop the conservation strategy and assess/estimate impacts to Covered Species and natural communities from implementation of the NCCP/HCP. The NCCP/HCP provides specific conservation measures to meet the biological needs of Covered Species, based upon the best available scientific information regarding the status of Covered Species within the Plan Area and anticipated impacts of Covered Activities on those species and their habitat. The NCCP/HCP identifies and quantifies the anticipated areas of impacts from Covered Activities (Chapter 4). Measures to be implemented for Covered Activities to avoid, minimize, and mitigate potential impacts are described in Section 5.6 of the NCCP/HCP.

The allowable amount of take associated with the covered 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 (Section 4.3). As Covered Activities are implemented, project-specific impacts will be more accurately quantified. The goal of the take analysis 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 type to account for the scale of resolution of the regional-level habitat mapping data (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. Implementation of the OCTA NCCP/HCP is anticipated to result in the direct take of the following vegetation communities: chaparral (10.9 acres), grassland (108.9 acres), riparian (5.2 acres), scrub (12.8 acres), water (0.4 acre), wet meadow/marsh (2.5 acres), and woodland (13.3 acres). Direct take of habitat for the Covered Species was also quantified (Table 4–6); however, actual direct take of Covered Species individuals is not anticipated. The permitted take of each of the 12 NCCP Covered Species was provided previously in Table 1 under Finding 4.1.4C.

Development of the NCCP/HCP conservation strategy was also guided by working with the Wildlife Agencies, recommendations provided in the Science Advisors Report (Rahn et al. 2011), the CBI (2009) report, and input from the EOC. The Science Advisors provided written guidance on the NCCP/HCP's biological goals and objectives, the Covered Species and species occurrence data, habitat suitability modeling, the conservation strategy and overall reserve design, and management, monitoring, and oversight of the NCCP/HCP Preserves. That report stated that the conservation and mitigation strategy of "purchasing inholdings and expanding preserved areas, emphasizing linkage and connectivity, and raising ecological condition through restoration is innately valid" and that "there is strong merit in the 'string of pearls' concept in which stepping stones link habitat allowing meta-population communication." CBI's (2009) report guided the overall prioritization process for the acquisition of the Preserves as well as providing an overview of the currently protected lands within the Plan Area.

Monitoring techniques and adaptive management will follow current guidelines as set forth in Atkinson et al. (2004), Hierl et al. (2007), and Lewison and Deutschman (2014)(Section 7.2.7.2). Monitoring protocols will follow current accepted standards, including vegetation mapping updates using the most current version of *A Manual of California Vegetation* (Sawyer et al. 2009) and *Vegetation Classification Report for Orange County* (AECOM 2013), statistical vegetation sampling developed in coordination with NCC, and covered plant and animal surveys according to the most current methods approved by the Wildlife Agencies (Table 7–1).

Therefore, CDFW finds that the level of and time limits for assurances specified in the IA were based on the use of the best available science to make assessments about the impacts of take, the reliability of mitigation strategies, and the appropriateness of monitoring techniques.

Finding 4.6.1D **CDFW finds that the level of and time limits for assurances specified in the IA were based on the appropriateness of the size and duration of the NCCP/HCP with respect to quality and amount of data (2820(f)(1)(D)).**

As stated in previous Findings, numerous data sources, recent studies and survey reports, in addition to consultation with regional experts, were used in the development of the OCTA NCCP/HCP. These data sources are either from Wildlife Agency or other government agencies (i.e. CDFW CNDDB, USFWS, USFS), surveys and studies conducted and/or funded by such agencies (e.g., CDFW, USGS, USFWS), or reputable firms and entities with recognized local knowledge and expertise (e.g., CBI, Bonterra Psomas, NCC, IRC). These sources are described in Chapters 2, 5, 6, and 10, and Appendix C of the NCCP/HCP.

Also discussed previously, species distribution models were used during the development of the conservation strategy (Section 2.4.2.2). 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:

- 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., CNDDB). Species distribution models, used in parallel with field data for known species occurrences, guide conservation planning analysis and decisions. Data gaps existed for certain species such as arroyo chub and least Bell's vireo. Plan Area-wide census type surveys have not been conducted for these species within the past 10 years. As stated above, the models allow for the prediction of presence/absence based on predicted suitable habitat.

In addition to the species models, recent reports that have been published about the Covered Species were also used to assess the status of these species within the Plan Area. These include genetics analyses, presence/absence surveys, regulatory agency monitoring requirements, and other field studies. In addition, CBI's (2009) landscape-level conservation analysis also provided critical guidance for Preserve acquisition.

Therefore, CDFW finds that the level of and time limits for assurances specified in the IA were based on the appropriateness of the size and duration of the NCCP/HCP with respect to quality and amount of data.

Finding 4.6.1E **CDFW finds that the level of and time limits for assurances specified in the IA were based on the sufficiency of mechanisms for long-term funding of all components of the NCCP/HCP and contingencies (2820(f)(1)(E)).**

As previously stated in Finding 4.1.10 and described in Section 8.3, implementation of the OCTA NCCP/HCP will be funded through 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 percent, which based on 2016 projections is roughly $285 million, of the M2 generated revenue will be allocated to mitigate the environmental impacts associated with the covered freeway improvements under the OCTA M2 EMP (Table 8–1). The EMP will be used to fund the conservation actions identified in the NCCP/HCP. The estimated expenditures for the development and implementation of the NCCP/HCP (including Preserve acquisitions, near-term and long-term Preserve management and monitoring, funding of restoration projects, program management, and interest of EMP) totals approximately $144 million over the 40-year permit term (Table 8–1). Therefore, there are sufficient funds available through the M2 EMP to cover the development and implementation of the OCTA NCCP/HCP.

Section 12.1 of the IA states that within six months of NCCP Permit issuance OCTA shall establish and manage a non-wasting endowment to fund interim Preserve management and monitoring, currently estimated at $14 million, and for no other purpose. OCTA is required to fully fund the final non-wasting endowment within 15 years of NCCP Permit issuance. 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 five years of NCCP Permit issuance, and

reviewed and approved by the Wildlife Agencies. This analysis will itemize and define the long-term obligation for each Preserve using Preserve-specific information developed for each of the RMPs. The NCCP/HCP gives an initial estimate of the non-wasting endowment as approximately $34.5 million. Management of the NPPC/HCP endowment will follow the safeguards and audit features applied to the M2 program, which include generally accepted accounting practices. As such, OCTA has the capacity to effectively manage endowments for mitigation properties, to obtain reasonable rates of return, and to ensure accountability on a property-by-property basis. Alternatively, OCTA may use third parties approved by the Wildlife Agencies to hold and manage the endowment. There are sufficient mechanisms for long-term funding of the mitigation for and conservation of the Covered Species and the natural communities to warrant provision of long-term assurances to the NCCP/HCP participants.

Therefore, CDFW finds that the level of and time limits for assurances specified in the IA were based on the sufficiency of mechanisms for long-term funding of all components of the NCCP/HCP and contingencies.

Finding 4.6.1F **CDFW finds that the level of and time limits for assurances specified in the IA were based on the degree of coordination and accessibility of centralized data for analysis and evaluation of the effectiveness of the NCCP/HCP (2820(f)(1)(F)).**

OCTA is tasked with tracking and reporting the impacts associated with the Covered Activities including both covered freeway improvement projects and Preserve management (Section 8.4). Tracking impacts on habitat types resulting from the covered freeway improvement projects and Preserve management activities will ensure that OCTA does not exceed the take allowance specified in the NCCP/HCP (Table 5–7). OCTA is also tasked with collecting and distributing data pertaining to the Covered Species and habitat communities collected during implementation of the RMPs. All of this information will be provided to the Wildlife Agencies and the public on an annual basis per Section 8.4 of the NCCP/HCP. The annual report will include, but not be limited to, the following: 1) a description and location of covered projects and management activities completed, including a summary of avoidance and minimization measures undertaken for each covered project and any on-site restoration that is required to offset temporary impacts; 2) summary of any Minor Amendments for the covered freeway improvement projects; 3) acreage of impacted habitat for the year and for all years combined; 4) summary of management and monitoring activities; 5) summary of the status of OCTA-funded restoration projects; 6) summary of NCCP/HCP funding, including endowment budgets; and 7) any revisions/amendments to the NCCP/HCP, permits, or the IA. OCTA will also participate in regional monitoring efforts such as the 2016 California gnatcatcher effort mentioned previously and stay informed of regional monitoring projects/issues through coordination with other management /monitoring entities such as NCC (Chapter 7). Regional monitoring efforts will also be summarized in the annual report.

The annual reports, individual Preserve RMPs, Preserve-level biological data, and any other reports published for NCCP/HCP compliance by OCTA will be made available on their website (Section 8.7.3): http://www.octa.net/Projects-and-Programs/Measure-M/Overview/. If a member of the public desires the information, OCTA can also provide it on a compact disc at the monthly EOC meetings. In addition, the Wildlife Agencies maintain authority under Section 10.2 of the IA to inspect any required data or records, including centralized data.

Therefore, CDFW finds that the level of and time limits for assurances specified in the IA were based on the degree of coordination and accessibility of centralized data for analysis and evaluation of the effectiveness of the NCCP/HCP.

Finding 4.6.1G **CDFW finds that the level of and time limits for assurances specified in the IA were based on the degree to which a thorough range of foreseeable circumstances are considered and provided for under the adaptive management program (2820(f)(1)(G)).**

Natural habitats are inherently subject to fluctuations, and many vegetation communities in southern California are adapted to cyclical events such as wildfire, flood, and drought. Many of these fluctuations will be monitored and addressed through the adaptive management and monitoring program (Section 7.2.7). This section includes Adaptive Management Goals and Objectives for the covered species, and describes anticipated circumstances (such as declining population numbers) and proposed strategies to address them (such as additional monitoring, invasive species control, public access management, habitat restoration).

Some events or the scale of events may exceed the level of change that can be addressed through adaptive management responses. Changes that are greater than those addressed through adaptive management are considered either "Changed Circumstances" or "Unforeseen Circumstances." Fish and Game Code Section 2805(c) identifies changed circumstances as "reasonably foreseeable circumstances that could affect a Covered Species or geographic area covered by the plan." Fish and Game Code Section 2805(k) further defines an "unforeseen" circumstance as "changes affecting one or more species, habitat, natural community, or the geographic area covered by a conservation plan 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."

Changed Circumstances are listed in Section 8.6.2 of the NCCP/HCP and include flood; fire; extended period of reduced precipitation; invasion by exotic species or disease; toxic spills, vandalism, encroachment, and other unauthorized human activities; and listing of non-Covered Species. The effects of climate change as they relate to Changed Circumstances were incorporated into the discussion for each applicable circumstance listed above. Events that meet the Changed Circumstance threshold will be addressed through various methods, such as assessment and remediation plans and altered monitoring regimes to evaluate habitat and species responses (Section 8.6.2).

Therefore, CDFW finds that the level of and time limits for assurances specified in the IA were based on the degree to which a thorough range of foreseeable circumstances are considered and provided for under the adaptive management program.

Finding 4.6.1H **CDFW finds that the level of and time limits for assurances specified in the IA were based on the size and duration of the NCCP/HCP (2820(f)(1)(H)).**

OCTA's Plan Area comprises all of Orange County, which is approximately 511,476 acres, within which incidental take will be permitted for OCTA Covered Activities. The linear, inter-connected configuration of Orange County's transportation system constrains nearly all Covered Activities to be located along or close to the system's rights-of-way and other infrastructure or

within the Preserves. Only the Covered Activities as stipulated in Section 6 of the IA and Chapter 3 of the NCCP/HCP are authorized for take under this NCCP Permit.

The OCTA NCCP/HCP conservation strategy is based on the acquisition of Preserves adjacent to or in close proximity of currently protected lands, and the funding of 11 restoration projects that benefit protected lands throughout the Plan Area. The conservation strategy is designed to acquire and adaptively manage approximately 1,232.5 acres of natural communities that support the Covered Species.

OCTA is seeking permits from the Wildlife Agencies that have a term of 40 years. Accordingly, all assessments in the NCCP/HCP are based on a 40-year time period. Prior to NCCP Permit expiration, OCTA may apply to renew or amend the NCCP/HCP and its associated permits and authorizations to extend their terms. The permit duration of 40 years was chosen because it is a reasonable timeframe over which to provide assurances based on the ability to forecast anticipated project needs for the future improvement of the existing transportation system. In addition, the size of the Plan Area, the size and configuration of the Preserves relative to the anticipated impacts associated with Covered Activities, and the duration of the permit are sufficient to warrant provision of long-term assurances to OCTA.

Therefore CDFW finds that the level of and time limits for assurances specified in the IA were based on the size and duration of the OCTA NCCP/HCP.

Finding 4.6.2 **CDFW finds that the level of assurances provided to OCTA is commensurate with long-term conservation assurances and associated implementation measures in regards to unforeseen circumstances pursuant to the approved NCCP/HCP (2820(f)(2)).**

The long-term conservation assurances and associated implementation measures are detailed in the Plan's Conservation Strategy (Section 5), and the responses for addressing Changed Circumstances are detailed in Sections 8.6.2 and 8.6.3. These include a range of habitat restoration, conservation, management and monitoring actions and dedicated resources to support such actions.

The level of assurances provided to OCTA are such that if there are unforeseen circumstances as defined in Section 3.39 of the IA (Section 8.6.4 of the Plan), 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 OCTA unless CDFW determines that the NCCP/HCP is not being implemented consistent with the substantive terms of the IA.

Therefore, CDFW finds that the long-term conservation assurances and associated implementation measures are commensurate with the level of assurances provided to OCTA in regard to unforeseen circumstances pursuant to the approved NCCP/HCP.

4.7 Findings Regarding Whether Take and Coverage are Warranted

Finding 4.7.1 **CDFW finds that the following species are authorized for take under the NCCP/HCP and coverage is warranted based on regional or landscape level consideration, such as healthy population levels, widespread distribution throughout the Plan Area, and life history**

characteristics that respond to habitat-scale conservation and management actions (2821(a)(1)).

Adequate habitat-scale conservation and management actions, with additional species-specific conservation measures and monitoring in an adaptive management framework, will be implemented for the following species: orange-throated whiptail and bobcat.

Orange-throated whiptail (*Aspidoscelis hyperythra*)

The orange-throated whiptail is a moderate-sized gray, reddish brown, dark brown, or black lizard with five to seven pale yellow or tan stripes (Stebbins 2003). It is typically found in association with loose, friable soils in coastal sage scrub, open chaparral, and along the edges of riparian zones (Brattstrom 2000). Populations of this species are also closely associated with sites that support their principal food source, western subterranean termites (*Reticulitermes hesperus*; Bostic 1966). Threats to this species include the loss, alteration, and fragmentation of occupied habitat (Jennings and Hayes 1994).

The historic and current range of orange-throated whiptail extends from Orange County and southern San Bernardino County southward through western Riverside and San Diego counties to Loreto, Baja California, Mexico (Jennings and Hayes 1994). Although the whiptail has a similar range as it did historically, Jennings and Hayes (1994) estimate that by the early 1990s about 75 percent of the potential habitat throughout its range had been lost as a result of urban development and agriculture. Most of the suitable habitat occurs in floodplains and stream terraces, which are the most developed areas in southern California, and remaining populations are highly fragmented because the lower floodplain of most coastal drainages have been developed (Jennings and Hayes 1994). In addition to the loss of habitat, the erosion, degradation, and channelization of streams and washes is a likely threat because these areas probably serve as foraging and dispersal areas for this species (Jennings and Hayes 1994).

The orange-throated whiptail is well distributed throughout the Plan Area and is known to occur in most of the core habitat areas (Figure 6–14 and 6.4.6). Fisher (2000) noted that orange-throated whiptail was the fourth most common lizard recorded during the study (although rare in Limestone Canyon), and that it does not appear to be at risk of extinction in the Central/Coastal NCCP/HCP Reserve. Backlin et al. (2003) found 48 individuals at Agua Chinon during surveys conducted in 2002. Of the 40 known occurrences in the Plan Area, 33 are currently conserved within currently protected lands. In addition, no known occurrences will be directly impacted by the Covered Activities (Table 6–9). A total of 23,469 acres of predicted suitable habitat for orange-throated whiptail occurs in the Plan Area, of which 71 percent (16,579 acres) is currently conserved within currently protected lands (Table 6–9). Based on the predicted suitable habitat model, approximately 45.6 acres of orange-throated whiptail habitat could be directly impacted and 110.7 acres indirectly impacted by the Covered Activities.

Mitigation for and conservation of the orange-throated whiptail will consist of the following (Section 6.4.6):

- The Preserves support 52.1acres of predicted suitable habitat and at least six occurrences of orange-throated whiptail. As identified through an independent assessment (CBI 2009), the Preserves support high quality vegetation that provides refugia habitat, local stepping stone/linkage habitat, and expands existing core habitat areas, which are necessary to ensure the persistence of sustainable populations of the orange-throated whiptail within the Plan Area. For example, the Northern Foothills and Chino Hills core

habitat areas have been identified at a regional scale as supporting orange-throated whiptail (CBI 2009). Therefore, the acquisition of Preserves within these areas helps to maintain the biological function and integrity of these larger protected lands. Ferber Ranch and O'Neill Oaks Preserves support known occurrences of orange-throated whiptail and the draft RMPs (ICF 2015a, 2015c) for these two Preserves include species-specific management directives listed previously in Finding 3.5.2 to ensure its continued viability/existence on the site (Section 7.2.8.4). Similar to horned lizard, these Preserves will help maintain landscape-level connectivity between the larger conserved areas in the Central Reserve of the Central/Coastal NCCP/HCP and the Southern Orange HCP.

- Together, 10 of the funded restoration projects support 140.8 acres of suitable habitat for orange-throated whiptail, with individuals documented at Bee Flat/Agua Chinon (IRC 2015b). The restoration efforts will improve the availability and quality of habitat for this species in key locations such as the Southern Foothills core habitat area.
- For all of the covered freeway improvement projects, orange-throated whiptail occupied habitat will be avoided to the maximum extent practicable and indirect impacts will be further minimized through the following minimization and avoidance measures described in Section 5.6 of the NCCP/HCP: delineation of environmentally sensitive areas, restoration of temporary impacts, invasive species control, and construction monitoring by a qualified biologist.

Direct take of orange-throated whiptail is not anticipated during implementation of the Covered Activities.

In summary, the OCTA NCCP/HCP:

1. Complements the conservation of 82 percent of orange-throated whiptail occurrences and 71 percent of the predicted suitable habitat for the species on protected lands in the Plan Area with the conservation and adaptive management of an additional 52.1 acres occupied by at least six occurrences.
2. Ensures restoration of approximately 140.8 acres of predicted suitable habitat on protected lands.
3. Ensures avoidance and minimization measures are implemented such that a maximum of 45.6 acres of modeled suitable orange-throated whiptail habitat is directly impacted.

Therefore, CDFW finds that coverage is warranted for orange-throated whiptail.

Bobcat (*Lynx rufus*)

The bobcat is a medium-sized member of the cat family, Felidae, and a permanent resident throughout most of California (Jameson and Peeters 1988). It occurs in a variety of habitats including chaparral and low- to mid-elevation forests dominated by conifers, oak, riparian vegetation, and/or junipers. Bobcats are most closely associated with rocky and brushy areas near springs or other perennial water sources, primarily in foothills composed of chaparral habitats (Zeiner et al. 1990b). Bobcats are threatened by the loss of habitat, habitat fragmentation, and disease. Viable populations rely heavily on large, undisturbed blocks of habitat, and adequate linkages between these large blocks are a key requirement for their long-term persistence.

Numerous 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, 2008b; Ordeñana et al. 2010; Ruell et al. 2012; Tracey et al. 2013; Alonso et al. 2014; Poessel et

al. 2014). These studies have shown that in southern California bobcats have home ranges averaging 0.5–5.2 square miles with male bobcats having larger home ranges than females (0.8–5.2 square miles versus 0.5–1.8 square miles). These studies have also shown that habitat fragmentation caused by urban development (i.e., roads) is a threat to wide ranging, larger carnivores such as the bobcat (Lyren et al. 2006, 2008a, 2008b; Alonso et al. 2014), and in general, both male and female bobcats avoid urbanized landscapes to the degree that they are able to given the highly urbanized environment of the Plan Area (Lyren et al. 2006; Ordeñana et al. 2010; Tracey et al. 2013); although adult males tend to be more urban-associated than adult females (Riley et al. 2003). These studies found that both primary and secondary roads crisscross most bobcat territories in the Plan Area, and these roads can act as barriers to bobcat movement. Collision with automobiles is a threat in the Plan Area for this species (Lyren et al. 2008b), as it is the leading cause of mortality in other regions of California (Riley et al. 2003; Tigas et al. 2002). Because of the high potential for bobcat-vehicle collisions, most of these studies emphasize the importance of appropriately designed undercrossings for the safe movement of bobcats within and throughout the Plan Area (Lyren et al. 2006, 2008a; Alonso et al. 2014). Lastly, these studies showed that fragmented habitat and the restricted ranges of bobcat in the Plan Area may lead to greater contact rates within and between large carnivore species, potentially prompting intra- and inter-species disease transmission (Lyren et al. 2008b; Ruell et al. 2012). For example, 10 of 17 (59 percent) bobcats captured in the Ruell et al. (2012) study tested positive for feline immunodeficiency virus (FIVfca), a type of lentivirus typically found in domestic cats.

In general, these studies have documented bobcat persistence throughout the Plan Area but individuals in the Coastal Reserve tend to be less genetically diverse than those in the Central Reserve; although gene flow into the Coastal Reserve was documented in 2007/2008 suggesting that individuals had been able to disperse into the Coastal Reserve (Lyren et al. 2008b; Ruell et al. 2012). The detection of first generation migrants in the Coastal Reserve suggests that isolation by major roads and urban development has not completely eliminated gene flow into this population and that the matrix surrounding the Coastal Reserve was still somewhat permeable to bobcat movement. The exact locations of movement routes into the Coastal Reserve population are unknown, but immigrating bobcats might be originating from natural areas to the southeast.

Lyren et al. (2006) states that landscape-level connectivity is the key to the persistence of wide-ranging large carnivores in coastal southern California. When viewed at a regional scale, the Central Reserve lies at the northern end of what has been identified as a critical connectivity zone (the El Toro linkage) between the Laguna Coast Wilderness and the Santa Ana Mountains that includes the Cleveland National Forest. Therefore, core habitat blocks within the Central Reserve appear to serve as critical components of a network of wildlands in the region. Core habitat areas in the Central Reserve include 1) Weir Canyon, bounded by SR–241 on the east and urban edges on the west; 2) Lomas/Limestone Canyon/Whiting Ranch, bounded by Santiago Canyon Road on the north and SR–241 on the south; and 3) North Irvine Ranch core habitat, east of the northern portion of SR–241 and north of Santiago Canyon Road (Lyren et al. 2006). CBI (2009) identified these areas as the Northern Foothills and Santa Ana Mountains core habitat areas.

With continued urban development and road construction, Lyren et al. (2006) states that maintaining and restoring connectivity among core habitat blocks within and outside of the Central Reserve is critical for bobcat. Similar to previous studies, they recorded bobcats using existing underpasses along SR–241 and Santiago Canyon Road. These results clearly indicate that roadway undercrossings that are properly situated and designed are helping facilitate wildlife movement in and around the Central Reserve. Landscape characteristics that have a negative impact on underpass use by bobcats include 1) high levels of residential/urban landscapes, 2) narrow corridors, 3) high road densities, and 4) high levels of habitat fragmentation. Native

vegetation surrounding the underpass entrance increases the probability of its use by bobcats, whereas using non-native, ornamental landscaping decreases the probability of it use. The function of the underpass is also important for bobcats, as they are less likely to use underpasses that have a road/trail/paved bike path going through them. In general, to optimize the probability of underpass use by bobcat, Lyren et al. (2006) recommended that underpasses be situated along primary wildlife travel routes, away from areas containing noise and light pollution, and serve only wildlife needs (i.e., not be co-located with trails). Additionally, native vegetation should surround all underpass entrances and replace any proposed rock fill slope protection.

More recent publications have also addressed the effects of roads on bobcat movement and habitat connectivity (Alonso et al. 2014; Poessel et al. 2014). Alonso et al. (2014) looked at the how the expansion of SR–71 and implementation of connectivity mitigation affected the use of underpasses by large mammals. Mitigation measures included the replacement of two culverts with span bridges, restoration of native vegetation around undercrossing structures, and the installation of wildlife exclusionary fencing. They found that bobcat use of the undercrossings increased as a result of these mitigation measures and that mortality decreased in areas that had the wildlife exclusionary fencing installed. They concluded that it is both feasible and beneficial to include connectivity mitigation for wildlife within existing plans to upgrade or maintain roads.

Poessel et al. (2014) found that bobcats in southern California generally placed their home ranges in areas of relatively low road density compared to the surrounding landscape, but bobcats had little opportunity to avoid roads entirely. Roads affected the size of bobcat home ranges and were infrequently incorporated into their ranges, suggesting that they can represent barriers to movement and, hence, functional landscape connectivity. Their results also demonstrate that male and female bobcats exhibit varying behavioral responses to roads, revealing important differences between sexes in movement patterns, mortality risk, and connectivity in urban areas. The fragmentation effects of roads were particularly evident for male bobcats due to their larger home ranges, and males were also more likely to cross roads, increasing mortality risk. Because of the continued expansion of the road network in the Plan Area, the authors suggest that functional connectivity for bobcats, and likely other fragmentation-sensitive species, will become increasingly compromised. Major roads, such as multi-lane freeways, are particularly significant barriers to animal movement and can lead to genetic isolation between populations, as has been demonstrated for urban bobcats in southern California. Poessel et al. (2014) states that a promising method of maintaining connectivity in urbanized areas is the use of wildlife crossing structures along new and existing roads. Indeed, recently constructed crossing structures along SR–71 in the Chino Hills area have facilitated successful road crossings of bobcats despite concurrent road construction that widened the roadway and increased traffic volume. The continued implementation of such strategies should benefit the conservation of bobcats and other species by increasing survival, movement, gene flow, and landscape connectivity in fragmented urban systems.

There are 189,607 acres of predicted suitable habitat in the Plan Area, of which 79 percent (149,544 acres) is conserved within currently protected lands (Table 6–15). As shown in the studies discussed above, bobcats are known to occur throughout the Plan Area including the Central/Coastal Reserve (i.e., Santa Ana Mountains, Northern Foothills, and San Joaquin Hills), Chino Hills, and Southern Foothills core habitat areas. Based on the predicted suitable habitat model, approximately 58.9 acres of bobcat habitat could be directly impacted and 246 acres indirectly impacted by the Covered Activities (Table 4–6).

Mitigation for and conservation of the bobcat will consist of the following (Section 6.4.12):

- The Preserves support 1,232.5 acres of predicted suitable habitat for this species. Incidental observations of bobcat were noted during the 2012 baseline surveys of the Hayashi Preserve (Bonterra Psomas 2012b), and photo monitoring stations on the O'Neill Oaks and Ferber Ranch Preserves detected bobcat in 2013 (OCTA unpublished data). Hayashi, MacPherson, Ferber Ranch, Hafen, O'Neill Oaks, and Saddle Creek South Preserves are part of a 40-mile stretch of nearly continuous natural habitat that spans from Marine Corp Base Camp Pendleton in the south to Chino Hills State Park in the north. This is the area that was identified by Lyren et al. (2006) as a critical connectivity zone in the Plan Area. Conservation and management of habitat in this area will improve the connectivity, biological integrity, and long-term viability of bobcat in this regionally important wildlife movement area. The Aliso Canyon Preserve, which is located adjacent to lands in the Central/Coastal NCCP/HCP Coastal Reserve, expands habitat in an area where the bobcat may be experiencing a loss of genetic diversity. Additional habitat conservation in this area will facilitate bobcat dispersal/movement within the Coastal Reserve and will likely improve the species' ability to immigrate into this area from other portions of the Plan Area.
- Together, eight of the restoration projects support 311.7 acres of bobcat habitat and will improve the functionality of three key wildlife movement corridors within the Plan Area (as described in Finding 4.1.4.B), allowing safer and more effective dispersal use areas for bobcat. Trail cameras have detected bobcat using Bee Flat/Agua Chinon (IRC 2015b).

  West Loma includes fence realignment around a key wildlife corridor in the vicinity of SR–241 and habitat restoration along the wildlife movement corridor. With fencing improvements and the restoration of habitat, use of this area by bobcat and other species is expected to increase. Increased use of this undercrossing by bobcat is anticipated to reduce vehicle-caused mortality in this portion of the Plan Area.

  North Coal Canyon is expected to facilitate bobcat movement between the Plan Area and adjacent open space in Riverside and San Bernardino counties. The restoration site is within 200 feet of the Santa Ana River channel and is a vital link (the Coal Canyon linkage) between the surrounding Puente-Chino Hills, the Cleveland National Forest, and the Santa Ana Mountains. A goal of the project is to enhance and restore coastal sage scrub/Riversidian alluvial fan sage scrub on the north side of SR–91 in an effort to make the undercrossing more attractive to bobcat. This follows recommendations made by Lyren et al. (2006), Alonso et al. (2014), and Poessel et al. (2014).

  Big Bend is an important connection between conserved lands in the Coastal Reserve including Aliso and Wood Canyons Wilderness Park, Laguna Coast Wilderness Park, and the Aliso Canyon preserve.

  Aliso Creek will improve connectivity between several open space areas in the southern portion of the Plan Area and restoration of the City Parcel will improve connectivity in the important Trabuco and San Juan Linkages identified by CBI (2009).
- For all of the covered freeway improvement projects, bobcat occupied habitat will be avoided to the maximum extent practicable, and indirect impacts will be further minimized through the following minimization and avoidance measures described in Section 5.6 of the NCCP/HCP: delineation and avoidance of environmentally sensitive areas, restoration of temporary impacts, invasive species control, and construction monitoring by a qualified biologist. Additionally, the Wildlife Crossing Policy will require OCTA to evaluate, during pre-construction surveys, whether existing structures function as important wildlife movement corridors. If it is determined that an existing

structure does function as an important movement corridor, the project will include appropriate design features to ensure that the structure experiences no decrease in wildlife movement functionality. This will include appropriate dimensions, native vegetation at the openings, and other recommendations made in the above-referenced scientific publications.

Direct take of bobcat is not anticipated during implementation of the Covered Activities.

In summary, the OCTA NCCP/HCP:

1. Complements the conservation of bobcat home ranges documented in the above-cited studies and 79 percent of the predicted suitable habitat for the species on protected lands within the Plan Area with the conservation and management of 1,232.5 acres of modeled suitable habitat that currently supports bobcat.
2. Ensures the restoration of approximately 311.7 acres of predicted suitable habitat on protected lands that are occupied by bobcat.
3. Ensures avoidance and minimization measures are implemented such that a maximum of 58.9 acres of modeled suitable bobcat habitat is directly impacted.

Therefore, CDFW finds that coverage is warranted for bobcat.

Finding 4.7.2 **CDFW finds that the following species are authorized for take under the NCCP/HCP and coverage is warranted based on regional or landscape level considerations with site-specific conservation and management requirements that are clearly identified in the NCCP/HCP for species that are generally well-distributed, but that have core habitats that must be conserved (2821(a)(2)).**

Adequate landscape-level considerations, with additional species-specific conservation measures and monitoring, including participating in regional monitoring efforts, in an adaptive management framework will be implemented for the following species: Intermediate mariposa lily, many-stemmed dudleya, southern tarplant, coast horned lizard, western pond turtle, cactus wren, California gnatcatcher, and least Bell's vireo.

Intermediate mariposa lily (*Calochortus weedii* var. *intermedius*)

Intermediate mariposa lily is a perennial herb (bulbiferous) in the Liliaceae family, occurring on dry, rocky, open slopes in coastal sage scrub, chaparral, and grassland communities between 350 and 2,800 feet elevation (CNPS 2001). This species is endemic to the South Coast ecoregion, with populations in Orange, Riverside, Los Angeles, and San Bernardino counties (CNPS 2015). Intermediate mariposa lily is threatened by urbanization, competition with nonnative species, and fuel modification treatments. The species is well distributed throughout the Plan Area and is known to occur in the Santa Ana Mountains, Northern Foothills, Southern Foothills, San Joaquin Hills, Chino Hills, West Coyote Hills, and Upper Santa Ana River Core Habitat Areas (CBI 2009).

There are 329 known occurrences of intermediate mariposa lily in the Plan Area, none of which will be directly or indirectly impacted by the Covered Activities. A total of 55,623 acres of predicted suitable habitat for intermediate mariposa lily occurs in the Plan Area, of which 85 percent (47,065 acres) is currently protected and supports 189 of the known occurrences (Table 6–4). Based on the predicted suitable habitat model, approximately 7.2 acres of intermediate

mariposa lily habitat could be directly impacted and 28.1 acres indirectly impacted by the Covered Activities (Table 4–6).

Mitigation for and conservation of the intermediate mariposa lily will consist of the following (Section 6.4.1):

- The Preserves support 315.7 acres of predicted suitable habitat and at least 93 occurrences. Based on the baseline surveys, approximately 600 individual plants occur on the Preserves (Bonterra Psomas 2013a, 2014, 2015). To ensure the viability/persistence of the intermediate mariposa lily on the Preserves, the RMPs will include species-specific management directives to benefit this species.
- There are no known occurrences of intermediate mariposa lily in the area of direct or indirect effect for the covered freeway improvement projects. During project-specific surveys, however, there is the potential for this species to be detected. If detected, intermediate mariposa lily occupied habitat will be avoided to the maximum extent practicable, and direct impact to this species will be further minimized through implementation of the minimization and avoidance measures described in Section 5.6 of the NCCP/HCP including delineation of environmentally sensitive areas, restoration of temporary impacts, and invasive species control. If direct impacts cannot be avoided then the NCCP/HCP includes the Covered Plant Species Policy (Section 5.6.2.2), which sets forth mitigation measures should the species be detected and subsequently impacted. This policy is based on an impact-to-credit mitigation ratio system. If individuals of intermediate mariposa lily are impacted due to implementation of the covered freeway improvement projects, then credits will be deducted from the conserved and/or restored populations. The policy will require OCTA to maintain a ledger-type accounting system to track credits and debits, with a yearly summary provided to the Wildlife Agencies as part of the annual report. In addition, cumulative impacts to intermediate mariposa lily from the Covered Activities will be capped at 500 individuals.

In summary, the OCTA NCCP/HCP:

1. Complements the conservation of 57 percent of the occurrences and 85 percent of the predicted suitable habitat on protected lands within the Plan Area with the conservation and adaptive management of 315.7 acres of habitat that supports at least 93 occurrences.
2. Ensures avoidance and minimization measures are implemented such that a maximum of 7.2 acres of modeled suitable intermediate mariposa lily habitat is directly impacted.

Therefore, CDFW finds that coverage is warranted for intermediate mariposa lily.

Many-stemmed dudleya (*Dudleya multicaulis*)

Many-stemmed dudleya is a perennial, deciduous succulent in the Crassulaceae family that occurs in open coastal sage scrub, chaparral, and grassland communities on heavy, often clay soils, coastal plains, or sandstone outcrops between 50 and 2,600 feet elevation (McCabe 2012). This species is endemic to the South Coast ecoregion, and was historically found in San Diego, Orange, Riverside, Los Angeles, and San Bernardino counties (CNPS 2015). Orange County is thought to support 80 percent of the known individuals and high concentrations of the species occur in the San Joaquin Hills, the northern Lomas de Santiago, and on Rancho Mission Viejo lands (Roberts 1999). Many-stemmed dudleya is threatened by urbanization, competition with nonnative species, and fire suppression (Marchant et al. 1998). The species is distributed throughout the Plan Area and is known to occur in the Santa Ana Mountains, Northern Foothills,

Southern Foothills, San Joaquin Hills, Chino Hills, and Upper Newport Bay Core Habitat Areas (CBI 2009).

There are 225 known occurrences of many-stemmed dudleya in the Plan Area, none of which will be directly or indirectly impacted by the Covered Activities. A total of 91,237 acres of predicted suitable habitat for many-stemmed dudleya occur in the Plan Area, of which 74 percent (67,788 acres) is conserved within the currently protected lands and supports 189 of the known occurrences (Table 6–5). Based on the predicted suitable habitat model, approximately 19.3 acres of many-stemmed dudleya habitat could be directly impacted and 83.7 acres indirectly impacted by the Covered Activities (Table 4–6).

Mitigation for and conservation of the many-stemmed dudleya will consist of the following (Section 6.4.2):

- The Preserves support 776.9 acres of predicted suitable habitat for many-stemmed dudleya and at least four occurrences. Based on recent baseline surveys (Bonterra Psomas 2015), approximately 60 individuals occur on the Aliso Canyon Preserve. The RMP for this Preserve will include species-specific management directives including habitat restoration/enhancement to benefit this species.
- West Loma and Big Bend are within 100 feet of known many-stemmed dudleya occurrences, and the restoration of these areas is expected to improve the potential for the species to expand its local distribution. OCTA will complete rare plant surveys in order to document whether this occurs. If many-stemmed dudleya are identified, then OCTA will provide documentation to the Wildlife Agencies for review and approval of credits as stipulated in the Covered Plant Species Policy (Section 5.6.2.2).
- 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.
- There are no known occurrences of many-stemmed dudleya in the area of direct or indirect effect for the covered freeway improvement projects. During project-specific surveys, however, there is the potential for this species to be detected. If detected, many-stemmed dudleya occupied habitat will be avoided to the maximum extent practicable, and direct impact to this species will be further minimized through implementation of the minimization and avoidance measures described in Section 5.6 of the NCCP/HCP including delineation of environmentally sensitive areas, restoration of temporary impacts, and invasive species control. If direct impacts cannot be avoided, then the NCCP/HCP includes the Covered Plant Species Policy (Section 5.6.2.2), which sets forth mitigation measures should the species be detected and subsequently impacted. This policy is based on an impact-to-credit mitigation ratio system. If individuals of many-stemmed dudleya are impacted due to implementation of the covered projects, then credits will be deducted from the conserved and/or restored populations. The policy will require OCTA to maintain a ledger-type accounting system to track credits and debits, with a yearly summary provided to the Wildlife Agencies as part of the annual report. In addition, cumulative impacts to multi-stemmed dudleya from the Covered Activities will be capped at 500 individuals.

In summary, the OCTA NCCP/HCP:

1. Complements the conservation of 84 percent of the known occurrences and 74 percent of the predicted suitable habitat on protected lands within the Plan Area with the conservation and adaptive management of 776.9 acres of habitat that supports at least four occurrences.
2. Ensures the protection, enhancement, and/or establishment of a major population consisting of at least 500 individuals.
3. Ensures avoidance and minimization measures are implemented such that a maximum of 19.3 acres of modeled suitable many-stemmed dudleya habitat is directly impacted.

Therefore, CDFW finds that coverage is warranted for many-stemmed dudleya.

Southern tarplant (*Centromadia parryi* ssp. *australis*)

Southern tarplant is an aromatic annual herb in the Asteraceae family that occurs at the margins of marshes and swamps, in vernally mesic grasslands and vernal pools below 1,400 feet elevation (CNPS 2001; Hickman 1993; Clarke et al. 2007). Historically this species occurred from Santa Barbara County south to Baja California, Mexico; however, many historical occurrences are thought to be extirpated, including many in the Plan Area (CNPS 2015). Southern tarplant is threatened by habitat fragmentation, trampling by vehicles and humans, grazing, and competition from nonnative species (CNPS 2015). The species is distributed throughout the Plan Area and is known to occur in the Northern Foothills, Southern Foothills, Chino Hills, Seal Beach, Bolsa Chica, Sana Ana Rivermouth, and Upper Newport Bay Core Habitat Areas (CBI 2009; Roberts 2008).

There are 42 known occurrences of southern tarplant in the Plan Area, none of which will be directly or indirectly impacted by the Covered Activities. A total of 5,963 acres of predicted suitable habitat for southern tarplant occurs in the Plan Area, of which 62 percent (3,708 acres) is conserved within the currently protected lands and supports 32 of the known occurrences (Table 6–6). Based on the predicted suitable habitat model, approximately 9.3 acres of southern tarplant habitat could be directly impacted and 35.3 acres indirectly impacted by the Covered Activities (Table 4–6).

Mitigation for and conservation of the southern tarplant will consist of the following (Section 6.4.3):

- Ferber Ranch Preserve includes 9.3 acres of predicted suitable habitat for this species.
- Harriet Weider and Fairview Park include a total of 31.2 acres of southern tarplant predicted suitable habitat and restoration of these areas is expected to allow expansion of the southern tarplant population. Southern tarplant was known to occur in the vicinity of Fairview Park, and natural recruitment of the species into the site has been documented during annual monitoring surveys (Endemic Environmental Services 2013). Although the restoration plan for Fairview Park did not include specific measures to promote expansion of southern tarplant, general site enhancement through nonnative species removal facilitated natural recruitment into the site. Southern tarplant is also expected to colonize Harriet Weider due to adjacent source populations and because locally collected seed stock has been incorporated into the restoration plant palette. OCTA will conduct rare plant surveys in order to document whether southern tarplant successfully established at Fairview Park. If individuals are identified, then OCTA will provide

documentation to the Wildlife Agencies for review and approval of credits as stipulated in the Covered Plant Species Policy (Section 5.6.2.2).

- There are no known occurrences of southern tarplant in the area of direct or indirect effect for the covered freeway improvement projects. During project-specific surveys, however, there is the potential for this species to be detected. If detected, southern tarplant occupied habitat will be avoided to the maximum extent practicable, and direct impact to this species will be further minimized through implementation of the minimization and avoidance measures described in Section 5.6 of the NCCP/HCP including delineation of environmentally sensitive areas, restoration of temporary impacts, and invasive species control. If direct impacts cannot be avoided, then the NCCP/HCP includes the Covered Plant Species Policy (Section 5.6.2.2), which sets forth mitigation measures should the species be detected and subsequently impacted. This policy is based on an impact-to-credit mitigation ratio system. If individuals of southern tarplant are impacted due to implementation of the covered projects, then credits will be deducted from the conserved and/or restored populations. The policy will require OCTA to maintain a ledger-type accounting system to track credits and debits, with a yearly summary provided to the Wildlife Agencies as part of the annual report. In addition, cumulative impacts to southern tarplant from the Covered Activities will be capped at 500 individuals.

In summary, the OCTA NCCP/HCP:

1. Complements the conservation of 76 percent of the currently known occurrences and 62 percent of the predicted suitable habitat on currently protected lands within the Plan Area.
2. Results in the conservation and adaptive management of 9.3 acres of habitat.
3. Ensures the restoration of approximately 31.2 acres of protected habitat, some of which supports known occurrences.
4. Ensures avoidance and minimization measures are implemented such that a maximum of 9.3 acres of modeled suitable southern tarplant habitat is directly impacted.

Therefore, CDFW finds that coverage is warranted for southern tarplant.

Coast horned lizard (*Phrynosoma blainvillii*)

The coast horned lizard is a medium sized, wide, flat-bodied lizard that has conspicuously pointed scales along its body and large horns around the base of its head. Coast horned lizards use a wide variety of habitats including chaparral, sage scrub, grassland, riparian woodland, and coniferous forest with sparse understory vegetation on relatively level or gently sloping terrain (Sherbrooke 2003; Stebbins 2003). Key habitat elements include loose, fine soils with a high sand content, an abundance of native ants, open areas with limited overstory for basking, and areas with low, dense shrubs for refuge (Jennings and Hayes 1994; Thomson et al. 2016). Threats and stressors for this species include loss of habitat due to urbanization, conversion of habitat for agricultural uses, grazing, off-road vehicles, and pesticide use (SDNHM 2015). Invasive, nonnative Argentine ants are also a threat due to their displacement of native harvester ants, the coast horned lizard's main prey item (SDNHM 2015; Mitrovich et al. 2010, Fisher et al. 2002; Sherbrooke 2003).

Both historically and currently, the coast horned lizard ranges from southern Kern County, southern Ventura County, and the Los Angeles basin southward through Orange, San Bernardino, Riverside, and San Diego counties into northern Baja California, Mexico (Jennings and Hayes 1994; Thomson et al. 2016). According to USFWS (2007a), the taxidermy and live-animal trade in the late 1800s to early 1900s was a large source of mortality for horned lizards in the greater

Los Angeles Basin. An estimated 115,000 were taken in a 45-year period, mostly between 1890 and 1910, mainly in the basin and its adjacent areas. In addition, habitat loss from agricultural development was another factor in reducing the population in that time period. The specialized diet, habitat requirements, and site fidelity make the coast horned lizard vulnerable to habitat destruction and disturbance, current threats to the species. At present, there are no population trend figures across the species' range.

There are 25 known occurrences of coast horned lizard in the Plan Area, none of which will be directly impacted by the Covered Activities (Table 6–8). Within the Plan Area, coast horned lizard occurs in the Santa Ana Mountains, Northern Foothills, Southern Foothills, San Joaquin Hills, Chino Hills, and Seal Beach core habitat areas. During a 1996 study, Fisher et al. (2002) documented 61 individuals in Limestone Canyon and previous efforts (Case and Fisher 1998) documented the species in Chino Hills on ridges between Carbon and Tonner canyons. Fisher (2000) found coast horned lizard at Weir Canyon in similar abundance to Limestone Canyon, and also preliminarily documented an unusually large number in Agua Chinon. Southern Foothill occurrences include individuals conserved as part of the Southern Orange HCP (USFWS 2007a). A total of 96,100 acres of predicted suitable habitat for coast horned lizard occurs in the Plan Area, of which 80 percent (76,797 acres) is conserved within currently protected lands. This conserved habitat supports 24 of the 25 (96 percent) known occurrences in the Plan Area (Table 6–8). Based on the predicted suitable habitat model, approximately 69 acres of coast horned lizard habitat could be directly impacted and 184.2 acres indirectly impacted by the Covered Activities (Table 4–6).

Mitigation for and conservation of the coast horned lizard will consist of the following (Section 6.4.5):

- The Preserves support 529.8 acres of predicted suitable habitat (e.g., coastal sage scrub) and at least one occurrence of coast horned lizard (Table 6–8). As identified through an independent assessment (CBI 2009), the Preserves support high quality vegetation that provides refugia habitat, local stepping stone/linkage habitat, and expands existing core habitat areas, which are necessary to ensuring sustainable populations of the coast horned lizard within the Plan Area. For example, Ferber Ranch, Hafen, O'Neill Oaks, and Saddle Creek South preserves are all located in Trabuco Canyon. These Preserves will help maintain landscape-level connectivity between the larger protected areas supporting coast horned lizard populations in the Central Reserve of the Central/Coastal NCCP/HCP with populations conserved under the Southern Orange HCP. The MacPherson Preserve supports at least one horned lizard occurrence and the draft RMP (ICF 2015e) includes species-specific management directives listed previously in Finding 3.5.2 to ensure its continued viability/existence on the site (Section 7.2.8.4).
- Together, 10 of the restoration projects support 140.8 acres of predicted suitable habitat for coast horned lizard with individuals documented at Bee Flat/Agua Chinon (IRC 2015b). In addition, the restoration efforts will improve the availability and quality of habitat for this species in key locations such as the Chino Hills core habitat area, which has been identified at a regional scale as supporting coast horned lizard (CBI 2009).
- For all of the covered freeway improvement projects, coast horned lizard occupied habitat will be avoided to the maximum extent practicable and indirect impacts will be further minimized through the following minimization and avoidance measures described in Section 5.6 of the NCCP/HCP: delineation of environmentally sensitive areas, restoration of temporary impacts, invasive species control, and construction monitoring by a qualified biologist.

Direct take of coast horned lizard is not anticipated during implementation of the Covered Activities.

In summary, the OCTA NCCP/HCP:

1. Complements the conservation of all known coast horned lizard occurrences and 81 percent of the predicted suitable habitat on protected lands within the Plan Area with the conservation and adaptive management of 529.8 acres of predicted suitable habitat that supports at least one occurrence.
2. Ensures restoration of approximately 140.8 acres of predicted suitable habitat on protected lands.
3. Ensures avoidance and minimization measures are implemented such that a maximum of 69 acres of predicted suitable coast horned lizard habitat will be directly impacted.

Therefore, CDFW finds that coverage is warranted for coast horned lizard.

Western pond turtle (*Emys marmorata* (syn. *Actinemys marmorata)*

The western pond turtle is the only native freshwater turtle in southern California (Fisher et al. 2013). Pond turtles vary in color from dark brown and olive to black with a radiating pattern of spots on the carapace shields. The plastron is yellowish (SDNHM 2015). It occurs in slow-moving permanent or intermittent streams, small ponds, and lakes (Davis 1998; Holland 1994; Goodman and Stewart 2000; Bondi 2009). Native upland habitat within 1,500 feet of the aquatic habitat is also important for nesting, winter hibernation, and dispersal (Davis 1998; Bondi 2009). Important habitat components include logs, rocks, or vegetation mats for basking, and emergent marsh vegetation for cover (Holland 1994). Water depth greater than six feet is also generally preferred. Threats to this species include habitat loss, alteration, and fragmentation; and predation (Fisher et al. 2013), especially by nonnative species such as bullfrogs, largemouth bass, and sunfish. Additionally, most, if not all, watersheds in southern California are invaded by nonnative turtles (e.g., red-eared slider), which appear to also threaten the long-term viability of this species (Fisher et al. 2013).

The historic and current range of the western pond turtle extends from Washington south to northern Baja California, Mexico (Ernst and Lovich 2009; Stebbins 2003). According to the USFWS (2007a), the western pond turtle is still extant throughout most of its range, but a number of populations have been extirpated. A recent genetic study suggests that western pond turtle should be split into two different species; one inhabiting the area north of San Francisco (and including the central valley and Sierra Nevada), and another inhabiting the central and southern coast (Spinks, et al. 2014). Between Ventura County and the Mexican border, known localities decreased from 87 sites in 1960 to 53 sites by 1987, and many of the remaining populations were small and/or isolated (USFWS 2007a). Over 90 percent of wetland habitat within its historic California range has been eliminated by agriculture, urban development, flood control and water diversion projects (e.g., dams, reservoirs, and channelization). Additionally, loss of upland habitat can isolate pond turtles from surrounding populations and eliminate potential nesting sites and thus the ability to successfully reproduce (Nordby 1992; Holland 1994; Spinks et al. 2003). Therefore, although pond turtle populations in developed areas may persist for years, they can become functionally extinct long before they are extirpated (Spinks et al. 2003).

Western pond turtle is patchily distributed and somewhat rare within the Plan Area. According to the OCTA NCCP/HCP, there are 12 occurrences and 54 individuals of western pond turtle documented in the Plan Area (Figure 6–15 and Table 6–10); nine (75 percent) of the occurrences

and 39 (72 percent) of the individuals are protected (Table 6–10). Presumed breeding sites documented in the southern portion of the County include six in San Juan Creek, a stock pond in upper Cristianitos Canyon, and Jerome's Lake in upper Gabino Canyon (USFWS 2007a). Based on a more recent U.S. Geological Survey (USGS) study (Fisher et al. 2013), western pond turtle was found in the following Plan Area locations: Santa Ana River, San Juan/Oso/Trabuco creeks, Aliso Creek, San Diego Creek, and Shady Canyon Pond. The Fisher et al. (2013) report discusses the genetic relatedness of individuals from these locations but does not provide details regarding breeding status or population demographics. Shady Canyon Pond is not one of the 12 occurrences listed in CNDDB. This may be due to the fact that it is not a historic location but a mitigation site that was created in 2001. In 2001, the pond was stocked with 27 translocated adult turtles taken from Bommer Canyon and the Sand Canyon Reservoir. By 2007, the population had risen to 94 individuals (Harmsworth Associates 2007), but by 2014, had declined to 74 individuals (Harmsworth Associates 2014). This population is located on protected land and although not a requirement of the OCTA NCCP/HCP, it may be an important source population for future reintroduction efforts in the Plan Area (Fisher et al. 2013; IRC 2013; Harmsworth Associates 2014d). According to IRC (2015a), western pond turtles have also been observed in lower Silverado Creek with a known breeding population occurring in neighboring Ladd Canyon in 2005. This occurrence is located on protected lands. Portions of Aliso Creek occupied by western pond turtle are also located on currently protected lands including the 55-acre Aliso Creek restoration project, while other occupied areas of the creek are not currently protected (Figure 6–15).

Areas of suitable habitat for pond turtle are mapped across the Plan Area with the largest blocks in Upper Newport Bay, Chino Hills, Northern Foothills, and Southern Foothills core habitat areas. A total of 5,963 acres of predicted aquatic and 90,120 acres of predicted upland habitat for western pond turtle occurs in the Plan Area, of which 83 percent (4,962 acres) and 72 percent (65,064 acres), respectively, are conserved within currently protected lands (Table 6–10). We acknowledge that suitable habitat for this species is likely overestimated due to the fact that suitable microhabitat requirements (i.e., pools) for this species are not recognized at the scale of vegetation data used for the habitat association projections. However, as recommended by the Science Advisors (Rahn et al. 2011), the selection of Preserves relied more on the CBI (2009) conservation assessment than species models. The currently protected habitat supports nine of the known occurrences in the Plan Area, including key populations at Aliso Creek, Shady Canyon Pond, San Diego Creek/San Joaquin Marsh, and San Juan Creek (Figure 6–15).

Based on the predicted suitable habitat model, approximately 3.2 acres of aquatic pond turtle habitat and 51.7 acres of upland habitat could be directly impacted and 16.5 acres of aquatic and 283.8 acres indirectly impacted by the Covered Activities (Table 4–6). Again, these are likely substantial overestimates due to the scale of the modeling effort.

Mitigation for and conservation of the western pond turtle will consist of the following (Section 6.4.7):

- The Preserves support approximately 9.9 acres of aquatic and 561.2 acres of upland predicted suitable habitat for this species. Although not currently occupied, some of this habitat has the potential to be restored allowing expansion of a nearby occurrence. For example, although western pond turtle was not observed during the baseline surveys of the Hayashi Preserve, the biological technical report stated that suitable habitat was present on site and the species was expected to occur (Bonterra Psomas 2013b). Western pond turtle modeled suitable habitat includes 6 acres of aquatic and 253.7 acres of upland habitat on the Hayashi Preserve (Table 5–3). Upland pond turtle habitat includes all non-

aquatic habitats (i.e., riparian and upland vegetation communities). The Bonterra Psomas (2013b) report also states that pond turtles are known to occur adjacent to the property in Carbon Canyon Creek, and that an expanding population of turtles within Carbon Canyon Creek could immigrate to suitable habitat within Soquel Canyon, which traverses the southwestern portion of the property. At least six western pond turtles were seen by CDFW staff, Christine Beck, OCTA staff, Lesley Hill, and CDPR staff, Ken Kietzer on a site visit February 10, 2016, in the portion of Carbon Canyon Creek that runs through Chino Hills State Park, approximately 0.25 mile south of the Hayashi Preserve. To facilitate dispersal of pond turtle onto the Hayashi Preserve, OCTA has installed fencing around the entire property to keep cattle out of all natural vegetation communities, including the riparian habitat. OCTA will further assess the need for active restoration of the riparian habitat in the RMP (Lesley Hill, OCTA Biologist; personal communication September 9, 2015). If active restoration of the riparian habitat is warranted, a habitat restoration project could be developed and could include species-specific management directives to directly benefit pond turtle such as ensuring there is appropriate aestivation and nesting habitat; enhancing existing pool hydrology; and/or adding basking substrates such as boulders or logs. All potential restoration efforts will be included in the Hayashi RMP and will be evaluated for their efficacy as part of the adaptive management program.

- Restoration of 55 acres of riparian and upland habitats within Aliso Creek that is currently occupied by western pond turtle through removal of arundo and other nonnative plant species will restore aestivation, foraging, and basking habitat for this species. Fisher et al. (2013) concluded that there appeared to be very few turtles left in the San Juan/Oso/Trabuco watershed, and expressed concern regarding breeding and/or recruitment in this area. Therefore, this restoration project could enhance habitat for a severely threatened portion of the population within the Plan Area.

  Restoration of the 53-acre City Parcel will also benefit the western pond turtle as 2.6 acres of predicted aquatic and 10.4 acres of predicted upland habitat occurs on site (Table 5–5). Approximately 13 acres of riparian habitat and 40 acres of coastal sage scrub adjacent to the creek are currently undergoing restoration, which began in 2011. Within the first year, over 100,000 nonnative plants, 25,000 pounds of illegally dumped concrete, 2,000 pounds of trash, and the compassionate removal of three homeless encampments have been removed from the site. The main nonnative plant species removed includes artichoke thistle, arundo, and mustard, species which do not support a diversity of wildlife. Enhancing the biological diversity and function of this portion of Trabuco Creek may make the area a potential reintroduction site for pond turtle. For example, reintroduction efforts were undertaken in 2013/14 by San Diego Zoo Global and USGS at Sycuan Peak Ecological Reserve in San Diego County. According to Chris Brown, USGS Biologist, a total of 10 captive reared individuals (5 in 2013 and 5 in 2014) were released and to date, all 10 have survived (personal communication, September 14, 2015).

- For all of the covered freeway improvement projects, western pond turtle occupied habitat will be avoided to the maximum extent practicable, and indirect impacts will be further minimized through the following minimization and avoidance measures described in Section 5.6 of the NCCP/HCP: delineation of environmentally sensitive areas, restoration of temporary impacts, invasive species control, stormwater and water quality BMPs, and the Wetland and Riparian Streambed Protection Program. Additionally, the Aquatic Resources and Species Policy will ensure that direct take of pond turtle will not occur during implementation of the covered freeway improvement projects.

Direct take of western pond turtle is not anticipated during implementation of the Covered Activities.

In summary, the OCTA NCCP/HCP:

1. Complements the conservation of 75 percent of the known occurrences and 83 percent of the predicted aquatic habitat and 72 percent of the predicted upland habitat within the Plan Area on protected lands with the conservation and adaptive management of 9.9 acres of aquatic and 561.2 acres of upland habitats.
2. Ensures the restoration of approximately 22.1 acres of aquatic habitat and 88.3 acres of upland habitat, a portion of which is currently occupied,
3. Ensures avoidance and minimization measures are implemented such that a maximum of 3.2 acres of modeled suitable western pond turtle aquatic habitat and 51.7 acres of upland habitat are directly impacted.

Therefore, CDFW finds that coverage is warranted for western pond turtle.

Cactus wren (*Campylorhynchus brunneicapillus*)

The cactus wren is a large and bulky wren, with a long, heavy bill and rounded tail (Sibley 2000).A total of seven subspecies of cactus wren have been recognized (Hamilton et al. 2011), although taxonomic affiliations of the populations in California have been under debate (Bancroft 1923; Rea and Weaver 1990; Teutimez 2012, Barr et al. 2013). In Orange and San Diego counties, the cactus wren is an obligate, nonmigratory resident of the coastal sage scrub plant community (as defined by Westman 1983 and O'Leary 1990). It occurs almost exclusively in *Opuntia prolifera* and *O. littoralis* dominated stands of coastal sage scrub below 1,500 feet elevation (Proudfoot et al. 2000; Hamilton et al. 2011; Unitt 2008). Suitable conditions are found on south-facing slopes, at the base of hillsides, or in dry washes (Rea and Weaver 1990). Historically, cactus wrens were found on the coastal slopes and lowlands of southern California in arid and semiarid regions with abundant cacti (Grinnell and Miller 1944; Unitt 2004). Historically, the primary threats to cactus wren were habitat loss, degradation, and fragmentation due to urbanization and agricultural development (Harper and Salata 1991). A more recent consequence of urbanization that is contributing to declines in this species is an increase in human-caused wildfires (Harper and Salata 1991). In the Plan Area, fire has played a critical role in the fluctuation of cactus wren populations due to the slow regrowth of the cactus patches (Mitrovich and Hamilton 2007; Leatherman BioConsulting 2009; Barr et al. 2015).

Several large-scale habitat conservation plans have been implemented in southern California including the Central/Coastal NCCP/HCP, Southern Orange HCP, the Multiple Species Conservation Plan in southwestern San Diego County, the Multiple Habitat Conservation Plan in northwestern San Diego County, and the Western Riverside County MSHCP. The cactus wren is a Covered Species in each of these habitat conservation plans, which have created large reserve systems that include substantial habitat for the cactus wren and requirements for monitoring and management actions beneficial to the long-term conservation of the species.

According to the OCTA NCCP/HCP, there are 80 known occurrences of cactus wren in the Plan Area, none of which will be directly impacted by the Covered Activities, although two occur within the limits of indirect effect (Tables 6–11 and 4–6). A total of 55,651 acres of predicted suitable habitat for cactus wren occurs in the Plan Area, of which 77 percent (42,885 acres) is protected and supports 40 of the known occurrences. We acknowledge that actual suitable habitat for this species is likely lower than the estimate provided due to the fact that suitable microhabitat

requirements (i.e., cactus patches) for this species are not recognized at the scale of vegetation data used for the habitat association projections. As discussed previously in Finding 4.1.4.C, however, 1,670 acres of suitable habitat has been mapped within the Central/Coastal NCCP/HCP Reserve, which exceeds the amount of habitat needed to sustain populations in those areas. Additional suitable habitat exists in other protected portions of the Plan Area.

According to USFWS (2007a), cactus wren is widely distributed in the San Juan Creek and San Mateo Creek watersheds (outside Plan Area), and there is continuous habitat connectivity among the occupied areas. These cactus wren occurrences comprise an important population that is located in habitat that provides a linkage between the San Diego County populations on Marine Corps Base Camp Pendleton and conserved populations in the Central/Coastal NCCP/HCP Reserve. Current population estimates for lands conserved under the Southern Orange HCP and other southern portions of the Plan Area such as Starr Ranch, however, are unknown.

Based on the predicted suitable habitat model, approximately 12.4 acres of cactus wren habitat could be directly impacted and 85.2 acres indirectly impacted by the Covered Activities (Table 4–6). Again, these are likely overestimates due to the scale of the modeling effort; however, OCTA obtained the results of a recent cactus wren model developed by Dr. Kris Preston of SDMMP and was able to compare the results of this model with the cactus wren habitat model used in the NCCP/HCP. The output results were similar.

Mitigation for and conservation of the cactus wren will consist of the following (Section 6.4.8):

- The Preserves support 254.7 acres of predicted suitable habitat and at least 26 occurrences of cactus wren (Table 6–11). As identified by CBI (2009), the Preserves support high quality vegetation communities that can act as refugia habitat, local stepping stone/linkage habitat, and expand existing core habitat areas, which are necessary to ensuring sustainable populations of the cactus wren within the Plan Area. Ferber Ranch, O'Neill Oaks, Hafen, Saddle Creek South, and MacPherson Preserves are located within priority conservation areas of the Northern Foothills and Santa Ana Mountains core habitat areas. The conservation of these Preserves adds to the protection of an important block of cactus scrub habitat that improves linkage between the Central/Coastal NCCP/HCP Central Reserve and conserved lands within the Southern Orange HCP. In addition, several of the Preserves located in Trabuco Canyon comprise important refugia habitat, as they did not burn in the 2007 Santiago Fire. This wildland fire burned approximately 75 percent of natural lands in the adjacent Central Reserve (Leatherman BioConsulting 2009; Dudek 2013). A recent USGS genetics study determined that there are six geographically distinct clusters of cactus wren within Ventura, Los Angeles, San Bernardino, Riverside, Orange, and San Diego counties, and the highest levels of habitat connectivity for cactus wren exists within the genetic cluster that includes Orange County (Barr et al. 2013). Barr et al. (2013) further state 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 Trabuco Canyon, OCTA has further enhanced habitat connectivity for this important genetic cluster of cactus wren and implemented an important management recommendation for this species.
- The UCI Ecological Reserve and Chino Hills State Park restoration projects include 14.5 acres of cactus scrub habitat known to support cactus wren (Table 5–5). The UCI project is located in the coastal portion of the Central/Coastal NCCP/HCP Reserve while Chino Hills is located in the northeastern portion of the Plan Area. Restoration of suitable cactus patches at these sites is expected to increase the amount of suitable breeding habitat in the

Plan Area. To date, a total of 326 prickly pear cactus plants and 1,200 cactus pads have been transplanted at the UCI site and recently, both cactus wren and California gnatcatcher were observed using the restored vegetation (Land IQ 2014).

- For all the covered freeway improvement projects, cactus wren occupied habitat will be avoided to the maximum extent practicable, and indirect impacts will be further minimized through the following minimization and avoidance measures described in Section 5.6 of the NCCP/HCP: delineation of environmentally sensitive areas, restoration of temporary impacts, invasive species control, and construction monitoring by a qualified biologist. Additionally, the Nesting Birds Policy and conformance with the Migratory Bird Treaty Act will ensure that direct take of cactus wren will not occur during implementation of the covered freeway improvement projects.

Direct take of cactus wren is not anticipated during implementation of the Covered Activities.

In summary, the OCTA NCCP/HCP:

1. Complements the conservation of 50 percent of the known occurrences and 77.1 percent of the modeled suitable habitat within the Plan Area on protected land in the Plan Area with the conservation and adaptive management of 254.7 acres of habitat that supports 26 cactus wren occurrences (resulting in total conservation of 82.5 percent of known occurrences).
2. Ensures the restoration of approximately 14.5 acres of cactus scrub habitat on protected lands.
3. Ensures avoidance and minimization measures are implemented such that a maximum of 12.4 acres of modeled suitable cactus wren habitat is directly impacted.

Therefore, CDFW finds that coverage is warranted for cactus wren.

California gnatcatcher (*Polioptila californica californica*)

The California gnatcatcher is a small gray and compact bird with a thin, short bill, short tail, and rounded wings (Sibley 2000). It is a local, uncommon, obligate resident of the maritime and coastal climate zones of southern California, primarily below 1,600 feet elevation (Atwood 1990). This species shows a preference for coastal sage scrub dominated by California sagebrush (*Artemisia californica*) and flat-topped buckwheat (*Eriogonum fasciculatum*). The primary threat to the California gnatcatcher is the loss and degradation of coastal sage scrub habitat. Since the federal listing of the California gnatcatcher, the Wildlife Agencies have worked with project proponents to offset the loss of occupied or potential California gnatcatcher habitat caused by development projects. This has been achieved through conservation, enhancement, and/or restoration of coastal sage scrub (CSS) on or near project sites, as agreed to during the NCCP/HCP process. California gnatcatcher habitat conservation, enhancement, and restoration since the listing of the California gnatcatcher are likely to have offset CSS loss to some degree and buffered any decline in the California gnatcatcher population caused by habitat destruction.

Restored habitat has the potential to support California gnatcatchers when there is a source population nearby that can access the restored site (USFWS 2007a). When combined with conserved CSS, enhanced and restored CSS has the potential to support a stable California gnatcatcher population. For example, in 1993, the Coyote Hills East Preserve area had about 12 pairs of California gnatcatchers on approximately 100 acres before development impacts and the implementation of habitat restoration associated with an HCP (USFWS 2007a). By 2001, 24 pairs

of California gnatcatchers and two single males were present, and in 2005, about 22 California gnatcatcher pairs were estimated to be present on the site, which in 2007 consisted of about 60 acres of preserved habitat and 60 acres of restored habitat. A more recent example has occurred at the Marblehead development in the City of San Juan Capistrano, which is located in the southern portion of the Plan Area. In 2006, 13.6 acres of on-site coastal sage scrub habitat supported two pairs of California gnatcatcher. Since that time, the applicant has been in the process of creating/restoring 83 acres of coastal sage scrub. According to information provided by the applicant's consultant, these 83 acres now support 14 pairs and three unpaired California gnatcatchers (Chambers Group, unpublished report). The 14 pairs produced 24 successful broods during the 2015 nesting season.

Other large-scale habitat conservation plans that have been implemented in southern California include the Central/Coastal NCCP/HCP, Southern Orange HCP, the Multiple Species Conservation Plan in southwestern San Diego County, the Multiple Habitat Conservation Plan in northwestern San Diego County, and the Western Riverside County MSHCP. The California gnatcatcher is a Covered Species in each of these five habitat conservation plans, which have created large reserve systems that include substantial habitat for the California gnatcatcher and requirements for monitoring and management actions beneficial to the long-term conservation of the species.

The current and historic range for this subspecies is 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 (Atwood 1991). As of 2007, the overall distribution of the California gnatcatcher south of Ventura County was roughly the same since its listing in 1993, but today many of the largest California gnatcatcher populations are conserved and managed in the regional NCCP/HCP reserves (USFWS 2007a). Additionally, within and between Orange, San Diego, and Riverside counties, many of the California gnatcatcher populations are interconnected with existing or planned linkages and corridors. A recent genetics study determined there are four distinct populations in southern California; three small ones in Ventura County, Palos Verdes Peninsula (Los Angeles County), and Coyote Hills (northern Orange County), and the Southern Population, which includes southeastern Los Angeles County, central and southern Orange County, western Riverside and San Bernardino Counties, and San Diego County (Vandergast et al. 2014). The most recent California gnatcatcher survey data for the Plan Area is from 2011, when NCC participated in an occupancy study conducted by the USFWS across San Diego and Orange counties (Leatherman BioConsulting 2012). California gnatcatchers were detected at a total of 34 plots across the Central/Coastal NCCP/HCP Reserve. The distribution of California gnatcatchers was highly skewed toward the Coastal Reserve where 24 of the 34 occupied plots were located. This appeared to be the result of the 2007 fires that burned approximately 75 percent of the Central Reserve.

According to the NCCP/HCP, there are 1,828 occurrences of California gnatcatcher in the Plan Area, with two in the direct effect limits and five within the indirect effect limits of the Covered Activities (Tables 6–12 and 4–6). A total of 65,607 acres of predicted suitable habitat occurs in the Plan Area, of which 78 percent (51,129 acres) is currently protected. Of the 51,129 acres, 80 percent (41,076 acres) was mapped as very high/high quality. The protected predicted suitable habitat supports 1,208 (66 percent) of the known occurrences (Table 6-12). Lastly, approximately 18,752 acres of California gnatcatcher critical habitat has been designated within the Plan Area, with 45 percent (8,463 acres) occurring on protected lands. Based on the predicted suitable habitat model, approximately 14.8 acres of California gnatcatcher habitat could be directly impacted and 96.0 acres indirectly impacted by the Covered Activities (Table 4–6).

Mitigation for and conservation of the California gnatcatcher will consist of the following (Section 6.4.9):

- The Preserves support 422.1 acres of predicted suitable habitat and at least 15 occurrences. The Preserves located in upper Trabuco Canyon are considered priority conservation acquisitions within the Northern Foothills core habitat area (CBI 2009). The conservation of these Preserves protects an important block of coastal sage scrub that supports a core population of California gnatcatcher. These four Preserves contribute to the protection of important stepping-stone linkage habitat between the Central/Coastal NCCP/HCP Central Reserve and conserved lands within the Southern Orange HCP for the California gnatcatcher. In addition, the Aliso Canyon Preserve provides an important stepping stone linkage between conserved lands in Laguna Beach and other areas of the Central/Coastal NCCP/HCP Coastal Reserve.

  Of the predicted habitat conserved on the Aliso Canyon, MacPherson, and Saddle Creek South Preserves, 183.9 acres is considered very high/high quality. According to Winchell and Doherty (2014), California gnatcatchers were more likely to colonize burned areas adjacent to high and very high quality habitat versus moderate to low quality. They recommended that very high/high quality sites should receive priority conservation actions, particularly at lower elevations. Therefore, as discussed throughout this NCCP Permit, these three Preserves may provide potential refugia habitat for the California gnatcatcher during the next wildland fire and potential source populations for subsequent recolonization events.

- The Preserves support a total of 608.5 acres of California gnatcatcher critical habitat.

- Together, 10 of the restoration projects include 140.8 acres of very high/high quality coastal sage scrub habitat (Table 5–5). Restoration of coastal sage scrub on these sites is expected to increase the amount of suitable foraging, breeding, and dispersal habitat in the Plan Area for California gnatcatcher. For example, the City Parcel project includes the restoration of 40 acres of coastal sage scrub adjacent to Central/Coastal NCCP/HCP Reserve lands that support known occurrences of California gnatcatcher. This site is also located adjacent to conserved lands that have been designated critical habitat for the California gnatcatcher (City of San Juan Capistrano 2010). Non-contiguous, conserved California gnatcatcher critical habitat that supports known California gnatcatcher occurrences also occurs due east of the City Parcel. Therefore, restoration of coastal sage scrub at the City Parcel will allow expansion of an existing California gnatcatcher population and will provide stepping-stone linkage habitat between two non-contiguous blocks of California gnatcatcher critical habitat.

- For all covered freeway improvement projects, California gnatcatcher occupied habitat will be avoided to the maximum extent practicable, and indirect impacts will be further minimized through the following minimization and avoidance measures described in Section 5.6 of the NCCP/HCP: delineation of environmentally sensitive areas, restoration of temporary impacts, invasive species control, and construction monitoring by a qualified biologist. Additionally, the Nesting Birds Policy and compliance with the Migratory Bird Treaty Act will ensure that direct take of California gnatcatcher will not occur during implementation of the covered freeway improvement projects.

Direct take of California gnatcatcher is not anticipated during implementation of the Covered Activities.

In summary, the OCTA NCCP/HCP:

1. Complements the conservation of 66 percent of the known occurrences and 78 percent of the predicted suitable habitat (of which 80 percent is high/very high quality) within the Plan Area on protected lands with the conservation and management of 422.1 acres of habitat and 608.5 acres of critical habitat that supports 15 California gnatcatcher occurrences.
2. Ensures the restoration of approximately 140.8 acres of very high/high quality habitat.
3. Ensures avoidance and minimization measures are implemented such that a maximum of 14.8 acres of modeled suitable California gnatcatcher habitat and 19.3 acres of critical habitat are directly impacted.

Therefore, CDFW finds that coverage is warranted for California gnatcatcher.

Least Bell's vireo (*Vireo bellii pusillus*)

The least Bell's vireo is a small, yellowish-gray, migratory songbird that prefers willow and mule fat-dominated riparian woodlands in southern California but has also been documented nesting in chaparral where it occurs adjacent to suitable riparian vegetation (Kus 2002). This species tends to prefer semi-open riparian woodlands with dense shrub understory. The primary cause of decline for this species has been the loss and alteration of riparian woodland habitats. Fragmentation of their preferred habitat has also increased their exposure to brown-headed cowbird (*Molothrus ater*) parasitism (Kus 2002). Within the Plan Area, the NCC contracts on an annual basis for cowbird trapping in the NCCP/HCP Central Reserve.

Least Bell's vireo was once a common and widespread summer resident below 2,000 feet elevation throughout the Sacramento and San Joaquin valleys and in the coastal valleys and foothills from Santa Clara County south into northern Mexico. It was also present east of the Sierra Nevada below 4,000 feet in the Owens and Benton valleys and along the Mojave River and other streams of the western to central deserts (Zeiner et al. 1990a; Grinnell and Miller 1944). 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 2007a). The vireo population in the U.S. has increased 10-fold since its listing in 1986, from 291 to 2,968 known territories (USFWS 2007a); and has grown during each five-year period since 1986, until it peaked in 2010 (Peter Beck, USFWS Fish and Wildlife Biologist, personal communication, December 5, 2016). Population growth has been greatest in San Diego and Riverside counties, with lesser but significant increases in Orange, Ventura, San Bernardino, and Los Angeles counties (USFWS 2007a). Currently, it is likely that any drainage with suitable habitat in the Plan Area supports least Bell's vireo (Paul Galvin, Harmsworth Associates, personal communication, September 15, 2015). Although a current Plan Area-wide population assessment has not been conducted for this species, confirmed least Bell's vireo occurrences include the majority of San Diego Creek, Rattlesnake Reservoir, Siphon Reservoir, Irvine Lake, Peter's Canyon, Trabuco Creek, San Joaquin Marsh, Sand Canyon, Aliso Creek, San Juan Creek, Gobernadora Creek, lower Arroyo Trabuco, Chiquita Creek, lower Cristianitos Creek, and in Prima Deshecha (Paul Galvin, Harmsworth Associates, personal communication, September 15, 2015; USFWS 2007a). Between 2000 and 2006, 27-34 least Bell's vireo pairs and three-five unpaired males had been documented within the southern portion of the Plan Area (USFWS 2007a).

There are 413 occurrences of least Bell's vireo in the Plan Area, four of which will be directly impacted by the Covered Activities and 10 that will be indirectly affected (Tables 6–13 and 4–6).

A total of 4,466 acres of predicted suitable habitat occurs in the Plan Area, of which 72 percent (3,224 acres) is conserved within the currently protected lands and supports 62 percent of the known occurrences. No critical habitat for least Bell's vireo has been designated within the Plan Area. Based on the predicted suitable habitat model, approximately 5.0 acres of least Bell's vireo habitat could be directly impacted and 55.2 acres indirectly impacted by the Covered Activities (Table 4–6).

Mitigation for and conservation of the least Bell's vireo will consist of the following (Section 6.4.10):

- The Preserves support 8.7 acres of predicted suitable habitat for the least Bell's vireo. The Hayashi Preserve in the Chino Hills area has an existing riparian corridor through Soquel Canyon. Prior to the purchase of the Hayashi Preserve, cattle were allowed to graze in the on-site portion of Carbon Canyon Creek (9.2 acres). Soon after acquiring the Preserve, OCTA installed fencing around the entire property to allow passive restoration of the riparian vegetation and to improve water quality. OCTA has committed to active restoration of the native riparian vegetation through nonnative weed removal and planting of native vegetation as part of their overall Preserve management responsibilities. Restoration of the Preserve will be included in the RMP (Lesley Hill, OCTA Biologist; personal communication, September 9, 2015). Chino Hills State Park has had recent documented success with riparian restoration for least Bell's vireo; once cattle were removed from the riparian zone, the riparian habitat quickly recovered and vireo reoccupied the site. There are 41 known least Bell's vireo occurrences within 5 miles of the Hayashi Preserve that are expected to act as source populations for the restored habitat on the Hayashi Preserve. The Hayashi Preserve is also located within a priority conservation area 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); therefore, the acquisition of the Hayashi Preserve contributes to the conservation of this regionally important block of habitat.
- Together, nine of the restoration projects support 110.4 acres of least Bell's vireo predicted suitable habitat (Table 5–5). The Aliso Creek and City Parcel sites both have documented occurrences of least Bell's vireo; therefore, restoration of riparian habitat at these two sites is expected to increase the availability of suitable foraging and nesting habitat as well as migratory stopover habitat (Ostensen and Associates 2010, 2012). It will also improve habitat connectivity in the Plan Area for this species by restoring habitat in key movement corridors such as Trabuco, Aliso, and Carbon Canyon creeks. The other six sites will also create/restore suitable least Bell's vireo habitat and allow for the possible expansion of the species within the Plan Area.
- For all of the covered freeway improvement projects, least Bell's vireo occupied habitat will be avoided to the maximum extent practicable, and indirect impacts will be further minimized through the following minimization and avoidance measures described in Section 5.6 of the NCCP/HCP: delineation and avoidance of environmentally sensitive areas, restoration of temporary impacts, invasive species control, and construction monitoring by a qualified biologist. Additionally, the Nesting Birds Policy and compliance with the Migratory Bird Treaty Act will ensure that direct take of least Bell's vireo will not occur during implementation of the covered projects.

Direct take of least Bell's vireo is not anticipated during implementation of the Covered Activities.

In summary, implementation of the OCTA NCCP/HCP:

1. Complements the conservation of 62 percent of the known occurrences and 72 percent of the modeled suitable habitat within the Plan Area on protected lands with the conservation and adaptive management of 8.7 acres of habitat.
2. Ensures the restoration of approximately 110.4 acres of habitat that includes known occurrences on protected lands.
3. Ensures avoidance and minimization measures are implemented such that a maximum of 5.0 acres of modeled suitable least Bell's vireo habitat and 55.2 acres of critical habitat are directly impacted.

Therefore, CDFW finds that coverage is warranted for least Bell's vireo.

Finding 4.7.3 **CDFW finds that the following species are authorized for take under the NCCP/HCP and coverage is warranted based on site- specific considerations and the identification of specific conservation and management conditions for species within a narrowly defined habitat or limited geographic area within the Plan Area (2821(a)(3)).**

Adequate landscape level considerations and species-specific conservation measures, including participating in regional monitoring efforts, within narrowly defined areas will be implemented for the following species: Arroyo chub and southwestern willow flycatcher.

Arroyo chub (*Gila orcutti*)

The arroyo chub is a small, chunky minnow in the Cyprinidae family. Preferred habitat for this species is slow moving or backwater sections of warm to cool streams with substrates of sand or mud and water depths greater than 16 inches (Moyle 1976). Threats and stressors include water quality degradation, predation, competition from nonnative species, and habitat degradation from stream modifications such as check dams and flood control structures (Moyle 2002; Herbold and Moyle 1986; Moyle and Light 1996). According to John O'Brien, CDFW Senior Fish Biologist, many of the extant populations of arroyo chub are threatened by nonnative fish species, especially red shiners and flathead minnows (personal communication, September 11, 2015). Severe drought conditions favor these nonnative species and have given them a competitive advantage over native fish such as the arroyo chub.

The historic range of the arroyo chub included the Los Angeles, San Gabriel, San Luis Rey, Santa Ana, and Santa Margarita rivers, Malibu Creek, and San Juan Creek (Wells and Diana 1975). Translocation of arroyo chub to drainages north of Malibu Creek and to the Mojave River system occurred in the 1930's and 1940's when this species was used as bait and incidentally with trout and mosquitofish plants (Swift et al. 1993). Because it is considered introduced and common in some watersheds north of its historic range (e.g., Santa Clara, Gaviota, Santa Ynez), there has been little effort to track the status of this species north of Malibu Creek (USFWS 2007a). In southern California, however, the range of the arroyo chub has been significantly reduced. It is no longer found in the lower Los Angeles, San Gabriel, or Santa Ana rivers where channels are cement lined, divided by dams and drop structures, or otherwise disturbed/dewatered for flood control, water percolation, and water conservation projects. 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 (USFWS 2007a; Benjamin et al. 2016).

Arroyo chub is somewhat rare in the Plan Area. There are 51 known occurrences and 345 individuals in the Plan Area. All of these occurrences/individuals are currently protected (Table 6–7). Recent surveys conducted in 2013 by CDFW detected individuals in San Juan Creek/Bell Canyon and Hot Springs Creek/Caspers Wilderness Park, which is within the San Juan Creek watershed (Benjamin et al. 2016). These surveys were part of a study that assessed population structure and genetic diversity of native arroyo chub populations in southern California. Although the San Juan Creek population shows high genetic diversity, the size of the population has significantly declined. Benjamin et al. (2016) conclude that conservation of this population is important to the recovery of arroyo chub, as it may become a source population for future reintroduction efforts in the Santa Margarita River and other suitable watersheds. They go on to say that efforts to restore habitat or maintain existing habitat will be essential in securing genetic stability for the arroyo chub across its native range.

Additionally, Audubon staff has been monitoring the arroyo chub population in Bell Canyon in some form since 2003 (Scott Gibson, Assistant Director of Research and Education, personal communication, May 20, 2016). For years 2011-2015, Mr. Gibson has observed 100+ individuals at two sites in Bell Canyon including adults and juveniles. Arroyo chub have also been recently documented in Trabuco Creek in O'Neill Regional Park (Russ Barabe, CDFW Environmental Scientist, personal communication, September 17, 2015), but the total number of individuals is unknown.

A total of 69 acres of predicted suitable habitat occurs within the Plan Area, of which 73 percent (50 acres) is conserved within currently protected lands (Table 6–7). This conserved habitat supports all 51 occurrences in the Plan Area including the populations in the San Juan Creek watershed. Based on the predicted suitable habitat model, approximately 0.1 acre of arroyo chub habitat could be directly impacted and 1.9 acres indirectly impacted by the Covered Activities (Table 4–6).

Mitigation for and conservation of the arroyo chub will consist of the following (Section 6.4.4):

- The Preserves support 0.1 acre of predicted suitable habitat for arroyo chub. In addition, the preservation of Ferber Ranch, Hafen, and O'Neill Oaks preserves, which are located in the headwaters of Trabuco Creek, will contribute to the improvement/protection of water quality and natural hydrological processes important for arroyo chub habitat downstream. Ensuring these Preserves retain native vegetation and are not converted to impervious surfaces such as asphalt/ concrete also ensures that sedimentation of the creek stays at the current condition.
- OCTA will implement a restoration project focused on improving habitat conditions for an existing population of arroyo chub in the Plan Area. Potential projects include actions to improve water quality in a subwatershed known to support arroyo chub (e.g., Bell Canyon), removal or modification of check dams to facilitate fish passage (e.g., along San Juan Creek on USFS lands), and/or nonnative fish removal. OCTA will coordinate closely with the Wildlife Agencies to identify, evaluate, and implement this future restoration project. According to John O'Brien, any of these projects would greatly benefit arroyo chub (personal communication, September 11, 2015).
- The City Parcel restoration project will enhance 13 acres of riparian habitat along the lower reaches of Trabuco Creek, which will help improve natural hydrological function and water quality for this important coastal stream and may improve the potential of arroyo chub establishing in the area through future potential reintroduction efforts as stated above; arroyo chub are still found in an upstream portion of Trabuco Creek.

- For all of the covered freeway improvement projects, arroyo chub occupied habitat will be avoided to the maximum extent practicable, and indirect impacts will be further minimized through the following minimization and avoidance measures described in Section 5.6 of the NCCP/HCP: delineation of environmentally sensitive areas, restoration of temporary impacts, invasive species control, stormwater and water quality BMPs, and the Wetland and Riparian Streambed Protection Program. Additionally, the Aquatic Resources and Species Policy (Section 5.6.2.1) will ensure that direct take of arroyo chub individuals will not occur during implementation of the covered freeway improvement projects. This policy was described in more detail in Finding 4.1.6.

Direct take of arroyo chub is not anticipated during implementation of the Covered Activities.

In summary, the OCTA NCCP/HCP:

1. Complements the conservation of all known occurrences and 73 percent of the modeled suitable habitat on protected lands within the Plan Area.
2. Ensures that approximately 13 acres of suitable habitat will be restored on protected lands.
3. Requires a restoration project be implemented in currently occupied habitat.
4. Ensures avoidance and minimization measures are implemented such that a maximum of 0.1 acre of modeled suitable habitat is directly impacted.

Therefore, CDFW finds that coverage is warranted for arroyo chub.

Southwestern willow flycatcher (*Empidonax traillii extimus*)

The southwestern willow flycatcher is a small, insectivorous songbird that is grayish-green above and pale white/yellow below (Sibley 2000). It is one of four subspecies of willow flycatcher in the United States. It typically occupies mature, closed canopy riparian forests that have a high cover of willow species located in close proximity to slow moving streams, standing water, or seeps (Sedgewick and Knopf 1992). Threats to the species include loss and modification of its riparian breeding habitat and nest parasitism by the brown-headed cowbird (USFWS 2002).

Its current and historical breeding range includes southern California, Arizona, New Mexico, extreme southern portions of Nevada and Utah, and western Texas (USFWS 2002). Within southern California, it breeds in the Owens Valley, the south fork of the Kern River, the Los Angeles Basin, the Santa Ynez River, the Prado Basin, and the Santa Margarita and San Luis Rey rivers (USFWS 2013). In the Plan Area it occurs in the Southern Foothills and Upper Santa Ana River Core Habitat Areas. Once considered a widespread common breeder in southern California, the flycatcher has declined precipitously throughout its range during the last 50 years (Unitt 2004). Current numbers remain significantly reduced from historical levels.

The southwestern willow flycatcher is somewhat rare in the Plan Area with a total of nine occurrences and 15 individuals; all of these occurrences are currently protected (Table 6–14). The Plan Area falls within the Coastal California Recovery Unit (RU) as identified in the Southwestern Willow Flycatcher Recovery Plan (USFWS 2002). At the time of publication, this RU included 186 territories. Documented breeding locations in the Plan Area included San Diego Creek-Laguna Lakes and San Juan Creek-Canada Gobernadora. A more recent range-wide population estimate for the southwestern willow flycatcher was compiled by USGS (Durst et al. 2008) and included all known flycatcher breeding sites reported between 1993 and 2007. As of 2007, there were only 120 territories present in the Coastal California RU and the two sites in the

Plan Area were reported as extirpated (i.e., did not support breeding pairs in 2007). However, based on information provided by USGS Western Ecological Research Center, a pair of southwestern willow flycatchers had persisted at the San Juan Creek-Canada Gobernadora location until 2009 (Scarlett Howell, Ecologist, personal communication, May 12, 2015). This is the last confirmed record for breeding southwestern willow flycatcher in the Plan Area.

As stated above, there are nine occurrences of southwestern willow flycatcher in the Plan Area, none of which will be directly or indirectly impacted by the Covered Activities (Tables 6–14 and 4–6). A total of 4,807 acres of predicted suitable habitat occurs in the Plan Area, of which 72 percent (3,471 acres) is conserved within the currently protected lands and supports all nine known occurrences. No critical habitat for southwestern willow flycatcher has been designated within the Plan Area. Based on the predicted suitable habitat model, approximately 5.2 acres of southwestern willow flycatcher habitat could be directly impacted and 60.5 acres indirectly impacted by the Covered Activities (Table 4–6).

Mitigation for and conservation of the southwestern willow flycatcher will consist of the following (Section 6.4.11):

- The Preserves support 8.7 acres of predicted suitable habitat for the southwestern willow flycatcher. This habitat may provide stepping-stone, refugia, and/or stopover habitat for this species. Conservation and adaptive management of these Preserves will ensure this habitat persists in the Plan Area.
- Together, nine of the restoration projects support 110.4 acres of willow flycatcher predicted suitable habitat (Table 5–5). The Aliso Creek site has three occurrences of southwestern willow flycatcher; however, it is unknown whether these were breeding or transient individuals. The restoration of riparian habitat along Aliso Creek is expected to increase the availability of suitable breeding, foraging, nesting, and stopover habitat for this species and improve habitat connectivity in the Plan Area.
- For all covered freeway improvement projects, southwestern willow flycatcher occupied habitat will be avoided to the maximum extent practicable, and indirect impacts will be further minimized through the following minimization and avoidance measures described in Section 5.6 of the NCCP/HCP: delineation and avoidance of environmentally sensitive areas, restoration of temporary impacts, invasive species control, and construction monitoring by a qualified biologist. Additionally, the Nesting Birds Policy (Section 5.6.3 of the NCCP/HCP) and compliance with the Migratory Bird Treaty Act will ensure that direct take of southwestern willow flycatcher will not occur during implementation of the covered projects.

Direct take of southwestern willow flycatcher is not anticipated during implementation of the Covered Activities.

In summary, the OCTA NCCP/HCP:

1. Complements the conservation of all of the known occurrences and 72 percent of the modeled suitable habitat on protected lands within the Plan Area with the conservation and adaptive management of 8.7 acres of suitable habitat.
2. Ensures the restoration of approximately 110.4 acres of habitat that include occurrences on protected lands.
3. Ensures avoidance and minimization measures are implemented such that a maximum of 5.2 acres of habitat is directly impacted.

Therefore, CDFW finds that coverage is warranted for the southwestern willow flycatcher.

Finding 4.8 **CDFW finds that the mitigation measures specified in the NCCP/HCP and imposed by the NCCP/HCP participants are consistent with subdivision (d) of Section 2801 (2821(b)).**

For the reasons set forth in the preceding findings, CDFW has determined that the NCCP/HCP specifies and imposes mitigation measures that are consistent with the standards of 2801(d) regarding coordination and cooperation among public agencies, landowners, and other private interests, providing a mechanism by which landowners and development proponents can effectively address cumulative impact concerns, promoting conservation and management of unfragmented diverse habitat areas, promoting multispecies and multihabitat management and conservation, providing an option for identifying and ensuring appropriate mitigation that is roughly proportional to impacts on fish and wildlife, and promoting the conservation of broad-based natural communities and species diversity (Findings 4.1.1, 4.1.3, 4.1.4, 4.2.2, 4.2.9, 4.4, 4.5, 4.6.1 of this NCCP Permit).

5.0 APPROVAL OF THE NCCP PERMIT

Based on the foregoing findings, CDFW concludes that the OCTA NCCP/HCP meets all necessary requirements for approval as an NCCP. CDFW hereby approves the OCTA NCCP/HCP for implementation as an NCCP and authorizes OCTA to take the species identified below in Section 5.2 (subject to the limitations in this NCCP Permit) incidental to the activities described below in Section 5.1. This NCCP Permit is specifically conditioned on OCTA's compliance with requirements of this Permit, the NCCP/HCP and the IA.

5.1 Covered Activities

This NCCP Permit covers take of Covered Species and habitat resulting from Covered Activities that are subject to and covered by the NCCP/HCP and the IA. Covered Activities include freeway improvement projects and conservation and management activities (including all ground-disturbing projects and activities that may occur within the Plan Area as described in Chapter 3 of the NCCP/HCP) to be carried out by OCTA, Caltrans as a Participating Special Entity, or third parties or agents authorized by OCTA in the Plan Area that may result in Authorized Take of Covered Species during the term of the NCCP/HCP, and that are otherwise lawful. Covered Activities authorized by the OCTA NCCP/HCP are:

- *Covered Freeway Improvement Projects* (Section 3.1.1).
- *Other Minor Freeway Improvement Projects* (Section 3.1.2).
- *Conservation Plan/Habitat Conservation Plan Preserves* (Section 3.1.3; i.e., Preserve Area Management, Monitoring, and Adaptive Management).

OCTA covered freeway improvement projects are defined in Section 3.1.1 of the NCCP/HCP. The current status and phasing of each of the covered freeway improvement projects can be found in Table 3–1 of the NCCP/HCP.

5.2 Covered Species

Table 1–1 of the NCCP/HCP Plan lists the 13 Covered Species; however, only 12 of those species are authorized for take under this NCCP Permit. As specified in the IA Section 7.6, the mountain lion is included in the list of Covered Species for purposes of the HCP but is not included in the list of Covered Species for the NCCP, and therefore take of mountain lion is not authorized under this NCCP Permit.

List of 12 Covered Species

Plants
Intermediate mariposa lily (*Calochortus weedii* var. *intermedius*)
Many-stemmed dudleya (*Dudleya multicaulis*)
Southern tarplant (*Centromadia parryi* ssp. *australis*)

Fish
Arroyo chub (*Gila orcutti*)

Reptiles
Coast horned lizard (*Phrynosoma blainvillii*)
Orange-throated whiptail (*Aspidoscelis hyperythra*)
Western pond turtle (*Emys marmorata* [syn. *Actinemys marmorata*])

Birds
Coastal California gnatcatcher (*Polioptila californica californica*)
Least Bell's vireo (*Vireo belli pusillus*)
Cactus wren (*Campylorhynchus brunneicapillus*)
Southwestern willow flycatcher (*Empidonax traillii extimus*)

Mammals
Bobcat (*Lynx rufus*)

Species by Coverage Categories

Regarding take authorization, the list of Covered Species is divided into two categories: species that can be taken upon NCCP Permit issuance, and species protected by the Migratory Bird Treaty Act (MBTA).

Species that can be taken upon NCCP Permit issuance

OCTA is requesting take[11] coverage under this NCCP Permit for a total of 12 species (Covered Species). This NCCP Permit allows incidental take of:

- Two state endangered animal species (southwestern willow flycatcher and least Bell's vireo).
- Five California Species of Special Concern (arroyo chub, western pond turtle, coast horned lizard, cactus wren, and coastal California gnatcatcher).

[11]Take under the NCCP/HCP in most cases is not the direct take of individuals but refers to the direct loss of occupied habitat.

- Three state rare plant species (intermediate mariposa lily, many-stemmed dudleya, and southern tarplant).
- Two state unlisted animal species (orange-throated whiptail and bobcat).

This NCCP Permit allows for continuing incidental take of the currently unlisted species in the event that they become listed in the future.

Species Protected by the Migratory Bird Treaty Act

The MBTA prohibits the taking, killing, or possessing of migratory birds. The MBTA identifies a variety of prohibited actions including the taking of individual birds, young, feathers, eggs, nests, etc. Actions conducted under the NCCP/HCP and its IA will comply with the provisions of the MBTA and avoid taking, killing, or possessing Covered Species that are protected by the MBTA (cactus wren and coastal California gnatcatcher) unless the applicant obtains an MBTA Special Purpose Permit consistent with the terms of the NCCP/HCP. Since the least Bell's vireo and southwestern willow flycatcher are state and federally endangered species, the NCCP/HCP will constitute a Special Purpose Permit for those species.

5.3 Limitations

This take authorization does not constitute or imply compliance with, or entitlement to proceed with, any project under laws and regulations beyond the authority and jurisdiction of CDFW. OCTA has independent responsibility for compliance with any and all applicable federal, state, and local laws and regulations.

6.0 AMENDMENTS

This NCCP Permit may be amended in a manner consistent with provisions in Section 8.5 of the NCCP/HCP and Section 15 of the IA.

7.0 SUSPENSION AND TERMINATION

This NCCP Permit is subject to suspension, revocation, or termination by action of the Director of CDFW in accordance with the terms of Section 16 of the IA**.**

Under these provisions, should OCTA request early termination of this NCCP Permit, OCTA will be required to fulfill the mitigation obligations for all authorized development approved, authorized, or carried out prior to termination. Mitigation obligations will be in accordance with the NCCP/HCP and the IA for any permitted activities that have been approved, authorized, or carried out.

CDFW may suspend or revoke this NCCP Permit as a result of a violation of this NCCP Permit and/or pursuant to any applicable State laws or regulations. If this NCCP Permit is revoked or suspended, OCTA shall remain obligated to fulfill all of its responsibilities under this NCCP Permit for any permitted activity approved, authorized, or carried out by OCTA between the effective date of this NCCP Permit and date of NCCP Permit suspension or revocation.

8.0 DURATION

This NCCP Permit shall remain effective for 40 years from the effective date below, unless suspended, terminated, or extended by earlier action of the Director of CDFW.

Approved by:

Sandra Morey

Sandra Morey, Deputy Director
California Department of Fish and Wildlife

Date: 6/19/17

9.0 LITERATURE CITED

AECOM. 2013. Vegetation Classification Report for Orange County. Prepared for: Nature Reserve of Orange County. April 2013.

Aerial Information Systems, Inc. (AIS). 2015. Orange County Vegetation Mapping Update Phase II: Final Vegetation Mapping Report. April 2015.

Alonso, R.S., L.M. Lyren, E.E. Boydston, C.D. Haas, and K.R. Crooks. 2014. Evaluation of road expansion and connectivity mitigation for wildlife in southern California. The Southwestern Naturalist. 59(2):181-187.

Anderson, R.A. 1993. An Analysis of Foraging in the Lizard, *Cnemidophorus tigris*. In: Wright, J.W., and L.J. Vitt, eds., 1993. Biology of Whiptail Lizards (Genus *Cnemidophorus*). Oklahoma Museum of Natural History, Norman, Oklahoma.

Atkinson, A.J., P.C. Trenham, R.N. Fisher, S.A. Hathaway, B.S. Johnson, S.G. Torres, and Y.C. Moore. 2004. Designing Monitoring Programs in an Adaptive Management Context for Regional Multiple Species Conservation Plans. U.S. Geological Survey, Western Ecological Research Center, Sacramento, CA. Available: https://www.wildlife.ca.gov/Conservation/Planning/NCCP/Guidance-Documents

Atwood, J.L.

1990. Status review of the California gnatcatcher (*Polioptila californica*). Unpublished technical report, Manomet Bird Observatory, Manomet, Massachusetts. 79 pp.

1991. Subspecies limits and geographic patterns of morphological variation in California gnatcatchers (*Polioptila californica*). Bulletin of the Southern California Academy of Sciences 90:118–133.

Backlin, A., et al. 2003. Monitoring Results for Reptiles, Amphibians and Ants in the Nature Reserve of Orange County (NROC) 2002. Prepared for the Nature Reserve of Orange County and The Nature Conservancy. US Geological Survey. Sacramento, California. 2003.

Bancroft, G. 1923. Some geographic notes on the cactus wren. Condor 25:165–168.

Barr, K.R., B.E. Kus, K.L. Preston, S. Howell, E. Perkins, and A.G. Vandergast. 2015. Habitat fragmentation in coastal southern California disrupts genetic connectivity in the cactus wren (*Campylorhynchus brunneicapillus*). Molecular Ecology 24:2349-2363.

Barr, K.R., A.G.Vandergast, and B.E. Kus. 2013. Genetic structure in the cactus wren in coastal southern California. USGS Report prepared for CDFW.

Beier, P. and S. Loe. 1992. A checklist for evaluating impacts to wildlife movement corridors. Wildlife Society Bulletin 20:434-440.

Beier, P. & R.H. Barrett. 1993. The Cougar in the Santa Ana Mountain Range, California. Final report to the Orange County Cooperative Mountain Lion Study.

Benjamin, A., B. May, J. O'Brien, and A.J. Finger. 2016. Conservation Genetics of an Urban Desert Fish, the Arroyo Chub, Transactions of the American Fisheries Society. 145(2): 277-286. DOI: 10.1080/00028487.2015.1121925.

Bondi, C.A. 2009. A Comparison of Western Pond Turtle (*Actinemys marmorata*) Movements in Perennial and Intermittent Portions of a Northwestern California River System. M.S. Thesis. Humboldt State University. Humboldt, California. 87 pp.

Bonterra Psomas.

2013a. Baseline Biological Surveys Technical Report for the South County Properties Measure M2 Freeway Environmental Mitigation Program Acquisition Properties Evaluation in Orange County, California. Prepared for OCTA, Orange, California. 142 pp.

2013b. Baseline Biological Surveys Technical Report for the Hayashi Property Measure M2 Freeway Environmental Mitigation Program Acquisition Properties Evaluation in Orange County, California. Prepared for OCTA, Orange, California. 77 pp.

2014. Baseline Biological Surveys Technical Report for the MacPherson Property Measure M2 Freeway Environmental Mitigation Program Acquisition Properties Evaluation in Orange County, California. Prepared for OCTA, Orange, California. 68 pp.

2015. Baseline Biological Surveys Technical Report for the Aliso Canyon Property Measure M2 Freeway Environmental Mitigation Program Acquisition Properties Evaluation in Orange County, California. Prepared for OCTA, Orange, California. 76 pp.

Bostic, D.L. 1966. Thermoregulation and hibernation of the lizard *Cnemidophorus hyperythrus beldingi* (Sauria, Teiidae). The Southwestern Naturalist 11:275–289.

Brattstrom, B.H. 2000. The range, habitat requirements, and abundance of the orange-throated whiptail, *Cnemidophorus hyperythrus beldingi*. Bulletin of the Southern California Academy of Science 99:1–24.

California Native Plant Society (CNPS).

2001. Inventory of Rare and Endangered Vascular Plants of California, 6th Edition. Sacramento, CA.

2015. Inventory of Rare and Endangered Plants (online edition, v8-02). Sacramento, CA. http://www.rareplants.cnps.org (accessed May 11, 2015).

California Natural Diversity Database (CNDDB). 2016. RareFind 5. California Department of Fish and Wildlife. Sacramento, CA.

Case, T. and R.N. Fisher. 1998. Inventories of the herpetofauna of the Chino-Puente Hills and identification of important conservation priorities. Unpublished report. Department of Biology, University of California, San Diego, CA.

City of Irvine. 2012. Draft Heritage Fields Project 2012 GPA/ZC Second Supplemental Environmental Impact Report. SCH No. 2002101020. Prepared by City of Irvine. July 2012.

City of San Juan Capistrano. 2010. Restoration and Enhancement Plan 2C Ranch/Trabuco Creek Restoration. San Juan Capistrano, California. 58 pp.

Clarke, O.F., D. Svehla, G. Ballmer, and A. Montalvo. 2007. Flora of the Santa Ana River and Environs with References to World Botany. Heyday Books, Berkeley, CA.

Conservation Biology Institute (CBI). 2009. Conservation Assessment of Orange County. Prepared for Orange County Transportation Authority, Orange, CA 92863-1584. December 2009.

Cotton/Bridges Associates and EcoSystems Restoration Associates. 2004. Irvine wildlife corridor plan. Prepared for City of Irvine. 112 pp.

County of Orange (County). 1991 (as amended). Foothill/Trabuco Specific Plan. Santa, Ana, California. County of Orange Environmental Management Authority. 225 pp.

Davis, C.J. 1998. Western Pond Turtle (*Clemmys marmorata pallida*) Winter Habitat Use and Behavior. M.S. Thesis. San Jose State University. San Jose, California. 74 pp.

Dudek. 2013. County of Orange Central/Coastal NCCP/HCP Wildland Fire Management Plan. Volumes I-III. Prepared for the Nature Reserve of Orange County. 856 pp.

Durst, S.L., M.K. Sogge, S.D. Stump, H.A. Walker, B.E. Kus, and S.J. Sferra. 2008, Southwestern willow flycatcher breeding sites and territory summary—2007: U.S. Geological Survey Open–File Report 2008–1303, 31 p.

Endemic Environmental Services, Inc. 2013. Fairview Park Phase II: Year 1 Maintenance Report. Unpublished report prepared for OCTA. 9 pp.

Ernst, C.H. and J.E. Lovich. 2009. Turtles of the United States and Canada, 2nd Edition. John Hopkins University Press, Baltimore, MD.

Fisher, R. 2000. Monitoring Reptiles and Amphibians and Biodiversity: Nature Reserve of Orange County. US Geological Survey and San Diego State University. August 12, 2000.

Fisher, R.N., A.V. Suarez, and T.J. Case. 2002. Spatial patterns in the distribution of the coastal horned lizard. Conservation Biology 16(1):205-2015.

Fisher, R.N., D.A. Wood, C.W. Brown, P.Q. Spinks, and A.G. Vandergast. 2013. Phylogenetic and Population Genetic Analyses of the Western Pond Turtle (*Emys marmorata*), in Southern California. Prepared for the Department of Fish and Wildlife in fulfillment of Agreement No. P0850013-01, January 2013. U. S. Geological Survey, San Diego, CA. 60 pp.

Glenn Lukos Associates (GLA).

2014. Memorandum 2014 many-stemmed dudleya monitoring for 2014-2019 Management Action Plan, Rancho Mission Viejo, Orange County, California. November 4, 2014. 32 pp.

2015. Memorandum 2015 many-stemmed dudleya monitoring for 2014-2019 Management Action Plan, Ranch Mission Viejo, Orange County, California. October 5, 2015. 17 pp.

Goodman, R.H. Jr., and G.R. Stewart. 2000. Aquatic home ranges of female western pond turtles, Clemmys marmorata, at two sites in southern California. Chelonian Conservation and Biology Volume 3(4): 743-744.

Grinnell, J. and A.H. Miller. 1944. The Distribution of the Birds of California. Pacific Coast Avifauna.

Hamilton, R. 2004. Target Bird Monitoring Study Nature Reserve of Orange County 2004. Report prepared for the Nature Reserve of Orange County. 119 p.

Hamilton, R.A., G.A. Proudfoot, D.A. Sherry, and S. Johnson. 2011. Cactus Wren (*Campylorhynchus brunneicapillus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/558 (accessed May 7, 2015).

Harmsworth Associates.

2007. Long-Term Management Plan for the Shady Canyon Turtle Pond Mitigation Site. Prepared for The Irvine Company. Newport Beach, California. 16 pp.

2014a. Report on Least Bell's Vireo Protocol Surveys in Planning Area 1 for 2014. Prepared for The Irvine Company. 23 pp.

2014b. Report on Least Bell's Vireo Protocol Surveys in Planning Area 6 2014. Prepared for The Irvine Company.19 pp.

2014c. Report on Bird Surveys in Planning Areas 18 and 39 2014. Prepared for The Irvine Company. 27 pp.

2014d. Exotic Species Control for the Shady Canyon Turtle Pond. Prepared for Irvine Ranch Conservancy. 13 pp.

Harper, B. and L. Salata. 1991. A status review of the coastal cactus wren. U.S. Fish and Wildlife Service, Southern California Field Station, Laguna Niguel, California.

Herbold, B. and P. B. Moyle. 1986. Introduced species and vacant niches. American Naturalist 128:751–760.

Hickman, J.C. 1993. The Jepson Manual: Higher Plants of California. University of California Press, Berkeley, CA.

Hierl, L. A., J. Franklin, D.H. Deutschman, and H.M. Regan. 2007. *Developing Conceptual Models to Improve the Biological Monitoring Plan for San Diego's Multiple Species Conservation Program*. Prepared for California Department of Fish and Game. Prepared by Department of Biology, San Diego State University. 39 pp.

Holland, D.C. 1994. The western pond turtle: habitat and history. U.S. Department of Energy, Bonneville Power Administration, Portland, Oregon. 11 chapters + appendices.

Hult, S.M. and D.J. Germano. 2015. Habitat use and home range of *Phrynosoma blainvillii* in the San Joaquin Desert of California. Herpetological Conservation and Biology 10(3): 850-863.

ICF International (ICF).

2015a. Draft Ferber Ranch Preserve Resource Management Plan. Prepared for Orange County Transportation Authority. 106 pp.

2015b. Draft Hafen Preserve Resource Management Plan. Prepared for Orange County Transportation Authority. 102 pp.

2015c. Draft O'Neill Oaks Preserve Resource Management Plan. Prepared for Orange County Transportation Authority. 106 pp.

2015d. Draft Saddle Creek South Preserve Resource Management Plan. Prepared for Orange County Transportation Authority. 110 pp.

2015e. Draft MacPherson Resource Management Plan. Prepared for Orange County Transportation Authority. 106 pp.

2016. OCTA M2 Natural Community Conservation Plan/Habitat Conservation Plan Administrative Final. Prepared for Orange County Transportation Authority. October 2016. 440 pp and associated appendices.

Irvine Ranch Conservancy (IRC).

2013. Proposed plan for sediment removal and prevention for the Shady Canyon Turtle Pond City of Irvine Open Space. Unpublished draft restoration plan. 9 pp.

2014. Draft Habitat Mitigation and Monitoring Plan: West Loma Subwatershed. Prepared for OCTA. October 2014. 77 pp.

2015a. Habitat Mitigation and Monitoring Plan: Lower Silverado Canyon. Prepared for the OCTA Measure M Freeway Mitigation and Resource Protection Program. Unpublished draft restoration plan. 78 pp.

2015b. Bee Flat Canyon and Agua Chinon Riparian Corridor Annual Status Report. Prepared for the OCTA Measure M Freeway Mitigation and Resource Protection Program. 47 pp.

Jameson, E.W. and H.J. Peeters. 1988. California Mammals. University of California Press, Berkeley, CA. 403 pp.

Jennings, M.R. and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. Final Report Submitted to the California Department of Fish and Game Inland Fisheries Division, Rancho Cordova, CA.

Kamada and Mitrovich. 2015. Nature Reserve of Orange County: Coastal Cactus Wren Survey of Translocation Sites and Habitat Restoration Areas in 2014. Prepared for CDFW. 54 pp.

Kus, B. 2002. Least Bell's Vireo (*Vireo bellii pusillus*). In The Riparian Bird Conservation Plan: a strategy for reversing the decline of riparian-associated birds in California. California Partners in Flight. http://www.prbo.org/calpif/pdfs/riparian_v-2.pdf (accessed on March 3, 2015).

Kus, B., P. Beck, and J. Wells. 2003. Southwestern willow flycatcher populations in California: distribution, abundance, and potential for conservation. Studies in Avian Biology 26:12- 19.

Land IQ. 2014. Performance Monitoring Report Environmental Enhancement and Mitigation Program Cactus Wren Habitat Linkage Enhancement and Restoration Project. Prepared for Nature Reserve of Orange County, Irvine, CA. Viewed on March 3, 2015.

Leatherman BioConsulting.

2009. Central Reserve Cactus Wren Habitat Assessment and Survey 2008. Prepared for Nature Reserve of Orange County.

2012. Central and Coastal Reserve California Gnatcatcher Study 2011. Prepared for Nature Reserve of Orange County. 28 pp.

Lee, J.S., E.W. Ruell, E.E Boydston, L.M. Lyren, R.S. Alonso, J.L. Troyer, K.R. Crooks, and S. VandeWoude. 2012. Gene flow and pathogen transmission among bobcats (*Lynx rufus*) in a fragmented urban landscape. Molecular Ecology 21:1617–1631.

Lewison, R.L. and D.H. Deutschman. 2014. *Framework Management Plan: Guidelines for Best Practices with Examples of Effective Monitoring and Management*. Prepared for San Diego Association of Governments (SANDAG). Contract 5001562. Prepared by Department of Biology and Institute for Ecological Monitoring and Management, San Diego State University.

Lyren L.M., G.M. Turschak, E.S. Ambat, C.D. Haas, J.A. Tracey, E.E. Boydston, S.A. Hathaway, R.N. Fisher, and K.R. Crooks. 2006. Carnivore activity and movement in a southern California protected area, the North/Central Irvine Ranch. U.S. Geological Survey Technical Report. 115 pp.

Lyren, L.M., R.S. Alonso, K.R. Crooks, and E.E. Boydston.

2008a. Evaluation of functional connectivity for bobcats and coyotes across the Former El Toro Marine Base, Orange County, California. Administrative Report, 179 pp.

2008b. GPS telemetry, camera trap, and mortality surveys of bobcats in the San Joaquin Hills, Orange County, California. Administrative Report prepared for U.S. Fish and Wildlife Service and The Nature Conservancy. 134 pp.

Marchant, T.A., R. Alarcon, J.A. Simonsen, and H. Koopowitz. 1998. Population ecology of *Dudleya multicaulis* (Crassulaceae); A rare narrow endemic. Madrono Vol. 45, No. 3:215–220.

McCabe, S.W. 2012. Dudleya. Pp. 666–673 in B.G. Baldwin, D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (eds.), The Jepson manual: vascular plants of California, 2nd ed. University of California Press, Berkeley, CA.

Mitrovich, M.J., T. Matsuda, K.H. Pease, and R.N. Fisher. 2010. Ants as a Measure of Effectiveness of Habitat Conservation Planning in Southern California. Conservation Biology 24(5):1239-1248.

Mitrovich, M.J. and R.A. Hamilton. 2007. Status of the Cactus Wren (*Campylorhynchus brunneicapillus*) within the Coastal Subregion of Orange County, California. Prepared for: Nature Reserve of Orange County. May 2007.

Mock, P. 2004. California Gnatcatcher (*Polioptila californica*). In The Coastal Scrub and Chaparral Bird Conservation Plan: a strategy for protecting and managing coastal scrub and chaparral habitats and associated birds in California. California Partners in Flight. http://www.prbo.org/calpif/htmldocs/scrub.html

Moyle, P.

1976. Inland Fishes of California. University of California Press, Berkeley, CA. 405 pp.

2002. Inland Fishes of California. University of California Press, Berkeley, CA. 502 pp.

Moyle, P.D. and T. Light. 1996. Fish invasions in California: do abiotic factors determine success? Ecology 77:1666–1670.

Natural Communities Coalition (NCC).

2014. Nature Reserve of Orange County. County of Orange Central/Coastal NCCP/HCP 2014 Annual Report. 357 pp.

2015. Nature Reserve of Orange County. County of Orange Central/Coastal NCCP/HCP 2015 Annual Report. 369 pp. www.occonservation.org

Nordby, J.C. 1992. Inventory Survey of the western pond turtle (*Clemmys marmorata*) in Washington, 1992. Center for Wildlife Conservation. Seattle, Washington. Unpublished data.

Noss, R.F. 1987. Corridors in real landscapes: a reply to Simberloff and Cox. Conservation Biology 1:59-64.

O'Leary, J.F. 1990. Californian coastal sage scrub: general characteristics and considerations for biological conservation in endangered plant communities. Pp. 24–41 in A. Schoenherr (ed.), Southern California Botanists Special Publication 3.

Ordeñana, M.A., K.R. Crooks, E.E. Boydston, R.N. Fisher, L.M. Lyren, S. Siudyla, C.D. Haas, S. Harris, S.A. Hathaway, G.M. Turschak, A.K. Miles, and D.H. Van Vuren. 2010. Effects of urbanization on carnivore species distribution and richness. Journal of Mammalogy 91(6):1322-1331.

Ostensen and Associates.

2010. Restoration and Enhancement Plan 2C Ranch/Trabuco Creek Restoration San Juan Capistrano, California. Prepared for the City of San Juan Capistrano. 58 pp.

2012. Draft Restoration Plan OCTA Measure M-Aliso Creek Habitat Restoration. Prepared for the Laguna Canyon Foundation. 43 pp.

2015. Annual Status Report 2C Ranch/Trabuco Creek (City Parcel) Restoration San Juan Capistrano, California. Prepared for the City of San Juan Capistrano. 94 pp.

Palstra, F.P. and D.E. Ruzzante. 2008. Genetic estimates of contemporary effective population size: what can they tell us about the importance of genetic stochasticity for wild populations? Molecular Ecology 17: 3428-3447.

Patten, M.A. 2017. Assessing Effectiveness of Adaptive Recreation Management Strategies and Evaluation of Core NCCP/HCP Habitat Areas. Prepared for the Natural Communities Coalition under CDFW Local Assistance Grant #P1482109. March 27, 2017.

Poessel, R.A., C.L. Burdett, E.E. Boydston, L.M. Lyren, R.S. Alonso, R.N. Fisher, and K.R. Crooks. 2014. Roads influence movement and home ranges of a fragmentation sensitive carnivore, the bobcat, in an urban landscape. Biological Conservation 180:224-232.

Preston, K. and Kamada, D.

2012. Nature Reserve of Orange County: Monitoring coastal cactus wren reproduction, dispersal and survival in 2011. Prepared for CDFW. 45 pp.

2013. Nature Reserve of Orange County: Monitoring coastal cactus wren reproduction, dispersal and survival in 2011. Prepared for CDFW. 93 pp.

Proudfoot, G.A., D.A. Sherry, and S. Johnson. 2000. Cactus Wren (*Campylorhynchus brunneicapillus*), in A. Poole and F. Gill (eds.), The Birds of North America No. 555. Birds N. Am., Philadelphia.

Rahn, M., P. Bowler, K. Preston, T. Smith, and B. DiGennaro. 2011. Independent Science Advisors Report: Orange County Transportation Authority M2 NCCP/HCP. Unpublished report. 25 pp.

Rea, A.M. and K.L. Weaver. 1990. The taxonomy, distribution, and status of coastal California cactus wrens. Western Birds 21:81–126.

Recon. 2011. Final restoration plan for the Lower Mesa of the Bolsa Chica Ecological Reserve. Prepared for Bolsa Chica Land Trust, Huntington Beach, California. Revised June 1, 2012. 98 pp.

Riley, S.P.D., R.M. Sauvajot, T.K. Fuller, E.C. York, D.A. Kamradt, C. Bromley, and R.K. Wayne. 2003. Effects of urbanization and habitat fragmentation on bobcats and coyotes in southern California. Conservation Biology 17:566–576.

Roberts, F.M.

1999. Many-stemmed dudleya (*Dudleya multicaulis*) Status Trend Summary. Unpublished Report prepared for the California Native Plant Society, Sacramento, CA.

2008. A Checklist of the Vascular Plants of Orange County, California: An Annotated Checklist. FM Roberts Publications, San Luis Rey, CA.

Rourke, J.W., B.E. Kus and M.J. Whitfield. 2004. Distribution and abundance of the Southwestern Willow Flycatcher at selected southern California sites in 2001. Prepared for the California Department of Fish and Game, Species Conservation and Recovery Program Report 2004-05, Sacramento, California.

Ruell, E.W., S.P.D. Riley, M.R. Douglas, M.F. Antolin, J.R. Pollinger, J.A. Tracey, L.M. Lyren, E.E. Boydston, R.N. Fisher, and K.R. Crooks. 2012. Urban habitat fragmentation and genetic population structure of bobcats in coastal southern California. American Midland Naturalist 168:265–280

Santa Ana Watershed Association (SAWA). 2012. Status and Management of the Least Bell's Vireo and Southwestern Willow Flycatcher in the Santa Ana River Watershed, 2012 and Summary Data by Site and Watershed-wide, 2000-2012. Prepared for Orange County Water District and U.S. Fish and Wildlife Service. 132 pp.

San Diego Natural History Museum (SDNHM). 2015. Coast Horned Lizard. Field guide Reptile and Amphibians. Text by Dick Schwenkmeyer and Brad Hollingsworth. Viewed on February 4, 2015. https://www.sdnhm.org/archive/fieldguide/herps/phry-cor.html (accessed May 8, 2015).

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. *A Manual of California Vegetation*, second edition. California Native Plant Society. Sacramento CA.

Sedgwick, J.A. and F.L. Knopf. 1992. Describing willow flycatcher habitats: scale perspectives and gender differences. Condor 94:720–733.

Serieys, L.E.K., T.C. Armenta, J.G. Moriarty, E.E. Boydston, L.M. Lyren, R.H. Poppenga, K.R. Crooks, R.K. Wayne, and S.P.D. Riley. 2015. Anticoagulant rodenticides in urban bobcats: exposure, risk factors and potential effects based on a 16-year study. Ecotoxicology 24(4):844–862.

Sherbrooke, W.C. 2003. Introduction to Horned Lizards of North America. University of California Press, Berkeley, CA.

Shuford, W.D. and T. Gardali, eds. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Sibley, D.A. 2000. The Sibley Guide to Birds. National Audubon Society. Chanticleer Press, Inc., New York. 544 pp.

Soule, M. and D. Simberloff. 1986. What do genetics tell us about preserve design? Biological Conservation 35:19-40.

Spinks, P.Q. and H.B. Shaffer. 2005. Rangewide molecular analysis of the western pond turtle (*Emys marmorata*): cryptic variation, isolation by distance, and their conservation implications. Molecular Ecology 14:2047-2064.

Spinks, P.Q., R.C. Thomson, and H.B. Shaffer.

2010. Nuclear gene phylogeography reveals the historical legacy of an ancient inland sea on lineages of the western pond turtle, *Emys marmorata* in California. Molecular Ecology 19: 542–556.

2014. The advantages of going large; genome-wide SNPs clarify the complex population history and systematics of the threatened western pond turtle. Molecular Ecology 23: 2228-2241.

Spinks, P.Q., G.B. Pauly, J.J. Crayon, and H.B. Shaffer. 2003. Survival of the western pond turtle (*Emys marmorata*) in an urban California environment. Biological Conservation 113:257-267.

Stebbins, T.C. 2003. A Field Guide to Western Reptiles and Amphibians, 3rd ed. Houghton Mifflin Company, Boston.

Stein, B.A., L.S. Kutner, and J.S. Adams. 2000. *Precious Heritage: The Status of Biodiversity in the United States*. The Nature Conservancy and Association for Biodiversity. Oxford University Press, Inc., New York, New York.

Swift, C.C., T.R. Haglund, M. Ruiz, and R.N. Fisher. 1993. The status and distribution of the freshwater fishes of southern California. Bulletin of Southern California Academy of Sciences. 92(3):101-167.

Teutimez, M.R. 2012. The cactus wren (*Campylorhynchus brunneicapillus*) in southern California: haplotype comparisons among coastal and inland populations. A thesis Presented to the Department of Biological Sciences California State University, Long Beach.

Thomson, R.C., A.N. Wright, and H.B. Shaffer. 2016. California Amphibian and Reptile Species of Special Concern. California Department of Fish and Wildlife. University of California Press. Oakland, California. 390 pp.

Tigas, L.A., D.H. Van Vuren, and R.M. Sauvajot. 2002. Behavioral responses of bobcats and coyotes to habitat fragmentation and corridors in an urban environment. Biological Conservation. 108:299–306.

Tracey, J.A., J. Zhu, E. Boydston, L. Lyren, R.N. Fisher, and K.R. Crooks. 2013. Mapping behavioral landscapes for animal movement: a finite mixture modeling approach. Ecological Application 23:654-669.

Unitt, P.

2004. San Diego County bird atlas. Proceedings of the San Diego Society of Natural History. 39.

2008. San Diego Cactus Wren (*Campylorhynchus brunneicapillus sandiegensis*). Pp. 300–305 in W.D. Shuford and T. Gardali (eds.), California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies 85 of Western Birds 1. Western Field Ornithologists and California Department of Fish and Game, Camarillo, CA, and Sacramento, CA.

U.S. Fish and Wildlife Service (USFWS).

1993. Endangered and threatened wildlife and plants; notice of a 1-year petition finding on the western pond turtle. Federal Register 58:42717–42718.

2002. Southwestern Willow Flycatcher Recovery Plan. Albuquerque, New Mexico. i–ix+ 210 pp., Appendices A–O.

2006. Least Bell's Vireo (*Vireo bellii pusillus*) 5-Year Review Summary and Evaluation. U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, Carlsbad, California. 27 pp.

2007a. Biological Opinion for the Southern Orange Habitat Conservation Plan, Orange County, California. Carlsbad Fish and Wildlife Service, Carlsbad, CA. 542 pp.

2007b. Endangered and threatened wildlife and plants; revised designation of critical habitat for the coastal California gnatcatcher (*Polioptila californica californica*). Federal Register 72:72010-72213.

2013. Endangered and threatened wildlife and plants; designation of revised critical habitat for southwestern willow flycatcher. Federal Register 78: 343-534. http://www.fws.gov/nevada/protected_species/birds/documents/swwf/1-02-13_SWWF_FR_Critial_Habitat.pdf (accessed on March 4, 2015).

U.S. Forest Service (USFS). 2009. Vegetation mapping. Existing vegetation (eveg) layers. Pacific Southwest Region Remote Sensing Lab. Data available at http://www.fs.usda.gov/detail/r5/landmanagement/resourcemanagement/?cid=stelprdb534712

Vandergast, A.G, B.E. Kus, K.R. Barr, and K.L. Preston. 2014. Genetic structure in the California gnatcatcher in coastal Southern California and implications for monitoring and management. Data Summary Report prepared for CDFW. U.S. Department of the Interior, U.S. Geological Survey.

Wells, A.W. and J.S. Diana. 1975. Survey of the freshwater fishes and their habitats in the coastal drainages of southern California. Rep. Submitted to California Department of Fish and Game, Inland Fish Branch by the L.A. County Museum of Natural History. 360 pp.

Westman, W.E. 1983. Xeric Mediterranean-type shrubland associations of Alta and Baja California and the community/continuum debate. Vegetation 52:3–19.

Winchell, C.S. and P.F. Doherty. 2014. Effects of habitat quality and wildfire on occupancy dynamics of Coastal California Gnatcatcher (*Polioptila californica californica*). The Condor 116(4):538-545.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White.

1988. California's Wildlife. Volume I. Amphbians and Reptiles. California Statewide Wildlife Habitat Relationships System, California Department of Fish and Game, Sacramento, CA.

1990a. California's Wildlife. Volume II. Birds. California Statewide Wildlife Habitat Relationships System, California Department of Fish and Game, Sacramento, CA.

1990b. California's Wildlife. Volume III. Mammals. California Statewide Wildlife Habitat Relationships System, California Department of Fish and Game, Sacramento, CA.

Personal Communications

Russ Barabe, CDFW Environmental Scientist, personal communication, September 17, 2015, conversation.

Peter Beck, USFWS Fish and Wildlife Biologist, personal communication, December 5, 2016, conversation.

Chris Brown, USGS Biologist, personal communication, September 14, 2015 and April 27, 2016, email.

Paul Galvin, Vice President/Senior Biologist, Harmsworth and Associates, personal communication, September 15, 2015, email.

Scott Gibson. 2015. Assistant Director of Research and Education at Audubon's Starr Ranch, personal communication, May 20, 2016, telephone call.

Lesley Hill, OCTA Biologist; personal communication, September 9, 2015, email.

Scarlett Howell. 2015. Ecologist at USGS, personal communication, May 12, 2015, email.

Dana Kamada, local species expert/Wildlife Biologist, personal communication. August 25, 2014, email.

John O'Brien, Senior Fish Biologist at CDFW, personal communication, September 11, 2015, telephone call.

Dr. Kris Preston, Ecologist, USGS/SDMMP, personal communication, August 22, 2014, email.

Kirsten Winters, Ecologist, USFS, personal communication, December 21, 2015, site visit meeting.