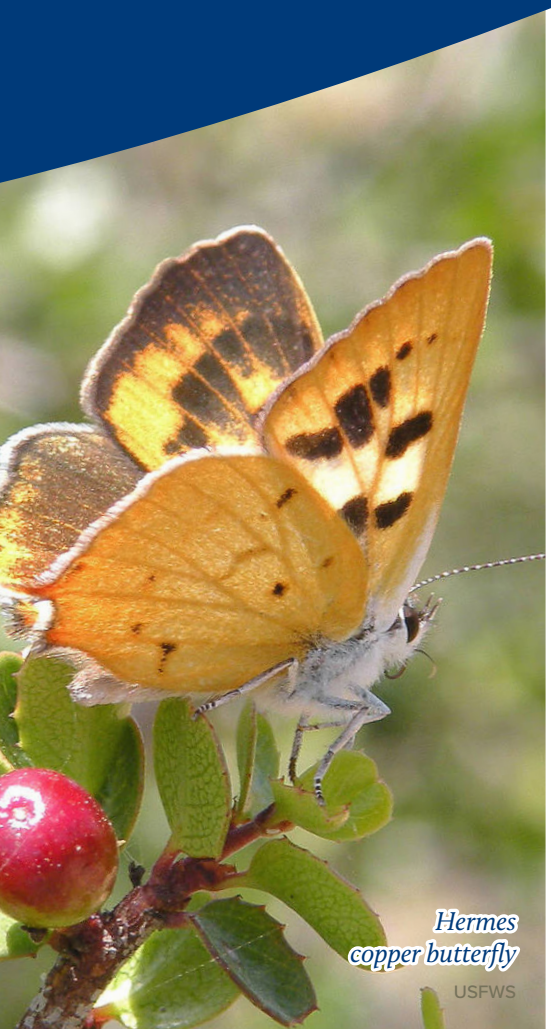
APPENDICES

Santee MSCP Subarea Plan

A Multiple Species Conservation Plan for the City of Santee, California

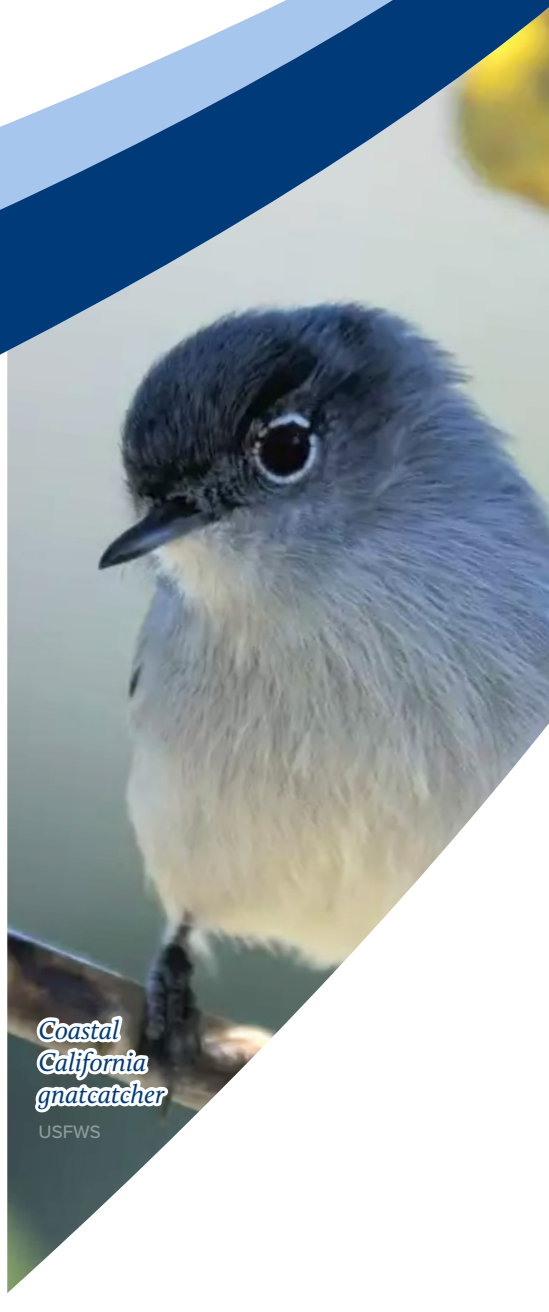
PUBLIC REVIEW DRAFT

AUGUST 2025



Hermes copper butterfly
USFWS

Willowy monardella
USFWS



Coastal California gnatcatcher
USFWS

Santee
DO MORE ▸ DUE EAST

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Appendix A
Implementing Agreement (IA)

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IMPLEMENTING AGREEMENT

BY AND AMONG
THE CITY OF SANTEE

AND THE

UNITED STATES FISH AND WILDLIFE SERVICE

AND THE

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

FOR THE CITY OF SANTEE SUBAREA PLAN FOR THE MULTIPLE SPECIES CONSERVATION PLAN ("MSCP")

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August 2025

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1. PARTIES TO THIS AGREEMENT

This Implementing Agreement (Agreement) is made and entered into by and among the UNITED STATES FISH AND WILDLIFE SERVICE (USFWS), the CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE (CDFW), and THE CITY OF SANTEE (CITY). USFWS, CDFW and the CITY are sometimes collectively referred to in this Agreement as the "Parties" or individually as a "Party." USFWS and CDFW may sometimes be collectively referred to in this Agreement as the "Wildlife Agencies." This Agreement informs the implementation of the joint habitat conservation plan (HCP) and natural community conservation plan (NCCP) for the Santee Subarea Plan (Subarea Plan).

2. RECITALS

2.1 The USFWS is a federal agency within the United States Department of the Interior charged with responsibility for administering the federal Endangered Species Act (ESA) and providing for the conservation of federally listed species and their habitat. The USFWS is authorized to issue a Take permit under Section 10(a) of the ESA for the incidental Take of federally listed animal species provided that the applicant for such a permit submits an HCP that meets permit issuance criteria set forth in Section 10 of the ESA. The USFWS enters into this Agreement pursuant to the ESA, the Fish and Wildlife Coordination Act (16 U.S.C. § 661-666c), and the Fish and Wildlife Act of 1956 (16 U.S.C. § 742(f) et seq.).

2.2 CDFW is a state agency within the California Natural Resources Agency charged with responsibility for administering the California Endangered Species Act (CESA) and the Natural Community Conservation Planning Act (NCCPA). CDFW is authorized to issue permits under Section 2835 of the California Fish and Game Code to authorize the Take of any species, whether or not it is listed as an endangered, threatened or candidate species under state law, where the conservation and management of the species is provided for in an NCCP approved by CDFW. CDFW enters into this Agreement pursuant to the NCCPA.

2.3 The CITY is a municipal corporation located within the County of San Diego. The CITY is authorized to enter into this Agreement pursuant to statutes and the Constitution of the State of California, including without limitation Article 11 thereof, authorizing the CITY to regulate

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the use of land, approve open space and conservation easements, create assessment districts, enact conservation and open space elements for general plans, preserve natural resources including plants and wildlife, exercise general planning and zoning powers, and enter into contracts and take other actions to conserve wildlife and plant resources and reconcile such concerns with economic development.

2.4 Pursuant to the ESA and CESA, the United States and the State of California identify certain plant and animal species that are listed as threatened or endangered or are candidates for listing as threatened or endangered.

2.5 In 1998, the Multiple Species Conservation Program (MSCP Subregional Plan) was approved in accordance with the requirements of the ESA, the NCCPA of 1991, the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). The MSCP Subregional Plan is a comprehensive, long-term Conservation program that represents the coordination of private development and the preservation interests of federal, state, and local governments. A goal of the MSCP Subregional Plan is to Conserve biodiversity in the MSCP Subregional Plan Area and to achieve certainty for both private and public land development projects. The MSCP Subregional Plan addresses the potential impacts of urban growth, natural habitat loss and species endangerment, and creates a framework to mitigate for the potential loss of Covered Species and their habitat due to the direct, indirect, and cumulative impacts of future development of private and public lands within the MSCP Subregional Plan Area.

2.6 The CITY enrolled as an NCCP participant and entered into a Memorandum of Agreement for coordinated habitat planning on May 13, 1992 (City of Santee City Council Resolution No. 54-92), signed an NCCP Enrollment Agreement with CDFW in 1992, and also signed an NCCP Planning Agreement with CDFW and USFWS for the City of Santee NCCP/HCP Subarea in 1992.

2.7 The CITY is a participant in the MSCP as one of the twelve (12) general purpose agencies whose territories are included in the MSCP Subregional Plan Area. A map of the MSCP Subregional Plan Area is included in the Subarea Plan as Figure 1-2, *MSCP Subregional Plan and Subareas*. The overall MSCP Subregional Plan is implemented through the development of individual

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subarea plans.

2.8 Future growth and land development within the MSCP Subregional Plan Area, including both public and private projects, may result in a reduction of Covered Species habitat and/or the Taking of Covered Species incidental to the carrying out of otherwise lawful activities.

2.9 The CITY participated in the development of the MSCP Subregional Plan to meet the requirements of the ESA, CESA, NCCPA, NEPA and CEQA with respect to public and private development in the greater San Diego area and to avoid potential obstacles posed by project-by-project review under the ESA and CESA. Consistent with the NCCPA, the MSCP Subregional Plan is a broad-based planning effort intended to provide for effective protection and Conservation of the region's wildlife and plant heritage while continuing to allow appropriate development and growth. Such planning is an effective tool in protecting the region's biodiversity while reducing conflicts between protection of wildlife and plants and the reasonable use of natural resources for economic development. The MSCP Subregional Plan has been developed through a cooperative effort involving the USFWS, CDFW, local government agencies, property owners, development interests, environmental groups, and the public within the MSCP Subregional Plan Area.

2.10 The MSCP Subregional Plan as implemented through the Subarea Plan and this Agreement establishes the conditions under which the CITY, for the benefit of itself and public and private landowners within its subarea boundaries, will receive from the USFWS and the CDFW ESA and NCCPA Permits that will allow the Taking of the Covered Species incidental to land development, construction of public facilities, and other lawful land uses that are authorized by the CITY.

2.11 Implementation of the MSCP Subregional Plan will allow the CITY and other Participating Local Jurisdictions to maintain development flexibility by proactively planning a regional preserve system that can meet future development project mitigation needs, while recognizing the independent land use planning and permitting authority of those entities.

2.12 Preservation of natural vegetation communities and wildlife will significantly enhance the quality of life in the MSCP Subregional Plan Area and set aside lands for the

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future use and enjoyment of the citizens within the MSCP Subregional Plan Area, the state, and the nation.

3. PURPOSE

The purpose of this Agreement is to clarify the provisions of the Subarea Plan and the processes the Parties intend to follow to ensure successful implementation of the Subarea Plan in accordance with the Permits and applicable law.

4. DEFINITIONS

The following terms as used in this Agreement shall have the meanings set forth below:

4.1 "Adaptive Management" means to use the results of new information gathered through the monitoring activities within the Subarea Plan Area and from other sources to adjust management strategies and practices to assist in providing for the Conservation of Covered Species. Adaptive Management measures in the Subarea Plan will respond to monitoring program information, contingencies, changed circumstances, and unforeseen circumstances affecting Covered Species. The Adaptive Management measures are to be consistent with the goals and objectives of the Subarea Plan and the terms and conditions of the Permits.

4.2 "Additional Conservation Measures" means the Conservation measures beyond those provided by the MSCP Subregional Plan and the Subarea Plan that the USFWS and the CDFW may seek from the CITY to add additional species as Covered Species as described in Sections 13.2.1 and 13.2.2 of this Agreement.

4.3 "Agreement" means this Implementing Agreement by and among USFWS, CDFW, and the CITY.

4.4 "Appropriate Managing Entity" means the manager of any portion of the Subarea Plan Managed Preserve, including, but not limited to, the CITY or a third party under the direct control of the CITY.

4.5 "CDFW" means the California Department of Fish and Wildlife, a subdivision

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of the California Resources Agency charged with administering CESA and the NCCPA.

4.6 "CEQA" means the California Environmental Quality Act (Cal. Public Resources Code § 21000 et seq.), including all regulations promulgated pursuant to that Act.

4.7 "Certificate of Inclusion" means a document other than an approval granted by the CITY, executed by the CITY and a third party that extends the Incidental Take authorization granted to Permittee to such third party for the purpose of carrying out a Covered Activity. Execution of a Certificate of Inclusion by the third-party places such third party under the legal control of Permittee for purposes of enforcing and implementing the Permits, including the Subarea Plan and this Agreement. A Certificate of Inclusion template is attached as Exhibit A.

4.8 "CESA" means the California Endangered Species Act (California Fish and Game Code § 2050 et seq.), including all regulations promulgated pursuant to that Act.

4.9 "Changed Circumstances" means "changes in circumstances affecting a species or geographical area covered by a conservation plan that can reasonably be anticipated by the plan's developers and the [USFWS] for which responses can be identified in a conservation plan." 50 C.F.R. 17.3. Categories of Changed Circumstances in the Subarea Plan include fire, climate change, flooding, prolonged drought, invasion by exotic species, and future listings of non-Covered Species or designation of critical habitat for non-Covered Species.

4.10 "Conservation" and "Conserve" means to use, and the use of, methods and procedures within the Subarea Plan Area as set forth in the Subarea Plan, that are necessary to bring listed species to the point at which the measures provided pursuant to ESA and the CESA are no longer necessary, and for Covered Species that are not listed, to maintain or enhance the condition of a species so that listing pursuant to ESA and CESA will not become necessary.

4.11 "Conservation Goal(s)" means a broad statement of intent that describes how the Subarea Plan will accomplish the protection of habitat, ecological processes, Biological

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Corridors and Linkages to ensure that the Covered Species are Conserved. Conservation Goals are also designed to ensure the persistence of natural communities.

4.12 "Conservation Objective(s)" means measurable statements of actions or measures that will lead to attainment of Conservation Goals.

4.13 "Conservation Strategy" means the overall approach to assure Conservation of Covered Species within the Subarea Plan Area.

4.14 "Covered Activity(ies)" means land uses, land and public infrastructure development, and Conservation activities identified in Section 4.2, *Types of Covered Activities Resulting in Effect*, of the Subarea Plan and subject to the CITY's jurisdiction and control that may result in Take of Covered Species during the term of the Subarea Plan and for which Take coverage is provided under the Permits.

4.15 "Covered Species" means all species within the Subarea Plan that will be Conserved by the CITY and for which Take will be authorized, except for fully and specially protected species.

4.16 "Effective Date" means the date when all of the following occur: (a) the CITY approves and signs the Agreement; (b) the USFWS approves and signs the Agreement; (c) the CDFW approves and signs the Agreement; (d) the USFWS issues the Section 10(a)(1)(B) Permit, and; (e) the CDFW issues the NCCP Permit.

4.17 "ESA" means the federal Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 et seq.), including all regulations promulgated pursuant to that Act.

4.18 "Fully Protected Species" means any species identified in California Fish and Game Code Sections 3511 (birds), 4700 (mammals), 5050 (amphibians and reptiles) or 5515 (fish). No Fully Protected Species are Covered Species under this Plan.

4.19 "Habitat Conservation Plan(s)" or "HCP" means a plan prepared pursuant to Section 10 of ESA.

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4.20 "HLIT" means the Habitat Loss and Incidental Take Ordinance promulgated by the CITY that establishes mitigation standards for biological resources and implements the Subarea Plan for Covered Activities. Third-Party Participant status will be extended to persons and entities under the jurisdiction and control of the CITY through permits issued pursuant to the HLIT.

4.21 "Incidental Take" or "Incidental Taking" means the Take of a species that is incidental to and not the purpose of the carrying out of an otherwise lawful activity. For purposes of the Section 10(a)(1)(B) Permit, Incidental Take refers solely to animal species.

4.22 "Independent Covered Species" means those species listed in Table 1-1, *Subarea Plan Covered Species*, of the Subarea Plan Conservation Analysis that are Conserved by the Subarea Plan, and the CITY shall receive Permits for them regardless of the participation or continued participation of any other Participating Local Jurisdiction in the MSCP Subregional Plan.

4.23 "Managed Preserve" means areas within and outside of the CITY's incorporated limits that will be set aside pursuant to the Subarea Plan for permanent Conservation and will be managed in perpetuity consistent with the Subarea Plan.

4.24 "MSCP Subregional Plan" means the Multiple Species Conservation Program, a comprehensive habitat conservation planning program, adopted in August 1998, which addresses multiple species habitat needs and the preservation of native vegetation for a 900-square mile area in southwestern San Diego County, California.

4.25 "MSCP Subregional Plan Area" means the area consisting of approximately 900 square miles in southwestern San Diego County, referred to in the MSCP Subregional Plan as the "MSCP Subregional Plan Study Area." The MSCP Subregional Plan Area is depicted in Figure 1-2, *MSCP Subregional Plan and Subareas*, of the Subarea Plan.

4.26 "Multi-Habitat Planning Area" or "MHPA" means the portion of the MSCP Subregional Plan Area, described in Section 3.1.1 of the MSCP Subregional Plan, within which preserve planning is focused and the portion where permanent Conservation of habitat lands will be accomplished through implementation of the subarea plans. Within each subarea, the MHPA is

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further defined by mapped boundaries and/or by quantitative targets for habitat Conservation and other criteria as specified in the individual subarea plans.

4.27 "NCCPA" means the California Natural Community Conservation Planning Act of 2002, as amended (California Fish and Game Code section 2800 et seq.). Changes to the NCCPA effective January 1, 2002, expressly provide that the Subarea Plan will be solely governed in accordance with the NCCPA as it read on December 31, 2001, and not by the other substantive provisions of the NCCPA.

4.28 "NCCP Permit" means the authorization issued in accordance with this Agreement by CDFW under California Fish and Game Code section 2835. The NCCP Permit authorizes the Take of Covered Species, including those species listed under CESA as threatened or endangered, species that are candidates for such a listing, and unlisted species.

4.29 "NCCP Plan" means a plan developed in accordance with the NCCPA that provides comprehensive management and Conservation of multiple wildlife species, and that identifies and provides for the regional or area-wide protection and perpetuation of natural wildlife diversity while allowing compatible and appropriate development and growth.

4.30 "No Surprises Rule" means the rule promulgated by USFWS and currently codified at 50 C.F.R. 17.3, 17.22(b)(5) and 17.32(b)(5) that extends certain assurances regarding future mitigation obligations to permittees obtaining Incidental Take permits under Section 10(a) of the ESA.

4.31 "Participating Local Jurisdiction(s)" means any of the local governments identified in Section 1.1 of the Subregional Plan that prepares and receives USFWS and CDFW approval of a subarea plan under the MSCP Subregional Plan and that enters into an Implementing Agreement with the USFWS and CDFW.

4.32 "Party" and "Parties" mean the signatories to this Agreement, namely the USFWS, the CDFW, and the CITY.

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4.33 "Permittee" means the CITY.

4.34 "Preserve Management Guidelines" means the guidelines developed by the CITY in Section 7.2.3, *Preserve Management Guidelines*, of the Subarea Plan to outline principal Subarea Plan Managed Preserve maintenance activities and requirements, provide specifications to limit "edge effects" and impacts from adjacent development, furnish a framework to address potential impacts to the Subarea Plan Managed Preserve from invasive, exotic species, and create a blueprint for managing public access, trails and recreational uses within the Subarea Plan Managed Preserve.

4.35 "Santee Subarea" means the land within the incorporated boundary of the CITY as depicted in Figure 1-3, *Subarea Plan Area*, of the Subarea Plan and two Offsite Conservation Areas located outside of the City. The Santee Subarea may be modified from time to time by annexation in accordance with this Agreement and to which the Section 10(a)(1)(B) Permit and/or NCCP Permit shall apply.

4.36 "Subarea Plan" means the plan prepared and adopted by the CITY, reviewed and approved by the USFWS and CDFW to implement the MSCP Subregional Plan within the Santee Subarea.

4.37 "Section 10(a)(1)(B) Permit" means the permit issued by the USFWS to the CITY under section 10(a)(1)(B) of the ESA (16 U.S.C. § 1539(a)(1)(B)) to allow the Incidental Take of animal species on the list of Covered Species and that identifies plant species on the list of Covered Species in recognition of the Conservation measures provided for such species under the CITY's Subarea Plan.

4.38 "Take" and "Taking" have the meaning provided by the ESA and the California Fish and Game Code, including relevant implementing regulations and case law. Take as defined under Section 3 of the ESA means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." Take as defined in Section 86 of the Fish and Game Code means "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."

4.39 "Take Authorization(s)" means the authority granted through the Section 10(a)(1)(B) Permit and the NCCP Permit.

4.40 "Third-Party Participant(s)" means any landowner or other public or private entity undertaking Covered Activities that obtains and maintains Third-Party Participant status in compliance with Sections 10.1 or 10.2 of this Agreement.

4.41 "Unforeseen Circumstances" according to Fish and Game Code, Section 2805 (k) means changes in circumstances affecting one or more species, habitat, natural community, or the geographic area covered by a Conservation plan that could not reasonably have been anticipated by the CITY, USFWS and CDFW at the time of plan development, and that result in a substantial and adverse change in the status of one or more Covered Species. Unforeseen Circumstances according to 50 C.F.R. Section 17.3 means changes in circumstances affecting a species or geographic area covered by a Conservation plan that could not reasonably have been anticipated by the CITY, USFWS and CDFW at the time of the Conservation plan's negotiation and development and that result in a substantial and adverse change in the status of the Covered Species.

4.42 "USFWS" means the United States Fish and Wildlife Service, an agency of the United States Department of the Interior charged with administering the ESA.

4.43 "Wetlands" means generally those areas that are inundated or saturated by surface or ground water at a frequency or duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. For purposes of the Subarea Plan, regardless of whether an area meets criteria to be regulated by either federal or state statutes, Wetlands are defined herein as those lands that contain one or more of the naturally occurring wetland communities listed in Section 1.3.2.7, *Federal and State Weland Laws and Regulations*, and Table 2-6, *Vegetation Communities within Plan Area*, of the Subarea Plan and further described in Appendix G, *Vernal Pool Conservation Standards*.

4.44 "Wildlife Agencies" means USFWS and CDFW, collectively.

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5. RELATIONSHIPS OF MSCP, SANTEE SUBAREA PLAN, AND OTHER SUBAREA PLANS

5.1 Separate Subarea Plans for Participating Jurisdictions

Subarea plans have been finalized for the cities of Poway (1996), San Diego (1998), La Mesa (1998) and Chula Vista (2005), and the unincorporated County of San Diego (1998). The Wildlife Agencies recognize and agree that the entire MSCP Subregional Plan will not be implemented simultaneously. The USFWS and CDFW also recognize and agree that the implementation of each Participating Local Jurisdiction's subarea plan will likewise be phased in over time in accordance with the schedule provided in each subarea plan and/or associated Implementing Agreement.

Habitat Conservation measures provided for in the Subarea Plan, including habitat management within the Subarea Plan Managed Preserve, shall be consistent with the MSCP Subregional Plan, and shall be implemented through the policies and local regulations established by the CITY pursuant to Section 9.1.1 of this Agreement. Such policies and local regulations may differ as between the CITY and other Participating Local Jurisdictions, and as between different MHPA habitat types within the Santee Subarea.

5.2 MSCP Subregional Plan Vegetation Community Conservation Target Acres

As part of the development of the MSCP Subregional Plan in 1998, the MHPA was established to delineate areas in which habitat preserve assembly should occur. The MSCP Subregional Plan set a target for the Santee Subarea of 2,067 acres to be conserved within the MHPA boundaries. The final Subarea Plan exceeds the conservation target and will result in the conservation of approximately 2,271.9 acres. The final Subarea Plan contains revisions to the 1996 Santee Draft Subarea Plan that the Wildlife Agencies agree are consistent with the goals of the MSCP Subregional Plan.

5.3 Take Authorizations for Independent Covered Species

The Take Authorizations issued to the CITY apply to Independent Covered Species and as such do not

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require the participation or continued participation of any other Participating Local Jurisdiction in the MSCP Subregional Plan.

6. CONSERVATION PROGRAM

6.1 Assembly and Protection of the Subarea Plan Managed Preserve

6.1.1. General Conservation Methods

Subarea Plan Managed Preserve lands will be Conserved in perpetuity consistent with methods outlined in Section 7.2.2.2, *Land Protection Mechanism*, of the Subarea Plan.

6.1.2. Conserved Habitat Acreage

Within its portion of the MHPA, the CITY shall permanently Conserve an estimated 2,271.9 acres in approximately the amount of habitat acreage and configuration of listed vegetation communities specified in Table 6-2, *Comparison of Representative Percentages of Vegetation Communities in Subarea Plan Area and Managed Preserve*, and Figure 5-1, *Santee Managed Preserve and Open Space System*, of the Subarea Plan. In addition, the City will ensure that the two Offsite Conservation Areas (conservation of 90.7 acres of habitat for the Quino checkerspot butterfly in the East Elliott area west of the City or the equivalent from other nearby locations and 80.4 acres of occupied Hermes copper butterfly habitat in eastern San Diego County outside of the City) are permanently Conserved.

6.1.3. Habitat Conservation and Upland Mitigation Ratios

The classifications of habitat types and associated mitigation ratios into tiers shall be as set forth in Section 5.5.2, *Mitigation Standards for Vegetation Communities*, of the Subarea Plan. The CITY shall apply the mitigation ratios to development project impacts in the manner set forth in Section 5.5.2 of the Subarea Plan.

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6.1.4. Wetlands Protection Program

For Wetlands, impacts will be avoided to the maximum extent practicable as set forth in Sections 5.5.1, *Avoidance and Minimization*, and 5.5.5, *Aquatic, Wetlands, and Riparian Protection Standards*, of the Subarea Plan. Impacts that cannot be avoided shall be minimized and mitigated in accordance with the wetland mitigation ratios set forth on Table 5-13, *Uniform Mitigation Ratios*, of the Subarea Plan. Mitigation consistent with the Subarea Plan will be identified through environmental review documents prepared pursuant to CEQA, as required, and associated mitigation monitoring and reporting programs, and required by the CITY as legally enforceable conditions of approval (i.e., tentative maps, HLIT permits, and the CITY's Excavation, Grading and Fills Ordinance require compliance with wetlands mitigation prior to issuance of grading permits).

6.1.5 Protection of Narrow Endemic Species

For certain species identified as "narrow endemic species" in Section 5.5.6, *Narrow Endemic Species Standards*, of the Subarea Plan, impacts will be avoided to the maximum extent practicable as set forth in Section 5.5.6 of the Subarea Plan. Impacts that cannot be avoided shall be minimized and mitigated in accordance with the Subarea Plan and the HLIT Ordinance.

7. COVERED ACTIVITIES

Chapter 4 of the Subarea Plan describes Covered Activities and includes private commercial and residential development on privately-owned parcels; capital improvement projects including public and private infrastructure development projects; and facilities operations and maintenance, including public and private activities to operate and maintain, as well as repair and replace, existing facilities, such as roads, drainage basins, and water systems.

Covered Activities also include activities associated with implementation of the Conservation Program. These activities are identified in Chapter 5, *Conservation Strategy*, and Chapter 7, *Management and Monitoring*, of the Subarea Plan and include, but are not limited to, habitat restoration and management, maintenance, and monitoring of habitat preserves used to mitigate the effects of the other Covered Activities.

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8. ISSUANCE OF THE TAKE AUTHORIZATION

8.1 Take Authorization

As of the Effective Date, the CITY may Take the Covered Species while carrying out Covered Activities in the Santee Subarea of the MSCP Subregional Plan Area, as authorized by and subject to the conditions of the Section 10(a)(1)(B) Permit, the NCCP Permit, the Subarea Plan, and this Agreement. The authority issued to the CITY through the Permits applies to all of the CITY'S administration, employees, agents and Third-Party Participants who engage in any Covered Activity.

Take as defined under the ESA does not apply to listed plant species. Plant species included on the list of the CITY'S Covered Species are listed on the Section 10(a)(1)(B) Permit in recognition of the Conservation measures and benefits provided for such plant species under the Subarea Plan. Any reference in this Agreement or in the Subarea Plan to Incidental Take or Take of Covered Species shall, for the purpose of Incidental Take authorized under the Section 10(a)(1)(B) Permit, refer solely to species other than plants on the Covered Species list.

As more particularly described in Section 9.2.2 of this Agreement, the Permits will authorize the Take of all Covered Species, including those Covered Species that are not currently listed as threatened, endangered or candidate species under the ESA or CESA. Conserving unlisted Covered Species (the Taking of which is not unlawful under the ESA or CESA) the same as listed Covered Species equally in the MSCP Subregional Plan and the Subarea Plan may prevent such species from ever becoming threatened or endangered and will provide certainty regarding how the subsequent listing of such species under the ESA and CESA will affect permitting and mitigation requirements for future land development within the Subarea Plan.

8.2 Take Authorizations for Non-listed Covered Species

If a Covered Species is not listed as threatened or endangered under the ESA as of the Effective Date, and becomes so listed during the term of this Agreement, then the Section 10(a)(1)(B) Permit shall become effective with respect to such species concurrent with its listing as threatened or endangered. The NCCP Permit authorizes Take of all Covered Species from the Effective Date; for that

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reason, the subsequent CESA listing or candidate status of a Covered Species will have no effect on the scope of the NCCP Permit.

8.3 No Take of Fully Protected Species

No Fully Protected Species are included in the list of Covered Species. Take of Fully Protected Species is not proposed by Permittee nor authorized under the NCCP Permit, and CDFW acknowledges and agrees that the measures set forth in the Subarea Plan for the Covered Activities are intended to avoid causing the Take of any Fully Protected Species.

9. OBLIGATIONS OF THE PARTIES

9.1 CITY

9.1.1. Adoption of HLIT Ordinance

The CITY shall, after any necessary environmental documentation and subject to its legislative discretion, adopt and implement the HLIT Ordinance as set forth in Section 8.3.1, *Habitat Loss and Incidental Take (HLIT) Ordinance*, of the Subarea Plan within 90 days of the Effective Date.

9.1.2. Amendments to General Plan

The CITY acknowledges that it has chosen to implement several of the commitments made by it under the Subarea Plan through the exercise of its land use authorities. As appropriate or necessary, the CITY shall make amendments to the General Plan in order to make the General Plan consistent with the Subarea Plan.

9.1.3. CITY Compliance with Subarea Plan Provisions

The CITY will ensure that all CITY departments comply with the policies, regulations and management obligations established as a result of the Subarea Plan on all CITY projects and day-to-day operations.

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9.2 USFWS

The MSCP Subregional Plan sets forth a commitment for federal contributions to the MHPA. As of the Effective Date, USFWS has fulfilled and exceeded the federal land acquisition commitments under the MSCP Subregional Plan. Federal agencies will manage, maintain, and monitor all lands they contributed to the MSCP Subregional Plan, whether owned or administered by them as of the Effective Date, consistent with the MSCP Subregional Plan.

9.2.1. Permit Issuance, Implementation and Monitoring

Following execution of this Agreement by each Party and satisfaction of all other applicable legal requirements, including Section 10(a)(1)(B) issuance criteria, the USFWS will issue Permittee a Section 10(a)(1)(B) Permit authorizing Incidental Take by Permittee of each listed animal Covered Species resulting from Covered Activities within the Subarea Plan Area. The Permit will be conditioned on compliance with all terms and conditions of the Permit, including the Subarea Plan, this Agreement and applicable law. USFWS will cooperate and provide to the extent appropriated funds are available for that purpose, technical assistance to Permittee in implementing the Section 10(a)(1)(B) Permit. USFWS will use its reasonable efforts to expeditiously review all conservation easements or equivalent legal mechanisms proposed to conserve lands dedicated to the Managed Preserve and all Resource Management Plans (RMPs) submitted to it for review and approval under the Subarea Plan. USFWS will also monitor Permittee's implementation of the Subarea Plan, this Agreement, and the Section 10(a)(1)(B) Permit to ensure compliance.

9.2.2. Sufficient Funds

The USFWS will include in its annual budget requests for sufficient funds to fulfill its commitments under the MSCP Subregional Plan, this Agreement, and the Subarea Plan.

9.2.3. Section 7 Consultations

Nothing in this Agreement is intended to eliminate or modify the obligation of a federal agency to consult with the USFWS pursuant to section 7(a) of the ESA (16 U.S.C. § 1536(a)). In any consultation

under said provision involving CITY or a prospective or existing Third-Party Participant with regard to Covered Species that are listed or proposed for listing under the ESA and a Covered Activity, the USFWS will, as appropriate, ensure that the biological opinion issued in connection with the Covered Activity is consistent with the biological opinions issued in connection with the MSCP Subregional Plan and the Subarea Plan, provided that the Covered Activity is consistent with the MSCP Subregional Plan and Subarea Plan. Any Take avoidance and Take minimization measures included under the terms and conditions of the section 7 biological opinion will, as appropriate, be consistent with the requirements imposed on the Covered Activity under the Subarea Plan, provided that, unless otherwise required by law, the USFWS shall not impose measures on the prospective or existing Third-Party Participant in excess of those that have been or will be required by the CITY pursuant to the MSCP Subregional Plan, the Subarea Plan, this Agreement, the section 10(a)(1)(B) Permit, and the NCCP Permit, except in accordance with the No Surprises Rule.

9.2.4. Future Environmental Review Under NEPA

In the event that the USFWS participates as a lead or cooperating agency under NEPA with respect to the implementation of a Covered Activity, the USFWS, to the maximum extent consistent with the requirements of NEPA and other applicable federal law, will utilize the NEPA document prepared for the Subarea Plan and Section 10(a)(1)(B) Permit.

9.2.5. Critical Habitat

The Subarea Plan and this Agreement provide a comprehensive, habitat-based approach to the protection of Covered Species by focusing on the habitat necessary to provide for the long-term conservation and management of the Covered Species. This approach is consistent with the overall purposes of the ESA to provide a means whereby the ecosystems upon which endangered and threatened species depend may be conserved. At the time critical habitat is considered for a species proposed for listing under the ESA or currently listed under the ESA, the USFWS will consider whether habitat protections under the Subarea Plan adequately protect habitat that would be deemed essential to the species' recovery and survival, and whether the benefits of exclusion outweigh the benefits of inclusion of such habitat as critical habitat. If critical habitat is designated

within the Santee Subarea subsequent to issuance of the permit, no compensation, mitigation, or minimization measures will be required of the CITY or Third-Party Participants as a result of the designation, except in accordance with the No Surprises Rule.

9.2.6. Draft Conservation Easements and Subarea Plan Managed Preserve Management Plans

USFWS will review draft conservation easements/restrictive covenants and draft preserve management plans within 60 working days of receipt and provide confirmation that the documents are: (1) complete and acceptable, (2) acceptable with modifications, or (3) incomplete. If there is a material deviation from the standard easement template or preserve management guidelines, then this timeline may not be met.

9.2.7. Consideration of the MSCP Subregional Plan and Similar Plans

To the extent required and permitted by the ESA, the USFWS will take into account the species and habitat Conservation provided under the MSCP Subregional Plan, the Subarea Plan, this Agreement, and the species and habitat Conservation provided through all other existing Conservation efforts, as well as all information and data developed in the course of these efforts that are made available to them, in any future determinations concerning the potential listing as threatened or endangered of any Covered Species or any other species occurring within the Subarea Plan Area that is not so listed as of the Effective Date.

9.3 CDFW

The MSCP Subregional Plan set forth an obligation for State contributions to the MHPA. As of the Effective Date, CDFW has fulfilled and exceeded the State land acquisition obligations under the MSCP Subregional Plan. State agencies will manage, maintain, and monitor all lands they contribute to the MSCP Subregional Plan, whether owned or administered by them as of the Effective Date, consistent with the MSCP Subregional Plan.

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9.3.1. Findings - CDFW

The CDFW has found, following opportunity for public comment, that the MSCP Subregional Plan, the Subarea Plan and this Agreement (1) provide for the Conservation and management of the Covered Species and their habitat within the MSCP Subregional Plan Area and the Santee Subarea, (2) satisfy all legal requirements under the NCCPA necessary for the CDFW to issue an NCCP Permit for such species, and (3) are consistent with the NCCP Process and Conservation Guidelines. The CDFW has found that the Subarea Plan, in combination with the MSCP Subregional Plan, meets the requirements of the NCCPA for an NCCP Plan, and has approved the Subarea Plan as an NCCP Plan. The CDFW has found further that the MSCP Subregional Plan, the Subarea Plan and this Agreement provide for the mitigation of potential "significant effects on the environment" (as defined in California Public Resources Code § 21068) that may result to Covered Species and their habitat (pursuant to California Government Code § 66474) that may result from the Covered Activities in the Subarea.

9.3.2. Issuance of NCCP Permit

CDFW will approve the Subarea Plan and issue a NCCP Permit that authorizes the Take of Independent Covered Species identified by the Subarea Plan, subject to the terms of, and consistent with, the MSCP Subregional Plan, the Subarea Plan and this Agreement. The NCCP Permit will take effect on the Effective Date and be effective for 35 years unless it is terminated, suspended, or revoked sooner. The NCCP Permit will be renewable utilizing the applicable procedures in effect at the time of renewal.

9.3.3. Sufficient Funds

The CDFW shall include in its annual budget requests for sufficient funds to fulfill its obligations under the MSCP Subregional Plan, this Agreement, and all NCCP Permits it issues pursuant to the MSCP Subregional Plan.

9.3.4. Future Environmental Review Under CEQA

Unless otherwise required by CEQA or other applicable law, the Permittee and CDFW shall rely on

and use relevant portions of the EA/EIR and the CEQA findings when conducting future environmental review of Covered Activities. In the event that CDFW participates as a lead, responsible, or trustee agency under CEQA with respect to the implementation of a Covered Activity, CDFW will not require, recommend, or request the imposition of any additional or more stringent minimization or mitigation measures directed at the protection or conservation of Covered Species or their habitats. As a responsible or trustee agency under CEQA, CDFW will further notify the lead CEQA agency that any avoidance, minimization, and mitigation measures otherwise required for any impact to or Take of any Covered Species or habitat resulting from Covered Activities will be satisfied through the implementation of the Plan.

9.3.5. Draft Conservation Easements and Subarea Plan Managed Preserve Management Plans

CDFW will review draft conservation easements/restrictive covenants and draft preserve management plans within 60 working days of receipt and provide confirmation that the documents are: (1) complete and acceptable, (2) acceptable with modifications, or (3) incomplete. If there is a material deviation from the standard easement/restrictive covenant template or preserve management guidelines, then this timeline may not be met.

9.3.6. Consideration of the MSCP Subregional Plan and Similar Plans

To the extent required and permitted by the CESA, CDFW shall take into account the species and habitat Conservation provided under the MSCP Subregional Plan, the Subarea Plan, this Agreement, and the species and habitat Conservation provided through all other existing Conservation efforts, as well as all information and data developed in the course of these efforts that are made available to them, in any future determinations, and in any future recommendations from the CDFW to the California Fish and Game Commission, concerning the potential listing as threatened or endangered of any Covered Species or any other species occurring within the Subarea Plan that is not so listed as of the Effective Date.

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10. EXTENSION OF TAKE AUTHORIZATIONS TO THIRD-PARTY PARTICIPANTS

Upon execution of this Agreement by the Parties and the issuance of Permits by USFWS and CDFW, the CITY may allow within the Santee Subarea the Take of Covered Species by Third-Party Participants under the direct control of the CITY, specifically including landowners and public and private entities undertaking Covered Activities in conformance with an approval granted by the CITY in compliance with this Agreement, the Permits and the Subarea Plan or carried out in conformity with a Certificate of Inclusion or other written mechanism, and in compliance with this Agreement, the Permits and the Subarea Plan.

10.1 Take Authorization Extended to Third-Party Participants Through Local Approval

The creation of Third-Party Participant status shall occur during the CITY's permitting process at the point in time when (1) review of the project's impacts on biological resources and a determination of necessary mitigation has occurred in compliance with this Agreement, the Subarea Plan and other applicable law (e.g., CEQA), (2) the determined mitigation includes an immediately effective requirement to maintain the biological values of the land committed for mitigation, and (3) the mitigation has been imposed through a condition of development that is recorded and runs with the land and is enforceable against and binding upon the Third-Party Participant and any successor-in-interest to the Third-Party Participant.

The Take Authorization extended by the CITY to a Third-Party Participant shall be for the length of time and run concurrent with the specific land development approval granted by the CITY. No grading, clearing and/or grubbing activities may be commenced by the Third-Party Participant pursuant to the CITY's development approval until the mitigation established pursuant to Section 5.5, *Conservation Measure 3-Avoidance, Minimization, and Mitigation*, of the Subarea Plan has been fully satisfied, via Conservation easement, transfer of fee title, etc., or is guaranteed, via irrevocable offer of dedication, mitigation bond, letter of credit, pledged savings account or other equivalent mechanism, to occur within a time frame approved by the CITY, which time frame shall not exceed one (1) year from the date the permit for grading, clearing and/or grubbing is issued.

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10.2 Take Authorization Extended to Third-Party Participants Through Certificate of Inclusion

Third-Party Participants not subject to the CITY's land use authority may enter into an agreement with the CITY to participate in the Subarea Plan and receive Take Authorization subject to the terms of this Agreement for Covered Activities by signing a Certificate of Inclusion in substantially the same form as Exhibit A. The CITY shall then issue the Certificate of Inclusion, which specifically describes the Take Authorization under the Permits and required avoidance and minimization measures and extends Take authorization under the Permits to the Third-Party Participant. Revisions to the template Certificate of Inclusion must be approved in writing by the Wildlife Agencies.

Upon CITY's issuance of the Certificate of Inclusion to the Third-Party Participant, the Third-Party Participant may Take the Covered Species while carrying out the Covered Activity in accordance with the terms and conditions of this Agreement, the Subarea Plan and the Permits. The Third-Party Participant shall comply fully with the applicable terms and conditions of the Agreement, the Subarea Plan and the Permits. The Third-Party Participant shall be liable for any non-compliance with such terms and conditions. Nothing in this Agreement or the Certificates of Inclusion shall limit the Wildlife Agencies' ability to enforce the terms and conditions of this Agreement, the Subarea Plan, the Section 10(a)(1)(B) Permit and the NCCP Permit against the CITY or the Third-Party Participant.

10.2.1. Maintenance of Third-Party Participant Status

Third-Party Participant status will remain in effect unless the Third-Party Participant alters the project in a manner that increases impacts to biological resources evaluated pursuant to Chapter 4, *Covered Activities*, of the Subarea Plan or fails to maintain the biological values of the land committed for mitigation pursuant to Section 5.5 of the Subarea Plan. In such circumstance, the Third-Party Participant status is automatically extinguished, and the subsequent creation of Third-Party Participant status will require biological review and imposition of mitigation for the increased impacts. However, Third-Party Participant status shall not be extinguished as a result of impacts to biological values resulting from natural or other causes beyond the Third-Party Participant's control, as determined by the Wildlife Agencies, including fire, flood, storm, and earth movement, or from any

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prudent action taken by the Third-Party Participant to prevent, abate, or mitigate significant injury to the land resulting from such causes.

11. PLAN IMPLEMENTATION

11.1 Introduction

The MSCP Subregional Plan establishes a plan to Conserve the Covered Species by ultimately providing permanent protection for such species' habitat through implementation of individual subarea plans. The USFWS and CDFW agree to phased implementation of the CITY's portion of the MSCP Subregional Plan based on the agreement of the CITY to comply with and implement the MSCP Subregional Plan through the Subarea Plan with respect to all lands within the Santee Subarea over which the CITY has land use authority.

11.2 Compliance and Implementation

11.2.1. Lands to be Preserved

As provided in Section 5.3, *Conservation Measure 1-Establish Subarea Plan Managed Preserve*, of the Subarea Plan and Section 6.2.1, *Size and Configuration of Managed Preserve*, of this Agreement, the CITY commits to preserve, manage, and monitor in perpetuity for the benefit of the Covered Species and their habitats approximately 2,263.0 acres placed into the Subarea Plan Managed Preserve as the result of development pursuant to the Permits and designated as habitat on Figure 3-5 of the MSCP Subregional Plan (Vegetation Communities for MSCP Subregional Plan Study Area) within the CITY's current jurisdictional boundaries.

11.2.2. Habitat Conservation Accounting System

The CITY agrees that the habitat Conservation accounting system known as "Habitrak" shall be used by the CITY, the USFWS, and CDFW as a tool to assess whether the CITY is meeting its obligation to ensure that habitat preservation is proceeding in "rough step" with development, within the context of the acreage accounting and annual reporting process set forth in Section 16.1 of this Agreement. The Habitrak system uses the Habitat Conservation Accounting Model developed for the MSCP

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Subregional Plan as the formula for measuring rough step.

11.2.3. Rough Step Implementation

The Subarea Plan contemplates a Preserve that will be assembled over time as development is proposed and, when assembly is completed, must be in a configuration and contain suitable habitats (both location and acres) that provide for the Conservation of Covered Species as outlined in the Subarea Plan and described in more detail in the Conservation Analysis. As additional Subarea Plan Managed Preserve areas are acquired, the CITY must be able to demonstrate that lands being Conserved within the Subarea Plan Managed Preserve achieve the Conservation objectives for Covered Species and are appropriately focused on preserving parcels needed to meet natural community preservation objectives described in Section 5.2, *Biological Goals and Objectives*, of the Subarea Plan.

Furthermore, the CITY must be able to demonstrate that as development in the CITY's Subarea continues over the duration of the Permits (35 years), an equal if not greater acreage of land is being Conserved (rough step, consistent with the Uniform Mitigation Ratios in Table 5-13 of the Subarea Plan) in accordance with the CITY's Subarea Plan. To track compliance with this condition, there will be an annual rough step analysis conducted by the CITY for the Subarea Plan, described fully in the Subarea Plan Section 7.1, *Compliance Monitoring*. The rough step report will become part of the Annual Report provided to the Wildlife Agencies. This rough step analysis will include a summary of the total acreage within the Managed Preserve (lands protected in perpetuity through deed or easement) at the beginning of the tracking year, the number of acres required to be added to the Preserve based on approved activities during the previous calendar year, and the number of acres that were actually added to the Managed Preserve during the year. The rough step analysis will also include a summary of the total acreage of vegetation communities impacted by development and Conserved during the previous calendar year. This annual accounting of acreage by habitat type and location, and financial analysis will be provided in writing to the Wildlife Agencies and will include a GIS element.

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The rough step analysis shall ensure**,** on an annual basis, that additions to the Managed Preserve are within 10% of the level needed to offset the level of development within the CITY. If the rough step parameters are not met during any annual analysis period, the CITY must 1) meet with the Wildlife Agencies to determine how best to get back in rough step, and 2) conserve appropriate lands necessary to meet the specific objectives to bring the CITY back into compliance with the rough step parameters. Within forty-five (45) days of the determination that rough step between impacts to Covered Species and the implementation of the Conservation measures is not being maintained, the CITY shall either (a) regain rough step by demonstrating substantial implementation of the actions according to the existing Conservation Strategy; or (b) enter into an agreement with the USFWS or CDFW to expeditiously regain rough step. Such an agreement may include advancing and/or accelerating plans to acquire, restore, or enhance lands of the appropriate land cover type.

If the CITY has not re-established rough step within forty-five (45) days or has not entered into and maintained compliance with an agreement with the USFWS or CDFW within that period that sets a course of action to regain rough step in a timely manner, the USFWS and CDFW may suspend or revoke their Permits, in whole or in part.

11.3 Subarea Plan Managed Preserve Management

11.3.1. Lands to be Managed

The CITY agrees to be responsible, either directly or through an Appropriate Managing Entity under the direct control of the CITY, for managing the Subarea Plan Managed Preserve in accordance with Section 7.2, *Preserve Management and Monitoring*, of the Subarea Plan.

11.3.2. Subarea Plan Managed Preserve Management Program

The Subarea Plan incorporates Framework Management Guidelines for the entire CITY, as well as area specific guidelines for the San Diego River, Rattlesnake Mountain, Mission Trails, Magnolia and Fanita Ranch Preserve Management Area Subunits as outlined in Section 7.2.2, *Preparation of Preserve Complex and Preserve-Specific Resource Management Plans (RMPs)*, of the Subarea Plan. The Framework Management Guidelines have been prepared consistent with the framework

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management guidelines of the MSCP Subregional Plan. The Framework Management Guidelines outline principal Subarea Plan Managed Preserve maintenance activities and requirements, provide specifications to limit "edge effects" and impacts from adjacent development, furnish a framework to address potential impacts to the Subarea Plan Managed Preserve from invasive, exotic species, and create a blueprint for managing public access, trails and recreational uses within the Subarea Plan Managed Preserve. Because each area of the Subarea Plan Managed Preserve will be unique in terms of existing conditions, Subarea Plan Managed Preserve configuration, ownership of land, the existence and location of sensitive species and management needs, area-specific management directives for discreet areas of land within the Subarea Plan Managed Preserve have been or will be prepared, pursuant to Section 7.2.2 of the Subarea Plan. Area-specific management directives must incorporate requirements of the Preserve Management Guidelines (Section 7.2.3 of the Subarea Plan).

11.4 Subarea Plan Managed Preserve Boundary Adjustments

Adjustments to the CITY's Subarea Plan Managed Preserve boundaries may be made in the circumstances as set forth in Section 8.6.2, *Minor Amendments to the Subarea Plan*, of the Subarea Plan. This Agreement need not be amended to reflect such adjustments.

11.5 Coordination of Subarea Plan Managed Preserve Management

11.5.1. Regional Habitat Management Technical Committee

Upon the Effective Date, the CITY will join the regional habitat management technical committee formed pursuant to the MSCP Subregional Plan that serves as a coordination forum for technical issues associated with MHPA management. The USFWS and CDFW will work with this committee to furnish information and advice on habitat management. The committee will have the responsibilities identified in Section 5.8.3 of the MSCP Subregional Plan.

11.5.2. Private Owners of Land Within the MHPA

This Agreement, the MSCP Subregional Plan and the Subarea Plan do not impose upon private owners

of land within the MHPA who are not Third-Party Participants any additional obligations, except as may otherwise be provided in existing Conservation easements and related agreements, for the management or maintenance of their land.

11.6 Annexation of Lands

To the extent permitted by law, the CITY shall enforce, as set forth in this Agreement, the terms of the Section 10(a)(1)(B) Permit and NCCP Permit, Subarea Plan, and this Agreement as to all persons or entities owning or developing land within the Santee MSCP Subregional Planning Area that become subject to the CITY's jurisdictional authority in the event of annexation or reorganization of such land from another jurisdiction.

If the lands proposed for annexation are covered by another approved NCCP/HCP and Federal and state permits and the conservation and implementation strategies are consistent, a Major Amendment may not be required. In the case of annexations of land that do require changes to Take Authorizations for Covered Species, one of the following considerations shall apply:

- A Major Amendment to the Plan and amendment of the Take Authorizations are required to cover the annexed lands that are not adequately covered by an existing NCCP/HCP and Federal and state permits.
- If the lands to be annexed will require Take Authorizations for any species not covered under another approved NCCP/HCP or under the City's Subarea Plan, then a Major Amendment to the City's Subarea Plan and Permits shall be required.

12. REGULATORY ASSURANCES

12.1 Purpose

The primary purpose of the Subarea Plan and this Agreement is to provide for the long-term reconciliation of new land development within the MSCP Subregional Plan Area, including the Santee Subarea, with the Conservation, protection, and management of the Covered Species. Based on and in consideration of this Agreement, the MSCP Subregional Plan, and the Subarea Plan, the Parties

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hereby agree on and the USFWS and CDFW here describe assurances pursuant to their respective regulatory authorities that will be provided to the CITY and Third-Party Participants upon issuance of the Permits.

12.2 No Surprises' Assurances of USFWS and CDFW Assurances

12.2.1. Unforeseen Circumstances

(a) USFWS Assurances

Pursuant to the No Surprises Rule (codified in USFWS's implementing regulations), and provided that the CITY is properly implementing the Subarea Plan and properly complying with the Section 10(a)(1)(B) Permit, USFWS shall not require the CITY to provide additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources beyond the level provided for under the Subarea Plan's Conservation Strategy, this Agreement and the Section 10(a)(1)(B) Permit with respect to Covered Species and Covered Activities, without the consent of the CITY. Adaptive management modifications and plan responses to Changed Circumstances are provided for under the Subarea Plan's Conservation Strategy and therefore are not subject to the restrictions on additional mitigation contained in the No Surprises Rule.

(b) CDFW Assurances

Except as otherwise provided in this subsection, CDFW shall not require the CITY to provide, without its consent, additional land, water or financial compensation, or additional restrictions on the use of land, water, or other natural resources, for the purpose of Conserving Covered Species with respect to Covered Activities in the event of Unforeseen Circumstances, provided that the CITY is properly implementing this Agreement and the Subarea Plan. The provisions of this Agreement and the Subarea Plan that address Adaptive Management and Changed Circumstances are not Unforeseen Circumstances and therefore are not subject to these assurances.

(c) Unforeseen Circumstances Finding

In the event that USFWS, CDFW or the CITY believes that Unforeseen Circumstances may exist, it shall

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immediately provide written notification to the other Parties clearly documenting the basis for the proposed finding. Within fifteen (15) days of receiving such notice, or within a mutually agreed upon time thereafter, the CITY, USFWS and CDFW shall meet and confer to consider the facts cited in the notice and potential changes to Subarea Plan or management and operation of the Managed Preserve lands. Any Unforeseen Circumstances finding shall be based on the best scientific evidence available, after considering any responses submitted by the CITY pursuant to this Section, and USFWS and/or CDFW shall have the burden of demonstrating that Unforeseen Circumstances exist.

(d) Effect of Unforeseen Circumstances Finding

In the event of a finding of Unforeseen Circumstances in which additional mitigation measures are deemed necessary to respond to such Unforeseen Circumstances, such measures may be required from the CITY where the Subarea Plan is being properly implemented, but only if such measures are limited to modifications within the Managed Preserve lands of the Subarea Plan for the affected species and maintain the original terms of the Subarea Plan to the maximum extent possible. Additional mitigation measures will not involve the commitment of additional land, water or financial compensation or additional restrictions on the use of land, water, or other natural resources without the consent of the CITY.

(e) Interim Obligations Upon a Finding of Unforeseen Circumstances

If any Party makes a finding of Unforeseen Circumstances, during the period necessary to determine the nature, location, and extent of any additional or modified mitigation deemed necessary to respond to Unforeseen Circumstances, the CITY will avoid contributing to appreciably reducing the likelihood of the survival and recovery of the affected Covered Species and will exercise its enforcement authorities as provided by law as to Third-Party Participants under the CITY's jurisdiction and control that are carrying out Covered Activities, to avoid such Third-Party

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Participants contributing to appreciably reducing the likelihood of the survival and recovery of the affected Covered Species.

12.2.2. Changed Circumstances

(a) Changed Circumstances Defined

Changed Circumstances and planned responses to those circumstances are defined in Section 4.9 of this Agreement and described in Section 8.7.2, *Changed Circumstances*, of the Subarea Plan. Changed Circumstances are an extension of the Adaptive Management Program.

(b) CITY- Initiated Response to Changed Circumstances

The CITY will immediately notify USFWS and CDFW upon learning that any of the Changed Circumstances listed in Section 8.7.2 of the Subarea Plan has occurred and shall provide written notice within seven (7) days. Within thirty (30) days, the CITY shall modify its activities and shall require affected third persons under its direct control to modify their activities, as appropriate, in accordance with Section 8.7.2 of the Subarea Plan, to the extent necessary to minimize and mitigate the effects of the Changed Circumstances. The CITY shall report to USFWS and CDFW on its actions. Such modifications will be initiated without awaiting notice from USFWS or CDFW. Such modifications are provided for in the Subarea Plan and do not constitute Unforeseen Circumstances or require amendment of the Section 10(a)(1)(B) Permit, NCCP Permit, or the Subarea Plan.

(c) USFWS-Initiated or CDFW-Initiated Response to Changed Circumstances

If USFWS or CDFW determines that Changed Circumstances have occurred and that the CITY has not responded in accordance with Section 8.7.2 of the Subarea Plan, the USFWS or CDFW will so notify the CITY and, as appropriate, direct the CITY to implement the required response, as set forth in Section 8.7.2 of the Subarea Plan. Within thirty (30) days after receiving such notice, the CITY, will implement the required response and report to USFWS and CDFW on its action. Such changes do not constitute Unforeseen Circumstances or require amendment of the Section 10(a)(1)(B) Permit, NCCP

Permit, or the Subarea Plan. The USFWS and/or CDFW may extend the period of time for the CITY to implement its planned responses upon the CITY's showing of good cause, and such extension will not be unreasonably withheld.

12.2.3. Assurances to Third-Party Participants

For a project or portion thereof where Third-Party Participant status has been attained and is effective, the Parties shall not alter existing mitigation obligations imposed by the CITY on the Third-Party Participant, except as otherwise specifically allowed under this Agreement, the Subarea Plan, or regulation, provided that the Third-Party Participant satisfies all mitigation obligations imposed by the CITY in conformance with this Agreement, the Subarea Plan, and the Permits. These assurances do not apply to circumstances under which this Agreement or regulation provides that USFWS or CDFW may require additional or modified Conservation and mitigation measures from the CITY; under such circumstances, the Parties may require Third-Party Participants to provide any additional Conservation and mitigation measures that are required.

13. FUTURE LISTINGS OF SPECIES THAT ARE NOT COVERED SPECIES

If a species that is not a Covered Species is subsequently proposed for listing as threatened or endangered under the ESA or CESA or is accepted by the California Fish and Game Commission as a candidate for listing under CESA after the Effective Date, and it is determined by the USFWS or CDFW based on best available scientific evidence that such species occurs within the Santee Subarea, the CITY will initiate responsive actions or measures to ensure Covered Activities avoid Take of, jeopardy to, or adverse modification of Critical Habitat developed in consultation with the Wildlife Agencies until the respective Permit is amended to include such species, or until the Wildlife Agencies notify the CITY that such measures are no longer needed to avoid Take of, jeopardy to, or adverse modification of the Critical Habitat of the non-Covered Species. The USFWS and CDFW will work with the CITY to identify, within six (6) months, the Conservation measures, if any, that are necessary to protect the species, and determine whether such Conservation measures are beyond those prescribed by the MSCP Subregional Plan and/or the Subarea Plan (i.e., Additional Conservation Measures). Although such Additional Conservation Measures may be identified after such species is proposed for listing, the CITY may choose not to approve and implement such measures until the

species is actually listed. The Major Amendment process to add a species to the Permits is identified in Section 8.6.3.2, *Process for Adding Species to Covered Species List*, of the Subarea Plan.

13.1 Adequate Conservation Measures Already in the MSCP Subregional Plan

If the Conservation measures already contained in the MSCP Subregional Plan, as implemented through the Subarea Plan and other approved subarea plans, are adequate to fulfill the Conservation measures identified pursuant to section 13 above, then upon application by the CITY for Take Authorization for such species and following satisfaction of applicable review procedures as required by the ESA and the NCCPA, the Parties will amend this Agreement to add such species to the list of Covered Species and, following compliance with all applicable statutory and regulatory requirements, the USFWS and/or CDFW shall amend the Section 10(a)(1)(B) Permit and/or NCCP Permit to add such species for the remaining term of the Permits.

13.2 Inadequate Conservation Measures in the MSCP Subregional Plan

13.2.1. Additional Conservation Measure Priorities

If the Conservation measures already contained in the MSCP Subregional Plan, the Subarea Plan, this Agreement, and other approved subarea plans do not adequately fulfill the Conservation measures identified pursuant to section 13 above, then the USFWS and CDFW will work with the CITY and other Participating Local Jurisdictions to identify and implement the Additional Conservation Measures necessary to add such species to the list of Covered Species. In developing a set of Additional Conservation Measures, the Parties will look to the following, in order of preference:

(a) Habitat management practices and enhancement opportunities within the MHPA using existing management resources, provided the redirection of such resources does not adversely affect any Covered Species.

(b) Habitat acquisition through the reallocation of Federal, State, regional and/or local funds identified for MSCP Subregional Plan implementation, provided such

reallocation does not adversely affect any Covered Species.

13.2.2. Developing Additional Conservation Measures

If the foregoing options are not adequate to fulfill the Conservation measures necessary to add the species to the Permits, then the USFWS and CDFW will work with the CITY to identify, consistent with the ESA and the NCCPA, the Additional Conservation Measures necessary to add such species to the list of Covered Species, including measures beyond those required by the MSCP Subregional Plan and Subarea Plan. Among equally effective Conservation measures, preference will be given by the USFWS and CDFW to Additional Conservation Measures that do not require additional mitigation or dedications of land. Although the Additional Conservation Measures necessary to add such species to the list of Covered Species may be identified at or after the time the species is proposed for listing, the CITY will not be required to approve or implement these Additional Conservation Measures until such time as the species is actually listed and/or Take Authorization for such species is granted to the CITY.

13.2.3. Application for Take Authorization for Non-Covered Species

The CITY makes no representation or commitment to pursue a Section 10(a)(1)(B) Permit from the USFWS or a NCCP Permit from the CDFW for such non-covered species. In the event the CITY does pursue Take Authorization, the USFWS and CDFW shall process any applications for Take Authorization that may be submitted for such species in accordance with the requirements of the ESA, CESA and/or the NCCPA.

14. MINOR AND MAJOR AMENDMENTS

Amendments to the Subarea Plan may be accomplished through the process fully described in Section 8.6, *Modifying and Amending the Subarea Plan*, of the Subarea Plan. Minor and/or major amendments to the Subarea Plan will be initiated at the request of the CITY and will be subject to approval by the Wildlife Agencies. As the CITY identifies actions that require a minor amendment, the CITY will notify the Wildlife Agencies. The CITY and Wildlife Agencies will then meet and confer to reach agreement upon the minor amendment as fully described in Section 8.6.2, *Minor*

Amendments to the Subarea Plan, of the Subarea Plan.

Major amendments to the Subarea Plan would be unusual and would generally be required for a significant acquisition of land placed into the Subarea Plan, change in Conservation action, adding a new species, or undertaking of a project or operation of a scope and scale that could not be accommodated as a minor amendment. The process for a major amendment is described in Section 8.6.3, *Major Amendments to the Subarea Plan*, of the Subarea Plan. Requests for amendments must be processed by the Wildlife Agencies in conformance with all applicable laws and regulations in effect at the time the request for an amendment is made.

15. FUNDING RESPONSIBILITIES OF THE CITY

15.1 Introduction

The MSCP Subregional Plan contains estimates for the costs of habitat acquisition, management and monitoring on a regional basis. To fully implement the MSCP Subregional Plan and the Subarea Plan, private property must be added to the Subarea Plan Managed Preserve within the MHPA. Assembly of the Subarea Plan Managed Preserve does not rely on public acquisition of private property: 100% of the Preserve will be acquired through the entitlement process and/or pursuant to agreements between landowners, the CITY, and the Wildlife Agencies, as provided in Section 5.3 of the Subarea Plan.

15.2 Funding

The CITY commits to funding Subarea Plan Managed Preserve maintenance, management and monitoring in perpetuity as provided in Section 8.4, *Subarea Plan Funding*, of the Subarea Plan. The CITY also commits to funding responses in the event of Changed Circumstances as described in Section 8.7.2 of the Subarea Plan. The CITY will secure this funding through the implementation of a variety of funding mechanisms, including, without limitation, community facilities districts, developer funded endowments, mitigation fees, special taxes, assessments, general fund appropriations, other sources of local funding and, as available, federal, state and regional funding. While the CITY will attempt to obtain and may use federal, state and regional funding to assist in the

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management of its Conserved lands, the CITY has the ability, independent of such federal, state and regional funding, to secure assured funding sources to pay for such management and monitoring.

15.3 Effect of Inadequate Funding on Permits

In the event that adequate funding to implement the MSCP Subregional Plan through the Subarea Plan is not provided by the CITY, the USFWS and CDFW will assess the impact of the funding deficiency on the scope and validity of the Permits. Unless the CITY exercises its authority to terminate pursuant to Section 17.3.3 of this Agreement, 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 Authorizations afforded by the Section 10(a)(1)(B) Permit and NCCP Permit until the funding situation can be remedied. Should CITY elect to terminate the Section 10(a)(1)(B) Permit and NCCP Permit, CITY shall remain obligated to mitigate fully in accordance with the Subarea Plan for all Take authorized prior to termination of the Section 10(a)(1)(B) Permit and NCCP Permit, including management of Subarea Plan Managed Preserve lands in perpetuity in accordance with the Subarea Plan.

16. REPORTING AND BIOLOGICAL MONITORING

16.1 Annual Reporting and Public Workshop

In accordance with Section 5.9.1 of the MSCP Subregional Plan, the CITY shall prepare and submit to the USFWS and the CDFW by March 30 of each year a public report containing an annual accounting, by project and cumulatively, of habitat acreage lost and Conserved within the Santee Subarea during the previous calendar year. This accounting shall specify acres Conserved within the MHPA by habitat type, as well as acres committed to land development both within and outside of the MHPA and compare these figures with results obtained utilizing Habitrak. This report shall also describe how habitat preservation is proceeding in rough step with development as defined in Section 8.5.1, *Habitat Tracking and Reporting*, of the Subarea Plan. The report will be used by the USFWS and CDFW to evaluate whether adequate progress toward implementation of the MSCP Subregional Plan and the Subarea Plan is being achieved. The CITY will participate in the annual MSCP Plan implementation public workshop jointly conducted by staff from the USFWS, the CDFW and the Participating Local

Jurisdictions to disseminate and discuss the information contained in annual report.

16.2 Annual Implementation Meeting

Once each year, the CITY shall meet with the USFWS and the CDFW to review and coordinate implementation of the Subarea Plan. The Parties will review the annual report described in Section 16.1 above for the purposes of evaluating the implementation of the Subarea Plan during the preceding year and the adequacy of the overall progress being made towards reaching the Conservation Goals of the Subarea Plan. Items to be considered in the evaluation include, but are not limited to, all contributions towards the preservation of habitat lands, such as public lands, private mitigation lands, land donations, land acquisitions, biological monitoring of Covered Species, and management activities undertaken or proposed on the Subarea Plan Managed Preserve. Habitat management issues will also be discussed. The CITY will not be subject to any annual, quantitative habitat preservation requirement, given the uncertainties created by natural economic and land development fluctuations, other than to remain in compliance with rough step provisions in Section 11.2.3 above. If the USFWS and the CDFW determine that adequate progress towards implementation of the Subarea Plan, including the rough step provisions, is not being achieved, CDFW and USFWS shall set forth their findings and the basis for such findings in writing; and the USFWS, the CDFW, and the CITY will take the actions specified in Section 8.5.2, *Subarea Plan Annual Report*, of the Subarea Plan and the terms of this Agreement to remedy that situation.

16.3 Public Report/Hearing

Every three (3) years the CITY, in conjunction with the other Participating Local Jurisdictions, shall prepare a public report on the status of the MSCP and shall participate in a public hearing in conjunction with the issuance of the report. The report shall incorporate information on the amount of land preserved within the MHPA and otherwise to date, the amount of land added to the MHPA or otherwise preserved within the previous three years, and the total expenditures made toward habitat acquisition to date and over the preceding three years. This report shall also include a subarea by subarea accounting of all funds received and expended during the previous three years to implement the subarea plans, including the amounts received and expended on habitat acquisition,

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management, and monitoring.

16.4 Biological Monitoring

The Parties agree that biological monitoring is necessary to determine whether Covered Species and their habitats are being maintained by the MSCP Subregional Plan as expected. Regional biological monitoring will be jointly funded by the federal and state governments and the Participating Local Jurisdictions through the federal, state, and regional funding programs. The federal and state agencies will monitor their present identified lands and those acquired for the MSCP Subregional Plan with federal and state funds, as described in the MSCP Subregional Plan. Proper management of the MHPA will require ongoing and detailed analysis of the data collected through biological monitoring activities. To ensure uniformity in data gathering and analysis, the USFWS and CDFW will assume primary responsibility for coordinating a regional biological monitoring program that collects and analyzes data and provides information and technical assistance to the Participating Local Jurisdictions. The USFWS, CDFW and Participating Local Jurisdictions will prioritize specific regional monitoring activities based on available budget and specific needs of individual species and habitats and will provide a summary on monitoring activities at the annual MSCP plan implementation public workshop described in Section 16.1, above.

As described in Section 7.2, *Preserve Management and Monitoring*, of the Subarea Plan, the CITY will be responsible for the biological monitoring of its own specified public lands, as well as mitigation lands obtained by it in fee title or easement, and lands acquired by it for the MSCP Subregional Plan using the regional funding program or other local sources. The coordination, data analysis, and reporting of monitoring activities within the Subarea Plan Area will be the responsibility of the CITY. Biological monitoring will focus on selected Covered Species and representative habitats within the Subarea Plan Area as described in Section 7.2 of the Subarea Plan. The CITY will provide biological monitoring data in appropriate electronic format to USFWS and CDFW annually, or more frequently if requested by USFWS or CDFW.

16.5 Audit

Once every three (3) or more years, as needed, the USFWS and CDFW may conduct an audit of (1) all

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development approvals and mitigation imposed through land use regulations or otherwise within the Subarea Plan; (2) all lands acquired by the CITY toward meeting its habitat acquisition obligation under the MSCP Subregional Plan; and (3) all monies received, invested and expended on acquisition, management and monitoring activities within the Subarea Plan during the previous three years or other applicable time period. The CITY shall cooperate fully with USFWS and CDFW to ensure a complete and accurate audit.

17. REMEDIES AND ENFORCEMENT

17.1 Remedies in General

Except as set forth below, each Party shall have all of the remedies available in equity (including specific performance and injunctive relief) and at law to enforce the terms of this Agreement and the Section 10(a)(1)(B) Permit and NCCP Permit, and to seek remedies and compensation for any breach or violation thereof, consistent with and subject to the following:

17.1.1. None of the Parties shall be liable in damages to the other Parties or to any other person or entity, including Third-Party Participants, for any breach of this Agreement, any performance or failure to perform a mandatory or discretionary obligation imposed by this Agreement, or any other cause of action arising from this Agreement. Notwithstanding the foregoing, each Party shall retain whatever liability it would possess for its present and future acts or failure to act apart from, and independent of, this Agreement.

17.1.2. The Parties acknowledge that the Covered Species are unique and that their loss as species would be irreparable and that therefore injunctive and temporary relief may be appropriate in certain instances involving a breach of this Agreement.

17.2 Federal Take Authorization

Nothing contained in this Agreement is intended to, or shall, limit the authority of the United States government to seek civil or criminal penalties or otherwise fulfill its enforcement and other responsibilities under the ESA or other applicable federal law. Nothing contained in this Agreement limits the rights of the Permittee under applicable federal or state law to seek redress against the

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USFWS as otherwise permitted by law.

17.2.1. Permit Suspension

The USFWS may suspend the Section 10(a)(1)(B) Permit, in whole or in part, for cause in accordance with the laws and regulations in force at the time of such suspension. (See 50 C.F.R. §§13.27-13.29, 17.22(b) and 17.32(b)). However, except where the USFWS determines that emergency action is necessary to avoid irreparable harm to a Covered Species, it will not suspend the Section 10(a)(1)(B) Permit without first requesting the CITY to take appropriate remedial actions, if any such actions are available, and providing the CITY with written notice of the facts or conduct that may warrant the suspension and an adequate and reasonable opportunity, including, where appropriate, use of the voluntary dispute resolution process outlined in Section 22.1 of this Agreement, to demonstrate why suspension is not warranted.

17.2.2. Reinstatement of Suspended Permit

In the event the USFWS suspends the Section 10(a)(1)(B) Permit, in whole or in part, as soon as practicable, and if possible within ten (10) days after such suspension, the USFWS will confer with the CITY concerning actions, if any, that would allow the suspension to be lifted. After conferring with the CITY, the USFWS will identify reasonable specific actions, if any, necessary to effectively redress the suspension. In making this determination the USFWS will consider the requirements of the ESA, regulations issued thereunder, the conservation needs of the Covered Species, the terms of the Section 10(a)(1)(B) Permit and any comments or recommendations received from the CITY. As soon as practicable, and if possible, within thirty (30) days after the conference, the USFWS will send the CITY written notice of any available, reasonable actions necessary to effectively redress the suspension. Upon CITY's timely and acceptable performance of such actions, the USFWS will promptly reinstate the Section 10(a)(1)(B) Permit. It is the general intent of the Parties that in the event of a total or partial suspension of the Section 10(a)(1)(B) Permit, and provided such action is appropriate in light of the circumstances that resulted in the suspension, the Parties will act expeditiously and cooperatively to reinstate the Section 10(a)(1)(B) Permit.

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17.2.3. Permit Surrender or Revocation

CITY may withdraw from the Section 10(a)(1)(B) Permit by surrendering the Section 10(a)(1)(B) Permit to the USFWS in accordance with the regulations of the USFWS in force on the date of such surrender. (These regulations are currently codified at 50 C.F.R. §§ 17.22(b)(8) and 17.32(b)(8) and by their express terms apply in place of 50 C.F.R. § 13.26 to the extent of any conflict). In addition, the USFWS may revoke the Section 10(a)(1)(B) Permit for cause. (These regulations are currently codified at 50 C.F.R. §§ 13.28, 17.22(b)(9) and 17.32(b)(9)). Upon surrender or revocation of the Section 10(a)(1)(B) Permit, no further Take shall be authorized under the Permit. Notwithstanding surrender of the Section 10(a)(1)(B) Permit by the CITY or revocation of the Section 10(a)(1)(B) Permit by the USFWS, the CITY will remain obligated to fulfill any existing and outstanding minimization and mitigation measures required under the Plan, this Agreement, and the Section 10(a)(1)(B) for any Take that occurred prior to surrender or revocation. A surrendered Section 10(a)(1)(B) Permit shall be deemed cancelled only upon a determination by the USFWS that such minimization and mitigation measures have been implemented.

17.3 The NCCP Permit

17.3.1. Permit Suspension

In the event of any material violation of the NCCP Permit by the CITY, as determined by CDFW, the CDFW may suspend the NCCP Permit in whole or in part; provided, however, that it may not suspend the NCCP Permit without first requesting the CITY take appropriate remedial actions, and providing the CITY with written notice of the facts or conduct that may warrant the suspension and an adequate and reasonable opportunity for the CITY to demonstrate why suspension is not warranted or to take steps necessary to cure the violation.

17.3.2. Reinstatement of Suspended Permit

In the event the CDFW suspends the NCCP Permit, in whole or in part, as soon as possible, but no later than ten (10) working days after such suspension, the CDFW shall meet and confer with the CITY concerning how the violation or breach that led to the suspension can be remedied. At the

conclusion of any such conference, the CDFW shall identify specific actions, if available, that are necessary to effectively redress the violation or breach. In making this determination, the CDFW shall consider the requirements of the NCCPA, regulations issued thereunder, the Conservation needs of the Covered Species, the terms of the NCCP Permit and of this Agreement and any comments or recommendations received during the meet and confer process. As soon as possible, but no later than thirty (30) working days after the conference, the CDFW shall send the CITY written notice of the actions, if available, that are necessary to effectively redress the violation or breach. Upon full performance of such necessary actions, the CDFW shall immediately reinstate the NCCP Permit or suspended portions thereof. It is the intent of the Parties that in the event of any suspension of the NCCP Permit, all Parties shall act expeditiously and cooperatively to reinstate the NCCP Permit.

17.3.3. Permit Revocation or Termination

(a) CDFW may only revoke or terminate the NCCP Permit for a violation of the NCCP Permit or material breach of this Agreement by the CITY, if the CDFW determines in writing that: (1) such violation or breach cannot be effectively redressed by other remedies or enforcement action; or (2) revocation or termination is required to avoid jeopardizing the continued existence of a Covered Species and/or to fulfill a legal obligation of the CDFW under the NCCPA.

(b) CDFW agrees that it will not revoke or terminate the NCCP Permit without first: (1) requesting that the CITY take appropriate remedial action, and (2) providing the CITY with notice in writing of the facts or conduct that warrant the revocation or termination and a reasonable opportunity, not less than sixty (60) working days, to demonstrate or achieve compliance with the NCCPA, the NCCP Permit, and this Agreement.

17.4 Circumstances Likely to Constitute Jeopardy to Species

In the event of circumstances that would cause continuation of a Covered Activity to appreciably reduce the likelihood of survival and recovery of a species in the wild, USFWS may suspend the Permit, in whole or in part, without resorting to the procedures specified above. The period of such emergency suspension shall not last longer than 90 days. During such 90-day period, USFWS shall

comply with 50 C.F.R. 13.27.

The CDFW shall suspend or revoke the NCCP Permit, in whole or in part, without resorting to the procedures specified above, if the continued Take of the Covered Species would result in jeopardizing the continued existence of the species.

17.5 The CITY's Obligations in the Event of Suspension or Revocation

In the event that the USFWS and/or CDFW suspend or revoke the Section 10(a)(1)(B) Permit and/or NCCP Permit issued to the CITY under this Agreement, the CITY will remain obligated to fulfill its existing mitigation, enforcement, management, and monitoring obligations, and its other existing MSCP Subregional Plan and Subarea Plan obligations, in accordance with this Agreement and applicable statutory and regulatory requirements for all Covered Activities authorized for Take prior to the breach that led to the suspension or revocation until the Wildlife Agencies determine that all Take of Covered Species that occurred under the Permits has been mitigated to the maximum extent practicable in accordance with the Subarea Plan.

17.6 Effect of Permit Revocation, Termination or Suspension

In the event that the USFWS and/or CDFW revoke, terminate or suspend the Section 10(a)(1)(B) Permit and/or NCCP Permit issued to the CITY in connection with this Agreement and provided the CITY continues to carry out its obligations under the Subarea Plan, this Agreement and the Permits with regard to Third-Party Participants, the assurances provided to Third-Party Participants under this Agreement and the right to take Covered Species extended by the CITY to the Third-Party Participants under the Permit and/or NCCP Permit, will remain in effect as to every individual Third-Party Participant that fulfills the mitigation obligations imposed on it by the CITY in compliance with this Agreement unless USFWS or CDFW determines that continuation of the CITY's Permit and/or NCCP Permit with regard to Take by Third-Party Participants would likely jeopardize the continued existence of Covered Species.

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17.7 Enforcement

The Parties reserve the right to enforce all applicable federal, state, or local laws against persons or entities that engage in unlawful land development activity without obtaining proper permits and approvals from the Parties. Also, the Parties reserve the right to enforce all applicable federal, state or local laws against Third-Party Participants that conduct land development activities in the Santee Subarea that are not in compliance with land development approvals granted by the CITY in conformance with this Agreement and the Subarea Plan.

17.8 No Right to Sue Under this Agreement

Notwithstanding the use of the term "Third-Party Participant" or any other provision of this Agreement, this Agreement shall confer no right upon Third-Party Participants or any other person or entity to sue the USFWS, the CDFW, or the CITY.

18. ENVIRONMENTAL REVIEW

18.1 Federal Law – NEPA

Issuance of a Section 10(a)(1)(B) Permit to the CITY by USFWS is an action subject to NEPA review. USFWS is a lead agency under NEPA. An Environmental Assessment (EA) has been prepared to evaluate the Subarea Plan pursuant to NEPA.

18.2 State Law – CEQA

Implementation and approval of the MSCP Subregional Plan and each of the subarea plans are actions subject to CEQA review. The CITY is the lead agency for the Subarea Plan, which has been evaluated pursuant to CEQA under the MSCP Subregional Plan Final EIR (1997) and the Subarea Plan EIR (2025). CDFW is a responsible agency under CEQA for purposes of approving the Subarea Plan and issuing the NCCP Permit under the NCCPA.

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19. TERM

19.1 Thirty-Five Year Agreement

This Agreement takes effect on the Effective Date and shall remain in full force and effect for a period of thirty-five (35) years, or until revocation or termination of the Section 10(a)(1)(B) Permit and/or NCCP Permit pursuant to Section 17.2.3 or Section 17.3.3 of this Agreement, whichever occurs sooner.

19.2 Thirty-Five Year Take Permits

The Section 10(a)(1)(B) Permit and NCCP Permit issued to the CITY shall be issued for a period of thirty-five (35) years from the Effective Date, unless revoked or terminated sooner in accordance with applicable laws and regulations.

19.3 Permanent Preservation

Notwithstanding the stated term as herein set forth, the Parties agree and recognize that once Take of a Covered Species has occurred and/or their habitat modified within the Santee Subarea, such Take and habitat modification will be permanent. The Parties, therefore, agree that the preservation, maintenance, monitoring and management of the habitat provided for under this Agreement is likewise intended to be permanent and to extend beyond the term of this Agreement.

20. WITHDRAWAL AND SURRENDER OF THE PERMITS

20.1 Upon ninety (90) days written notice to USFWS and CDFW and all other Participating Local Jurisdictions, the CITY may unilaterally withdraw from this Agreement provided: (1) the CITY and all Third-Party Participants have complied with all mitigation obligations incurred under the Section 10(a)(1)(B) Permit and NCCP Permit, the MSCP Subregional Plan, Subarea Plan and this Agreement up to the date of withdrawal; (2) the CITY has complied with its obligation to record all habitat losses and gains in Habitrak; (3) the CITY provides written evidence of such compliance to USFWS and CDFW; and (4) the CITY and Third-Party Participants shall remain obligated to carry out all of their existing long-term management and monitoring obligations

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assumed under the MSCP Subregional Plan, Subarea Plan and this Agreement with respect to habitat Conservation lands included in, or required to be included in, the Managed Preserve as a result of Take associated with Covered Activities authorized for Take by the CITY prior to withdrawal from the Agreement.

20.2 Any Take associated with Covered Activities approved by the CITY for mitigation referenced in Section 20.1 above that has been assured as provided in Section 12 .2 shall continue to be authorized under the terms of the Section 10(a)(1)(B) Permit and NCCP Permit after withdrawal by the CITY, provided the CITY continues to carry out its obligations under this Agreement.

20.3 Withdrawal of the CITY from this Agreement shall be deemed to constitute a surrender of the CITY's Permits issued pursuant to this Agreement.

21. FORCE MAJEURE

In the event that the CITY is wholly or partially prevented from performing obligations under this Agreement because of unforeseeable causes beyond the reasonable control of and without the fault or negligence of the CITY ("force majeure"), including, but not limited to, acts of God, labor disputes, forces of nature, or actions of federal or state agencies or other local jurisdictions, the CITY shall be excused from whatever performance is affected by such unforeseeable cause to the extent so affected, and such failure to perform shall not be considered a material violation or breach, provided that nothing in this Section shall be deemed to authorize any Party to violate ESA or CESA, and provided further that:

- The suspension of performance is of no greater scope and no longer duration than is required by the force majeure;
- Within fifteen (15) days after the occurrence of the force majeure the CITY gives the USFWS and CDFW written notice describing the particulars of the occurrence;
- The CITY uses its best efforts to remedy its inability to perform (however, this paragraph shall not require the settlement of any strike, walk-out, lock-out or other labor dispute on

terms that in the sole judgment of the CITY are contrary to its interest); and

- When the CITY is able to resume performance of its obligations, the CITY shall give USFWS and CDFW written notice to that effect.

21.1 Changed Circumstances not Subject to Force Majeure

Events or causes identified as Changed Circumstances in the Subarea Plan and this Agreement are not considered unforeseeable events or Acts of God within the meaning of Section 21 above and the CITY shall be responsible for implementing the responses to Changed Circumstances provided for in Section 8.7.2 of the Subarea Plan.

22. DISPUTE RESOLUTION

The Parties recognize that disputes concerning implementation of, compliance with, or termination of this Agreement, the Subarea Plan, and the Permits may arise from time to time. The Parties agree to work together in good faith to resolve such disputes, using the informal dispute resolution procedures set forth in this section, or such other procedures upon which the Parties may later agree. However, if at any time any Party determines that circumstances so warrant, it may seek any available remedy without waiting to complete informal dispute resolution.

22.1 Dispute Resolution Process

Unless the Parties agree upon another dispute resolution process, or unless an aggrieved Party has initiated administrative proceedings or suit in federal court as provided in this section, the Parties may use the following process to attempt to resolve disputes:

A. The aggrieved Party will notify the other Parties of the provision that may have been violated, the basis for contending that a violation has occurred, and the remedies it proposes to correct the alleged violation.

B. The Party alleged to be in violation will have thirty (30) days, or such other time as may be agreed, to respond. During this time, it may seek clarification of the information provided in

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the initial notice. The aggrieved Party will use its best efforts to provide any information then available to it that may be responsive to such inquiries.

C. Within thirty (30) days after such response was provided or was due, representatives of the Parties having authority to resolve the dispute will meet and negotiate in good faith toward a solution satisfactory to all Parties or will establish a specific process and timetable to seek such a solution.

D. If any issues cannot be resolved through such negotiations, the Parties will consider non-binding mediation and other alternative dispute resolution processes and, if a dispute resolution process is agreed upon, will make good faith efforts to resolve all remaining issues through that process.

23. MISCELLANEOUS PROVISIONS

23.1 No Partnership

Neither this Agreement nor the Subarea Plan shall make or be deemed to make any Party to this Agreement the agent for or the partner of any other Party.

23.2 Independent State and Federal Permits

The NCCP Permit and the Section 10(a)(1)(B) Permit are independent such that revocation of the NCCP Permit or of the 10(a)(1)(B) Permit does not automatically cause revocation of the other Permit.

23.3 Severability

The USFWS and CDFW recognize and agree that the Take Authorizations for the Independent Covered Species are independent and severable from the other Permits that have been or will be issued to other Participating Local Jurisdictions. Additionally, in the event one or more of the provisions contained in this Agreement is held to be invalid, illegal or unenforceable by any court of competent jurisdiction, such portion will be deemed severed from this Agreement and the remaining

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parts of this Agreement will remain in full force and effect as though such invalid, illegal, or unenforceable portion had never been a part of this Agreement.

23.4 Incorporation of the MSCP Subregional Plan and Subarea Plan

The MSCP Subregional Plan and Subarea Plan and each of their provisions are intended to be and by this reference are incorporated herein. Notwithstanding such incorporation, it is acknowledged by the Parties that the Subarea Plan was drafted by the Permittee and submitted to the USFWS and CDFW in support of applications for Federal and State Permits. Characterizations, analyses and representations in the Subarea Plan, and in particular, characterizations, analyses and representations in the Subarea Plan of federal or state laws, regulations, and policies, represent the views of the Permittee and shall not control the administration of the Permits by the USFWS and CDFW in accordance with federal and state laws, regulations, and policies. In the event of any inconsistency between the Subarea Plan and this Agreement, the provisions of this Agreement control. Similarly, in the event of any inconsistency between the Subarea Plan or this Agreement and the Section 10(a)(1)(B) or NCCP Permits, the Permits control.

In the event of any direct contradiction, conflict, or inconsistency between the MSCP Subregional Plan and the Subarea Plan, the Subarea Plan shall control with respect to issues relating to the Santee Subarea. In the event of any direct contradiction, conflict, or inconsistency between the MSCP Subregional Plan, the Subarea Plan, and this Agreement, the terms of this Agreement shall control with respect to issues relating to the Santee Subarea. In all other cases, the terms of this Agreement and the terms of the MSCP Subregional Plan and Subarea Plan shall be interpreted to be consistent with and complementary to each other.

23.5 Agreement is not an Enforceable Contract as between USFWS and Permittee

Notwithstanding any language to the contrary in this Agreement, this Agreement is not intended to create and shall not be construed to create an enforceable contract between Permittee and the USFWS under law with regard to the Permit or otherwise, and neither the USFWS nor Permittee shall be liable in damages to each other or to any other third party for any performance or failure to

perform any obligation identified in this Agreement. The sole purpose of this Agreement as between the USFWS and Permittee is to clarify the provisions of the Subarea Plan and the processes the Parties intend to follow to ensure successful implementation of the Subarea Plan in accordance with the Permit and applicable federal law. Notwithstanding the foregoing, the USFWS intends to follow the provisions of this Agreement in administering the Permit, and Permittee intends to follow the provisions of this Agreement in implementing the Plan. This Agreement will be incorporated by reference into the Section 10(a)(1)(B) Permit.

23.6 Successors and Assigns

This Agreement and each of its covenants and conditions shall be binding on and shall inure to the benefit of the Parties and their respective successors and assigns. The CITY may only assign its rights and obligations under this Agreement with the approval of the USFWS and CDFW, which approval shall not be unreasonably withheld. Assignment or other transfer of the Section 10(a)(1)(B) Permit or NCCP Permit shall be governed, respectively, by then-current USFWS regulations and any applicable NCCP regulations.

23.7 Changes in Environmental Laws

It is acknowledged and agreed by the USFWS and CDFW that the CITY and Third-Party Participants are agreeing to perform substantial avoidance, minimization, mitigation, conservation, and management measures as set forth in this Agreement. If a change in, or an addition to, any federal or State law governing or regulating the impacts of development on land, water or biological resources as they relate to Covered Species, including, but not limited to, the ESA, NEPA, NCCPA, CESA, and CEQA, the USFWS and CDFW shall give due consideration to the measures required under the Subarea Plan in applying the new laws and regulations to the CITY and Third-Party Participants.

23.8 No Third-Party Beneficiaries

Without limiting the applicability of rights granted to the public pursuant to the ESA, CESA, NCCPA or other applicable law, this Agreement will not create any right or interest in the public, or any member thereof, as a third-party beneficiary thereof, nor will it authorize anyone not a Party to this

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Agreement to maintain a suit for personal injuries or property damages under the provisions of this Agreement. The duties, obligations, and responsibilities of the Parties to this Agreement with respect to third-party beneficiaries will remain as imposed under existing State and federal law.

23.9 Calendar Days

Throughout this Agreement and the Subarea Plan, the use of the term "day" or "days" means calendar days, unless otherwise specified.

23.10 Response Times

Except as otherwise set forth herein or as statutorily required by CEQA, NEPA, CESA, the ESA, NCCPA or any other laws or regulations, the Parties will use reasonable efforts to respond to written requests from any Party within a forty-five (45) day time period.

23.11 Attorney's Fees

If any action at law or equity, including any action for declaratory relief, is brought to enforce or interpret the provisions of this Agreement, each Party to the litigation will bear its own attorneys' fees and costs. Notwithstanding the foregoing, attorneys' fees and costs that may be recoverable against the United States may be sought as provided by applicable federal law.

23.12 Notice

Any notice permitted or required by this Agreement shall be in writing and delivered personally to the persons set forth below or shall be deemed given five (5) days after deposit in the United States mail, certified and postage prepaid, return receipt requested and addressed as follows or at such other address as any Party may from time to time specify to the other Parties in writing. Notices may be delivered by facsimile or other electronic means, provided that they are also delivered personally or by certified mail. Notices shall be transmitted so that they are received within the specified deadlines.

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United States Fish and Wildlife Service
Regional Director
Pacific Southwest Region
2800 Cottage Way, room W-2606
Sacramento, California 95825

United States Fish and Wildlife Service
Field Supervisor, Carlsbad Field Office
2177 Salk Avenue
Carlsbad, California 92008

Regional Manager
California Department of Fish and Game
South Coast Region
4949 Viewridge Avenue
San Diego, California 92123

Chief, Habitat Conservation Branch
California Department of Fish and Game
1416 9th Street, 12th Floor
Sacramento, California 95814

The City of Santee
Office of the City Manager
10601 Magnolia Avenue
Santee, California 92071

Copy to Santee City Attorney
Best, Best & Krieger
655 W. Broadway
San Diego, CA 92101

23.13 Entire Agreement

This Agreement, together with the Subarea Plan, supersedes any and all prior agreements, either oral or in writing, among the Parties with respect to the subject matter hereof and contains all of the covenants and agreements among them with respect to said matters; and each Party acknowledges that no representation, inducement, promise or agreement, oral or otherwise, has been made by the other Party or anyone acting on behalf of the other Party that is not embodied herein. This Agreement

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shall not be construed as if it had been prepared by any one Party, but rather as if all Parties had prepared the Agreement.

23.14 Duplicate Originals and Counterparts

This Agreement may be executed in any number of duplicate originals and counterparts. This Agreement shall become operative as soon as one counterpart hereof has been executed by each member. The counterparts so executed shall constitute one Agreement notwithstanding that the signatures of all Parties do not appear on the same page. A complete original of this Agreement shall be maintained in the official records of each of the Parties.

23.15 Federal and State Appropriations

The duty of the USFWS to carry out its obligations under the MSCP Subregional Plan, the Subarea Plan and this Agreement shall be subject to the federal Anti-Deficiency Act and the availability of appropriated funds. Nothing in this Agreement shall be construed by the Parties to require the obligation, appropriation, or expenditure of any money from the U.S. Treasury. The Parties acknowledge that USFWS will not be required under this Agreement to expend any federal agency's appropriated funds unless and until an authorized officer of that agency affirmatively acts to commit to such expenditures as evidenced in writing.

The duty of CDFW to carry out its obligations under the MSCP Subregional Plan, the Subarea Plan and this Agreement shall be subject to the availability of appropriated funds. Nothing in this Agreement shall be construed by the Parties to require the obligation, appropriation, or expenditure of any money from the Treasury of the State of California. The Parties acknowledge that CDFW will not be required under this Agreement to expend any State of California agency's appropriated funds unless and until an authorized officer of that agency affirmatively acts to commit to such expenditures as evidenced in writing.

23.16 Elected Officials

No member of the California state legislature or United States Congress shall be entitled to any share

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or part of this Agreement, or to any benefit that may arise from it.

23.17 Governing Law

This Agreement shall be governed by and construed in a manner consistent with the statutory and regulatory authority of the USFWS under the ESA, its implementing regulations and other applicable federal laws, and of the CDFW under the CESA, the NCCPA and other applicable state laws and regulations. Nothing in this Agreement is intended to nor shall be construed to limit or compromise the authority of the USFWS to fulfill its responsibilities under the ESA or CDFW under CESA and the NCCPA, including but not limited to seeking penalties against the CITY. Further, nothing in this Agreement is intended or shall be construed to limit or diminish the responsibility of the USFWS as an agency of the federal government or CDFW as an agency of the State or California.

23.18 References to Regulations

Any reference in this Agreement, the MSCP Subregional Plan, the Subarea Plan or the Section 10(a)(1)(B) Permit or NCCP Permit to any regulation or rule of USFWS or CDFW, shall be deemed to be a reference to such regulation or rule in existence at the time an action is taken.

23.19 Applicable Laws

Notwithstanding any other provisions of this Agreement, all activities covered under the MSCP Subregional Plan, the Subarea Plan, this Agreement and the Section 10(a)(1)(B) Permit and NCCP Permit must be in compliance with all applicable state or federal laws and regulations.

23.20 Due Authorization

Each Party warrants that the signatory is authorized to execute this Agreement on behalf of that Party.

[Signatures on Following Pages]

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SIGNATURE PAGE TO IMPLEMENTING AGREEMENT BY AND AMONG UNITED STATES FISH AND WILDLIFE SERVICE, CALIFORNIA DEPARTMENT OF FISH AND GAME, AND CITY OF SANTEE

IN WITNESS WHEREOF, THE PARTIES HERETO have executed this Implementing Agreement to be in effect as of the date last signed below.

BY:_____ Date_____

Regional Director
United States Fish and Wildlife Service
Sacramento, California

BY:_____ Date_____

Deputy Director
California Department of Fish and Game
Sacramento, California

BY: _____ Date_____

City Manager
The City of Santee
Santee, California

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EXHIBIT A

Certificate of Inclusion

The United States Fish and Wildlife Service and the California Department of Fish and Wildlife have issued Permits pursuant to the Federal Endangered Species Act and the California Natural Community Conservation Planning Act (collectively, "Permits") authorizing "Take" of certain species in accordance with the terms and conditions of the Permits, the Multiple Species Conservation Program for the City of Santee Subarea Plan ("Plan"), and the associated Implementing Agreement. Through execution of this Certificate of Inclusion, you, [*insert entity name*] agree to implement all applicable terms and conditions of the Permits, which include the Plan and the associated Implementing Agreement, and to submit to the direct legal control of the City of Santee ("City") for purposes of the City's enforcement of all applicable terms and conditions of the Permits, against you with regard to the Take of certain species resulting from the [*insert Covered Activity as applicable*] identified below.

As the owner/operator of the property depicted on Exhibit "1", attached hereto and incorporated herein by this reference, you are extended the protection of the Permits for the proposed activities as set forth in Exhibit "2", with respect to any Take of species covered by the City's Plan. In the event that you use the property depicted on Exhibit "1" for other purposes without the express consent of the Permittee, or fail to follow the applicable requirements of the Permits, Take Authorization under the Permits will automatically cease. Such Authorization is provided as described in the Permits, including the City's Plan, and the Implementing Agreement. By signing this Certificate of Inclusion, you signify your election to receive Take Authorization under the Permits in accordance with the terms and conditions thereof. Further, by signing this Certificate of Inclusion you agree to provide reasonable access to the property depicted on Exhibit 1 to the City, the United States Fish and Wildlife Service pursuant to 50 C.F.R. § 13.21(e)(2) and the California Department of Fish and Wildlife as necessary to monitor your compliance with the applicable terms of the Permits, the Subarea Plan, and the Implementing Agreement.

Coverage under the Permits will become effective upon receipt of the executed Certificate of Inclusion by the City. In the event that the subject property is sold or leased, the buyer or lessee must be informed of these provisions and execute a new Certificate of Inclusion.

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_____

_____

Address

_____

Phone

_____

Signature

_____

Title

_____

City of Santee Representative

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Appendix B
MSCP Subregional Plan Tables

This appendix includes copies of tables with the MSCP Subregional Plan that summarize the target for conservation for the Santee Subarea. This includes:

- Table 3-1 – Vegetation Community Acres Within Multi-Habitat Planning Area (MHPA)
- Table 3-2 – Portions of Core and Linkage Areas Targeted for Conservation in Multi-Habitat Planning Area (MHPA)
- Table 3-5 – Species Evaluated for Coverage Under the MSCP

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Table 3-1 (Continued)

VEGETATION COMMUNITY ACRES WITHIN MULTI-HABITAT PLANNING AREA BY SUBAREA

Vegetation Communities	Total MSCP Study Area (acres)	Total MHPA (acres)	MHPA Conserved[1] (acres)	% of MSCP Veg. Comm. Conserved
SANTEE				
Coastal Sage Scrub	2,785	1,152	1,121	40
Chaparral	822	549	544	66
Coastal Sage/Chaparral	49	20	20	41
Grassland	660	181	178	27
Freshwater Marsh	5	2	2	40
Riparian Forest	17	3	3	18
Oak Riparian Forest	41	38	38	93
Riparian Scrub	124	80	80	65
Oak Woodland	6	2	2	33
Eucalyptus Woodland	3	0	0	0
Open Water	68	58	58	85
Disturbed Wetlands	26	0	0	0
Natural Flood Channel	39	21	21	54
Subtotal Habitat	*4,645*	*2,107*	*2,067*	*44*
Disturbed	512	30	0	0
Agriculture	11	0	0	0
Subtotal Vacant Land	*5,169*	*2,136*	*2,067*	*40*
Developed	5,117	0	0	0
TOTAL	10,286	2,136	2,067	20

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Table 3-2

PORTIONS OF CORE AND LINKAGE AREAS TARGETED FOR CONSERVATION IN MULTI-HABITAT PLANNING AREA

Core #	Core Name	Habitat Acres	Study Area	Subareas											
				CV	CD	DM	EC	IB	NC	PO	SD	SN	CO	WD	MI
1.	Tijuana Estuary/ River Valley	Total	3,051	0	0	0	0	1,089	0	0	1,962	0	0	0	-
		MHPA	2,925	0	0	0	0	1,088	0	0	1,837	0	0	0	-
		(%)	(96)	(0)	(0)	(0)	(0)	(100)	(0)	(0)	(94)	(0)	(0)	(0)	(-)
2.	S. San Diego Bay/ Silver Strand	Total	2,316	416	463	0	0	11	183	0	883	0	0	0	359
		MHPA	1,644	302	350	0	0	0	175	0	817	0	0	0	-
		(%)	(71)	(73)	(76)	(0)	(0)	(0)	(96)	(0)	(93)	(0)	(0)	(0)	(-)
3.	Pt. Loma	Total	709	0	0	0	0	0	0	0	117	0	0	0	592
		MHPA	92	0	0	0	0	0	0	0	92	0	0	0	-
		(%)	(13)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(79)	(0)	(0)	(0)	(-)
4.	Otay Lakes/Mesa/ River Valley	Total	17,158	2,025	0	0	0	0	0	0	4,002	0	11,104	26	-
		MHPA	12,587	1,231	0	0	0	0	0	0	3,058	0	8,298	0	-
		(%)	(73)	(61)	(0)	(0)	(0)	(0)	(0)	(0)	(76)	(0)	(75)	(0)	(-)
5.	Otay Mtn/Marron Valley	Total	28,221	0	0	0	0	0	0	0	2,521	0	25,700	0	-
		MHPA	26,396	0	0	0	0	0	0	0	2,302	0	24,094	0	-
		(%)	(94)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(91)	(0)	(94)	(0)	(-)
6.	Jamul Mtn	Total	8,285	0	0	0	0	0	0	0	178	0	8,107	0	-
		MHPA	7,028	0	0	0	0	0	0	0	161	0	6,867	0	-
		(%)	(85)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(90)	(0)	(85)	(0)	(-)
7.	Sweetwater/San Miguel Mtn	Total	12,963	689	0	0	0	0	0	0	116	0	10,306	1,852	-
		MHPA	10,116	178	0	0	0	0	0	0	105	0	8,167	1,665	-
		(%)	(78)	(26)	(0)	(0)	(0)	(0)	(0)	(0)	(91)	(0)	(79)	(90)	(-)
8.	McGinty Mtn/ Sequan Peak/ Dehesa	Total	15,909	0	0	0	0	0	0	0	0	0	15,907	2	-
		MHPA	10,456	0	0	0	0	0	0	0	0	0	10,456	0	-
		(%)	(66)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(66)	(0)	(-)
9.	Lake Jennings/ Wildcat Cyn/El Cajon Mtn	Total	9,830	0	0	0	0	0	0	0	24	0	8,895	911	-
		MHPA	8,228	0	0	0	0	0	0	0	21	0	7,453	754	-
		(%)	(84)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(88)	(0)	(84)	(83)	(-)
10.	Mission Trails/Kearny Mesa/E. Elliott/ Santee	Total	17,629	0	0	0	0	0	0	0	8,258	3,181	2,487	26	3,677
		MHPA	10,499	0	0	0	0	0	0	0	6,625	1,753	2,114	8	-
		(%)	(60)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(80)	(55)	(85)	(31)	(-)
11.	Poway/San Vicente	Total	27,948	0	0	0	0	0	0	11,381	4,759	0	11,808	0	-
		MHPA	21,079	0	0	0	0	0	0	8,620	4,191	0	8,267	0	-
		(%)	(75)	(0)	(0)	(0)	(0)	(0)	(0)	(76)	(88)	(0)	(70)	(0)	(-)

Table 3-2 (Continued)

PORTIONS OF CORE AND LINKAGE AREAS TARGETED FOR CONSERVATION IN MULTI-HABITAT PLANNING AREA

Core #	Core Name	Habitat Acres	Study Area	Subareas											
				CV	CD	DM	EC	IB	NC	PO	SD	SN	CO	WD	MI
12.	Hodges Reservoir/ San Pasqual	Total	25,965	0	0	0	0	0	0	5	13,534	0	12,426	0	-
		MHPA	18,739	0	0	0	0	0	0	4	10,589	0	8,146	0	-
		(%)	(72)	(0)	(0)	(0)	(0)	(0)	(0)	(80)	(78)	(0)	(66)	(0)	(-)
13.	San Dieguito Lagoon	Total	1,278	0	0	199	0	0	0	0	1,078	0	1	0	-
		MHPA	880	0	0	129	0	0	0	0	751	0	0	0	-
		(%)	(69)	(0)	(0)	(65)	(0)	(0)	(0)	(0)	(70)	(0)	(0)	(0)	(-)
14.	Los Peñasquitos Lagoon/Cyn/Del Mar Mesa	Total	9,154	0	0	<1	0	0	0	0	9,154	0	0	0	-
		MHPA	6,236	0	0	0	0	0	0	0	6,236	0	0	0	-
		(%)	(68)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(68)	(0)	(0)	(0)	(-)
15.	Vernal Pools, Kearny Mesa	Total	8,289	0	0	0	0	0	0	0	1,965	0	5	0	6,320
		MHPA	1,085	0	0	0	0	0	0	0	1,085	0	0	0	-
		(%)	(13)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(55)	(0)	(0)	(0)	(-)
16.	Vernal Pools, Otay Mesa	Total	885	0	0	0	0	0	0	0	885	0	0	0	-
		MHPA	425	0	0	0	0	0	0	0	425	0	0	0	-
		(%)	(48)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(48)	(0)	(0)	(0)	(-)
Subtotal Cores		Total	189,590	3,130	463	199	0	1,100	183	11,386	49,436	3,181	106,746	2,817	10,948
		MHPA	138,415	1,711	350	129	0	1,088	175	8,624	38,295	1,753	83,862	2,427	(-)
		(%)	(73)	(55)	(76)	(65)	(0)	(99)	(96)	(76)	(77)	(55)	(79)	(86)	(-)
Linkages		Total	13,166	185	0	0	28	0	48	1	2,104	0	10,646	23	131
		MHPA	9,876	98	0	0	13	0	41	1	1,626	0	8,084	13	-
		(%)	(75)	(53)	(0)	(0)	(46)	(0)	(85)	(100)	(77)	(0)	(76)	(57)	(-)
TOTAL IN CORES AND LINKAGES		Total	202,757	3,315	463	199	28	1,100	231	11,387	51,540	3,181	117,392	2,840	11,079
		MHPA	148,290	1,809	350	129	13	1,088	216	8,625	39,921	1,753	91,946	2,440	(-)
		(%)	(73)	(55)	(76)	(65)	(46)	(99)	(94)	(76)	(77)	(55)	(78)	(86)	(-)

Note: Numbers may not sum to total as shown, due to rounding. Acreages exclude Disturbed, Agriculture, and Developed. These numbers represent habitat acres targeted for conservation (from Table 3-1) that also occur in the biological core and linkage areas. Percent (in parentheses) represents the portion of the core and linkage areas targeted for conservation in the MHPA.

CV = Chula Vista, CD = Coronado, DM = Del Mar, EC = El Cajon, IB = Imperial Beach, NC = National City, PO = Poway, SD = San Diego, SN = Santee, CO = County, WD = Water Districts, MI = Military. (Military acreages are not included in the MHPA.)

Source: 1996 MSCP GIS database.

Table 3-5

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
PLANTS					
Acanthomintha ilicifolia San Diego thorn-mint PE/CE	85% of 8 major populations	15% of major populations	Site-specific preserve design and special measures/management	Monitoring Plan - Site Specific (4 populations) and Management Plans/Directives	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because all major populations are within the MHPA, and each of the eight major populations will be conserved from 80-100%, with 85% conserved overall. This species is on the list of narrow endemics[3] which requires jurisdictions to specify and implement measures in their subarea plans to avoid or minimize impacts to all populations (including Asphalt Inc., Sky Mesa, El Capitan sites) during project design. **Notes:** This species occurs on clay and gabbro soils which will be conserved at >28% and >43%, respectively. **Conditions:** Area-specific management directives and the SPA for the Otay Lakes Resort area must include specific measures to protect against detrimental edge effects from the surrounding development.[4]					
Agave shawii Shaw's agave FSC*/	100% of major populations	No major populations	Preserve design/landscape level	Monitoring Plan - Habitat Based	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because all known extant populations are within protected public land (Torrey Pines State Reserve and Border Field State Park). This species is on the MSCP's list of narrow endemics and therefore participating jurisdictions must specify in their subarea plans additional specific conservation measures for the species.[3]					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Notes: Additional important populations are found on military lands (Pt. Loma) which are not part of the MSCP. Populations at Pt. Loma are not part of the MSCP but will be conserved at a minimum of 91% in the Pt. Loma Ecological Reserve Area. **Conditions:** Area-specific management directives must include specific measures to protect against detrimental edge effects.[4]					
Ambrosia pumila San Diego ambrosia FSC*/	90% of the only major population	10% of the only major population	Site-specific preserve design and special measures/management	Monitoring Plan - Site Specific (major population) and Management Plans/ Directives	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered because 90% of the only major population in the MSCP will be conserved, and the adjoining population at the radio tower site will be 100% conserved. This major population occurs on public lands in the Mission Trails Regional Park. This species is on the MSCP's list of narrow endemics, and therefore participating jurisdictions must specify in their subarea plans additional specific conservation measures for the species.[3] **Notes:** Occurrences thought to be *Ambrosia pumila* in Spring Canyon, Otay Mesa (east of Otay Lakes), Otay Valley (along the Otay River), and Hidden Trails were misidentified and are now known to be a common species of *Ambrosia*. The small population within the San Diego National Wildlife Refuge (Rancho San Diego) will also be conserved and managed by the USFWS. **Conditions:** If more than 10% of the population at the Mission Trails Regional Park is impacted, this species will no longer be a covered species. Area-specific management directives must include monitoring of transplanted populations and specific measures to protect against detrimental edge effects.[4]					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Aphanisma blitoides Aphanisma FSC*/	90% of potential habitat (261± acres) - 92% of southern foredunes (123± acres), 88% of southern coastal bluff scrub (138± acres)	10% of potential habitat (28± acres) - 8% of southern foredunes (9± acres) , 12% of southern coastal bluff scrub (17± acres)	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Habitat Based and Incidental	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 90% of its potential habitat will be conserved. **Notes:** Additional potential habitat occurs on military lands (Silver Strand, Imperial Beach) which are not a part of the MSCP. There are no known populations of this species in the MSCP Plan area.					
Arctostaphylos glandulosa var. *crassifolia* Del Mar manzanita FE/	91% of major populations and 67% of southern maritime chaparral habitat	9% of major populations	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Site Specific	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 91% of the major populations will be conserved and 67% of the habitat for the species will be conserved. This species is a Group A species in the County's proposed BMO.[3]					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Notes: Within the County, this species occurs in the western portion of the Metro-Lakeside-Jamul segment, primarily in open space areas. Although not dedicated to the preserve, these areas will not likely be developed. **Conditions:** Area-specific management directives must include specific management measures to address the autecology and natural history of the species and to reduce the risk of catastrophic fire.[4] Management measures to accomplish this may include prescribed fire.					
Arctostaphylos otayensis Otay manzanita FSC*/	95% of major populations	5% of major populations	Preserve design/landscape level	Monitoring Plan - Habitat Based and Photo Plot	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 95% of the major populations are located on BLM land and in the open space (100% protection) designation for Otay Ranch, Jamul Mountain, and San Miguel Mountain. This species is a Group A species in the County's proposed BMO.[5] **Notes:** This species is often associated with metavolcanic soils of which 34,000 acres are included within the MHPA. **Conditions:** Area-specific management directives must include specific management measures to promote germination of seeds, maintenance of diverse age class structure, and reduction in the risk of catastrophic fire.[4] Management measures to accomplish this may include prescribed fire.					
Astragalus deanei Dean's milk vetch FSC*/	Unknown conservation level and therefore not covered by the plan.				NO

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Astragalus tener var. *titi* Coastal dunes milk vetch PE/CE	92% of southern foredunes (123± acres)	8% of southern foredunes (11± acres)	Preserve design/landscape level	Monitoring Plan - Habitat Based and Incidental	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 92% of the vegetative community that is potential habitat for this species will be conserved. **Notes:** This species historically occurred on the Silver Strand but is thought to be extirpated from the MSCP study area. **Conditions:** Area-specific management directives must provide for reintroduction opportunities, identify potential reintroduction sites, and include measures to prevent non-native species introductions.[4] Any newly found populations shall be evaluated for inclusion in the preserve strategy through acquisition, like exchange, etc.					
Baccharis vanessae Encinitas baccharis FT/CE	92% of major populations	8% of major populations	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Site Specific (1 population) and Management Plans/ Directives	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 92% of major populations will be conserved. This species is on the MSCP's list of narrow endemics, and therefore participating jurisdictions must specify in their subarea plans additional specific conservation measures for the species.[3] **Conditions:** Based on BMPs, area-specific management directives must include specific management measures to address the autecology and natural history of the species, measures to reduce the risk of catastrophic fire, and appropriate male/female plant ratios.[4] Management measures to accomplish this may include prescribed fire.					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Berberis nevinii Nevin's barberry PE/CE	100% of populations (occurrences are all persisting cultivars)	No natural populations present	Site-specific preserve design and special measures/management	Monitoring Plan - Habitat Based	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because persisting cultivars occurring in Spring Valley and Torrey Pines State Reserve will be conserved. This species is on the MSCP's list of narrow endemics, and therefore participating jurisdictions must specify in their subarea plans additional specific conservation measures for the species.[3] **Notes:** As no known natural populations occur within the plan area, development covered by the plan will not impact the species. Persistence of naturally occurring populations in San Diego County is dependent on conservation efforts outside the MSCP area.					
Brodiaea filifolia Thread-leaved brodiaea PT/CE	88% of vernal pool habitat, 38% of grassland	12% of vernal pool habitat may be impacted, but this habitat is subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level	Monitoring Plan - Habitat Based	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 88% of the vernal pool habitat and 38% of grassland habitat that are potential habitat for this species will be conserved. This species is on the MSCP's list of narrow endemics, and therefore participating jurisdictions must specify in their subarea plans additional specific conservation measures for the species if a population is identified in the future.[3] **Notes:** This species is not known to occur within the MSCP area.					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Brodiaea orcuttii Orcutt's brodiaea FSC*/	All major populations in MSCP area, 88% of vernal pool habitat, 38% of grassland	12% of vernal pool habitat may be impacted, but this habitat is subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Site Specific (4 populations) and Management Plans/ Directives	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because all of the major populations in the MSCP Plan area (4 populations) will be conserved. This is a Group A species in the County's proposed BMO.[5] **Notes:** Three major populations occur on Miramar military lands which are not part of the MSCP. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands. **Conditions:** The San Vincente population is identified as a critical population in the County's Subarea Plan and must be 100% conserved. Area-specific management directives must include specific measures to protect against detrimental edge effects.[4]					
Calamagrostis densa Dense reed grass none	91% of major populations	9% of major populations	Preserve design/landscape level	Monitoring Plan - Habitat Based	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 91% of major populations will be conserved. **Notes:** Taxonomic reclassification has combined this taxon in a more common taxon (*Calamagrostis koelerioides*) which is widespread. **Conditions:** Trail maintenance/placement to avoid human impacts must be addressed in area-specific management directives.[4] Enhancement opportunities using prescribed fire should be evaluated in management plans. Area-specific management directives must include specific management measures to address the autecology and natural history of the species and to reduce the risk of catastrophic fire.[4]					
Calochortus dunnii Dunn's mariposa lily FSC*/CR	100% of major populations	No major populations	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Habitat Based and Photo Plot and Management Plans/ Directives	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 100% of the major populations will be conserved. This species is on the MSCP's list of narrow endemics, and therefore participating jurisdictions must specify in their subarea plans additional specific conservation measures[3] for the species if a population is identified in the future. **Notes:** Fifty-two percent of one of the three major populations occurs within a major amendment area in the Otay Mountain area. (Take authorization amendments will be subject to public review through CEQA and NEPA processes and require approval by CDFG and USFWS.) This species occurs on gabbro and metavolcanic soils, and >43% of the gabbro soils in the MSCP Plan area are within the MHPA. **Conditions:** At the time permit amendments are proposed, strategies to provide protection for this species within the amendment area must be included.					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Caulanthus stenocarpus Slender-pod jewelflower FSC*/CR	75% of major populations	25% of major populations	Site-specific preserve design and special measures/management	Monitoring Plan - Habitat Based and Incidental and Management Plans/ Directives	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 3 of 4 (75%) of the major populations and 89% of occurrences will be conserved. The Wildcat Canyon, Poway/Sanrex, and Fortuna Mountain populations are identified as critical and will be 100% protected (San Diego County Subarea Plan requirement). **Note:** This taxon has been combined with the more widespread and common *Caulanthus heterophyllus* var. *heterophyllus*. **Conditions:** Area-specific management directives must include specific management measures to address the autecology and natural history of the species and to reduce the risk of catastrophic fire.[4] Management measures to accomplish this may include prescribed fire.					
Ceanothus cyaneus Lakeside ceanothus FSC*/	75% of major populations	25% of major populations	Site-specific preserve design and special measures/management	Monitoring Plan - Habitat Based and Photo Plot	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 3 of 4 (75%) of the major populations will be conserved. This species is on the MSCP's list of narrow endemics, and therefore participating jurisdictions must specify in their subarea plans additional specific conservation measures[3] for the species if a population is identified in the future. This is a Group A species in the County's proposed BMO.[5] **Conditions:** Area-specific management directives must include specific management measures to address the autecology and natural history of the species and to reduce the risk of catastrophic fire. Management measures to accomplish this may include prescribed fire.					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Ceanothus verrucosus Wart-stemmed ceanothus FSC*/	67% of major populations, and 64% of known localities	33% of major populations, and 36% of known localities	Site-specific preserve design and special measures/management	Monitoring Plan - Habitat Based and Photo Plot and Management Plans/ Directives	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 67% of the major populations will be conserved, and special management actions will increase populations. This is a Group B species in the County's proposed BMO.[5] **Notes:** Additional important populations (30% of known populations) are found on military lands (Pt. Loma, Miramar) which are not part of the MSCP. **Conditions:** Revegetation efforts within appropriate habitats must include restoration of this species. Area-specific management directives for the protected populations must include specific measures to increase populations, including specific management measures to address the autecology and natural history of the species and to reduce the risk of catastrophic fire.[4] Management measures to accomplish this may include prescribed fire. Any newly found populations should be evaluated for inclusion in the preserve strategy through acquisition, like exchange, etc.					
Chorizanthe orcuttiana Orcutt's spineflower FE/CE	Unknown conservation level and therefore not covered by the Plan.				NO
Cordylanthus maritimus ssp. *maritimus* Salt marsh bird's-beak FE/CE	100% of major populations	No major populations	Site-specific preserve design and special measures/management	Monitoring Plan - Site Specific (3 populations)	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 100% of major populations within the MSCP Plan area will be conserved. **Note:** Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional protection. One population of this species also occurs on military lands (Naval Radar Receiving Facility) which are not part of the MSCP. **Conditions:** Area-specific management directives must (1) include measures to reduce threats and stabilize populations (e.g., relocation of footpaths, establishment of buffer areas, etc.), (2) address opportunities for reintroduction, and (3) include measures to enhance existing populations (e.g., protect and improve upland habitat for pollinators). There is a federal recovery plan for this species, and management activities should help achieve the specified goals. Any newly found populations shall be evaluated for inclusion in the preserve strategy through acquisition, like exchange, etc.					
Cordylanthus orcuttianus Orcutt's bird's-beak FSC*/	75% of major populations	25% of major populations	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Site Specific (4 populations) and Management Plans/ Directives	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 3 of 4 (75%) major populations will be conserved. A portion of the Otay River Valley population lies outside of the MHPA but will be subject to the County's Biological Mitigation Ordinance (80-100% conservation).[5] The Otay Ranch population (southeast of Lower Otay Lake) is considered conserved subject to landowner and agency agreement. **Condition:** At the time permit amendments are proposed, strategies to provide protection for this species within the amendment area must be included. (Take authorization amendments are subject to public review through CEQA and NEPA processes and require approval by CDFG and USFWS.)					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Corethrogyne filaginifolia var. *linifolia* Del Mar Mesa sand aster FSC†/	48% of major populations, 57% of known localities, and 67% of southern maritime chaparral	52% of major populations, 43% of known localities, and 33% of southern maritime chaparral	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Site Specific	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 48% of major populations and 67% of its potential habitat (southern maritime chaparral) will be conserved. This is a Group A species in the County's proposed BMO.[5] **Notes:** This taxon has been merged with two other *Corethrogyne filaginifolia* varieties and has been determined not to meet the taxonomic standards for listing. **Conditions:** Area-specific management directives for the protected populations must include specific measures to protect against detrimental edge effects to this species, including specific management measures to address the autecology and natural history of the species and to reduce the risk of catastrophic fire.[4] Management measures to accomplish this may include prescribed fire.					
Cupressus forbesii Tecate cypress FSC*/	98% Tecate cypress forest	2% Tecate cypress forest	Preserve design/landscape level	Monitoring Plan - Habitat Based and Photo Plot	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 98% of major populations will be conserved, primarily on lands administered by BLM. **Conditions:** Area-specific management directives for the protected populations will include specific measures to maintain or increase populations, including specific management measures to address the autecology and natural history of the species and to reduce the risk of catastrophic fire.[4] Management measures to accomplish this may include prescribed fire.					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Dudleya blochmaniae ssp. *brevifolia* Short-leaved dudleya FSC†/CE	100% of major populations	No major populations	Site-specific preserve design and special measures/management	Monitoring Plan - Site Specific (3 populations) and Management Plans/ Directives	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 100% of major populations will be conserved. This species is on the MSCP's list of narrow endemics, and therefore participating jurisdictions must specify in their subarea plans additional conservation measures for the species.[3] **Notes:** The populations on Del Mar Mesa, Carmel Mountain, and Crestview Canyon are subject to considerable edge effects. The wildlife agencies will work with the University of California, San Diego to protect and manage the University of California property adjacent to Skeleton Canyon for this species. **Conditions:** Area-specific management directives must include (1) specific measures to protect against detrimental edge effects to this species, (2) species-specific monitoring, and (3) maintenance of surrounding habitat for pollinators.[4]					
Dudleya variegata Variegated dudleya FSC*/	56% of major populations, 75% of known localities	44% of major populations, 25% of known localities	Site-specific preserve design and special measures/management	Monitoring Plan - Site Specific (5 populations) and Management Plans/ Directives	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 56% of major populations and 75% of known localities will be conserved. This species is on the MSCP's list of narrow endemics, and therefore participating jurisdictions must specify in their subarea plans additional conservation measures for the species.[3] **Conditions:** Area-specific management directives must include species-specific monitoring and specific measures to protect against detrimental edge effects to this species, including effects caused by recreational activities.[4] Some populations now occur within a major amendment area (Otay Mountain), and at the time permit amendments are proposed, strategies to provide protection for this species within the amendment area must be included. (Proposed take authorization amendments will have public review through CEQA and NEPA processes and require approval by CDFG and USFWS.)					
Dudleya viscida Sticky dudleya FSC*/	100% of major population	No major populations	Preserve design/landscape level	Monitoring Plan - Habitat Based	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 100% of the only major population within the MSCP will be conserved. **Notes:** Persistence of this species in San Diego County depends largely on conservation efforts in the MHCP and Camp Pendleton areas. **Conditions:** Area-specific management directives must address specific measures to protect against detrimental edge effects.[4]					
Ericameria palmeri ssp. *palmeri* Palmer's ericameria FSC*/	66% of major populations	34% of major populations	Site-specific preserve design and special measures/management	Monitoring Plan - Habitat Based and Photo Plot and Management Plans/ Directives	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 66% of major populations will be conserved. This species is on the MSCP's list of narrow endemics, and therefore participating jurisdictions must specify in their subarea plans additional conservation measures for the species.[3] **Notes:** Impacts will be fully mitigated through avoidance, minimization, and compensation. Two of the six major populations are subject to potential impacts from proposed road widening projects (Jamacha Blvd., Highways 54/94).					
Eryngium aristulatum var. *parishii* San Diego button-celery FE/CE	82% of major populations, 88% of vernal pool habitat	18% of major populations may be impacted, but vernal pool habitat is subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level with site-specific consideration(s)/ management	Area-specific Management Directives (wetlands)	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 82% of major populations and 88% of vernal pool habitat will be conserved. **Notes:** Additional important populations are found on military lands (Miramar) which are not part of the MSCP. Four populations (Proctor Valley, Otay River Valley, Del Mar Mesa, Spring Canyon) are likely to be subject to edge effects. This species has been added to the City of San Diego's list of narrow endemic species. Vernal pools that become part of the National Wildlife Refuge will be managed for the recovery of this species. **Conditions:** Area-specific management directives must include specific measures to protect against detrimental edge effects.[4]					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Erysimum ammophilum Coast wallflower FSC*/	92% of southern foredunes, 67% of southern maritime chaparral	8% of southern foredunes, 33% of southern maritime chaparral	Preserve design/landscape level	Monitoring Plan - Habitat Based and Incidental	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 92% of southern foredunes and 67% of southern maritime chaparral vegetation communities (that are potential habitat for this species) will be conserved. **Notes:** Populations from San Diego County are now being treated as *Erysimum capitatum* ssp. *capitatum*, a common species of wallflower.					
Ferocactus viridescens San Diego barrel cactus FSC*/	81% of major populations	19% of major populations	Preserve design/landscape level	Monitoring Plan - Habitat Based and Photo Plot	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 81% of major populations will be conserved. This is a Group B species in the County's proposed BMO.[5] **Notes:** This is an abundant species that will be protected at varying levels in several subareas: Carmel Mountain, 64%; East Elliott, 75%; Marron Valley, 90%; Mission Trails Regional Park, 94%; Otay Mesa, 70%; Otay River Valley, 100%; Sweetwater Reservoir, 100%; Sycamore Canyon-Fanita Ranch, 50%. **Conditions:** Area-specific management directives must include measures to protect this species from edge effects and unauthorized collection;[4] directives should also include appropriate fire management/control practices to protect against a too frequent fire cycle.					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Fremontodendron mexicanum Mexican flannelbush PE/CR	Insufficient distribution data and unknown conservation level; therefore, the species is not covered by the Plan.				NO
Githopsis diffusa spp. *filicaulis* Mission Canyon bluecup FSC*/	Unknown conservation level and therefore not covered by the Plan.				NO
Hemizonia conjugens Otay tarplant PE/CE	66% of major populations	34% of major populations	Site-specific preserve design and special measures/management	Monitoring Plan - Site Specific (5 populations) and Management Plans/ Directives	YES

DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED

This species will be covered by the MSCP because 66% of major populations will be conserved. This species is on the MSCP's list of narrow endemics, and therefore participating jurisdictions must specify in their subarea plans additional conservation measures for the species.[3]

Conditions: MSCP coverage of this species requires avoidance of populations in the Otay River Valley through sensitive design and development of the active recreation areas as described in the Otay Ranch RMP and GDP. One of the seven major populations occurs within an amendment area (Proctor Valley). At the time permit amendments are proposed, strategies to provide protection for this species within the amendment area must be included (proposed take authorization amendments will be subject to public review through CEQA and NEPA processes, and take authorization amendments require approval by CDFG and USFWS). Area-specific management directives must include specific measures for monitoring of populations, adaptive management of preserves (taking into consideration the extreme population fluctuations from year to year), and specific measures to protect against detrimental edge effects to this species.[4]

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Hemizonia floribunda Tecate tarplant FSC*/	Unknown conservation levels and therefore not covered by the Plan.				NO
Lepechinia cardiophylla Heart-leaved pitcher sage FSC*/	85% of major populations	15% of major populations	Preserve design/landscape level	Monitoring Plan - Habitat Based and Photo Plot	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 85% of major populations will be conserved. The Iron Mountain population falls within a 100% conservation area. The other three major populations fall within the County's area of undetermined development status and will receive 80-100% conservation based on the County's proposed BMO (Group A species).[5] **Conditions:** Area-specific management directives must include: (1) specific measures to protect against detrimental edge effects; (2) specific measures to promote increase of populations; and (3) specific management measures to address the autecology and natural history of the species and to reduce the risk of catastrophic fire (management measures to accomplish this may include prescribed fire).[4]					
Lepechinia ganderi Gander's pitcher sage FSC*/	All known locations	No known locations	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Habitat Based and Photo Plot and Management Plans/ Directives	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 100% of the known locations will be conserved. This species is on the MSCP's list of narrow endemics, and therefore participating jurisdictions must specify in their subarea plans additional conservation measures for the species.[3] **Conditions:** Area-specific management directives must include: (1) specific measures to protect against detrimental edge effects and uncontrolled access; (2) measures to promote the increase of populations; and (3) specific management measures to address the autecology and natural history of the species and to reduce the risk of catastrophic fire (management measures to accomplish this may include prescribed fire).[4] One of the five major populations occurs within a major amendment area (Otay Mountain). At the time permit amendments are proposed, strategies to provide protection for this species within the amendment area must be included (proposed take authorization amendments are subject to public review through CEQA and NEPA processes and require approval by CDFG and USFWS).					
Lotus nuttallianus Nuttall's lotus FSC*/	80-100% of major populations; 92% of southern foredune habitat	0-20% of major populations; 8% of southern foredune habitat	Preserve design/landscape level	Monitoring Plan - Site Specific (1 population)	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 80-100% of the major populations will be conserved and 92% of the habitat (southern foredunes) will be conserved. **Notes:** Additional important populations are found on military lands (Imperial Beach, Silver Strand) which are not part of the MSCP. The USFWS is currently working with the Navy to provide protection for this species on Silver Strand. **Conditions:** Area-specific management directives must include specific measures to protect against detrimental edge effects.[4]					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Monardella hypoleuca ssp. *lanata* Felt-leaved monardella none	89% of major populations	11% of major populations	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Habitat Based and Photo Plot and Management Plans/ Directives	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 89% of major populations will be conserved. The Sequan Peak and Iron Mountain populations are identified as critical populations which will be 100% protected (San Diego County Subarea Plan). This species is on the MSCP's list of narrow endemics, and therefore participating jurisdictions must specify in their subarea plans additional specific conservation measures for this species.[3] This is a Group A species in the County's proposed BMO.[5] **Notes:** Persistence of this species in San Diego County depends, in part, on conservation efforts outside the MSCP area. **Conditions:** Area-specific management directives must also include measures to protect against detrimental edge effects and uncontrolled access.[4]					
Monardella linoides ssp. *viminea* Willowy monardella PE/CE	100% of major populations	No major populations	Preserve design/landscape level	Monitoring Plan - Site Specific (2 populations) and Management Plans/ Directives	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 100% of major populations will be conserved. Additional important populations are found on military lands (Miramar) which are not included as part of the MSCP. This species occurs in drainages and would receive protection based on Fish and Game Code 1600 agreements and federal wetlands permitting. This is a Group A species in the County's proposed BMO.[5] **Conditions:** Area-specific management directives must include specific measures to protect against detrimental edge effects.					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Muilla clevelandii San Diego goldenstar FSC*/	73% of major populations and 38% of grasslands	27% of major populations	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Site Specific (4 populations)	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 8 of 11 major populations, 125 of 144 occurrences, and 38% of the grassland vegetation community will be conserved. The City of San Diego will avoid populations within its 25% encroachment area. The 4S Ranch population will be transplanted into an appropriate preserve area. This is a Group A species in the County's proposed BMO.[5] **Conditions:** Area-specific management directives must include monitoring of the transplanted population(s) and specific measures to protect against detrimental edge effects to this species.[4]					
Myosurus minimus ssp. *apus* Little mousetail FSC*/	The MSCP preserve does not include adequate habitat to conserve this species.				NO
Navarretia fossalis Prostrate navarretia PT/	63% of only major population, 88% of vernal pool habitat	37% of only major population, 12% of vernal pool habitat may be impacted, but this habitat is subject to no net loss of function and value and 404(b)1 guidelines	Site-specific preserve design and special measures/ management	Area-specific Management Directives (wetlands)	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 63% of the one major population and 88% of vernal pool habitat will be conserved. Federal wetland regulations will provide additional protection for vernal pool habitats. This is a Group A species in the County's proposed BMO.[5] **Notes:** State and federal transportation agencies will need to avoid or adequately mitigate the impacts to this species from the extension of State Route 125. An additional small population is found on military lands (Miramar) and is not included as part of the MSCP. Vernal pools incorporated into the National Wildlife Refuge System will be managed for the recovery of this species. **Conditions:** Area-specific management directives must include specific measures to protect against detrimental edge effects to this species and must incorporate measures to conserve and maintain surrounding habitat (1) for pollinators and (2) as part of the hydrological system for the vernal pools.					
Nolina interrata Dehesa bear-grass PT/CE	90-100% of major populations	<10% of major populations	Preserve design/landscape level	Monitoring Plan - Habitat Based and Photo Plot and Management Plans/ Directives	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because: 100% of the McGinty Mountain population will be conserved; half of the Sequan Peak population is under protected ownership, and 80-100% of the other half will be conserved; and 80-100% of the Dehesa Peak population will be conserved under the County's proposed BMO (Group A species).[5] This species is on the MSCP's list of narrow endemics, and therefore participating jurisdictions must specify in their subarea plans additional specific conservation measures for this species.[3] **Notes:** Acquisition of the remaining portions of the population on Sequan Peak is important, and efforts are underway by CDFG. **Conditions:** Area-specific management directives must include specific measures to protect against detrimental edge effects[4] and management measures to maintain surrounding habitats for pollinators.					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Opuntia parryi var. *serpentina* Snake cholla FSC*/	75% of major populations and 67% of southern maritime chaparral	25% of major populations and 33% of southern maritime chaparral	Preserve design/landscape level with site-specific consideration(s)/ management	Area-specific Management Directives	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 75% of major populations and 67% of the southern maritime chaparral vegetation community will be conserved. This species is on the MSCP's list of narrow endemics, and therefore participating jurisdictions must specify in their subarea plans additional specific conservation measures for this species.[3] **Notes:** Additional important populations are found on military lands (Pt. Loma) which are not part of the MSCP. **Conditions:** Area-specific management directives must include (1) specific measures to protect against detrimental edge effects to this species[4] and (2) translocation, where appropriate. The Otay Ranch project GDP and RMP require protection of 80% of existing occurrences and transplantation of any impacted occurrences to restored areas of comparable size.					
Orcuttia californica California Orcutt grass FE/CE	86% of only major population, 88% of vernal pool habitat	14% of only major population may be impacted, but vernal pool habitat is subject to no net loss of function or value and 404(b)1 guidelines	Preserve design/landscape level with site-specific consideration(s)/ management	Area-specific Management Directives (wetlands)	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 86% of the one major population will be conserved. This species is on the MSCP's list of narrow endemics, and therefore participating jurisdictions must specify in their subarea plans additional specific conservation measures for this species.[3] **Notes:** A population outside of the MHPA (J-13N pool complex) is conserved within dedicated open space as mitigation for the Ramona K-mart. The USFWS will work with the Border Patrol to minimize impacts to this species. An additional small population is found on military lands (Miramar) and is not part of the MSCP. **Conditions:** Area-specific management directives must include specific measures to protect against detrimental edge effects to this species[4] and measures to maintain surrounding habitats for pollinators.					
Pinus torreyana Torrey pine FSC*/	100% of native population	No major populations	Preserve design/landscape level	Monitoring Plan - Habitat Based	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because the single naturally occurring population at Torrey Pines State Reserve will be conserved and appropriately managed.					
Pogogyne abramsii San Diego mesa mint FE/CE	88% of vernal pool habitat	12% of vernal pool habitat may be impacted, but this habitat is subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level with site-specific consideration(s)/ management	Area-specific Management Directives	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 88% of its potential habitat (vernal pool habitat) will be conserved. Federal wetland regulations will provide additional protection for vernal pool habitats. **Notes:** The three major populations in the county occur on military lands (Miramar) which are not part of the MSCP. The City of San Diego has added this species to its narrow endemics list. The population at Montgomery Field was mistakenly omitted from the original mapping and has now been included. This population will be conserved and managed by the City of San Diego. Vernal pools included in the National Wildlife Refuge will be managed for recovery of this species. **Conditions:** Area-specific management directives must include measures to: (1) protect against detrimental effects; (2) maintain surrounding habitat for pollinators; and (3) maintain pool watershed areas.					
Pogogyne nudiuscula Otay Mesa mint FE/CE	91% of the major population, 88% of vernal pool habitat	9% of the major population may be impacted, and this habitat is subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level with site-specific consideration(s)/ management	Area-specific Management Directives	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 91% of the one major population will be conserved, and federal wetland regulations will provide additional protection for vernal pool habitats. **Notes:** Twenty-six percent of the stockpan soils will be conserved, which will provide for enhancement opportunities for this species. The City of San Diego has added this species to its narrow endemics list. Vernal pools included in the National Wildlife Refuge will be managed for recovery of this species. The RMP for the Otay Ranch project includes protection for vernal pools with sensitive species. **Conditions:** Area-specific management directives must include measures to: (1) protect against detrimental edge effects; (2) maintain surrounding habitat for pollinators; and (3) maintain pool watershed areas.					
Rosa minutifolia Small-leaved rose /CE	Only known MSCP occurrence transplanted into preserve, propagation and restoration in appropriate habitat	Only known MSCP occurrence transplanted into preserve	Site-specific preserve design and special measures/management	Area-specific Management Directives (1 population)	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED There is only one known occurrence of this species in the MSCP on Otay Mesa near Dennery Canyon. The occurrence may be a single clone, and some evidence suggests it may be a cultivar. This species will be covered by the MSCP because the only known occurrence will be conserved through the California Terraces project. The following conditions for small-leaved rose conservation are required in the CDFG 2081 as a part of the California Terraces project: 1. The rose population shall be salvaged, propagated, and transplanted to a new location that will support a healthy, reproducing population in perpetuity. This goal shall be achieved through a 5-year program that includes site improvement, propagation, transplantation, and monitoring. (a) The rose population shall be transplanted to a suitable open space preserve location on Otay Mesa or to an alternative location subject to Department approval. Criteria in site selection shall include similar habitat, slope, aspect, soils, and hydrology as present on the existing rose site. (b) Propagation and transplanting of the rose population shall be implemented by a qualified native plant nursery/habitat restoration contractor, acceptable to the Department, and under supervision of a qualified botanist. The rose propagation shall take place over a 2-year period. Rose plants to be extirpated shall be salvaged through: (i) seed collection; (ii) preparation of cuttings from rose canes; and (iii) salvage of underground parts and transplantation. (d) Transplantation of the rose clone shall commence during the period of October-December 1997. The remaining rose clone shall be cut into a minimum of 200 clumps. Each clump possessing roots and de-caned stems shall be planted on the habitat management lands as prescribed by a qualified botanist. 2. There shall be no removal of the rose population for a 2-year period commencing from the date of planting propagated rose plants at the approved locations. 3. The progress of the rose mitigation effort shall be assessed through measurements and observations for a period of at least 5 years following implementation of rose transplantation, commencing in December 1997 and ending in July 2002. Factors to be monitored shall include growth, survival and/or establishment rate of the species, presence of introduced weeds, erosion, effects of herbivores, and any other factors important to the success of the mitigation effort. Community structure and species diversity at the mitigation site shall also be assessed. (a) Transplant success criteria over a 5-year period shall include: (i) measurable annual growth on a minimum of 50% of the rose plants; and (ii) flowering of 50% of the rose plants during a minimum of one flowering season. In the event that success criteria are not met, the project applicant shall implement remedial measures subject to Department approval.					
Satureja chandleri San Miguel savory None	80-100% of future identified occurrences	0-20%	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Habitat Based and Photo Plot	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because it will be conserved at the 80+% level. The County will add this species to Group A or B of the County's proposed BMO.[5] **Conditions:** Area-specific management directives must include specific management measures to address the autecology and natural history of the species and to reduce the risk of catastrophic fire. Management measures to accomplish this may include prescribed fire. This species will be conserved at the 80+% level.					
Senecio ganderi Gander's butterweed FSC*/CR	90-100% of major populations	<10% of major populations	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Habitat Based and Photo Plot	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 90-100% of known major populations will be conserved. Half of the Sequan Peak population is under protected ownership, 80-100% of the other half will be conserved, and 90-100% of the McGinty Mountain population will be conserved. The El Cajon Mountain (between El Capitan and San Vicente Reservoir) population is identified as critical which requires 100% protection based on the San Diego County Subarea Plan. Occurrences in the County's areas of undetermined development status will receive 80-100% protection under the County's proposed BMO (Group A species).[5] **Notes:** This species is often associated with gabbro soils which will be conserved at the 43+% level. Acquisition of the remaining portions of the population on Sequan Peak is important, and efforts are underway by CDFG. **Conditions:** Area-specific management directives must include: (1) specific measures to protect against detrimental edge effects to this species;[4] and (2) measures to address the autecology and natural history of the species.					
Solanum tenuilobatum Narrow-leaved nightshade FSC*/	90% of major populations	10% of major populations	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Habitat Based and Photo Plot and Management Plans/ Directives	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 90% of major populations will be conserved. Two smaller populations, Silverwood and Fernbrook, are identified as critical and will be 100% protected in the San Diego County Subarea Plan. **Notes:** This species is now taxonomically included in *Solanum xanti*.					
Tetracoccus dioicus Parry's tetracoccus FSC*/	80-100% of major populations	0-20% of major populations	Preserve design/landscape level	Monitoring Plan - Habitat Based and Photo Plot	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 80-100% of major populations will be conserved. **Notes:** Fourteen of 33 (43%) small populations are already under protected ownership. The Dehesa population is identified as critical and will be 100% protected in the San Diego County Subarea Plan. Occurrences in the County's areas of undetermined development status will receive 80-100% protection under the County's proposed BMO (Group A species).[5] Acquisition of the remaining portions of the population on Sequan Peak is important, and efforts are underway by CDFG. This species is often associated with gabbro soils, and 43+% of the gabbro soils are within the MHPA. **Conditions:** Area-specific management directives must include specific measures to protect against detrimental edge effects to this species.[4]					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
ANIMALS					
Invertebrates					
Euphydryas editha quino Quino checkerspot butterfly FE/	Unknown conservation level and lack of assurances that Plan will protect preferred habitat (mesa tops/grassland) and connection to known source populations, therefore, not covered by the Plan.				NO
Euphyes vestris harbisoni Harbison's dun skipper FSC*/	Unknown conservation level and therefore not covered by the Plan based on insufficient distribution and life history data.				NO
Lycaena hermes Hermes copper butterfly FSC*/	Unknown conservation level and therefore not covered by the Plan based on insufficient distribution and life history data.				NO
Mitoura thornei Thorne's hairstreak butterfly FSC*/	98% of Tecate cypress forest (larval host plant)	2% of Tecate cypress forest	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Habitat Based	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 98% of the major populations of its larval host plant, Tecate cypress, will be conserved. Most of the Tecate cypress forest occurs on BLM lands. **Conditions:** Area-specific management directives must manage for the host species (Tecate cypress).[4] Management measures to accomplish this may include prescribed fire.					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Panoquina errans Salt marsh skipper FSC*/	93% of salt marsh habitat (1,700± acres)	7% of salt marsh habitat (120± acres) may be impacted, but this habitat is subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level	Monitoring Plan - Habitat Based	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 93% of its potential habitat will be conserved. **Conditions:** Area-specific management directives must include measures to: (1) control exotic weeds and invertebrate predators, where appropriate, and (2) control access to saltmarsh habitat.[4]					
Branchinecta sandiegoensis San Diego fairy shrimp FE/	88% of vernal pool habitat	12% of vernal pool habitat may be impacted, but this habitat is subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level	Area-specific Management Directives (wetlands)	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 88% of its potential habitat (vernal pool habitat) will be conserved. Federal and local wetland regulations will provide additional protection for vernal pool habitats. The Otay Ranch project RMP and GDP require protection for vernal pools with sensitive species. **Notes:** Additional important habitat for this species occurs on military lands (Miramar) and is not part of the MSCP. **Conditions:** Area-specific management directives must include specific measures to protect against detrimental edge effects to this species.[4]					
Streptocephalus woottoni Riverside fairy shrimp FE/	88% of vernal pool habitat	12% of vernal pool habitat may be impacted, but this habitat is subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level	Area-specific Management Directives (wetlands)	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 88% of its potential habitat (vernal pool habitat) will be conserved. Federal and local wetland regulations will provide additional protection for vernal pool habitats. The Otay Ranch project RMP and GDP require protection for vernal pools with sensitive species. **Notes:** Additional important habitat for this species occurs on military lands (Miramar) and is not part of the MSCP. **Conditions:** Area-specific management directives must include specific measures to protect against detrimental edge effects to this species.[4]					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Reptiles and Amphibians					
Bufo microscaphus californicus Arroyo southwestern toad FE/SSC	All known locations (Cottonwood Creek in Marron Valley, San Vicente Creek and Santa Ysabel Creek in San Pasqual Valley, Sweetwater River, and Otay River), 78% riparian wetland areas in suitable habitat	Upland habitats adjacent to riparian wetlands (potential habitat) in un-determined status areas in Sloan Canyon - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Site Specific (7 locations) and Management Plans/ Directives	YES

DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED

This species will be covered by the MSCP because the MHPA preserves all known locations, and 90-95% of the upland habitats within the Marron Valley area will be conserved. Impacts to upland habitats within 1 km of riparian corridors within the MHPA will be minimized during project review by CDFG and USFWS. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands.

Notes: Important habitat areas include the San Diego River below El Capitan Reservoir, San Vicente Creek between Sweetwater Reservoir and Loveland Reservoir, Dulzura Creek, San Pasqual Valley from Lake Hodges to Boden Canyon, Otay River, Jamul Creek, Cedar Creek, and Sycamore Creek.

Conditions: Area-specific management directives must address the maintenance of arroyo toad through control of nonnative predators, protection and maintenance of sufficient suitable low-gradient sandy stream habitat (including appropriate water quality) to meet breeding requirements, and preservation of sheltering and foraging habitat within 1 km of occupied breeding habitat within preserve lands. Area-specific management directives must include measures to control human impacts to the species within the preserve (e.g., public education, patrol, etc.).[4] Take authorization holders must minimize impacts to upland habitats that are: within the MHPA and are within 1 km of riparian habitat that supports or is likely to support arroyo toad.

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Rana aurora draytoni California red-legged frog FT/SSC	72% of riparian habitats and freshwater marsh (9,500± acres)	28% of riparian habitats and freshwater marsh (3,800± acres) - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level	Monitoring Plan - Habitat Based	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species is believed to be extirpated from the county. Although unlikely, additional survey effort may detect red-legged frog. Therefore, this species will be covered by the MSCP because 70% of its potential habitat will be conserved. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands. **Conditions:** Area-specific management directives must provide for management of any new discovered populations within the preserve.[4]					
Clemmys marmorata pallida Southwestern pond turtle FSC*/SSC	72% of riparian habitats and freshwater marsh (9,501± acres)	28% of riparian habitats and freshwater marsh (3,800± acres) - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Habitat Based and Management Plans/Directives	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 72% of its potential habitat will be conserved. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands. **Conditions:** Maintain and manage areas with 1500 feet around known locations within preserve lands for the species. Within this impact avoidance area, human impacts will be minimized, non-native species detrimental to pond turtles will be controlled/removed, and habitat restoration/enhancement measures will be implemented.					
Cnemidophorus hyperythrus beldingi Orange-throated whiptail FSC*/SSC	59% of potential habitat (129,600± acres) - 64% of coastal sage scrub, 60% of maritime succulent scrub, 54% of chaparral, 67% of southern maritime chaparral, 44% of coastal sage/chaparral - 62% of known point occurrences	41% of potential habitat (89,800± acres) - 38% of known point occurrences	Preserve design/landscape level	Monitoring Plan - Site Specific (pit traps at 12 locations)	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED **This species will be covered by the MSCP because 59% of its potential habitat and 62% of known point occurrences will be conserved. Habitat linkages between large blocks of protected lands are conserved in a functional manner. Monitoring of populations and adaptive management of preserves will occur as a result of plan implementation.** **Notes:** **This species also occurs extensively on military lands.** **Conditions:** **Area-specific management directives must address edge effects.[4]**					
Phrynosoma coronatum blainvillei San Diego horned lizard FSC*/SSC	60% of potential habitat (132,000± acres) - 64% of coastal sage scrub, 54% of chaparral, 44% of coastal sage/chaparral, 80% of riparian scrub - 63% of known point occurrences	40% of potential habitat (89,700± acres) - 37% of known point occurrences	Preserve design/landscape level	Monitoring Plan - Site Specific (pit traps at 12 locations)	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 60% of its potential habitat and 63% of known point occurrences will be conserved. Habitat linkages between large blocks of protected lands are conserved in a functional manner. Monitoring of populations and adaptive management of preserves will occur as a result of plan implementation. **Conditions:** Area-specific management directives must include specific measures to maintain native ant species, discourage the Argentine ant, and protect against detrimental edge effects to this species.[4]					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Birds					
Pelecanus occidentalis californicus California brown pelican FE/CE	91% of roosting and foraging habitat (2,900± acres) - 93% of southern coastal saltmarsh, 88% of natural flood channel, 90-95% of beach outside of intensively used recreational beaches	9% of roosting and foraging habitat (270± acres) - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level	Monitoring Plan - Habitat Based	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 91% of roosting and foraging habitat within the MSCP Plan area will be conserved. No new development of beaches is authorized which will result in 90-95% protection of beach habitat that is outside of intensively used beach areas. **Notes:** Most of the important roosting and foraging habitat occurs on military lands and waters under Port Authority jurisdiction which are not included as part of the MSCP. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands. This species is a common to very common non-breeding visitor which uses mud flats, piers, jetties, etc. to roost, and it forages primarily in coastal ocean waters and San Diego Bay.					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Egretta rufescens Reddish egret FSC*/	92% of potential habitat (2,700± acres)- 93% of southern coastal saltmarsh, 99% of saltpan, 88% of natural flood channel	8% of potential habitat (230± acres) - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level	Monitoring Plan - Habitat Based	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 90% of its potential habitat will be conserved. **Notes:** Additional important habitat occurs in waters under Port Authority and military jurisdiction which are not included as part of the MSCP. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands. This species forages in shallow lagoons, mud flats, tidal channels, and salt marsh. This species is a rare visitor in fall and winter and a casual visitor in spring and summer but does not nest in San Diego County.					
Plegadis chihi White-faced ibis FSC*/SSC	80% of potential habitat (1,200± acres) - 68% of freshwater marsh, 88% of natural flood channel; additionally 1,800± acres of agricultural land will be conserved	20% of potential habitat (300± acres) - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level	Monitoring Plan - Habitat Based	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 78% of its potential habitat will be conserved. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands. The preserve management plan for the City of San Diego cornerstone lands must include protection and management of potential nesting habitat at Lake Hodges. **Conditions:** Area-specific management directives must include specific measures to protect against detrimental edge effects to this species.[4]					
Branta canadensis Canada goose none	8,200± acres of potential habitat	1,100± acres of potential habitat - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level	Monitoring Plan - Habitat Based	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED Although not considered sensitive, this species has aesthetic and intrinsic values and is a regulated game species, thereby being an important species to protect. This species will be covered by the MSCP because 8,200± acres of its potential habitat will be conserved, including open water areas for loafing. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands.					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Haliaeetus leucocephalus Bald eagle FT/CE	89% of potential foraging habitat (wetlands, 5,719± acres), 68% of freshwater marsh, 92% of open water. In addition, foraging opportunities on 100,000+ acres will be conserved.	11% of potential foraging habitat (wetlands, 692± acres) - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level	Monitoring Plan - Habitat Based	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 89% of its potential foraging habitat (open water and freshwater marsh) will be conserved. Bald eagles are a rare winter visitor which require perching and roosting sites adjacent to open water and marshes. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands.					
Circus cyaneus Northern harrier /SSC	42% of potential nesting habitat (12,000± acres) - 93% of saltmarsh, 68% of freshwater marsh, and 38% of grasslands - 85,000± acres of potential foraging habitat	58% of potential nesting habitat (16,300± acres) - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Habitat Based and Management Plans/Directives (nest sites)	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS

DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED

This species is an uncommon migrant, winter visitor, and rare summer resident/breeder. This species will be covered by the MSCP because 42% of its potential nesting habitat and 85,000± acres of its potential foraging habitat will be conserved. The plan will not adversely affect the species' long-term survival.

Notes: Harriers tolerate patchiness in their habitat, exhibit nest area fidelity, and forage within 4 miles of their nests. Additional conservation of grassland habitats should be a priority and one of the primary factors in the design of preserves in the major amendment areas. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands. Active nesting areas include:

Tijuana River Valley - The City of San Diego Subarea Plan includes conservation of two known nesting sites in the Tijuana River Valley and maintenance of some agricultural lands (available for foraging harriers) within the Tijuana River Valley Regional Park. The Tijuana National Estuarine Sanctuary will continue to enhance marshlands and manage for nesting harriers. Some existing grasslands and agricultural lands at the outer limits of the foraging distance for nesting harriers will be developed. With the addition of over 4,000 acres of agricultural and disturbed lands to the City of San Diego's preserve (in comparison with the March 1995 preserve design), adequate foraging areas within this area are conserved. Food production for harriers on preserve lands can be enhanced.

South San Diego Bay/Sweetwater Marsh - The City of San Diego Subarea Plan includes conservation of one known nesting site in the Sweetwater Marsh area. All nesting and foraging habitat within 4 miles of the known nesting site will be conserved. Upland habitat enhancement opportunities exist at the D Street fill area.

Proctor Valley - Proctor Valley includes a historical nesting location (1970s). Over 80% of the Proctor Valley area will be conserved, with most of the development occurring in the upper portion of the valley, away from the more likely nesting areas.

Conditions: Area-specific management directives must: (1) manage agricultural and disturbed lands (which become part of the preserve) within 4 miles of nesting habitat to provide foraging habitat; (2) include an impact avoidance area (900 feet or maximum possible within the preserve) around active nests; and (3) include measures for maintaining winter foraging habitat in preserve areas in Proctor Valley, around Sweetwater Reservoir, San Miguel Ranch, Otay Ranch east of Wueste Road, Lake Hodges, and San Pasqual Valley. The preserve management coordination group shall coordinate efforts to manage for wintering northern harriers' foraging habitat within the MSCP preserve.

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Accipiter cooperii Cooper's hawk /SSC	59% of potential foraging habitat (133,400± acres) (47% of oak woodland, 58% of oak riparian, 64% of coastal sage scrub, 54% of chaparral, 44% of coastal sage scrub/chaparral - 57% of known localities) and 52% (5,705± acres) of potential nesting habitat (58% of oak riparian and 47% of oak woodland)	41% of potential foraging (93,900± acres) and 48% of potential nesting habitat (5,200± acres)	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Habitat Based and Management Plans/Directives (site-specific nest territories)	YES

DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED

This species will be covered by the MSCP because 59% of potential foraging habitat, 52% of potential nesting habitat, and 57% of known occurrences will be conserved.

Conditions: In the design of future projects within the Metro-Lakeside-Jamul segment, preserve areas shall conserve patches of oak woodland and oak riparian forest of adequate size for nesting and foraging habitat. Area-specific management directives must include 300-foot impact avoidance areas around active nests and minimization of disturbance in oak woodlands and oak riparian forests.[4]

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Buteo swainsoni Swainson's hawk /CT	22% of foraging habitat (11,600± acres) - 38% of grassland, 6% of agricultural fields	78% of foraging habitat (42,000± acres)	Preserve design/landscape level	Monitoring Plan - Habitat Based (10 grassland locations)	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species is an extremely rare visitor during migration which forages in grasslands and agricultural fields. This species will be covered by the MSCP because more than 11,000 acres of potential foraging habitat will be conserved. **Notes:** The plan will not adversely affect the species' long-term survival. Additional conservation of grassland habitats should be a priority and one of the primary factors in the design of preserves in the major amendment areas. This species is a rare migrant through the area.					
Buteo regalis Ferruginous hawk FSC*/SSC	22% of foraging habitat (11,600± acres) - 38% of grassland, 6% of agricultural fields	78% of foraging habitat (42,000± acres)	Preserve design/landscape level	Monitoring Plan - Habitat Based (10 grassland locations)	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered because 11,600± acres of potential foraging habitat will be conserved. This species is an uncommon winter visitor which forages in grasslands and agricultural fields. **Notes:** The plan will not adversely affect the species' long-term survival. Additional conservation of grassland habitats should be a priority and one of the primary factors in the design of preserves in the major amendment areas. This species is not known to nest within the MSCP study area.					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Aquila chrysaetos Golden eagle BEPA/SSC	53% of potential foraging/nesting habitat (coastal sage scrub, chaparral, grassland and oak woodland) (139,000± acres) - large blocks of habitat conserved in the eastern portion of the plan area where active nesting territories exist. Of the 11 active nesting territories (based on information from the Golden Eagle Survey Project, San Diego) which are fully or partially within the MSCP plan area, 7 nesting territories should remain viable.	Viability of 4 of the 11 active nesting territories (partially or fully within the plan area)	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Habitat Based and Management Plans/Directives (site-specific nest territories)	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS

DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED

This species will be covered by the MSCP because 53% of potential foraging and nesting habitat will be conserved. Local populations are not critical to, and the plan will not adversely affect, the species' long-term survival.

Notes: Fourteen active nesting territories occur primarily outside of the MSCP area (east and northeast of the plan area). Plans developed for these areas should include measures to conserve adequate habitat to maintain their viability. The following is an analysis of the plan's effects on each nesting territory within the MSCP study area:

1. Rancho San Diego- development under the plan will result in <10% loss of habitat in the nesting territory; nesting territory should remain viable.
2. East Otay Mountain- development under the plan will result in <5% loss of habitat in the nesting territory; nesting territory should remain viable.
3. Sequan Peak- between 30% and 40% of the habitat in the nesting territory could be developed; the nesting territory may not remain viable, but the steepness of the areas that could be developed may preclude enough development to keep the territory viable.
4. Loveland Reservoir- development under the plan will result in <20% loss of habitat in the nesting territory; nesting territory should remain viable.
5. Lake Jennings- between 40% and 60% of the habitat in the nesting territory could be developed under the plan; the nesting territory may not remain viable.
6. El Capitan- development under the plan will result in <15% loss of habitat within the nesting territory; the territory should remain viable.
7. San Vicente Reservoir- development under the plan will result in <30% of the high quality golden eagle habitat being developed, although low quality habitat (steep chaparral) could be developed, resulting in greater habitat loss within the nesting territory (although high density development is not likely to occur because of the steep slopes); the nesting territory may not be viable.

8 and 9. San Pasqual (two nesting territories)- development under the plan will result in <20% loss of habitat in the nesting territory; both nesting territories should remain viable.

10. Santee- development under the plan could result in 30%-40% loss of habitat in the nesting territory; nesting territory may not remain viable, although a significant amount of foraging habitat (Miramar and Mission Trails) occurs just outside of the territory and within normal foraging distances.
11. Lake Hodges- development under the plan will result in <20% loss of habitat in the nesting territory; nesting territory should remain viable.

Conditions: Area-specific management directives for areas with nest sites must include measures to avoid human disturbance while the nest is active, including establishing a 4,000-foot disturbance avoidance area within preserve lands.[4] Area-specific management directives must also include monitoring of nest sites to determine use/success.

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Falco peregrinus anatum American peregrine falcon FE/CE	61% of historic nesting sites - 58% of foraging habitat (89,400± acres) - 93% southern coastal saltmarsh, 99% of saltpan, 68% of freshwater marsh, 92% of open water, 88% of natural flood channel, 64% of coastal sage scrub, 38% of grassland	39% of foraging habitat (57,000± acres) - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level	Monitoring Plan - Habitat Based	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because more than 89,000 acres of potential foraging habitat will be conserved. **Notes:** This species has very low population numbers in the county, being primarily a rare fall and winter visitor. All three nest sites occur outside of the MHPA: one on Coronado Bridge, one on a crane in Port Authority jurisdiction, and one on Pt. Loma federal lands. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands.					
Rallus longirostris levipes Light-footed clapper rail FE/CE	93% of potential habitat (1,700± acres of southern coastal saltmarsh)	7% of potential habitat (120± acres) - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Site-specific preserve design and special measures/management	Management Plans/Directives	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 93% of its habitat will be conserved. **Notes:** Additional important habitat is found on military lands (Silver Strand) which are not included as part of the MSCP. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands. **Conditions:** Area-specific management directives must include active management of wetlands to ensure a healthy tidal saltmarsh environment and specific measures to protect against detrimental edge effects to this species.[4]					
Charadrius alexandrinus nivosus Western snowy plover FT/SSC	93% of potential habitat (650± acres) - 99% of saltpan, 90-95% of beach outside of intensively used recreational beaches	7% of potential habitat (46± acres) - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level with site-specific consideration(s)/ management	Area-specific Management Directives	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 93% of its potential habitat will be conserved. All breeding activity of western snowy plovers in the county occurs in saltpan habitat. No new development of beaches is authorized, which will result in 90-95% conservation of beach habitat that is outside of intensively used beach areas. **Notes:** Additional important habitat is found on military lands (Silver Strand) which are not part of the MSCP. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands. **Conditions:** Area-specific management directives must include protection of nesting sites from human disturbance during the reproductive season and specific measures to protect against detrimental edge effects to this species.[4] Incidental take (during the breeding season) associated with maintenance/removal of levees/dikes is not authorized except as specifically approved on a case-by-case basis by the wildlife agencies.					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Charadrius montanus Mountain plover C/SSC	22% of potential foraging habitat (11,600± acres) - 38% of grassland, 6% of agricultural fields	78% of potential foraging habitat (41,100± acres)	Preserve design/landscape level	Monitoring Plan - Habitat Based	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because over 11,000 acres of potential foraging habitat will be conserved. The plan will not adversely affect the species' long-term survival. **Notes:** This species is an uncommon winter visitor (primarily in the Tijuana River Valley) that forages in grasslands and agricultural fields. The MSCP conservation requirement for the Tijuana River Valley area is primarily 94%, with a small area identified as 75%. **Conditions:** Area-specific management directives for the Tijuana River Valley should specifically address the habitat requirements for this species.[4]					
Numenius americanus Long-billed curlew FSC*/SSC	24% of potential foraging habitat (13,500± acres) - 93% of southern coastal saltmarsh, 99% of saltpan, 38% of grassland, 6% of agricultural fields	76% of potential foraging habitat (42,800± acres) - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level	Monitoring Plan - Habitat Based	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species is a fairly common migrant and winter visitor. **Notes:** This species will be covered by the MSCP because more than 13,500 acres of potential foraging habitat will be conserved. The plan will not adversely affect the species' long-term survival. Additional conservation of grassland habitats should be a priority and one of the primary factors in the design of preserves in the major amendment areas. Additional habitat occurs on military lands (Silver Strand, San Diego Bay) which are not part of the MSCP. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands.					
Sterna elegans Elegant tern FSC*/SSC	93% of potential habitat (650± acres) - 99% of saltpan, 90-95% of beach outside of intensively used recreational beaches	7% of potential habitat (46± acres) - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level with site-specific consideration(s)/ management	Area-specific Management Directives	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 93% of its potential habitat will be conserved. **Notes:** All breeding activity of elegant terns in the county occurs in saltpan habitat. No new development of beaches is authorized, which will result in 90-95% protection of beach habitat that is outside of intensively used beach areas. Additional important foraging habitat (bay waters) is under the jurisdiction of the Port Authority and military and is not part of the MSCP. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands. **Conditions:** Area-specific management directives must include protection of nesting sites from human disturbance during reproductive season and specific measures to protect against detrimental edge effects to this species.[4] Incidental take (during the breeding season) associated with maintenance/removal of levees/dikes is not authorized except as specifically approved on a case-by-case basis by the wildlife agencies.					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Sterna antillarum browni California least tern FE/CE	93% of potential habitat (650± acres) -99% of saltpan, 90-95% of beach outside of intensively used recreational beaches	7% of potential habitat (46± acres) - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level	Area-specific Management Directives	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 93% of its potential habitat will be conserved. **Notes:** No new development of beaches is authorized, which will result in 90-95% conservation of beach habitat that is outside of intensively used beach areas. Additional important breeding habitat occurs on military lands (North Beach, Silver Strand, Naval Training Center) and is not part of the MSCP. Additional important foraging habitat (bay waters) is under the jurisdiction of the Port Authority and the military and is not part of the MSCP. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands. **Conditions:** Area-specific management directives must include protection of nesting sites from human disturbance during reproductive season, predator control, and specific measures to protect against detrimental edge effects to this species.[4] Incidental take (during the breeding season) associated with maintenance/removal of dikes/levees, beach maintenance/enhancement is not authorized except as specifically approved on a case-by-case basis by the wildlife agencies.					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Speotyto cunicularia hypugaea Burrowing owl FSC*/SSC	4 known locations (Spring Canyon, northeast of Brown Field, Lake Hodges), 8 known locations within major amendment area (South County segment), 4,000± acres of known habitat	8 known locations (Otay Ranch, San Pasqual Valley, and South County at border), 5,000± acres of known habitat	Site-specific preserve design and special measures/management	Monitoring Plan (10 grassland locations) and Area-specific Management Directives	YES

DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED

This species will be covered by the MSCP because 5,770± acres of potential and 4,000± acres of known suitable habitat (grassland vegetation community) will be conserved, including portions of Spring Canyon, San Pasqual Valley, Lake Hodges, Otay Mesa northeast of Brown Field, Otay Ranch, Otay River Valley, and Future Urbanizing Area 4.

Notes: Habitat enhancement opportunities for the species occur in the Spring Canyon, San Pasqual Valley, Lake Hodges, Otay Mesa northeast of Brown Field, Otay Ranch, Otay River Valley, and Future Urbanizing Area 4. The wildlife agencies will enhance and manage lands within their ownership to allow for relocation of burrowing owls, particularly in conjunction with burrowing owl removal programs in areas where their presence conflicts with nesting of California least terns. The wildlife agencies will attempt to achieve additional conservation of occupied burrowing owl habitat or habitat suitable for restoration using state and federal acquisition resources. Persistence of the species in San Diego County is also dependent on adequate conservation of known concentrations in the Santa Maria Valley in the vicinity of Ramona.

Conditions: During the environmental analysis of proposed projects, burrowing owl surveys (using appropriate protocols) must be conducted in suitable habitat to determine if this species is present and the location of active burrows. If burrowing owls are detected, the following mitigation measures must be implemented: within the MHPA, impacts must be avoided; outside of the MHPA, impacts to the species must be avoided to the maximum extent practicable; any impacted individuals must be relocated out of the impact area using passive or active methodologies approved by the wildlife agencies; mitigation for impacts to occupied habitat (at the subarea plan specified ratio) must be through the conservation of occupied burrowing owl habitat or conservation of lands appropriate for restoration, management, and enhancement of burrowing owl nesting and foraging requirements.

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Management plans/directives must include: enhancement of known, historical, and potential burrowing owl habitat and management for ground squirrels (the primary excavator of burrowing owl burrows). Enhancement measures may include creation of artificial burrows and vegetation management to enhance foraging habitat. Management plans must also include: monitoring of burrowing owl nest sites to determine use and nesting success; predator control; and establishing a 300 foot-wide impact avoidance area (within the preserve) around occupied burrows.[4] Eight known burrowing owl locations occur within major amendment areas of the South County Segment of the County Subarea Plan, and the conservation of occupied burrowing owl habitat must be one of the primary factors in preserve design during the permit amendment process.					
Empidonax traillii extimus Southwestern willow flycatcher FE/CE	76% of potential habitat (4,900± acres) - 93% of riparian woodland, 80% of riparian scrub - 88% of known localities	24% of potential habitat (1,400± acres) - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan -Habitat Based and Area-specific Management Directives	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 4,900± acres (76%) of potential habitat will be conserved. **Conditions:** Jurisdictions must require surveys (using appropriate protocols) during the CEQA review process in suitable habitat proposed to be impacted and incorporate mitigation measures consistent with the 404(b)1 guidelines into the project. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands. For new developments adjacent to preserve areas that create conditions attractive to brown-headed cowbirds, jurisdictions must require monitoring and control of cowbirds. Area-specific management directives must include measures to provide appropriate successional habitat, upland buffers for all known populations, cowbird control, and specific measures to protect against detrimental edge effects to this species. Any clearing of occupied habitat must occur between September 1 and May 1 (i.e., outside of the nesting period).					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Campylorhynchus brunneicapillus couesi Coastal cactus wren FSC*/SSC	60% of maritime succulent scrub habitat in large contiguous blocks (850± acres)	40% of maritime succulent scrub habitat in small isolated blocks (580± acres)	Site-specific preserve design and special measures/management	Monitoring Plan - Site Specific (31 locations) and Management Plans/ Directives	YES

DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED

This species is covered because four of five major populations are conserved, including populations at Lake Hodges/San Pasqual Valley, Lake Jennings, South Sweetwater Reservoir/San Miguel Ranch, and Salt Creek/Otay Mesa, and 60% (850 ± acres) of potential habitat will be conserved, allowing for expansion of the populations with management.

Notes: This species also uses other habitat types (coastal sage scrub and chaparral) containing cactus patches. Small clusters of birds at Black Mountain and Spring Valley will also be conserved. Conservation of the Salt Creek population is critical to the persistence of the species in San Diego County, and it would only be conserved under the City of Chula Vista's "Modified GDP B" alternative. The existing distribution of cactus wrens in the MSCP Plan area has been greatly reduced, and restoration of suitable cactus wren habitat and its management are important components of the MSCP Plan. Significant opportunities for restoration within the MHPA occur on Otay Ranch, Spring Canyon (and adjacent areas), Dennery Canyon, San Miguel Ranch, Lake Hodges/San Pasqual Valley, Otay River Valley, and Santee/Lake Jennings. The participating jurisdictions should seek OHV funds for restoration, as much of these areas has been heavily impacted by OHVs. The City of San Diego already has acquired habitat in Spring Canyon as mitigation. The City of San Diego and the wildlife agencies have agreed to make restoration of maritime succulent scrub in Spring Canyon a high priority. The USFWS also will make restoration of maritime succulent scrub a high priority on any lands it acquires in Spring Canyon.

Conditions: The restoration of maritime succulent scrub habitat as specified in the Otay Ranch RMP and GDP must occur at the specified 1:1 ratio. Area-specific management directives must include restoration of maritime succulent scrub habitat, including propagation of cactus patches, active/adaptive management of cactus wren habitat, monitoring of populations within preserves, and specific measures to reduce or eliminate detrimental edge effects.[4] No clearing of occupied habitat may occur from the period February 15 through August 15.

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Polioptila californica californica California gnatcatcher FT/SSC	73,300± acres of coastal sage scrub and interdigitated habitats in an interconnected network of preserves	67,300± acres of coastal sage scrub and interdigitated habitats	Preserve design/landscape level	Area-specific Management Directives (31 locations)	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because: over 73,300 acres of existing and potential gnatcatcher habitat will be conserved and linked together; over 81% of the core areas where the species occurs (Otay, San Miguel, Mission Trails, Santee, Kearny Mesa, Poway, San Pasqual, and Lake Hodges) will be conserved; and 65% (1,819 of 2,814) of the known locations will be conserved. **Notes:** 68% (57,874 acres) of habitat supporting core gnatcatcher populations, 70% (30,273 acres) of Very High value and 62% High value (4,609 acres) gnatcatcher coastal sage scrub habitat will be conserved. Critical habitat linkages between core areas will be conserved in a functional manner, with a minimum of 75% of the habitat within identified linkages conserved. Populations of this species also occur on military lands which are not part of the MSCP. **Conditions:** Area-specific management directives must include measures to reduce edge effects and minimize disturbance during the nesting period, fire protection measures to reduce the potential for habitat degradation due to unplanned fire, and management measures to maintain or improve habitat quality including vegetation structure.[4] No clearing of occupied habitat within the cities' MHPAs and within the County's Biological Resource Core Areas may occur between March 1 and August 15.					
Sialia mexicana Western bluebird none	59% of potential habitat (15,500± acres) - 58% of oak riparian forest, 47% of oak woodland, 38% of grassland	41% of potential habitat (12,100± acres) - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level	Monitoring Plan - Habitat Based	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because over 15,000 acres of habitat will be conserved. **Notes:** Persistence of this species in San Diego County depends largely on conservation of existing large populations on public lands east of the MSCP Plan area.					
Vireo bellii pusillus Least Bell's vireo FE/CE	81% of potential habitat (1,700± acres) - 93% of riparian woodland, 58% of oak riparian forest - 82-100% of major populations	19% of potential habitat (400± acres) - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level with site-specific consideration(s)/ management	Monitoring Plan - Habitat Based and Management Plans/Directives	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 1,700± acres (81%) of potential habitat will be conserved. **Conditions:** Jurisdictions will require surveys (using appropriate protocols) during the CEQA review process in suitable habitat proposed to be impacted and incorporate mitigation measures consistent with the 404(b)1 guidelines into the project. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands. Jurisdictions must require new developments, adjacent to preserve areas that create conditions attractive to brown-headed cowbirds, to monitor and control cowbirds. Area-specific management directives must include measures to provide appropriate successional habitat, upland buffers for all known populations, cowbird control, and specific measures to protect against detrimental edge effects to this species.[4] Any clearing of occupied habitat must occur between September 15 and March 15 (i.e., outside of the nesting period).					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Aimophila ruficeps canescens California rufous-crowned sparrow FSC*/SSC	61% of potential habitat (73,600± acres) - 64% of coastal sage scrub, 60% of maritime succulent scrub, 44% of coastal sage/chaparral - 71% of mapped localities	39% of potential habitat (46,600± acres) - 29% of mapped localities	Preserve design/landscape level	Monitoring Plan - Habitat Based	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 61% (73,600± acres) of potential habitat (including 71% of mapped localities) will be conserved. **Notes:** This species is tolerant of edge effects, small habitat patches, low shrub volume, and short-term habitat disturbance. **Conditions:** Area-specific management directives must include maintenance of dynamic processes, such as fire, to perpetuate some open phases of coastal sage scrub with herbaceous components.[4]					
Passerculus sandwichensis beldingi Belding's Savannah sparrow FSC*/CE	93% of potential habitat (1,700± acres of southern coastal saltmarsh) - 71% of mapped localities	7% of potential habitat (120± acres) - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level	Monitoring Plan - Habitat Based and Management Plans/Directives	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 93% (1,700± acres) of potential habitat (including 71% of mapped localities) will be conserved, and the remaining acres (120±) are subject to no net loss of value and function. **Notes:** Additional important habitat is found on military lands (Silver Strand, North Island, etc.) which are not part of the MSCP. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands. **Conditions:** Area-specific management directives must include specific measures to protect against detrimental edge effects to this species.[4]					
Passerculus sandwichensis rostratus Large-billed Savannah sparrow FSC*/SSC	93% of potential habitat (1,700± acres of southern coastal saltmarsh) - 50% of mapped localities	7% of potential habitat (120± acres) - wetlands are subject to no net loss of function and value and 404(b)1 guidelines	Preserve design/landscape level	Monitoring Plan - Habitat Based and Management Plans/Directives	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 93% (1,700± acres) of potential habitat (including 50% of mapped localities) will be conserved, and the remaining acres (120±) are subject to no net loss of value and function. **Notes:** Additional important habitat is found on military lands (Silver Strand, North Island, etc.) which are not part of the MSCP. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands. **Conditions:** Area-specific management directives must include specific measures to protect against detrimental edge effects to this species.[4]					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Ammodramus savannarum Grasshopper sparrow none	This species will not be covered by the MSCP because insufficient information is available to determine if adequate habitat is conserved.				NO
Agelaius tricolor Tricolored blackbird FSC*/SSC	77% of breeding habitat (4,800± acres) - 68% of freshwater marsh, 80% of riparian scrub - 59% of known localities	23% of breeding habitat (1,400± acres)	Preserve design/landscape level	Management Plans/ Directives	YES

DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED

This species will be covered by the MSCP because 77% of potential habitat (including 59% of mapped localities) will be conserved. Breeding colonies move from season to season, and with a goal of no net loss of wetlands, most of the suitable breeding sites will continue to be available. This species forages in grasslands and agricultural fields near its breeding habitat. Foraging habitat near the known nesting colonies will be conserved at 70-100%. Additionally, foraging opportunities will continue to be provided and created in turfed areas such as golf courses and cemeteries. Jurisdictions will require surveys during the CEQA review process in suitable breeding habitat proposed to be impacted. Participating jurisdictions' guidelines and ordinances and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands.

Conditions: Project approvals must require avoidance of active nesting areas during the breeding season. Area-specific management directives must include measures to avoid impacts to breeding colonies and specific measures to protect against detrimental edge effects to this species.[4]

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Mammals					
Corynorhinus townsendii pallescens Townsend's western big-eared bat FSC*/SSC	Unknown/Insufficient data on distribution and life history.				NO
Eumops perotis californicus California mastiff bat FSC*/SSC	Unknown/Insufficient data on distribution and life history.				NO
Perognathus longimembris pacificus Pacific pocket mouse FE/SSC	Unknown/Only 3 to 4 known populations in Southern California. Insufficient data on distribution and life history.				NO
Taxidea taxus American badger /SSC	58% of potential habitat (82,500± acres) - 38% of grassland, 64% of coastal sage scrub, 44% of coastal sage/chaparral	42% of potential habitat (58,300± acres)	Preserve design/landscape level	Monitoring Plan - Habitat Based	YES

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 82,500± acres (58%) of its potential habitat will be conserved. **Notes:** This species has a wide range, and the plan will not adversely affect the species' long-term survival. Additional conservation of grassland habitats should be a priority and one of the primary factors in the design of preserves in the major amendment areas. **Conditions:** Area-specific management directives must include measures to avoid direct human impacts to this species if it is present or likely to be present.[4]					
Felis concolor Mountain lion /protected	81% of core areas 5, 6, 7, 8, 9, 11, and 12 (105,000± acres) - connected by linkages C, D, N	19% of core areas (24,000± acres)	Preserve design/landscape level	Monitoring Plan - Habitat Based and Corridor Sites	YES
DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED This species will be covered by the MSCP because 81% of the core areas (105,000± acres) that support its habitat will be conserved. **Notes:** Although not considered sensitive, this species has aesthetic and intrinsic values, thereby being an important species to protect. This species has a wide range, and the plan will not adversely affect the species' long-term survival. The criteria used to define core and linkage areas involve maintaining ecosystem function and processes, including large animal movement. Each core area is connected to other core areas or to habitat areas outside of the MSCP either through common boundaries or through linkages. Core areas have multiple connections to help ensure that the balance in the ecosystem will be maintained. An extensive monitoring program will be implemented by the wildlife agencies to detect unanticipated changes in ecosystem function and allow for adaptive management of the preserve system. Specific design criteria for linkages and road crossings/undercrossings are included in subarea plans.					

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

SCIENTIFIC NAME COMMON NAME STATUS (Federal/State)[1]	CONSERVED[2] (BASED ON THE MSCP PLAN)	POTENTIALLY IMPACTED/ DEVELOPED (BASED ON THE MSCP PLAN)	GENERAL BASIS FOR ANALYSIS OF COVERAGE	MONITORING METHOD(S) (MONITORING PLAN AND/OR MANAGEMENT PLANS/ DIRECTIVES)	MEETS STATE & FEDERAL TAKE AUTHORIZATION STANDARDS
Odocoileus hemionus fuliginata Southern mule deer none	81% of core areas 5, 6, 7, 8, 9, 11, and 12 (105,000± acres) - connected by linkages C, D, N	19% of core areas (24,000± acres)	Preserve design/landscape level	Monitoring Plan - Habitat Based and Corridor Sites	YES

DETAILS OF RATIONALE FOR IDENTIFYING SPECIES AS COVERED

This species will be covered by the MSCP because 81% of the core areas (105,000± acres) that support its habitat will be conserved.

Notes: Although not considered sensitive, this broadly distributed species has aesthetic and intrinsic values, and is the only large native herbivore in the plan area, thereby making it an important species to protect. The criteria used to define core and linkage areas involve maintaining ecosystem function and processes, including large animal movement. Each core area is connected to other core areas or to habitat areas outside of the MSCP either through common boundaries or through linkages. Core areas have multiple connections to help ensure that the balance in the ecosystem will be maintained. An extensive monitoring program will be implemented by the wildlife agencies to detect unanticipated changes in ecosystem function and allow for adaptive management of the preserve system. Specific design criteria for linkages and road crossings/ undercrossings are included in subarea plans.

Table 3-5 (Continued)

SPECIES EVALUATED FOR COVERAGE UNDER THE MSCP

[1] Status (Federal/State)

FE=Federally Endangered	BEPA	=	Bald Eagle Protection Act	protected	=	moratorium on hunting
PE=Proposed for federal listing as Endangered	CE	=	State Endangered	none	=	no federal or state status
FT=Federally Threatened	CR	=	State Rare			
PT=Proposed for federal listing as Threatened	CT	=	State Threatened			
C=Candidate for federal listing	SSC	=	State Species of Special Concern			

FSC* = Federal species of concern; formerly Category 2 or Category 3 candidate for federal listing.
FSC† = Federal species of concern; proposed federal rule to list as Endangered or Threatened has been withdrawn.
Shading indicates federally and state listed species, species proposed for listing, candidate species, and NCCP target species.

[2] This column indicates the conservation level for the species. Not all major populations are in the GIS database, i.e., if specific locality data are lacking. In these cases, the percentage of major populations preserved is determined or estimated from the percentage of associated habitat in the MHPA.

[3] Measures to conserve population of species on the MSCP Plan's narrow endemic list must be incorporated into the subarea plans that do not have preserve/development areas specifically delineated based on site-specific surveys. The City of San Diego's and the County of San Diego's Subarea Plan areas are primarily where this requirement is applicable, and both subarea plans specify MSCP narrow endemic species conservation measures. Within the City of San Diego's MHPA, populations of MSCP narrow endemic species will be avoided.

The County will conserve MSCP narrow endemic species using a process that: (1) requires avoidance to the maximum extent possible; (2) allows for a maximum 20% encroachment into a population if total avoidance is not possible; and (3) requires mitigation at a 1:1 to 3:1 ratio (in-kind) for impacts if (1) avoidance and (2) minimization of impacts would result in no reasonable use of the property. The County requirements for (1) avoidance, (2) minimization, and (3) mitigation are specifically described in the County's proposed Biological Mitigation Ordinance (BMO).

[4] Area-specific management directives for preserve areas will include specific guidelines for managing and monitoring covered species and their habitats, including following best management practices. Edge effects may include (but are not limited to) trampling, dumping, vehicular traffic, competition with invasive species, parasitism by cowbirds, predation by domestic animals, noise, collecting, recreational activities, and other human intrusion.

[5] The County's proposed BMO includes a list of sensitive plant species (Groups A and B) that require special consideration in project design. The County will conserve Groups A and B species using a process that: (1) requires avoidance to the maximum extent possible; (2) allows for a maximum 20% encroachment into a population if total avoidance is not possible; and (3) requires mitigation at a 1:1 to 3:1 ratio (in-kind) for impacts if (1) avoidance and (2) minimization of impacts would result in no reasonable use of the property.

Source: 1996 MSCP GIS database. Military lands excluded from analysis.

Appendix C
1991 NCCPA and Relevant Sections of 2003 NCCPA

In 1991, California's NCCPA (California Fish and Game Code, Section 2800 et seq.) was enacted to implement broad-based planning that balances appropriate development and growth with conservation of wildlife and habitat. The 1991 NCCPA was repealed and replaced with a substantially revised and expanded NCCPA in 2002. While the revised NCCPA established new standards and guidance on many facets of the program, including scientific information, public participation, biological goals, interim project review, and approval criteria, amendments to the NCCPA enacted effective January 1, 2003 (Section 2830[b][2]) expressly provide that Subarea Plans for the San Diego MSCP will be solely governed in accordance with the NCCPA as it read on December 31, 2001. Copies of the 1991 NCCPA and Section 2830 of the 2003 NCCPA are included in this appendix.

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NCCP Act 1991

CHAPTER 765

An act to add Chapter 10 (commencing with Section 2800) to Division 3 of the Fish and Game Code, relating to fish and game, and making an appropriation therefor.

[Approved by Governor October 9, 1991. Filed with Secretary of State October 10, 1991.]

The people of the State of California do enact as follows:

SECTION 1. The Legislature finds and declares all of the following:

(a) The continuing population growth in California will result in increasing demands for dwindling natural resources and result in the continuing decline of the state's wildlife.

(b) There is a need for broad-based planning to provide for effective protection and conservation of the state's wildlife heritage while continuing to allow appropriate development and growth.

(c) Natural community conservation planning is an effective tool in protecting California's natural diversity while reducing conflicts between protection of the state's wildlife heritage and reasonable use of natural resources for economic development.

(d) Natural community conservation planning promotes coordination and cooperation among public agencies, landowners, and other private interests, provides a mechanism by which landowners and development proponents can effectively participate in the resource conservation planning process, provides a regional planning focus which can effectively address cumulative impact concerns, minimizes wildlife habitat fragmentation, promotes multispecies management and conservation, provides one option for identifying and ensuring appropriate mitigation for impacts on fish and wildlife, and promotes the conservation of broad based natural communities and species diversity.

(e) Natural community conservation planning can provide for efficient use and protection of natural and economic resources while promoting greater sensitivity to important elements of the state's critical natural diversity.

(f) Natural community conservation planning is an effective planning process which can facilitate early coordination to protect the interest of the state, the federal government, and local public agencies, landowners, and other private parties.

(g) Natural community conservation planning is a mechanism that can provide an early planning framework for proposed development projects within the planning area in order to avoid, minimize, and compensate for project impacts to wildlife.

(h) Natural community conservation planning is consistent with and will support the fish and wildlife management activities of the Department of Fish and Game in its role as the trustee for fish and

wildlife within the state.

(i) The purpose of natural community conservation planning is to sustain and restore those species and their habitat identified by the Department of Fish and Game which are necessary to maintain the continued viability of those biological communities impacted by growth and development.

SEC. 2. Chapter 10 (commencing with Section 2800) is added to Division 3 of the Fish and Game Code, to read:

CHAPTER 10. NATURAL COMMUNITY CONSERVATION PLANNING

2800. This chapter shall be known and may be cited as the Natural Community Conservation Planning Act.

2805. The definitions in this section govern the construction of this chapter.

(a) "Natural community conservation plan" means the plan prepared pursuant to an agreement entered into in accordance with subdivision (a) of Section 2810. The plan identifies and provides for the regional or areawide protection and perpetuation of natural wildlife diversity, while allowing compatible and appropriate development and growth.

(b) "Wildlife" has the same meaning as defined in Section 711.2.

(c) "Person" has the same meaning as defined in Section 711.2.

2810. The department may enter into agreements with any person for the purpose of preparing and implementing a natural community conservation plan to provide comprehensive management and conservation of multiple wildlife species, including, but not limited to, those species listed pursuant to Article 2 (commencing with Section 2070) of Chapter 1.5. The agreement shall include cost reimbursement provisions pursuant to Section 2840.

2820. Natural community conservation planning may be undertaken by local, state, and federal agencies independently or in cooperation with other persons. The plan shall be consistent with the agreement entered into pursuant to Section 2810 and shall be approved by the department for implementation upon meeting the standards established by the department for natural community conservation.

2825. (a) The department may prepare nonregulatory guidelines for the development and implementation of natural community conservation plans. The guidelines are exempt from Chapter 3.5 (commencing with Section 11340) of Division 3 of Title 2 of the Government Code. The guidelines may include, but are not limited to, all of the following:

(1) Defining the scope of a conservation planning area.

(2) Determining conservation standards, guidelines, and objectives for the planning area.

(3) Appointing one or more advisory committees to review and make recommendations regarding the preparation and

implementation of natural community conservation plans.

(4) Coordinating with local, state, and federal agencies.

(5) Incorporating public input.

(6) Ensuring compatibility with the federal Endangered Species Act (16 U.S.C. Sec. 1531 et seq.).

(7) Obtaining approval of the natural community conservation plan by the department.

(8) Provisions for implementation of the plan.

(9) Monitoring and reporting on plan implementation.

(10) Amending the plan consistent with the initial intent of the plan.

(b) Nothing in this chapter exempts projects proposed in a natural community conservation planning area from the requirements of the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code).

(c) Natural community conservation plans, as appropriate, shall be implemented pursuant to Section 2081.

(d) To the extent practicable, implementation of natural community conservation plans shall use the services of either the California Conservation Corps or local community conservation corps.

2830. Upon recommendation of the department, the commission may authorize, pursuant to Section 2084, the taking of any candidate species whose conservation, protection, restoration, and enhancement is provided for in a department approved natural community conservation plan consistent with paragraph (6) of subdivision (a) of Section 2825.

2835. The department may permit the taking, as provided in this code, of any identified species whose conservation and management is provided for in a department approved natural communities conservation plan.

2840. (a) The department shall be compensated for the actual costs incurred in participating in the preparation and implementation of natural community conservation plans. These costs may include consultation with other parties to agreements authorized by Section 2810, providing and compiling wildlife and wildlife habitat data, reviewing and approving the final plan, monitoring implementation of the plan, and other activities necessary to the preparation and implementation of a plan.

(b) The department shall be compensated for those expenses identified in subdivision (a) according to a schedule in the agreement authorized by Section 2810.

SEC. 3. This act does not apply to any agreement for the preparation of a habitat conservation plan or natural community conservation plan approved by the Director of Fish and Game at the time of enactment of this act.

111700

NCCP Act 2003, Section 2830

2823. The department shall suspend or revoke any permit, in whole or in part, issued for the take of a species subject to Section 2835 if the continued take of the species would result in jeopardizing the continued existence of the species.

2825. The department may adopt regulations for the development and implementation of natural community conservation plans consistent with this chapter.

2826. Nothing in this chapter exempts a project proposed in a natural community conservation planning area from Division 13 (commencing with Section 21000) of the Public Resources Code or otherwise alters or affects the applicability of that division.

2827. To the extent practicable, implementation of natural community conservation plans shall use the services of either the California Conservation Corps or local community conservation corps.

2828. Nothing in this chapter prohibits a local government from exercising any power or authority granted to it pursuant to state law to acquire land or water to implement a plan.

2829. (a) The department may be compensated for the actual costs incurred in participating in the preparation and implementation of natural community conservation plans. These costs may include consultation with other parties to agreements authorized by Section 2810, providing and compiling wildlife and wildlife habitat data, reviewing and approving the final plan, monitoring implementation of the plan, and other activities necessary to the preparation and implementation of a plan.

(b) The department may be compensated for those expenses identified in subdivision (a) according to a schedule in the agreement authorized by Section 2810.

2830. Nothing in this chapter prohibits the taking or the incidental take of any identified species if the taking is authorized by the department pursuant to any of the following:

(a) A natural community conservation plan or amended plan approved by the department prior to January 1, 2002. Any permits, plans, implementation agreements, and amendments to those permits, plans, or implementation agreements described in this section are deemed to be in full force and effect as of the date approved or entered into by the parties insofar as they authorize the take of identified species

pursuant to an approved natural community conservation plan and shall be governed solely by former Chapter 10 (commencing with Section 2800) as it read on December 31, 2001.

(b) Any natural community conservation plan, or subarea plan, approved, or amended on or after January 1, 2002, for which a planning or enrollment agreement meets any of the following criteria, which shall be solely governed in accordance with former Chapter 10 (commencing with Section 2800) as it read on December 31, 2001:

(1) The natural community conservation plan was entered into between the department and plan participants prior to January 1, 2001, and is carried out pursuant to Rule 4(d) for the California Gnatcatcher (Federal Register Volume 58, December 10, 1993), including the southern subregion of Orange County.

(2) The natural community conservation plan was prepared pursuant to the planning agreement for the San Diego Multiple Species Conservation Plan.

(3) The natural community conservation plan was prepared pursuant to the planning agreement for the San Diego Multiple Habitat Conservation Plan.

(c) Any programmatic natural community conservation plan approved by the department on or before January 1, 2002.

(d) Any natural community conservation plan developed pursuant to a planning or enrollment agreement executed on or before January 1, 2001, and for which the department finds that the plan has been developed using a public participation and scientific analysis process substantially in conformance with the intent of paragraph (5) of subdivision (b) of Section 2810 and Section 2815.

(e) Any natural community conservation plan developed pursuant to a planning agreement executed on or before January 1, 2002, and which the department finds is in substantial compliance with Section 2820.

(f) (1) Any natural community conservation plan or subarea plan initiated on or before January 1, 2000, or amendments thereto, by Sweetwater Authority, Helix Water District, Padre Dam Municipal Water District, Santa Fe Irrigation District, or the San Diego County Water Authority, which the department determines is consistent with the approved San Diego Multiple Habitat Conservation Program or the San Diego Multiple Species Conservation Program, is exempt from Section 2810, and paragraph (1) of subdivision (a) of Section 2820, except as provided in paragraph (2), if the department finds that the plan has been developed and is otherwise in conformance with this chapter.

(2) The public water agencies identified in this subdivision and the department shall include independent scientific input as described in subparagraphs (A) to (D), inclusive, of paragraph (5) of subdivision (b) of Section 2810 into the proposed plans in a manner that focuses on the covered species that are proposed for take authorization and that are not otherwise covered in the San Diego Multiple Species Conservation Program or the San Diego Multiple Habitat Conservation Program.

The scientific input required by this paragraph shall be based on the best and most current scientific data generally available, and shall assure that documentation for coverage of all species is equal or greater than the San Diego Multiple Habitat Conservation Program.

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Appendix D
Hardline Development Project
Vernal Pool and Wetlands Mitigation Plan

This appendix contains the hardline development project (Fanita Ranch) vernal pool and wetlands mitigation plan. This plan was developed as an appendix (Appendix C) to the:

> Habitat Mitigation and Monitoring Plan, Fanita Ranch Project, Santee California. U.S Army Corps of Engineers File No. SPL-2016-00574-AJW, Regional Water Quality Control Board 401 Certification No. [TBD] California Department of Fish and Wildlife [TBD]. Prepared for HomeFed Fanita Rancho LLC. Prepared by Dudek. March 2025.

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Vernal Pool and Wetlands Mitigation Plan

Fanita Ranch Project Santee, California

U.S. Army Corps of Engineers File No. SPL-2016-00574-AJW Regional Water Quality Control Board 401 Certification No. [TBD] California Department of Fish and Wildlife [TBD]

MARCH 2025

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Summary

The proposed mitigation outlined in this habitat mitigation and monitoring plan for the Fanita Ranch Project (project or proposed project) is intended to compensate for impacts to jurisdictional aquatic resources associated with implementation of the project. The proposed project would be a new community consisting of a development clustered into three villages to preserve natural open space areas, drainages, and key wildlife corridors. The remaining portion of the project site would continue to function as open space, including a 1,650-acre open space hardline Fanita Ranch Habitat Preserve (Habitat Preserve), which would include preservation, management, rehabilitation, and enhancement of existing basins and the creation of new basins. Although the Draft Santee Multiple Species Conservation Plan Subarea Plan (City of Santee 2018) has not yet been approved or permitted, development of the project will help contribute 1,650 acres to the targeted 171,917 acres within the Multi-Habitat Planning Area for conservation (City of San Diego 1998). Therefore, mitigation occurring within the Habitat Preserve will occur within the Multiple Species Conservation Plan's Multi-Habitat Planning Area designated lands.

Implementation of the project would result in unavoidable impacts to U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (CDFW)-jurisdictional non-wetland waters, wetlands, and vernal pool basin resources (i.e., vernal pools and non-wetland water basins). Mitigation for project impacts is required under the state Porter–Cologne Act, as determined by the San Diego RWQCB, Sections 404 and 401 of the federal Clean Water Act, and Section 1602 of the California Fish and Game Code.

This plan provides the mitigation strategy for the re-establishment/creation, rehabilitation, and enhancement of on-site vernal pool resources as compensatory mitigation for project impacts. All vernal pool mitigation would occur within the on-site Habitat Preserve. Impacts to USACE, RWQCB, and CDFW-jurisdictional aquatic resources will be mitigated through a combination of preservation, enhancement, rehabilitation, and re-establishment/creation of vernal pool habitat and upland watershed buffers. Additional mitigation requirements would be fulfilled through preservation of existing USACE/RWQCB/CDFW-jurisdictional areas within the Habitat Preserve associated with Sycamore Canyon Creek. This plan has been developed in cooperation with and incorporates input from USACE and RWQCB. This plan is intended to comply with Section 404 and 401 permit/certification by USACE and RWQCB and Section 1602 of the California Fish and Game Code, as well as to meet Endangered Species Act requirements.

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1 Project Information

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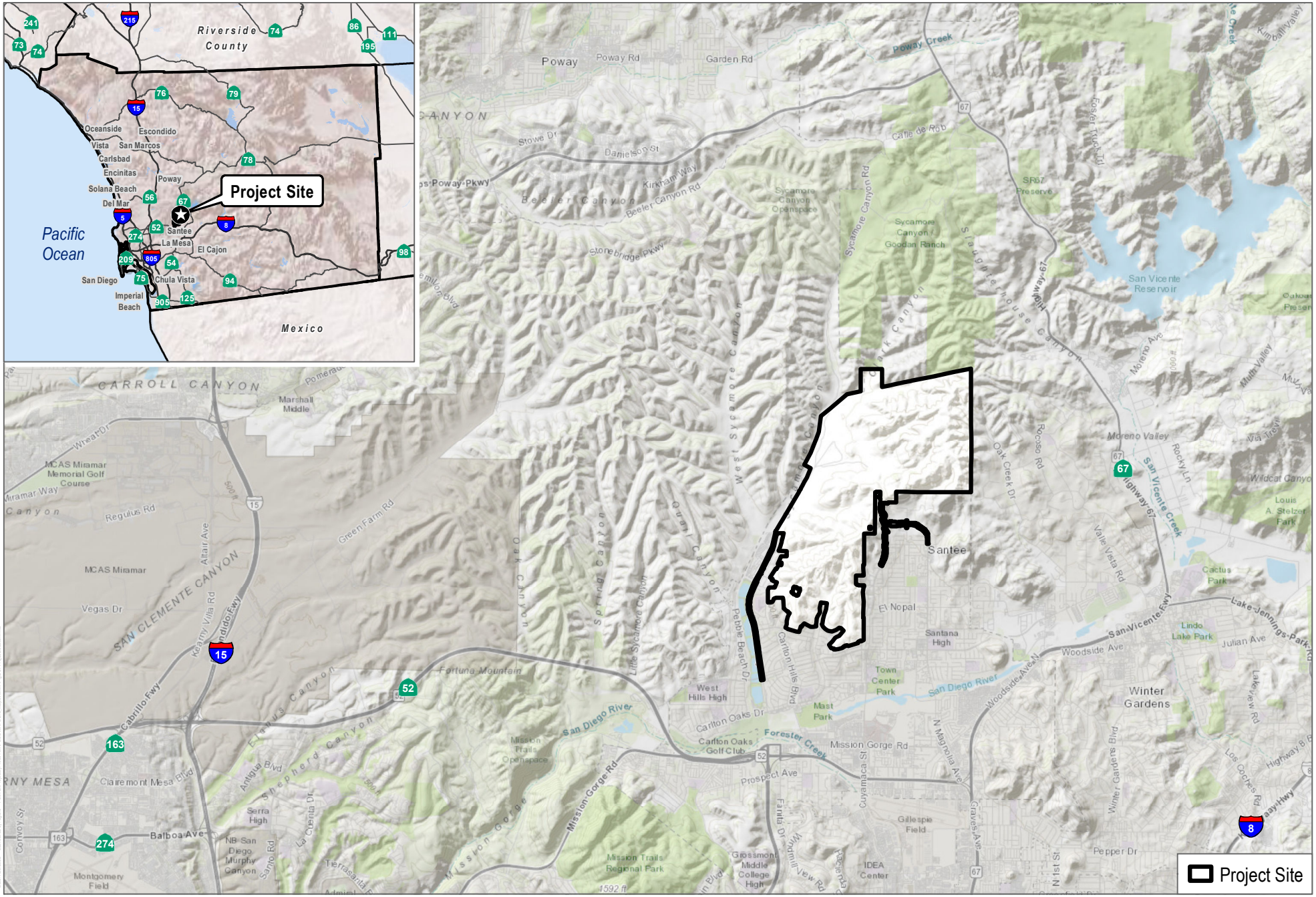
1.2 Project Location and Surrounding Land Uses

The Fanita Ranch Project (project or proposed project) is located in the northwest portion of the City of Santee (City) in central San Diego County (County), California (Figure 1, Project Location). The project is bordered primarily by City residential neighborhoods to the south and the unincorporated residential communities of Lakeside and Eucalyptus Hills to the east. To the northeast, separated by a large hillside, active mining operations occur in Slaughterhouse Canyon. To the north, Sycamore Canyon Open Space preserve, which is owned by the County, and unincorporated vacant lands border the project site. Farther north lies the Goodan Ranch Regional Park, which is jointly owned by the Cities of Santee and Poway, the County, and the State of California. To the west of the project site lie the Marine Corps Air Station (MCAS) Miramar and the Santee Lakes Recreation Preserve, which is owned and operated by Padre Dam Municipal Water District.



SOURCE: USGS Topographic World Map; SANGIS 2021

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FIGURE 1

Project Location

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project

2 Project Impacts and Mitigation

Pursuant to the Porter–Cologne Act, Sections 401 and 404 of the federal Clean Water Act, and Section 1602 of the California Fish and Game Code, direct impacts to jurisdictional aquatic resources, including vernal pools and non-wetland water basins, require mitigation. Impacts to jurisdictional aquatic resources will be mitigated to meet U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (CDFW) requirements through restoration, enhancement, creation, and preservation of vernal pools within the project's Fanita Ranch Habitat Preserve (Habitat Preserve). Table 1 summarizes the impacts to USACE-jurisdictional aquatic resources, Table 2 summarizes the impacts to RWQCB resources, and Table 3 summarizes the impacts to CDFW resources. The majority of USACE, RWQCB, and CDFW aquatic resources overlap, and the tables should not be summed.

Table 1. Impacts and Conservation/Avoidance of USACE-Jurisdictional Aquatic Resources (acres)

Habitat Types/ Vegetation Communities	Project Site Total[1]	Section 404 Wetlands and Waters Avoided and Conserved[2]	Permanent Impacts[3]		
			On Site	Off Site	Total
Non-Wetland Waters of the United States					
Stream channel[4]	10.63	6.52	4.04	0.06	4.10
Basin	0.051	0.038	0.012	—	0.012
Non-wetland waters	*10.68*	*6.56*	*4.06*	*0.06*	*4.11*
Wetlands					
Cismontane alkali marsh	0.39	0.39	—	—	—
Disturbed wetland	0.06	0.06	—	—	—
Freshwater marsh (including disturbed)	0.10	—	0.10	—	0.10
Mulefat scrub	1.28	1.13	0.15	—	0.15
Southern arroyo willow riparian forest	1.54	1.54	—	—	—
Southern willow scrub (including disturbed)	0.41	0.04	0.36	—	0.36
Vernal pool	0.046	0.043	0.003	—	0.003
Wetlands	*3.84*	*3.21*	*0.62*	—	*0.62*
Total	**14.51**	**9.78**	**4.68**	**0.06**	**4.74**

Notes: Totals may not sum due to rounding.

1 Project site includes both on-site and off-site areas, as well as overlap with RWQCB-jurisdictional aquatic resources.

2 Total includes jurisdictional aquatic resources within the Habitat Preserve, Impact Neutral areas (i.e., areas not impacted by the proposed project but not included in the Habitat Preserve), and rehabilitation of 0.044 acres of existing USACE-jurisdictional basins (0.011 acres) and vernal pools (0.033 acres) currently located within the Habitat Preserve. Refer to Table 10 for details on rehabilitation of these USACE-jurisdictional basins and vernal pools.

3 Temporary impacts would occur from the grading buffer and manufactured slopes, which are unlikely to provide in-place restoration. Therefore, temporary impacts are included in the permanent impact total.

4 Intermittent and ephemeral streams are both included under this habitat type.

Table 2. Impacts and Avoidance of RWQCB-Jurisdictional Aquatic Resources (acres)

Habitat Types/ Vegetation Communities	Project Site Total[1]	Section 401 Wetlands and Waters Avoided and Conserved[2]	Permanent Impacts[3]		
			On Site	Off Site	Total
Non-Wetland Waters of the United States					
Non-vegetated channel[4]	13.98	9.17	4.71	0.10	4.81
Basin	0.051	0.038	0.012	—	0.012
Non-wetland waters	*14.03*	*9.21*	*4.73*	*0.10*	*4.82*
Wetlands					
Cismontane alkali marsh	0.39	0.39	—	—	—
Disturbed wetland	0.06	0.06	—	—	—
Freshwater marsh (including disturbed)	0.10	—	0.10	—	0.10
Mulefat scrub	1.28	1.13	0.15	—	0.15
Southern arroyo willow riparian forest	1.54	1.54	—	—	—
Southern willow scrub (including disturbed)	0.41	0.04	0.36	—	0.36
Vernal pool	0.046	0.043	0.003	—	0.003
Wetlands	*3.84*	*3.21*	*0.62*	—	*0.62*
Total	**17.87**	**12.42**	**5.35**	**0.10**	**5.44**

Notes: Totals may not sum due to rounding.

1 Project site includes both on-site and off-site areas, as well as overlap with the majority of USACE-jurisdictional aquatic resources.

2 Total includes jurisdictional aquatic resources within the Habitat Preserve, Impact Neutral areas (i.e., areas not impacted by the proposed project but not included in the Habitat Preserve), and rehabilitation of 0.044 acres of existing USACE/RWQCB/CDFW-jurisdictional basins (0.011 acres) and vernal pools (0.033 acres) currently located within the Habitat Preserve. Refer to Table 10 for details on rehabilitation of these jurisdictional basins and vernal pools.

3 Temporary impacts would occur from the grading buffer and manufactured slopes, which are unlikely to provide in-place restoration. Therefore, temporary impacts are included in the permanent impact total.

4 Intermittent and ephemeral streams, as well as swales, are all included under this habitat type.

Table 3. Impacts and Conservation/Avoidance of CDFW-Jurisdictional Aquatic Resources (acres)

Habitat Types/ Vegetation Communities	Project Site Total[1]	Avoided and Conserved[2]	Permanent Impacts[3]		
			On Site	Off Site	Total
Streambeds					
Stream channel[4]	10.63	6.52	4.04	0.06	4.10
Basin	0.051	0.038	0.012	—	0.012
Streambeds	*10.68*	*6.56*	*4.06*	*0.06*	*4.11*
Riparian Habitat					
Arundo-dominated riparian	1.40	0.02	1.38	—	1.38
Cismontane alkali marsh	0.39	0.39	—	—	—
Coast live oak woodland	25.03	22.65	2.38	—	2.38

Table 3. Impacts and Conservation/Avoidance of CDFW-Jurisdictional Aquatic Resources (acres)

Habitat Types/ Vegetation Communities	Project Site Total[1]	Avoided and Conserved[2]	Permanent Impacts[3]		
			On Site	Off Site	Total
Disturbed wetland	0.12	0.07	0.05	—	0.05
Freshwater marsh (including disturbed)	0.14	—	0.14	—	0.14
Mulefat scrub	1.85	1.31	0.54	—	0.54
Southern arroyo willow riparian forest	1.54	1.54	—	—	—
Southern sycamore-alder riparian woodland	3.15	2.95	0.21	—	0.21
Southern willow scrub (including disturbed)	1.33	0.04	1.28	—	1.28
Vernal pool	0.046	0.043	0.003	—	0.003
Riparian Habitat	*35.01*	*29.03*	*5.99*	—	*5.99*
Total	**45.69**	**35.59**	**10.04**	**0.06**	**10.10**

Notes: Totals may not sum due to rounding.

1 Project site includes both on-site and off-site areas, as well as overlap with USACE/RWQCB-jurisdictional aquatic resources.

2 Total includes jurisdictional aquatic resources within the Habitat Preserve, impact neutral areas (i.e., areas not impacted by the proposed project but not included in the Habitat Preserve), and rehabilitation of 0.044 acres of existing USACE/RWQCB/CDFW jurisdictional basins (0.011 acres) and vernal pools (0.033 acres) currently located within the Habitat Preserve. Refer to Table 10 for details on rehabilitation of these jurisdictional basins and vernal pools.

3 Temporary impacts would occur from the grading buffer and manufactured slopes, which are unlikely to provide in-place restoration. Therefore, temporary impacts are included in the permanent impact total.

4 Intermittent and ephemeral streams are both included under this habitat type.

The Habitat Preserve currently contains an extensive existing trail system, much of which is subject to frequent unauthorized off-road vehicular traffic and unauthorized human activities that have been detrimental to the sensitive habitats on site. The project would involve the following regarding the trail system within the Habitat Preserve: close off and revegetate a large proportion of the existing trails, retain a portion of the existing trails for pedestrian and bicycle use, and create new trails to avoid sensitive resources (i.e., vernal pools, willowy monardella [*Monardella viminea*] locations, and ridges and hilltops suitable for Quino checkerspot butterfly [*Euphydryus editha quino*]) within the Habitat Preserve. Any portion of a trail occurring with the 12 proposed vernal pool watershed areas would be adjusted to upland areas outside the watershed area. The proposed Habitat Preserve trails would be approximately 2.5 feet wide and composed of either compacted earth or decomposed granite. Trails that cross smaller drainages would be created through the use of dry fords, stepping stones, or boulders. Trails that cross larger drainages would have a puncheon or pedestrian bridge and/or open-bottom culverts, such as a multiplate structure. Puncheon bridges would be constructed outside the ordinary high water mark. All impacts from trails occurring within the Habitat Preserve were quantified; at locations where they overlap USACE, RWQCB, and CDFW-jurisdictional aquatic resources, those impacts are included in the permanent impact totals summarized in Tables 1–3. It should be noted that there are no proposed trails crossing drainages within the southern portion of the Habitat Preserve.

2.1 Mitigation for Impacts

Implementation of the proposed project will result in a total of 4.74 acres of impacts to USACE-jurisdictional aquatic resources, 5.44 acres of impacts to RWQCB-jurisdictional aquatic resources, and 10.10 acres of impacts to CDFW-jurisdictional aquatic resources. The mitigation approach described in this habitat mitigation and monitoring plan (HMMP) consists of restoring, enhancing, creating, and preserving vernal pools, wetlands, and non-wetland waters, as well as their surrounding upland watersheds and buffers, within the project's on-site Habitat Preserve. This involves establishment/creation of vernal pools within degraded areas of the site where appropriate hardpan and clay soils exists, rehabilitation of existing low-functioning vernal pools, restoration and enhancement of existing upland habitat, and preservation of existing USACE-jurisdictional resources (collectively referred to as waters of the United States), including non-wetland waters (intermittent and ephemeral) and wetlands; a 50-foot upland buffer surrounding these USACE aquatic resources is also proposed. These areas would be managed and conserved in perpetuity through establishment of a conservation easement and in-perpetuity funding. Mitigation activities will involve reconfiguration and reconstruction of the mima mounds and basins on site (as appropriate), removal of weedy vegetation, revegetation of the mounds and surrounding upland buffers with upland sage scrub and native grassland species, and inoculation of the vernal pools with appropriate plant and wildlife species.

Based on project impacts, the total USACE-required mitigation is 12.34 acres (i.e., sum of mitigation totals in Tables 4A–4C) of various mitigation types. Vernal pool mitigation within the Habitat Preserve will provide 4.12 acres of USACE-jurisdictional vernal pool establishment credit, 0.43 acres of USACE-jurisdictional vernal pool rehabilitation credit, and 0.17 acres of USACE-jurisdictional vernal pool preservation credit. Vernal pool mitigation will be performed within 12 locations of disturbed upland and degraded vernal pool habitat within the Habitat Preserve with a total watershed of 33.30 acres (Figures 2A–2C, USACE Vernal Pool and Wetland Mitigation Areas). Mitigation would also include 2.55 acres of USACE wetland preservation credit within the Habitat Preserve. The remaining mitigation would be provided through 3.55 acres of non-wetland waters preservation and 51.45 acres of the surrounding 50-foot upland buffer to meet USACE mitigation requirements. The USACE waters of the United States preservation areas are shown on Figures 2A–2C.

Based on project impacts, the RWQCB-required mitigation totals 15.12 acres (i.e., sum of mitigation totals in Tables 5A–5C) of various mitigation types. Vernal pool mitigation within the Habitat Preserve will provide 4.12 acres of RWQCB-jurisdictional vernal pool establishment credit, 0.43 acres of RWQCB-jurisdictional vernal pool rehabilitation credit, and 0.17 acres of RWQCB-jurisdictional vernal pool preservation credit. Vernal pool mitigation will be performed within 12 locations of disturbed upland and degraded vernal pool habitat within the Habitat Preserve with a total watershed of 33.30 acres (Figures 3A–3C). Mitigation would also include 2.55 acres of RWQCB wetland preservation credit within the Habitat Preserve. The remaining mitigation would be provided through preservation of 6.80 acres of RWQCB non-wetland waters and rehabilitation of 1.08 acres of non-wetland waters to meet RWQCB mitigation requirements. The RWQCB preservation areas are shown on Figures 3A–3E.

Based on project impacts, the total CDFW-required mitigation is 42.51 acres (i.e., sum of mitigation totals in Tables 6A–6C) of various mitigation types. Vernal pool mitigation within the Habitat Preserve will provide 4.12 acres of CDFW-jurisdictional vernal pool establishment credit, 0.43 acres of CDFW-jurisdictional vernal pool rehabilitation credit, and 0.17 acres of CDFW-jurisdictional vernal pool preservation credit. Vernal pool mitigation will be performed within 12 locations of disturbed upland and degraded vernal pool habitat within the Habitat Preserve with a total watershed of 33.30 acres (Figures 4A–4C). Mitigation would also include 26.45 acres of CDFW riparian habitat preservation credit within the Habitat Preserve. The remaining mitigation would be provided through preservation of 6.16 acres of CDFW streambeds and 5.18 acres of off-site mitigation at the

Lakeside mitigation parcel through rehabilitation and enhancement of riparian habitat. The CDFW mitigation areas are shown on Figures 4A–4E.

Existing permanently impacted features and existing features proposed for rehabilitation within the Habitat Preserve that support San Diego fairy shrimp (*Branchinecta sandiegonensis*), western spadefoot (*Spea hammondii*), and vernal pool indicator plant species (i.e., source features) will have the top 1–3 inches of soil removed and set aside prior to mass grading. This soil will be kept in a dry location until it is deposited into the new features. Once the created or rehabilitated pools are proven to hold water for the appropriate amount of time, they will be inoculated with the soil from the source features. The inoculum will be spread within rehabilitated and created pools with suitable conditions to support San Diego fairy shrimp and western spadefoot life history as a voluntary measure to encourage the creation of a minimum of 0.37 acres of occupied habitat. The 0.37-acre total is based on the presence of San Diego fairy shrimp within the development area. The acreage of surface area that will be created will be verified using on-site soil hydrological properties (ponding depths and surface flow indicators) and modeling of rainfall seasons.

2.1.1 U.S. Army Corps of Engineers

Vernal pool mitigation and preservation of USACE-jurisdictional wetlands and non-wetland waters, including surrounding 50-foot upland buffers, occurring within the on-site Habitat Preserve will provide mitigation for the 4.74 acres of USACE-jurisdictional aquatic resource impacts based on the mitigation ratios outlined in Tables 4A–4C.

Table 4A. Impacts to USACE-Jurisdictional Vernal Pools/Basins and Required Mitigation

Habitat Types/ Vegetation Communities	Permanent Impacts (acres)	Mitigation Ratio[1]	Mitigation Required (acres)
Non-Wetland Waters of the United States			
Basin	0.012	1.9:1	0.023
Wetlands			
Vernal pool	0.003	2.9:1	0.009
Total	**0.015**	**—**	**0.032**

Notes: Totals may not sum due to rounding.

[1] Mitigation provided would be vernal pool establishment; ratios are based on the USACE mitigation checklists associated with impacts to the habitat types/vegetation communities listed.

Table 4B. Impacts to USACE-Jurisdictional Wetlands and Required Mitigation

Habitat Types/ Vegetation Communities	Permanent Impacts (acres)	Mitigation Ratio[1]	Mitigation Required (acres)
Wetlands			
Cismontane alkali marsh	—	—	—
Disturbed wetland	—	—	—
Freshwater marsh (including disturbed)	0.10	1.55:1	0.16
Mulefat scrub	0.15	1.55:1	0.24
Southern arroyo willow riparian forest	—	—	—

Table 4B. Impacts to USACE-Jurisdictional Wetlands and Required Mitigation

Habitat Types/ Vegetation Communities	Permanent Impacts (acres)	Mitigation Ratio[1]	Mitigation Required (acres)
Southern willow scrub (including disturbed)	0.36	1.55:1	0.56
Total	**0.62**	—	**0.96**

Notes: Totals may not sum due to rounding.

1 Mitigation provided would be vernal pool establishment; ratios are based on the USACE mitigation checklists associated with impacts to the habitat types/vegetation communities listed.

Table 4C. Impacts to USACE-Jurisdictional Non-Wetland Waters and Required Mitigation

Habitat Types/ Vegetation Communities	Permanent Impacts (acres)[1]	Mitigation Ratio	Mitigation Required (acres)
Non-Wetland Waters of the United States			
Non-vegetated channel[2]	3.11	1:1	3.11
Non-vegetated channel [3]	0.215	2:1	0.43
Non-vegetated channel [4]	0.02	7:1	0.17
Non-vegetated channel [5]	0.32	8:1	2.55
Non-vegetated channel [6]	0.33	11:1	3.55
Non-vegetated channel [7]	0.11	14:1	1.54
Total	**4.10**	—	**11.35**

Notes: Totals may not sum due to rounding.

1 Permanent impact totals include both on-site and off-site impacts.

2 Non-vegetated channel (i.e., intermittent/ephemeral streams) impacts will be mitigated through vernal pool establishment at the required ratio based on the USACE mitigation ratio checklist.

3 Non-vegetated channel (i.e., intermittent/ephemeral streams) impacts will be mitigated through vernal pool rehabilitation at the required ratio based on the USACE mitigation ratio checklist.

4 Non-vegetated channel (i.e., intermittent/ephemeral streams) impacts will be mitigated through vernal pool preservation at the required ratio based on the USACE mitigation ratio checklist.

5 Non-vegetated channel (i.e., intermittent/ephemeral streams) impacts will be mitigated through wetlands preservation at the required ratio based on the USACE mitigation ratio checklist.

6 Non-vegetated channel (i.e., intermittent/ephemeral streams) impacts will be mitigated through non-wetland waters (intermittent/ephemeral) preservation at the required ratio based on the USACE mitigation ratio checklist.

7 Non-vegetated channel (i.e., intermittent/ephemeral streams) impacts will be mitigated through non-wetland waters upland buffer establishment at the required ratio based on the USACE mitigation ratio checklist.

2.1.2 Regional Water Quality Control Board

Vernal pool mitigation, preservation of RWQCB-jurisdictional wetlands and non-wetland waters, and rehabilitation of existing non-wetland waters occurring within the on-site Habitat Preserve will provide mitigation for the 5.44 acres of RWQCB-jurisdictional aquatic resource impacts based on the mitigation ratios outlined in Tables 5A–5C. The compensatory mitigation proposed has taken into consideration that the Santee Multiple Species Conservation Program (MSCP) Subarea Plan has been drafted with a specific goal of aquatic resource restoration, establishment, enhancement, and preservation within a watershed pursuant to the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State. The RWQCB does not allow for the 50-foot upland buffer surrounding the non-wetland waters to count toward mitigation. However, the 50-foot upland buffer surrounding the RWQCB-only non-wetland waters, as shown on Figures 3A–3E, will be included in the Habitat Preserve and managed as part of the mitigation program.

Table 5A. Impacts to RWQCB-Jurisdictional Vernal Pools/Basins and Required Mitigation

Habitat Types/ Vegetation Communities	Permanent Impacts (acres)	Mitigation Ratio[1]	Mitigation Required (acres)
Non-Wetland Waters of the United States			
Basin	0.012	1.8:1	0.022
Wetlands			
Vernal pool	0.003	2:1	0.006
Total	**0.015**	—	**0.028**

Notes: Totals may not sum due to rounding.

1 Mitigation provided would be vernal pool establishment; ratios are based on the USACE mitigation checklists associated with impacts to the habitat types/vegetation communities listed.

Table 5B. Impacts to RWQCB-Jurisdictional Wetlands and Required Mitigation

Habitat Types/ Vegetation Communities	Permanent Impacts (acres)	Mitigation Ratio[1]	Mitigation Required (acres)
Wetlands			
Cismontane alkali marsh	—	—	—
Disturbed wetland	—	—	—
Freshwater marsh (including disturbed)	0.10	1.55:1	0.16
Mulefat scrub	0.15	1.55:1	0.24
Southern arroyo willow riparian forest	—	—	—
Southern willow scrub (including disturbed)	0.36	1.55:1	0.56
Total	**0.62**	—	**0.96**

Notes: Totals may not sum due to rounding.

1 Mitigation provided would be vernal pool establishment; ratios are based on the USACE mitigation checklists associated with impacts to the habitat types/vegetation communities listed.

Table 5C. Impacts to RWQCB-Jurisdictional Non-Wetland Waters and Required Mitigation

Habitat Types/ Vegetation Communities	Permanent Impacts (acres)[1]	Mitigation Ratio	Mitigation Required (acres)
Non-Wetland Waters of the United States			
Non-vegetated channel[2]	3.10	1:1	3.10
Non-vegetated channel[3]	0.215	2:1	0.43
Non-vegetated channel[4]	0.02	7:1	0.17
Non-vegetated channel[5]	0.32	8:1	2.55
Non-vegetated channel[6]	0.54	2:1	1.08
Non-vegetated channel[7]	0.62	11:1	6.80
Total	**4.81**	—	**14.13**

Notes: Totals may not sum due to rounding.

1 Permanent impact totals include both on-site and off-site impacts.

2 Non-vegetated channel (i.e., intermittent/ephemeral streams) impacts will be mitigated through vernal pool establishment at the required ratio based on the USACE mitigation ratio checklist.
3 Non-vegetated channel (i.e., intermittent/ephemeral streams) impacts will be mitigated through vernal pool rehabilitation at the required ratio based on the USACE mitigation ratio checklist.
4 Non-vegetated channel (i.e., intermittent/ephemeral streams) impacts will be mitigated through vernal pool preservation at the required ratio based on the USACE mitigation ratio checklist.
5 Non-vegetated channel (i.e., intermittent/ephemeral streams) impacts will be mitigated through wetlands preservation at the required ratio based on the USACE mitigation ratio checklist.
6 Non-vegetated channel (i.e., intermittent/ephemeral streams) impacts will be mitigated through non-wetland waters (intermittent/ephemeral) rehabilitation at the required ratio based on the USACE mitigation ratio checklist.
7 Non-vegetated channel (i.e., intermittent/ephemeral streams) impacts will be mitigated through non-wetland waters (intermittent/ephemeral) preservation at the required ratio based on the USACE mitigation ratio checklist.

2.1.3 California Department of Fish and Wildlife

Vernal pool mitigation and preservation of CDFW-jurisdictional streambeds and riparian habitat occurring within the on-site Habitat Preserve will provide mitigation for the majority of impacts to CDFW-jurisdictional aquatic resources based on the mitigation ratios outlined in Tables 6A–6C and shown on Figures 4A–4E. The remaining mitigation requirements will be provided off site at the Lakeside mitigation parcel.

Table 6A. Impacts to CDFW-Jurisdictional Vernal Pools/Basins and Required Mitigation

Habitat Types/ Vegetation Communities	Permanent Impacts (acres)	Mitigation Ratio[1]	Mitigation Required (acres)
CDFW Basins/Vernal Pools			
Basin	0.012	1.9:1	0.023
Vernal pool	0.003	2.9:1	0.009
Total	**0.015**	—	**0.032**

Notes: Totals may not sum due to rounding.
1 Mitigation provided would be vernal pool establishment; ratios are based on the USACE mitigation checklists associated with impacts to the habitat types/vegetation communities listed.

Table 6B. Impacts to CDFW-Jurisdictional Riparian Habitat and Required Mitigation

Habitat Types/ Vegetation Communities	Permanent Impacts (acres)[1]	Mitigation Ratio	Mitigation Required (acres)
Riparian Habitat			
Riparian habitat[2]	0.96	1:1	0.96
Riparian habitat[3]	0.11	2:1	0.22
Riparian habitat[4]	0.01	7:1	0.08
Riparian habitat[5]	3.01	8:1	24.10
Riparian habitat[6]	1.89	2.7:1	5.18
Total	**5.98**	—	**30.54**

Notes: Totals may not sum due to rounding.
1 Permanent impact totals include both on-site and off-site impacts.
2 Mitigation provided would be vernal pool establishment and ratios are based on the USACE mitigation checklists associated with impacts to the habitat types/vegetation communities listed.
3 Riparian habitat impacts will be mitigated through vernal pool rehabilitation.
4 Riparian habitat impacts will be mitigated through vernal pool preservation.
5 Riparian habitat impacts will be mitigated through wetlands preservation.
6 The remaining mitigation requirements for impacts to riparian habitat will be provided at the Lakeside mitigation parcel through rehabilitation and enhancement of riparian habitat.

Table 6C. Impacts to CDFW-Jurisdictional Streambeds and Required Mitigation

Habitat Types/ Vegetation Communities	Permanent Impacts (acres)[1]	Mitigation Ratio	Mitigation Required (acres)
Streambeds			
Non-vegetated channel[2]	3.13	1:1	3.13
Non-vegetated channel[3]	0.11	2:1	0.22
Non-vegetated channel[4]	0.01	7:1	0.08
Non-vegetated channel[5]	0.29	8:1	2.35
Non-vegetated channel[6]	0.56	11:1	6.16
Total	**4.10**	—	**11.94**

Notes: Totals may not sum due to rounding.

1 Permanent impact totals include both on-site and off-site impacts.

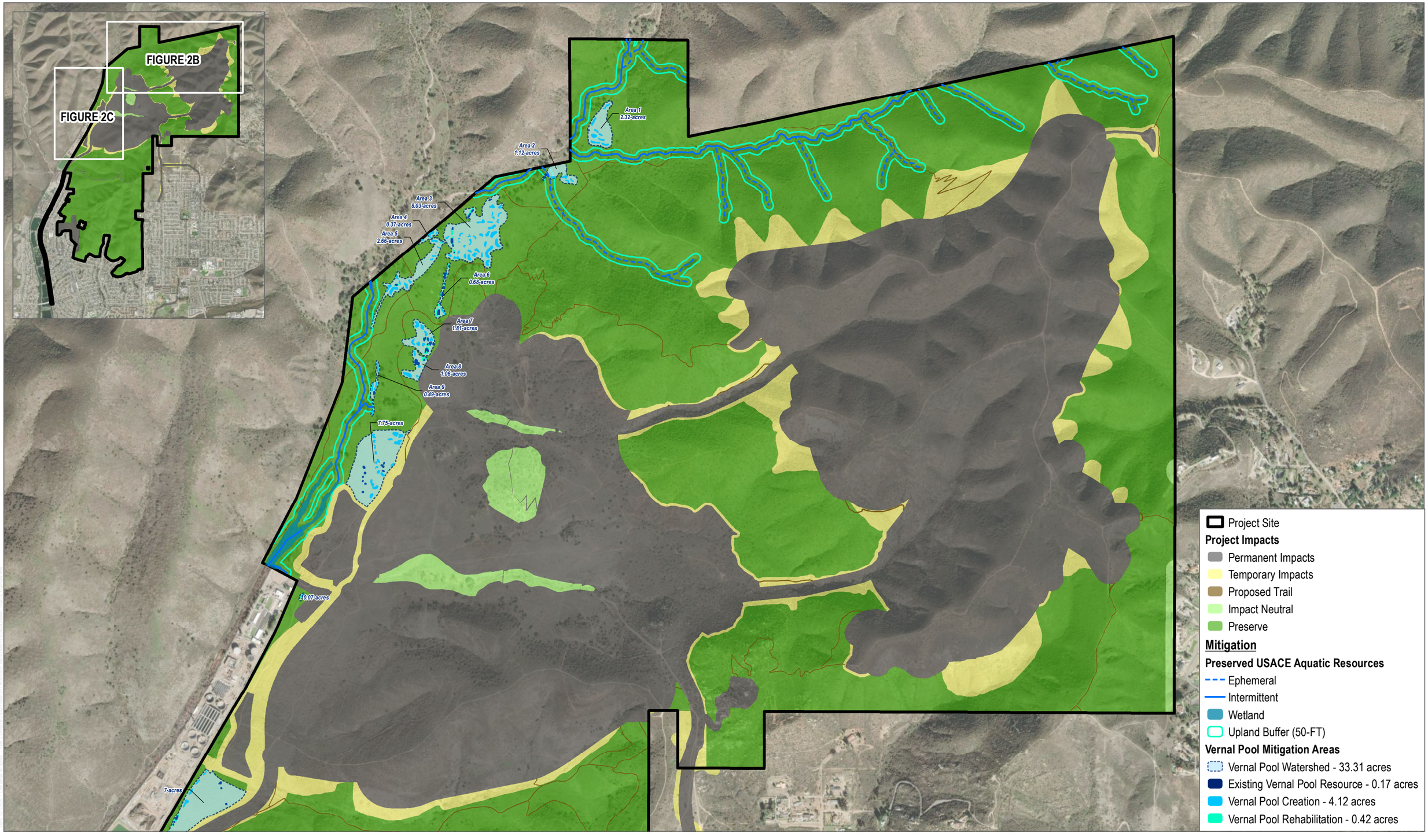
2 Non-vegetated channel (i.e., intermittent/ephemeral streams) impacts will be mitigated through vernal pool establishment at the required ratio based on the USACE mitigation ratio checklist.

3 Non-vegetated channel (i.e., intermittent/ephemeral streams) impacts will be mitigated through vernal pool rehabilitation at the required ratio based on the USACE mitigation ratio checklist.

4 Non-vegetated channel (i.e., intermittent/ephemeral streams) impacts will be mitigated through vernal pool preservation at the required ratio based on the USACE mitigation ratio checklist.

5 Non-vegetated channel (i.e., intermittent/ephemeral streams) impacts will be mitigated through riparian habitat preservation at the required ratio based on the USACE mitigation ratio checklist.

6 Non-vegetated channel (i.e., intermittent/ephemeral streams) impacts will be mitigated through streambed (intermittent/ephemeral) preservation at the required ratio based on the USACE mitigation ratio checklist.



SOURCE: ESRI World Imagery

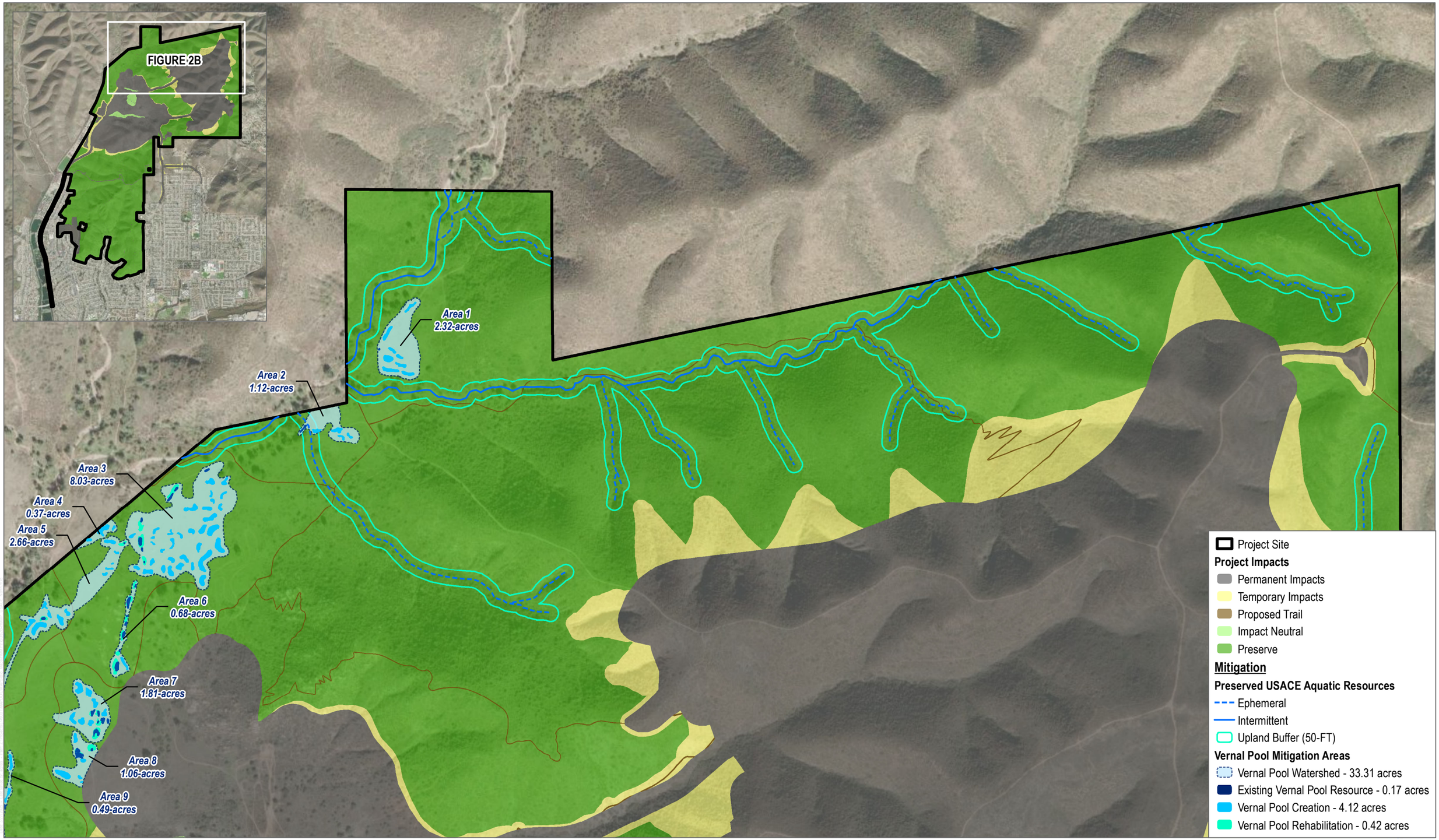
DUDEK

0 500 1,000 Feet

FIGURE 2A

USACE Vernal Pool and Wetland Mitigation Areas

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project



SOURCE: ESRI World Imagery

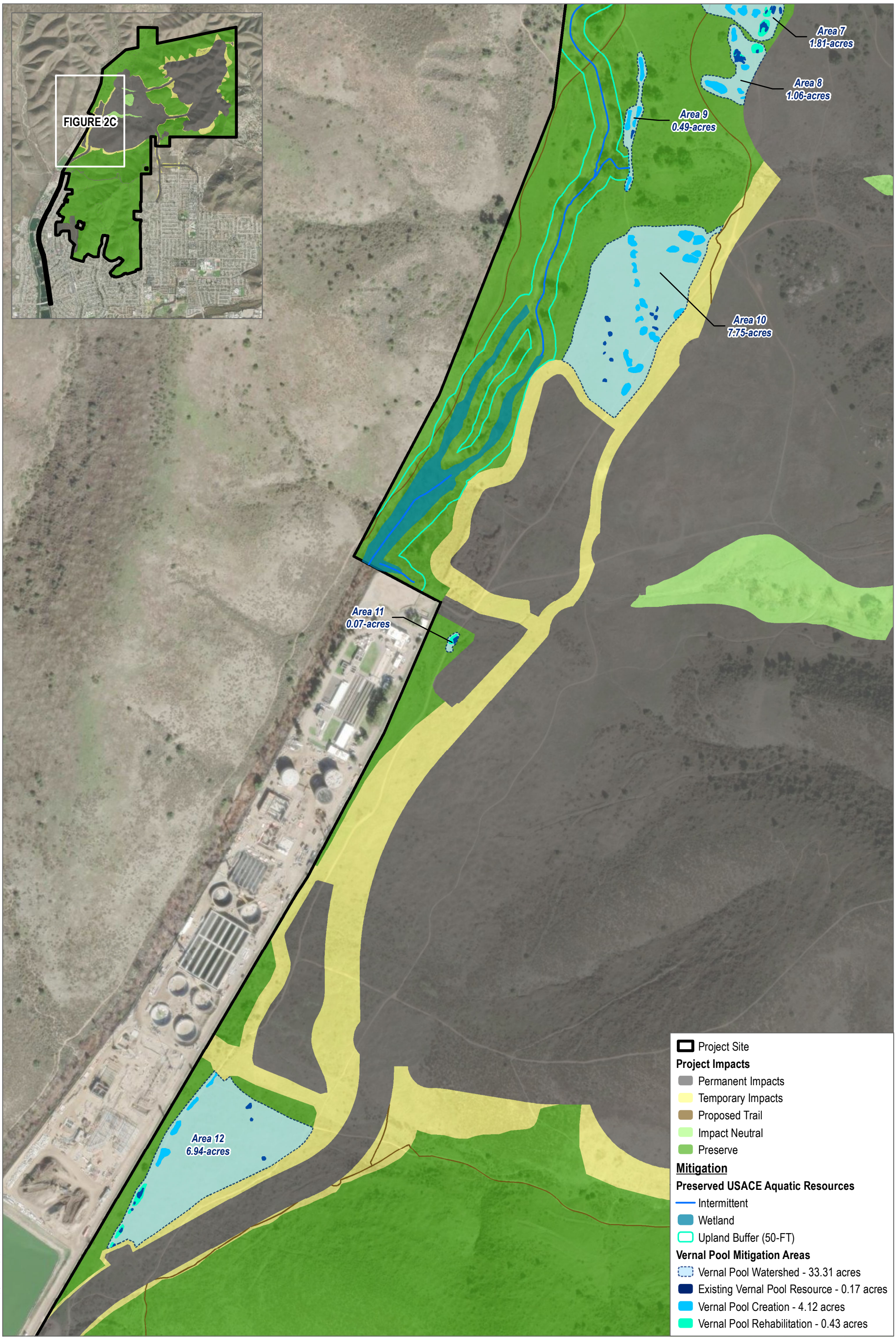
DUDEK

0 290 580 Feet

FIGURE 2B

USACE Vernal Pool and Wetland Mitigation Areas

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project



SOURCE: ESRI World Imagery

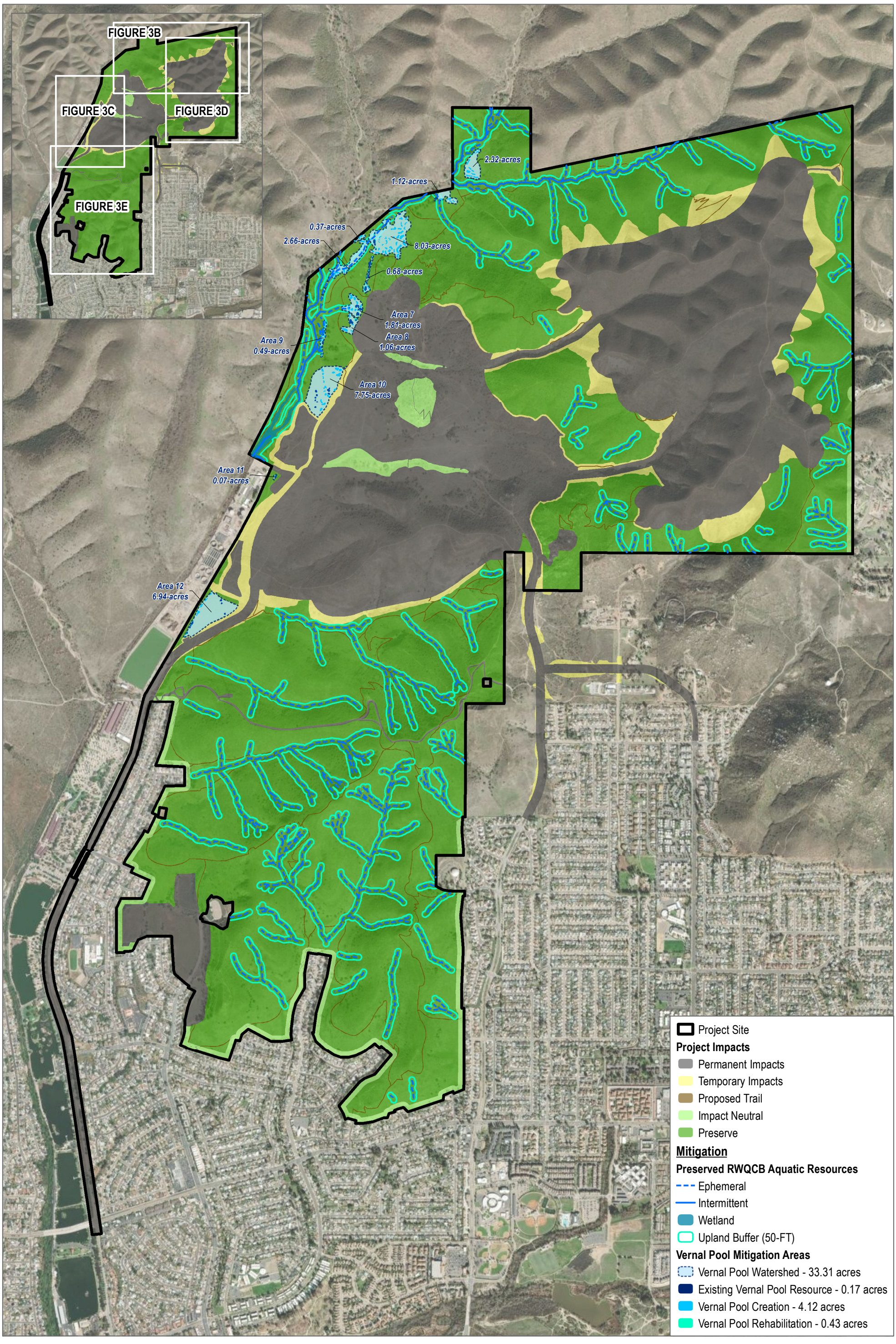
DUDEK

0 200 400 Feet

FIGURE 2C

USACE Vernal Pool and Wetland Mitigation Areas

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project



SOURCE: ESRI World Imagery

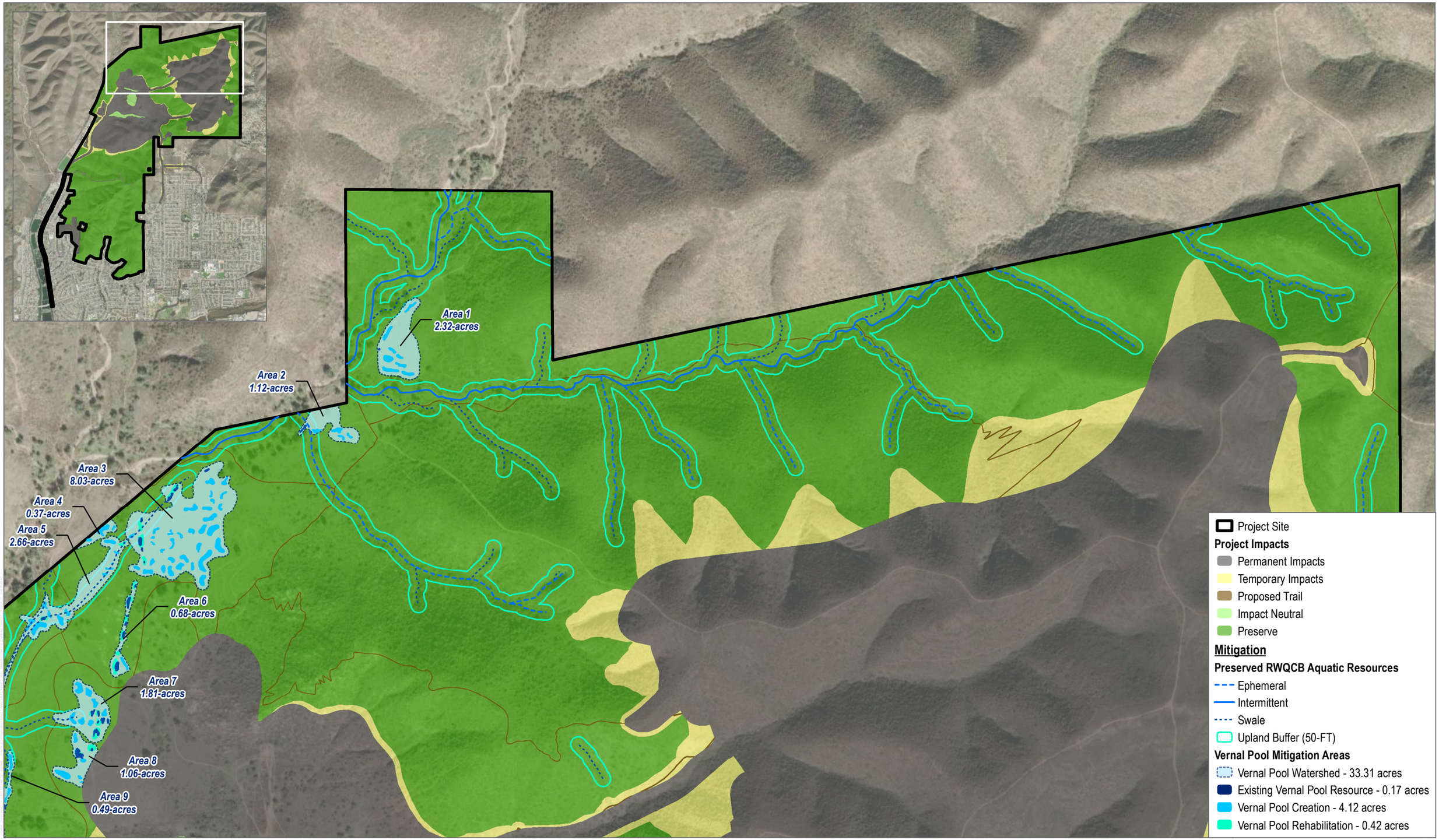
DUDEK

0 750 1,500 Feet

FIGURE 3A

RWQCB Vernal Pool and Wetland Mitigation Areas

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project



SOURCE: ESRI World Imagery

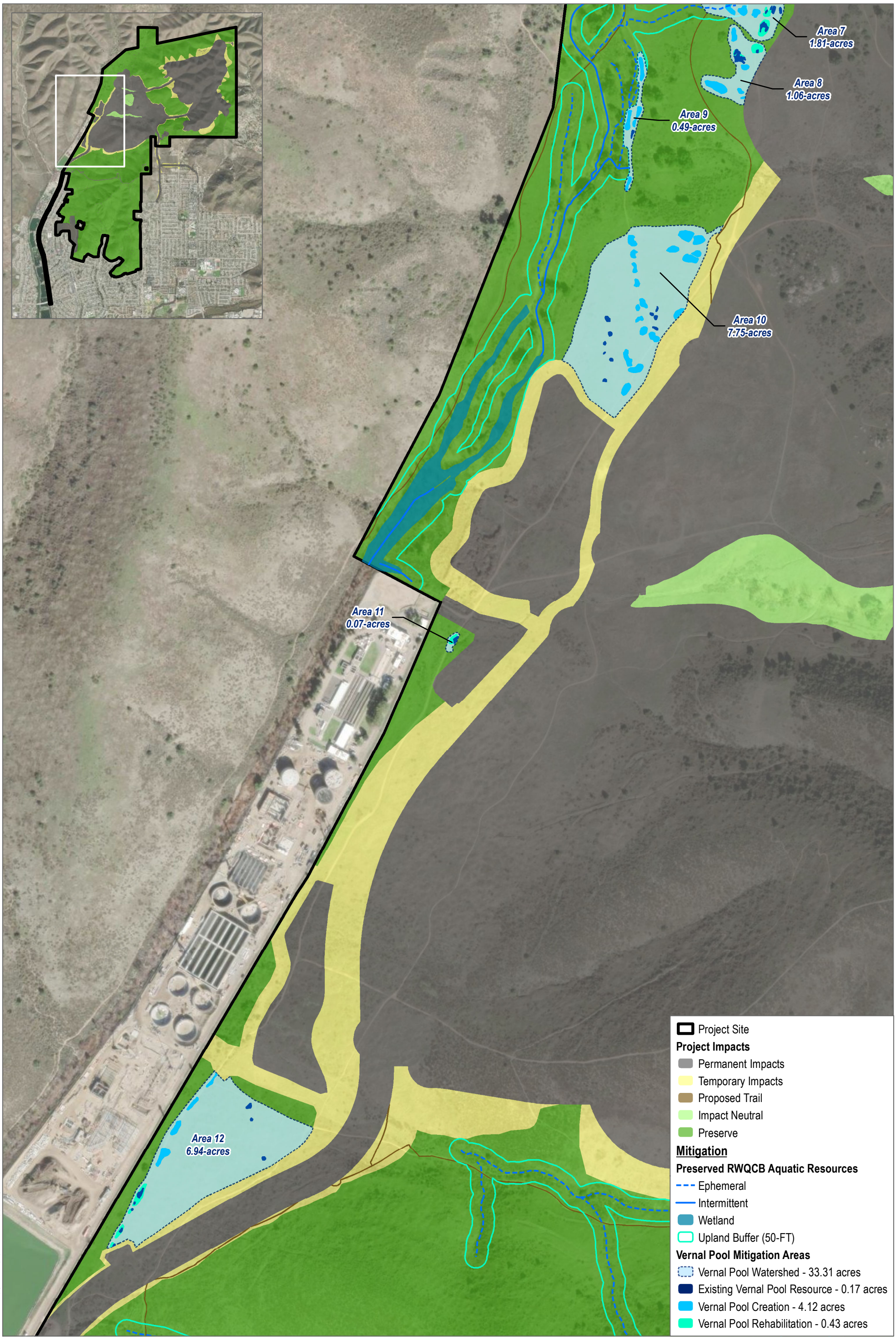
DUDEK

0 290 580 Feet

FIGURE 3B

RWQCB Vernal Pool and Wetland Mitigation Areas

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project



SOURCE: SANGIS 2017, 2021

DUDEK

0 200 400 Feet

FIGURE 3C

RWQCB Vernal Pool and Wetland Mitigation Areas

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project

SOURCE: ESRI World Imagery

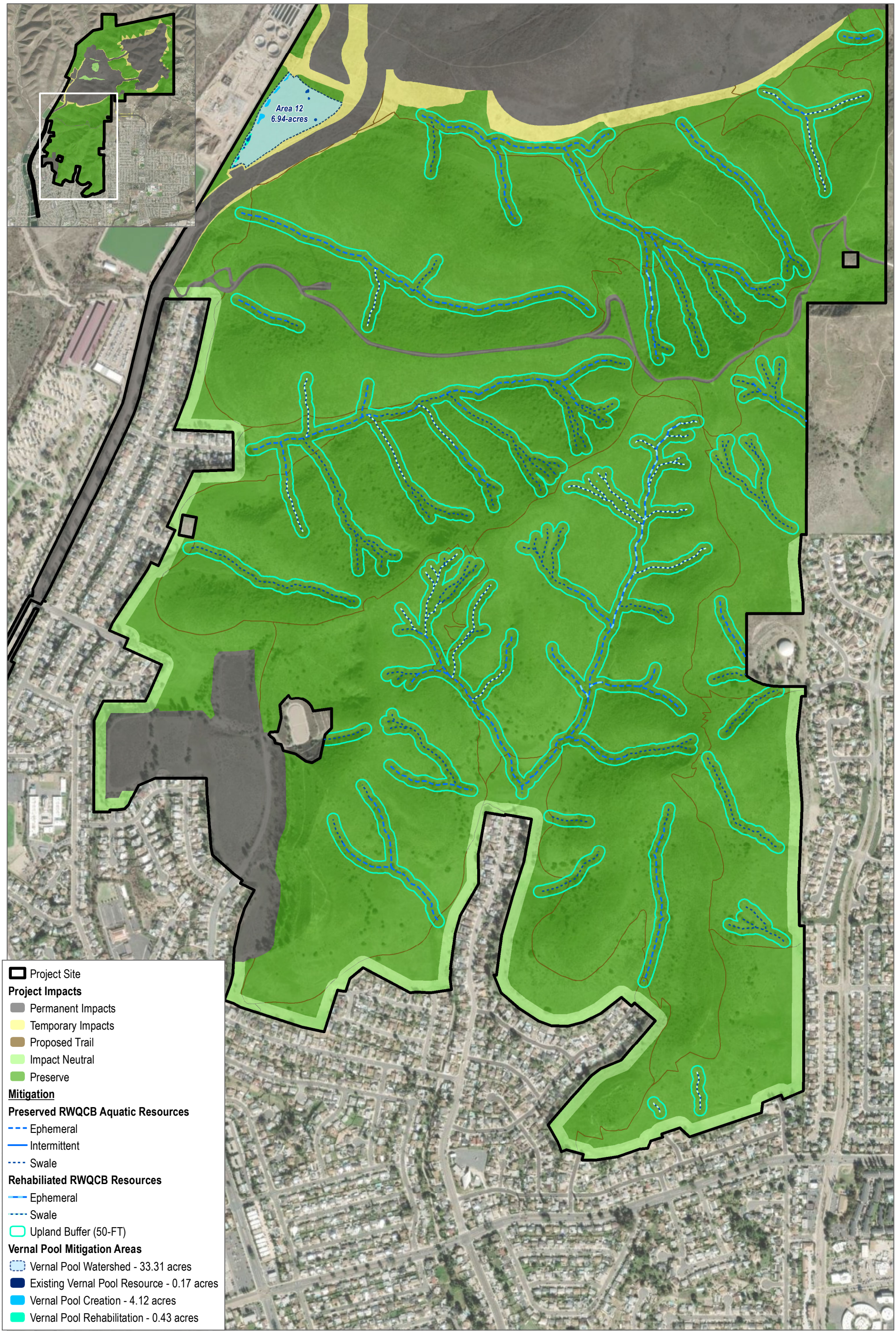
DUDEK

0 250 500 Feet

FIGURE 3D

RWQCB Vernal Pool and Wetland Mitigation Areas

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project



SOURCE: ESRI World Imagery

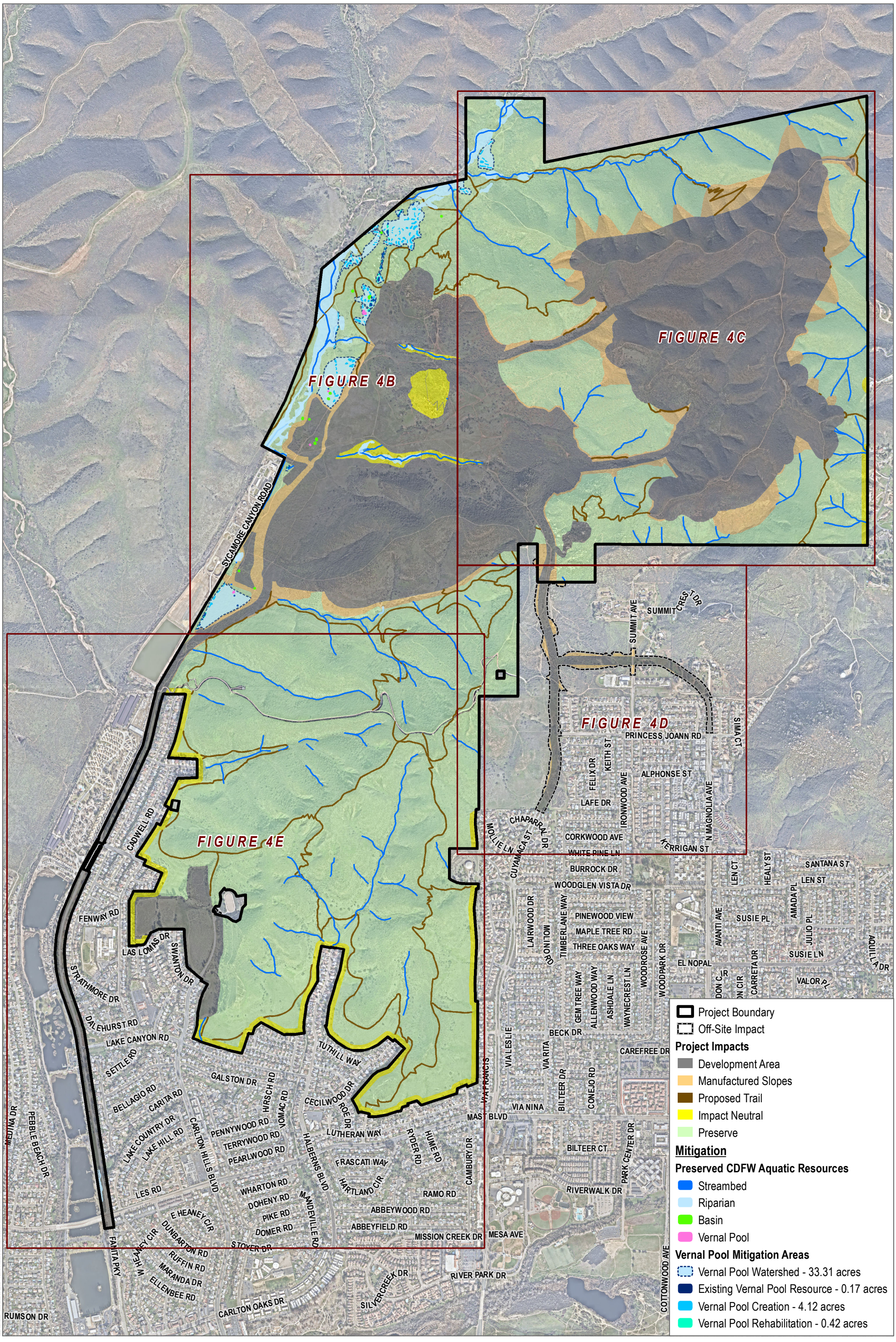
DUDEK

0 370 740 Feet

FIGURE 3E

RWQCB Vernal Pool and Wetland Mitigation Areas

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project



SOURCE: Hunsaker 2024; SANGIS 2023, 2025

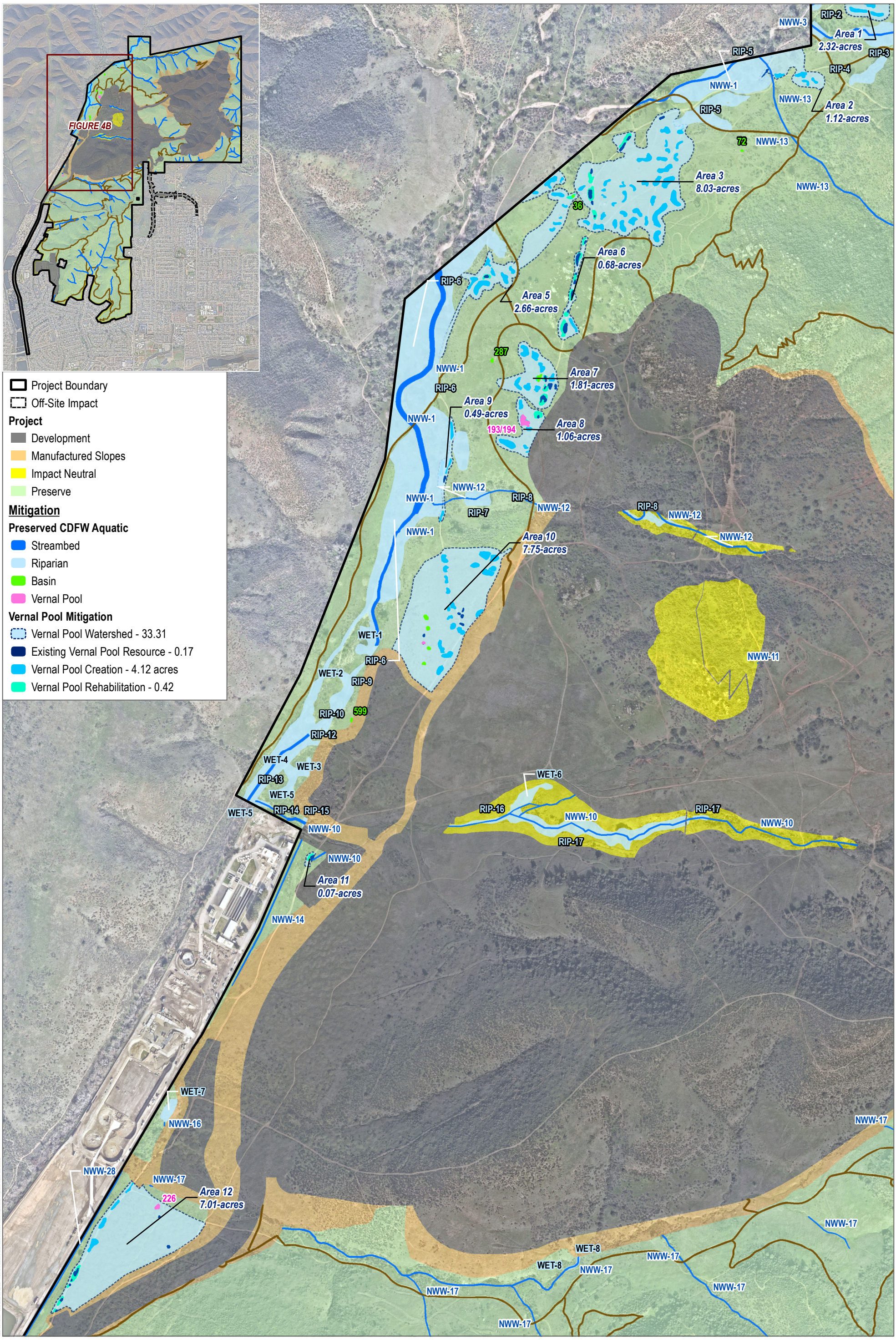
DUDEK

0 1,000 2,000 Feet

FIGURE 4A

Preserved CDFW Aquatic Resources

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project



SOURCE: Hunsaker 2020; CDFW 2024; SANGIS 2023, 2024

DUDEK

0 250 500 Feet

FIGURE 4B

Preserved CDFW Aquatic Resources

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project

Project Boundary
Off-Site Impact

Project Impacts

Development
Manufactured Slopes
Proposed Trail
Impact Neutral
Preserve

Mitigation

Preserved CDFW Aquatic Resources

Streambed
Riparian

Vernal Pool Mitigation

Vernal Pool Watershed - 33.31 acres
Existing Vernal Pool Resource - 0.17 acres
Vernal Pool Creation - 4.12 acres

FIGURE 4C

RIP-1
RIP-2
RIP-3
RIP-4
NWW-1
NWW-2
NWW-3
NWW-4
NWW-5
NWW-6
NWW-7
NWW-8
NWW-9
NWW-10
NWW-11
NWW-12
NWW-13
Area 1
2.32-acres
Area 2
1.12-acres

SOURCE: Hunsaker 2020; CDFW 2024; SANGIS 2023, 2024

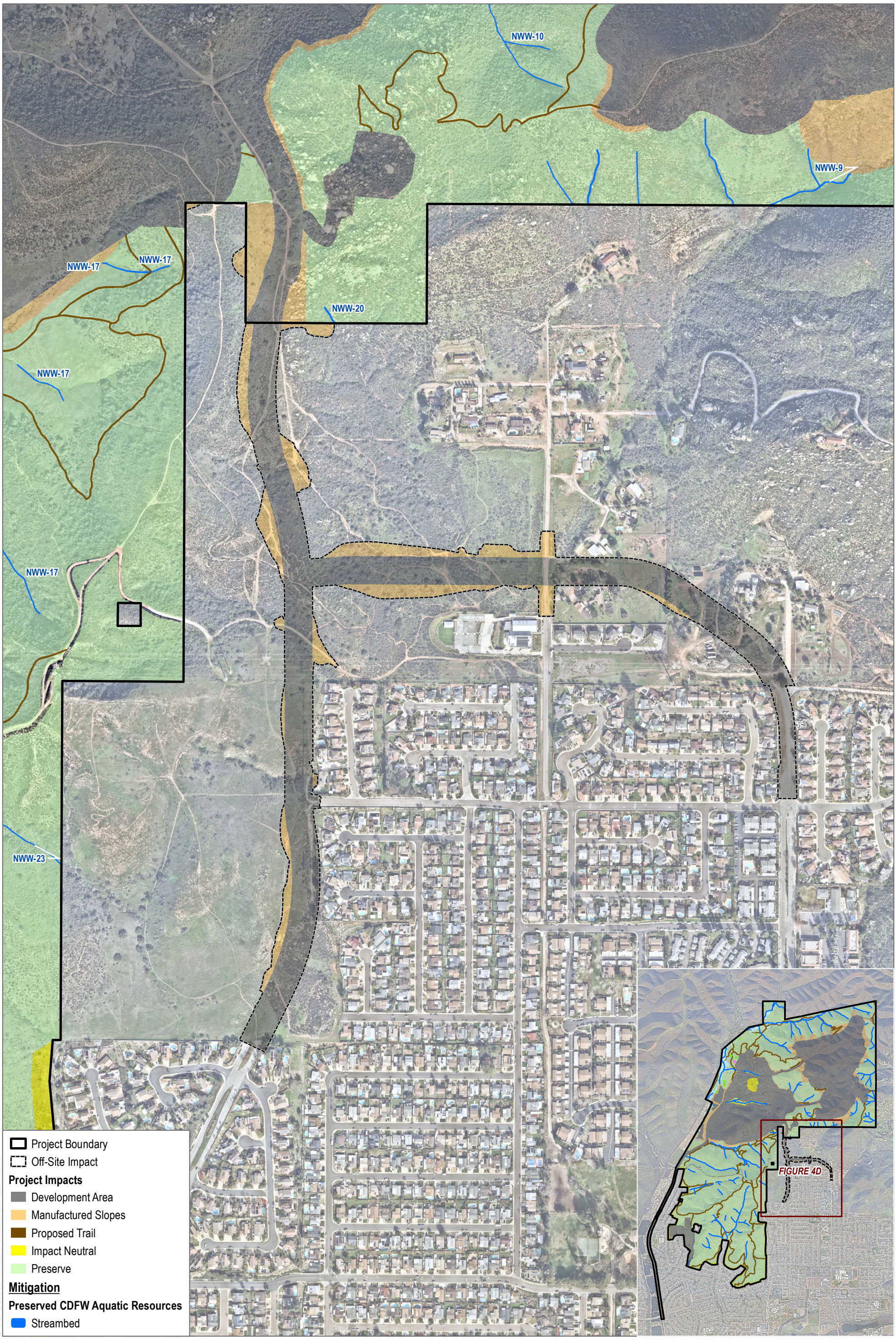
DUDEK

0 250 500 Feet

FIGURE 4C

Preserved CDFW Aquatic Resources

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project



SOURCE: Hunsaker 2020; CDFW 2024; SANGIS 2023, 2024

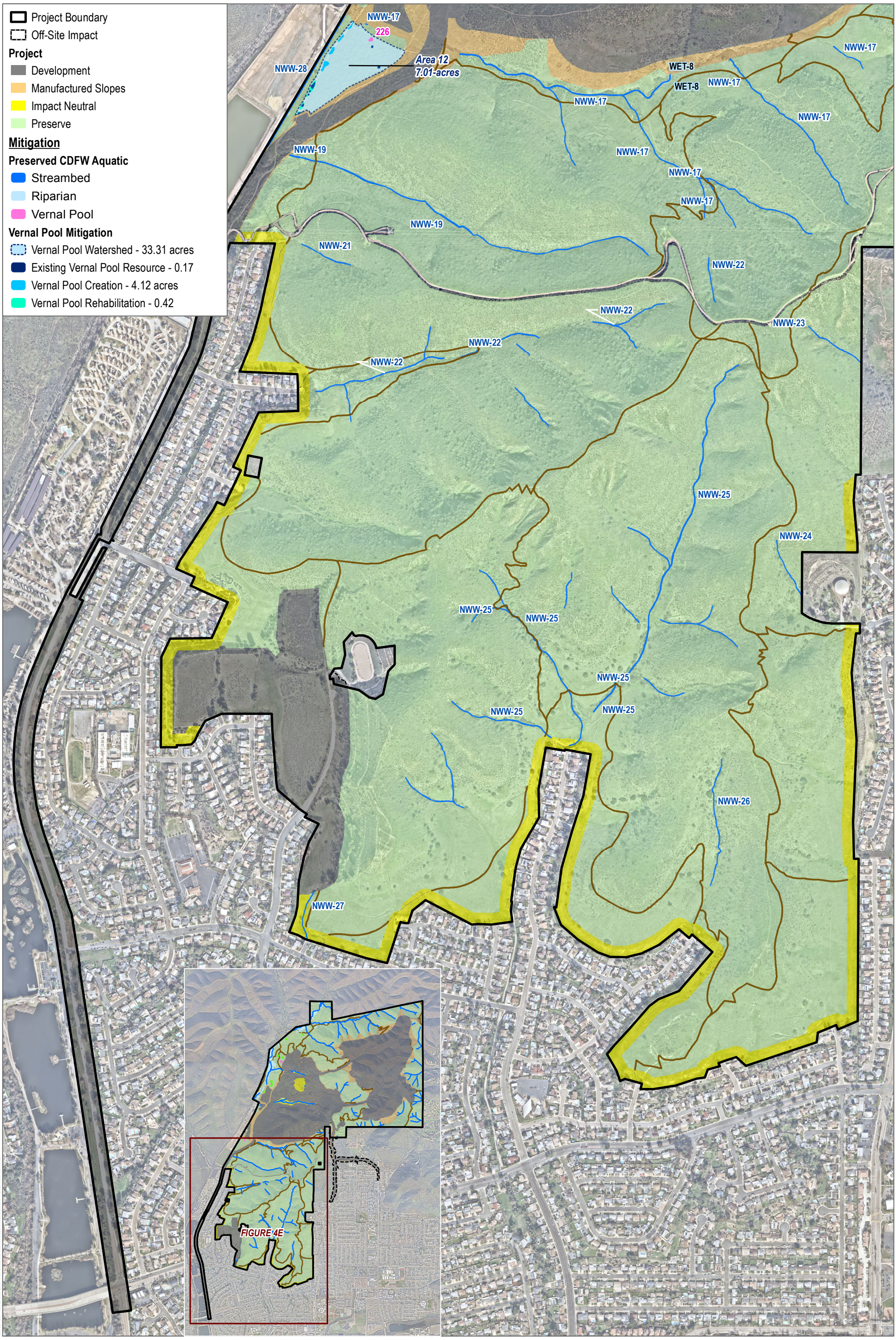
DUDEK

0 250 500 Feet

FIGURE 4D

Preserved CDFW Aquatic Resources

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project



SOURCE: Hunsaker 2020; CDFW 2024; SANGIS 2023, 2024

DUDEK

0 500 1,000 Feet

FIGURE 4E

Preserved CDFW Aquatic Resources

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project

2.2 Determination of Mitigation Credits

For impacts occurring to USACE/RWQCB/CDFW-jurisdictional aquatic resources, the determination of mitigation ratio, type, and acreage was based on functions and services of the existing aquatic resources to be impacted, their acreage, temporal losses, location and type of proposed mitigation (establishment, enhancement, rehabilitation, etc.), risk and uncertainty, and other items included in USACE's Mitigation Ratio Setting Checklists (Appendix A), the Santee MSCP Subarea Plan, and comments received on the conceptual planning.

2.3 Site Selection

The Habitat Preserve occupies portions of the San Vicente Reservoir, El Cajon, La Mesa, and Poway West U.S. Geological Survey 7.5-minute quadrangles. Elevations within the Habitat Preserve range from approximately 432–1,193 feet above mean sea level. The Habitat Preserve is approximately 1,650 acres in size. The Habitat Preserve contains a series of northeast- to southwest-trending hills and valleys that form a transition between the relatively low, flat Sycamore Canyon on the western end to the foothills of the Peninsular Range to the east.

As part of the planning for the project, the Habitat Preserve was assessed for biological resources (Dudek 2020a). Dudek Senior Restoration Ecologist Scott McMillan and Senior Wildlife Biologist Brock Ortega reevaluated the potential for these mitigation opportunities on the project's Habitat Preserve in April 2022. The results of baseline condition surveys indicated that the Habitat Preserve is suitable for on-site mitigation for vernal pools and their surrounding upland watershed because the mitigation area includes existing vernal pool complexes occupied by San Diego fairy shrimp, western spadefoot toad, and vernal pool indicator plant species. The Habitat Preserve is situated adjacent to the project site. Therefore, the Habitat Preserve shares climate, soils, watershed, landform, geological formation, and many other biotic characteristics with the vernal pool impact site.

A total of 12 areas were identified where additional vernal pool mitigation could be implemented beyond preservation (Figures 2A–2C). These areas represent the vernal pools and the watershed areas that would need to be restored and managed. The mitigation sites range in size from 0.07 acres to 8.03 acres, with a total watershed acreage of 33.30 acres. In the 33.30 acres, there are an estimated 0.17 acres of vernal pool habitat to be preserved (existing seasonal basins), 0.43 acres where vernal pools would be rehabilitated, and another 4.12 acres where vernal pools would be established (created). The overall 7:1 watershed to vernal pool ratio proposed for this mitigation program is well within the known limits for supporting successful vernal pool habitat mitigation. Table 7A summarizes the vernal pool mitigation proposed within the Habitat Preserve to meet the project's mitigation requirements, and Table 7B lists all proposed created, rehabilitated, and preserved pools within each watershed area.

Table 7A. Proposed Vernal Pool Mitigation within the Habitat Preserve (acres)

Location	Watershed[1]	Creation[2]	Rehabilitation[3]	Preservation[4]	Total Watershed
Area 1	1.96	0.34	0.02	<0.01	**2.32**
Area 2	0.98	0.11	—	0.03	**1.12**
Area 3	6.51	1.39	0.09	0.04	**8.03**
Area 4	0.28	0.08	0.01	—	**0.37**
Area 5	2.19	0.40	0.05	0.01	**2.66**
Area 6	0.42	0.20	0.06	—	**0.68**

Table 7A. Proposed Vernal Pool Mitigation within the Habitat Preserve (acres)

Location	Watershed[1]	Creation[2]	Rehabilitation[3]	Preservation[4]	Total Watershed
Area 7	1.36	0.37	0.08	0.01	**1.81**
Area 8	0.81	0.21	0.04	—	**1.07**
Area 9	0.34	0.14	0.01	<0.01	**0.49**
Area 10	7.06	0.61	0.02	0.06	**7.75**
Area 11	0.05	0.02	0.01	—	**0.07**
Area 12	6.64	0.24	0.03	0.02	**6.92**
Total	**28.58**	**4.12**	**0.43**	**0.17**	**33.30**

Notes: Totals may not sum due to rounding.

1 Watershed totals in this column refer to the acreage outside all vernal pool creation, rehabilitation, or preservation areas.

2 Creation refers to all new surface area, outside of any existing pools, added within the watershed areas.

3 Rehabilitation refers to all existing pools that would be recontoured to provide functional vernal pool surface area.

4 Preservation refers to any existing seasonal basin that occurs within the watershed areas, but no restoration treatments would occur within these seasonal basins beyond enhancement (i.e., weeding and invasive species removal).

Table 7B. Proposed Vernal Pool Mitigation within the Habitat Preserve (acres)

Watershed Area	Pool Number[1]	Creation[2]	Rehabilitation[3]	Preservation[4]	Total Acreage
Area 1	1-1	0.039	—	—	0.039
	1-2	0.057	—	—	0.057
	1-3	0.027	—	—	0.027
	1-4	0.022	—	—	0.022
	1-5	0.058	—	—	0.058
	1-6	0.035	—	—	0.035
	1-7	0.057	—	—	0.057
	1-8	0.041	—	—	0.041
	69	—	—	0.002	0.002
	90	—	0.017	—	0.017
	91	—	—	0.003	0.003
	Area 1 Totals	***0.337***	***0.017***	***0.005***	***0.359***
Area 2	2-1	0.019	—	—	0.019
	2-2	0.021	—	—	0.021
	2-3	0.043	—	—	0.043
	2-4	0.030	—	—	0.030
	86	—	—	0.001	0.001
	87	—	—	0.008	0.008
	88	—	—	0.002	0.002
	89	—	—	<0.001	<0.001
	96	—	—	0.015	0.015
	Area 2 Totals	***0.113***	***—***	***0.025***	***0.138***
Area 3	3-1	0.030	—	—	0.030
	3-2	0.043	—	—	0.043
	3-3	0.015	—	—	0.015

Table 7B. Proposed Vernal Pool Mitigation within the Habitat Preserve (acres)

Watershed Area	Pool Number[1]	Creation[2]	Rehabilitation[3]	Preservation[4]	Total Acreage
	3-4	0.025	—	—	0.025
	3-5	0.017	—	—	0.017
	3-6	0.025	—	—	0.025
	3-7	0.061	—	—	0.061
	3-8	0.034	—	—	0.034
	3-9	0.063	—	—	0.063
	3-10	0.082	—	—	0.082
	3-11	0.047	—	—	0.047
	3-12	0.085	—	—	0.085
	3-13	0.127	—	—	0.127
	3-14	0.055	—	—	0.055
	3-15	0.025	—	—	0.025
	3-16	0.028	—	—	0.028
	3-17	0.043	—	—	0.043
	3-18	0.030	—	—	0.030
	3-19	0.042	—	—	0.042
	3-20	0.049	—	—	0.049
	3-21	0.028	—	—	0.028
	3-22	0.031	—	—	0.031
	3-23	0.019	—	—	0.019
	3-24	0.019	—	—	0.019
	3-25	0.031	—	—	0.031
	3-26	0.013	—	—	0.013
	3-27	0.025	—	—	0.025
	3-28	0.048	—	—	0.048
	3-29	0.023	—	—	0.023
	3-30	0.028	—	—	0.028
	3-31	0.010	—	—	0.010
	3-32	0.010	—	—	0.010
	3-33	0.024	—	—	0.024
	3-34	0.052	—	—	0.052
	3-35	0.034	—	—	0.034
	3-36	0.021	—	—	0.021
	3-37	0.053	—	—	0.053
	5a	—	—	0.003	0.003
	13a	—	—	0.001	0.001
	37	—	0.018	—	0.018
	38	—	0.003	—	0.003
	45	—	0.001	—	0.001
	46	—	0.001	—	0.001
	98	—	<0.001	—	<0.001

Table 7B. Proposed Vernal Pool Mitigation within the Habitat Preserve (acres)

Watershed Area	Pool Number[1]	Creation[2]	Rehabilitation[3]	Preservation[4]	Total Acreage
	99	–	0.007	–	0.007
	100	–	0.012	–	0.012
	101	–	–	0.007	0.007
	102	–	0.001	–	0.001
	103	–	0.016	–	0.016
	104	–	–	0.002	0.002
	105	–	–	<0.001	<0.001
	106	–	–	0.001	0.001
	107	–	–	0.018	0.018
	108	–	–	0.002	0.002
	109	–	0.010	–	0.010
	110	–	0.005	–	0.005
	111	–	–	0.005	0.005
	112	–	0.017	–	0.017
	Area 3 Totals	***1.394***	***0.091***	***0.039***	***1.524***
Area 4	4-1	0.012	–	–	0.012
	4-2	0.055	–	–	0.055
	4-3	0.015	–	–	0.015
	113	–	0.011	–	0.011
	Area 4 Totals	***0.083***	***0.011***	***–***	***0.094***
Area 5	5-1	0.023	–	–	0.023
	5-2	0.041	–	–	0.041
	5-3	0.013	–	–	0.013
	5-4	0.005	–	–	0.005
	5-5	0.020	–	–	0.020
	5-6	0.016	–	–	0.016
	5-7	0.026	–	–	0.026
	5-8	0.047	–	–	0.047
	5-9	0.021	–	–	0.021
	5-10	0.029	–	–	0.029
	5-11	0.020	–	–	0.020
	5-12	0.096	–	–	0.096
	5-13	0.046	–	–	0.046
	31	–	0.001	–	0.001
	32	–	0.006	–	0.006
	33	–	–	0.004	0.004
	34	–	–	0.001	0.001
	35	–	0.028	–	0.028
	MGB-109 (PIB-36)	–	0.001	–	0.001
	64	–	–	0.001	0.001
	114	–	0.019	–	0.019

Table 7B. Proposed Vernal Pool Mitigation within the Habitat Preserve (acres)

Watershed Area	Pool Number[1]	Creation[2]	Rehabilitation[3]	Preservation[4]	Total Acreage
	115	—	—	0.004	0.004
	116	—	—	0.002	0.002
	Area 5 Totals	***0.404***	***0.054***	***0.012***	***0.471***
Area 6	6-1	0.017	—	—	0.017
	6-2	0.029	—	—	0.029
	6-3	0.017	—	—	0.017
	6-4	0.027	—	—	0.027
	6-5	0.017	—	—	0.017
	6-6	0.054	—	—	0.054
	6-7	0.038	—	—	0.038
	4a	—	0.001	—	0.001
	39	—	0.023	—	0.023
	40	—	0.009	—	0.009
	41	—	0.004	—	0.004
	42	—	0.001	—	0.001
	43	—	0.017	—	0.017
	44	—	0.001	—	0.001
	213	—	0.005	—	0.005
	Area 6 Totals	***0.199***	***0.061***	***—***	***0.260***
Area 7	7-1	0.031	—	—	0.031
	7-2	0.054	—	—	0.054
	7-3	0.029	—	—	0.029
	7-4	0.015	—	—	0.015
	7-5	0.039	—	—	0.039
	7-6	0.042	—	—	0.042
	7-7	0.040	—	—	0.040
	7-8	0.009	—	—	0.009
	7-9	0.027	—	—	0.027
	7-10	0.036	—	—	0.036
	7-11	0.048	—	—	0.048
	23	—	0.015	—	0.015
	24	—	0.001	—	0.001
	25	—	0.001	—	0.001
	26	—	0.005	—	0.005
	PIB-27	—	0.009	—	0.009
	28	—	—	0.001	0.001
	29	—	0.004	—	0.004
	30	—	0.008	—	0.008
	117	—	—	0.005	0.005
	210	—	0.037	—	0.037
	Area 7 Totals	***0.369***	***0.080***	***0.006***	***0.456***

Table 7B. Proposed Vernal Pool Mitigation within the Habitat Preserve (acres)

Watershed Area	Pool Number[1]	Creation[2]	Rehabilitation[3]	Preservation[4]	Total Acreage
Area 8	8-1	0.046	—	—	0.046
	8-2	0.032	—	—	0.032
	8-3	0.016	—	—	0.016
	8-4	0.020	—	—	0.020
	8-5	0.016	—	—	0.016
	8-6	0.085	—	—	0.085
	22	—	0.002	—	0.002
	216	—	0.008	—	0.008
	MGB-381 (PIB-193/194)	—	0.033	—	0.033
	Area 8 Totals	***0.214***	***0.043***	***—***	***0.257***
Area 9	9-1	0.044	—	—	0.044
	9-2	0.034	—	—	0.034
	9-3	0.037	—	—	0.037
	9-4	0.022	—	—	0.022
	47	—	0.001	—	0.001
	48	—	0.002	—	0.002
	49	—	—	0.005	0.005
	129	—	0.001	—	0.001
	130	—	0.011	—	0.011
	Area 9 Totals	***0.138***	***0.015***	***0.005***	***0.157***
Area 10	10-1	0.046	—	—	0.046
	10-2	0.065	—	—	0.065
	10-3	0.033	—	—	0.033
	10-4	0.027	—	—	0.027
	10-5	0.053	—	—	0.053
	10-6	0.032	—	—	0.032
	10-7	0.025	—	—	0.025
	10-8	0.021	—	—	0.021
	10-9	0.016	—	—	0.016
	10-10	0.028	—	—	0.028
	10-11	0.013	—	—	0.013
	10-12	0.017	—	—	0.017
	10-13	0.028	—	—	0.028
	10-14	0.037	—	—	0.037
	10-15	0.031	—	—	0.031
	10-16	0.047	—	—	0.047
	10-17	0.047	—	—	0.047
	10-18	0.041	—	—	0.041
	15	—	—	0.003	0.003
	125	—	0.003	—	0.003

Table 7B. Proposed Vernal Pool Mitigation within the Habitat Preserve (acres)

Watershed Area	Pool Number[1]	Creation[2]	Rehabilitation[3]	Preservation[4]	Total Acreage
	126	–	–	0.002	0.002
	127	–	0.001	–	0.001
	128	–	0.011	–	0.011
	187	–	–	0.005	0.005
	PIB-188	–	–	0.005	0.005
	189	–	–	0.003	0.003
	MGB-534 (PIB-190)	–	–	0.002	0.002
	PIB-191	–	–	0.003	0.003
	PIB-192	–	–	0.004	0.004
	198	–	–	0.002	0.002
	199	–	–	0.001	0.001
	201	–	–	0.004	0.004
	205	–	0.003	–	0.003
	206	–	–	0.006	0.006
	PIB-207	–	–	0.009	0.009
	208	–	–	0.005	0.005
	209	–	–	0.002	0.002
	221	–	–	0.002	0.002
	222	–	0.002	–	0.002
	Area 10 Totals	***0.607***	***0.020***	***0.058***	***0.685***
Area 11	11-1	0.023	–	–	0.023
	14	–	0.007	–	0.007
	Area 11 Totals	***0.023***	***0.007***	***–***	***0.030***
Area 12	12-1	0.016	–	–	0.016
	12-2	0.027	–	–	0.027
	12-3	0.042	–	–	0.042
	12-4	0.061	–	–	0.061
	12-5	0.056	–	–	0.056
	12-6	0.007	–	–	0.007
	12-7	0.025	–	–	0.025
	12-8	0.007	–	–	0.007
	6	–	0.011	–	0.011
	10	–	0.003	–	0.003
	11	–	0.001	–	0.001
	12	–	0.001	–	0.001
	12a	–	0.006	–	0.008
	65	–	0.001	–	0.005
	121	–	–	<0.001	<0.001
	161	–	0.002	–	0.002
	162	–	0.002	–	0.002

Table 7B. Proposed Vernal Pool Mitigation within the Habitat Preserve (acres)

Watershed Area	Pool Number[1]	Creation[2]	Rehabilitation[3]	Preservation[4]	Total Acreage
	163	—	—	0.003	0.003
	MGB-918 (PIB-226)	—	—	0.008	0.008
	227	—	—	0.002	0.002
	228	—	—	0.004	0.004
	Area 12 Total	*0.241*	*0.028*	*0.018*	*0.292*
	Total	**4.121**	**0.428**	**0.168**	**4.717**

Notes: PIB = USACE-jurisdictional basin or vernal pool previously identified during past focused San Diego fairy shrimp surveys; MGB = USACE-jurisdictional basin or vernal pool identified by model during the 2020 delineation.
Totals may not sum due to rounding.

1 All USACE-jurisdictional basins and vernal pools are labeled with either MGB or PIB.
2 Creation refers to all new surface area, outside of any existing pools, added within the watershed areas.
3 Rehabilitation refers to all existing pools that would be recontoured to provide functional vernal pool surface area.
4 Preservation refers to any existing seasonal basin that occurs within the watershed areas, but no restoration treatments would occur within these seasonal basins beyond enhancement (i.e., weeding and invasive species removal).

Also included in this HMMP is the preservation of existing USACE-jurisdictional non-wetland waters and wetlands within the Habitat Preserve (Figures 2A–2C). The waters of the United States are all associated with Sycamore Canyon Creek and comprise 2.71 acres of intermittent streams, 0.84 acres of ephemeral streams, and 2.55 acres of wetlands. Also included for preservation is a 50-foot upland buffer totaling 51.45 acres surrounding the existing waters of the United States. Therefore, a total of 57.54 acres of preservation would occur within the Habitat Preserve (Figures 2A–2C). Table 8 summarizes the preservation of waters of the United States proposed within the Habitat Preserve to meet the project's remaining mitigation requirements.

Table 8. Preservation of Existing USACE-Jurisdictional Aquatic Resources and Buffers within Habitat Preserve

Existing Jurisdictional Aquatic Resource	Preservation Acreage within Habitat Preserve
Non-Wetland Waters of the United States	
Intermittent	
NWW-1	2.05
NWW-3	0.58
NWW-10	<0.01
NWW-12	0.07
Intermittent Subtotal	*2.71*
Ephemeral	
NWW-2	0.14
NWW-3	0.34
NWW-4	0.14
NWW-13	0.22
Ephemeral Subtotal	*0.84*
Non-Wetland Waters Total	**3.55**

Table 8. Preservation of Existing USACE-Jurisdictional Aquatic Resources and Buffers within Habitat Preserve

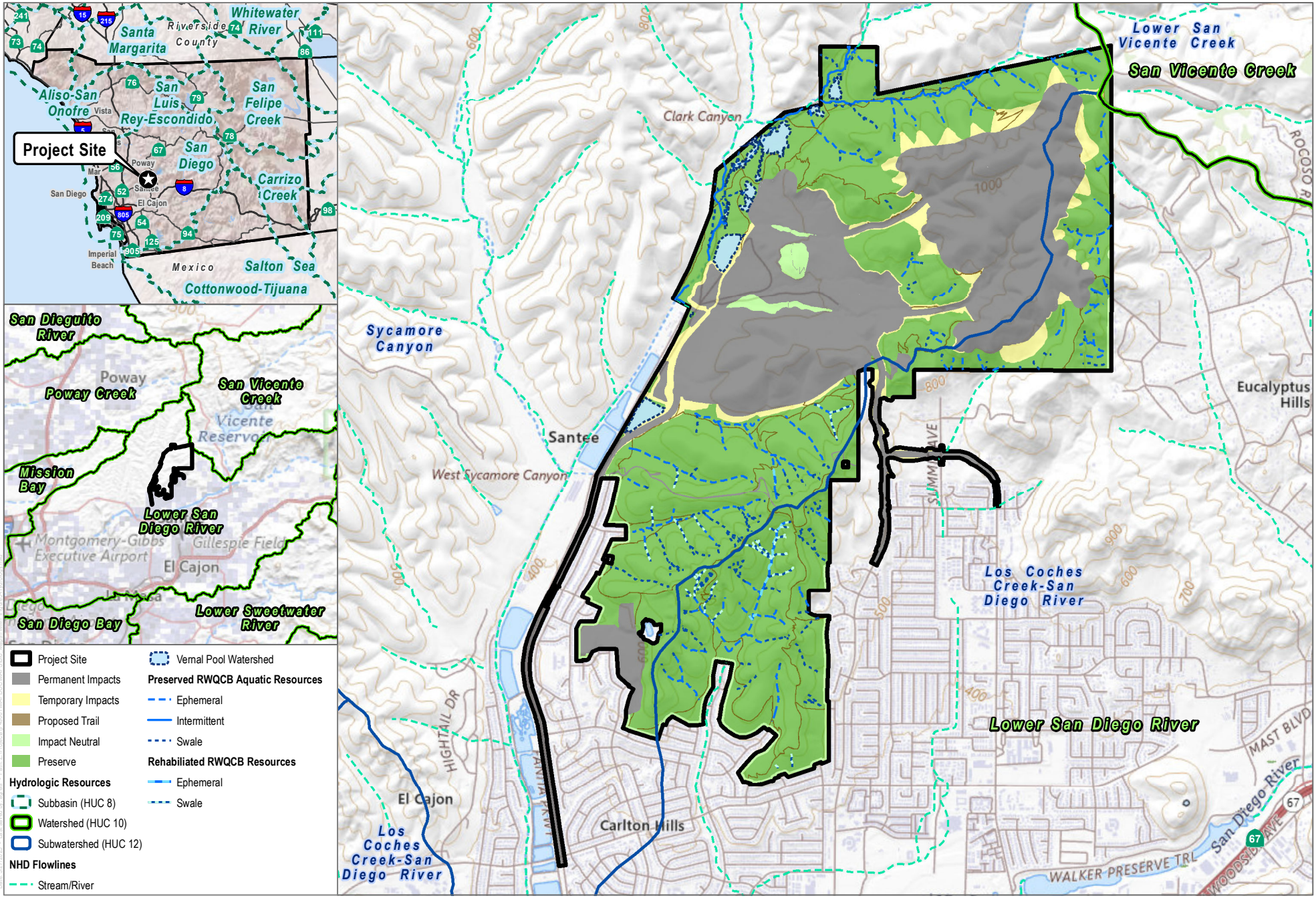
Existing Jurisdictional Aquatic Resource	Preservation Acreage within Habitat Preserve
Wetlands	
WET-1, Mulefat Scrub	0.47
WET-2, Mulefat Scrub	0.36
WET-3, Southern Arroyo Willow Riparian Forest	1.54
WET-4, Mulefat Scrub	0.11
WET-5, Disturbed Wetlands	0.06
Wetlands Total	**2.55**
50-foot Upland Buffer	
Waters of the United States Upland Buffer	51.45
Preservation Total	**57.54**

Note: Totals may not sum due to rounding.

2.4 Mitigation Site Baseline Conditions

The proposed mitigation site within the Habitat Preserve is situated immediately adjacent to the project's impact area. The Habitat Preserve shares climate, soils, and many other abiotic characteristics with the impact site. Elevations within the Habitat Preserve range from approximately 432–1,193 feet above mean sea level. The Habitat Preserve is approximately 1,651 acres in size. The Habitat Preserve contains a series of northeast- to southwest-trending hills and valleys that form a transition between the relatively low, flat Sycamore Canyon on the western end to the foothills of the Peninsular Range to the east. According to the U.S. Department of Agriculture Web Soil Survey, soils within the Habitat Preserve are underlain by the following soil types: Bosanko clay (Bsc), Cieneba rocky coarse sandy loam (CmE2), Cieneba very rocky coarse sandy loam (CmrG), Diablo clay (DaE), Diablo-Olivenhain complex clay (DoE), Las Flores loamy fine sand (LeC), Las Posas stony fine sandy loam (LrE, LrG), Linne clay loam (LsE), Redding gravelly loam (RdC), Redding cobbly loam (ReE, RfF), Redding-Urban land complex (RhC), Visalia gravelly sandy loam (VbB), and Wyman loam (WmC) (USDA 2019). Stony land (SvE) is present along the western edge of the Habitat Preserve, associated with the historic floodplain of the Sycamore Canyon Creek.

The Habitat Preserve is located in the San Diego Region (9), the San Diego Hydrologic Unit (907) in the Lower San Diego Hydrologic Area (907.1), and in the Santee Hydrologic Subarea (907.12) (RWQCB 1995) (Figure 5, Hydrology and Watershed Profile). The San Diego Hydrologic Unit is a triangular-shaped area that occupies approximately 440 square miles, extending from the Laguna Mountains in the east to the Pacific Ocean in the west and from the Santa Ysabel Indian Reservation in the north to Interstate 8 in the south. This watershed includes the Cleveland National Forest and Mission Trails Regional Park. It has the highest population of the County's watersheds and includes portions of the Cities of San Diego, El Cajon, La Mesa, Poway, and Santee, as well as several unincorporated jurisdictions. The watershed is drained by the San Diego River and contains five water storage reservoirs: El Capitan, San Vicente, Cuyamaca, Jennings, and Murray Reservoirs. The Lower San Diego Hydrologic Area occurs downstream of El Capitan, San Vicente, and Cuyamaca Reservoirs and extends from the El Monte Valley through the City and into Mission Trails Regional Park and the City of San Diego. Sycamore Canyon Creek flows from north to south along the western edge of the Habitat Preserve, and most of the project site drains toward it. Sycamore Canyon Creek and adjacent storm drain systems discharge to the San Diego River in the western portion of the City.



SOURCE: CA Department of Water Resources; USGS NHD; SANGIS 2022; USGS Topographical Basemap

DUDEK

0 0.5 1 Miles

FIGURE 5

Hydrology and Watershed Profile

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project

2.5 Proposed Mitigation Establishment

The primary goal of the proposed mitigation within the Habitat Preserve is to compensate for the impacts to the native habitats and jurisdictional waters located within the project's development area. Mitigation will occur through enhancement, restoration, and preservation of vernal pools and their surrounding upland watershed. As a component of the overall goal, this HMMP will provide guidance for enhancement and restoration of adjacent mima mounds and degraded upland vernal pool watershed habitat surrounding the vernal pools within the Habitat Preserve. This vernal pool restoration will include topographic recontouring (including vernal pool creation), non-native plant species control, and a program of seeding and planting, along with detailed monitoring and reporting. In addition, preservation and enhancement of the existing USACE/RWQCB/CDFW-jurisdictional non-wetland waters/streambeds and associated habitat associated with Sycamore Canyon Creek will be conducted to provide preservation of high-quality wetland habitats within the Habitat Preserve.

2.6 Restoration Definitions

Restoration is a general term for the repair and rehabilitation of natural ecosystems. USACE has defined restoration as "the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource" (USACE and EPA 2008). USACE further subdivides the definition of restoration into two subcategories, reestablishment/creation and rehabilitation, with the difference being the "returning" of natural/historic functions (reestablishment/creation) or "repairing" of natural/historic functions (rehabilitation). For the purpose of this report, three categories of restoration activities are described, including re-establishment/creation, rehabilitation, and enhancement. These terms are used herein to describe the following restoration activities:

- Restoration—general term to describe reestablishment/creation and rehabilitation of vernal pools; also used to describe restoring upland watershed habitats through planting and/or seeding and weed control.
- Re-establishment/Creation—the return to a preexisting condition through manipulation of the surface topography to support inundation and ponding for vernal pools. Re-establishment/creation can consist of the conversion of a currently non-wetland habitat into wetland (or other aquatic) habitat. In some instances, re-establishment/creation may consist of establishing new vernal pools where they did not previously occur. However, restrictive or impermeable soils have to be present for vernal pools to function. Therefore, vernal pool re-establishment/creation consists of the restoration of the characteristic vernal pool topography and associated habitat.
- Rehabilitation—the repair of an existing degraded vernal pool through the manipulation of the surface topography. Rehabilitation in this HMMP is used to describe repairing vernal pools that have been damaged by vehicles (e.g., road ruts and depressions) or excavations. Rehabilitation may also include expanding the inundation area of a degraded vernal pool to improve overall ecological function of the vernal pool system.
- Enhancement—the improvement of ecological function through control of invasive plant species and the planting or seeding of appropriate native plant species.

2.7 Types of Habitats to be Restored and Enhanced

This HMMP proposes restoration of disturbed areas within the Habitat Preserve, including vernal pools and associated mima mounds, as well as degraded upland watershed. The restored habitat will consist of a mosaic of

coastal scrub and native grassland habitat, typical of vernal pool complexes in the region (Figure 6, Mima Mound Habitat Example). The mitigation area will include vernal pools (both existing and re-established), mima mounds, and upland habitats including Diegan coastal sage scrub (including disturbed), Diegan coastal sage scrub–valley needlegrass grassland, and valley needlegrass grassland (including disturbed).

Biological fieldwork and topographic analysis have identified locations for re-establishment/creation of some additional mima mounds and vernal pools within the Habitat Preserve. The terraces and mesas have been previously disturbed (both vegetation and topography), and several areas that appear to have previously functioned as vernal pools and mima mounds are impaired and no longer function as such. These areas will be contoured to enhance the concave/convex attributes of vernal pool/mima mound topography, as shown on Figures 7A–7E. Surrounding topography will be left undisturbed. The herbaceous vegetation that currently exists is largely non-native, and the intent of this HMMP is to enhance the surrounding habitat with the addition of native species. Habitat enhancement in the surrounding habitat areas will consist of weed control, native container plant installation, and native species seeding in some areas.

The mitigation also includes the preservation of existing waters of the United States associated with the portion of Sycamore Canyon Creek that flows through the Habitat Preserve, with a program of preservation and enhancement to provide high-quality wetland and non-wetland water habitats in perpetuity. Enhancement of the surrounding 50-foot upland buffer areas, including areas of coast live oak woodland and southern sycamore-alder riparian woodland, will take place where these areas have been compromised by invasion of non-native plant species (Figures 2A–2C). This non-native plant invasion includes some perennial species (e.g., arundo, fan-palms); most non-native issues concern the annual non-native grasses and forbs (e.g., bromes, mustards).

2.8 Functions and Services to be Restored

The degraded condition of the Habitat Preserve is the result of previous vehicular access, sediment accumulation from erosion, invasive plant species invasion, other prior site disturbances, and recent site disturbance (e.g., off-road activity, trash dumping). As a result of these disturbances, the area is currently functioning well below capacity relative to historical conditions.

This HMMP intends to add additional vernal pool and mima mound area through restoration, thereby increasing biological and hydrological functions and services including vernal pool density, inundation area, structural patch richness, floral and faunal biodiversity, topographic diversity, and increased populations of sensitive species (e.g., San Diego fairy shrimp, western spadefoot, and suitable host plant habitat for reintroduction and use by Quino checkerspot butterfly). Control of non-native vegetation in and around the existing and restored vernal pools is expected to reduce non-native species presence and thereby encourage native floral diversity and associated habitat functions. Protecting all habitats within the Habitat Preserve from future disturbances with exclusionary fencing and restoring the dirt road and trails that bisect the vernal pool complex to native habitat will increase habitat functions such as wildlife usage. Additional adaptive long-term management will ensure the viability of the vernal pool complex.

In the Sycamore Canyon Creek waters of the United States preservation areas, non-native annual species dominate most of the understory areas, with well over 50% cover throughout the surrounding 50-foot upland buffer areas, which include areas of coast live oak woodland and southern sycamore-alder riparian woodlands. This weed cover has dramatically increased since the site burned in 2003, and this invasion by non-natives is having a substantial impact on the ecological functions of these aquatic resources, including available moisture in the soil. Little to no

recruitment of native trees or shrubs (including willowy monardella) was seen under the coast live oak and sycamore-alder woodlands. As the older trees and shrubs continue to die over time, there will be no natural replacement in the absence of weed control management and other restoration activities. With a program of weed control and other enhancement activities (native seeding and container plantings), these woodland vegetation types will be able to persist and thrive in perpetuity. The health of these upland buffers will have a direct impact on the ability of the adjacent wetlands to provide proper wildlife corridors and appropriate wildlife habitat and on the general water quality in those wetlands.

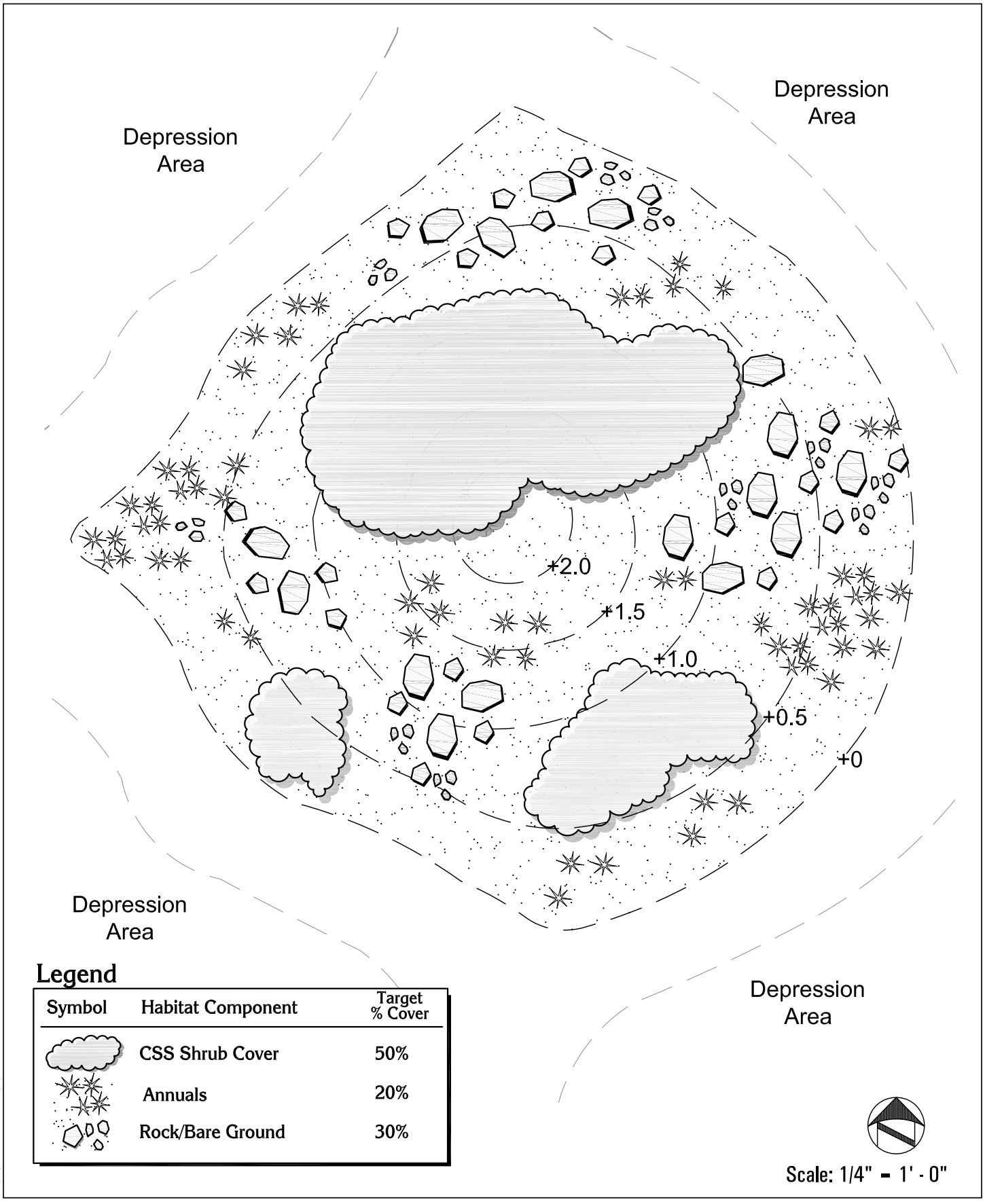
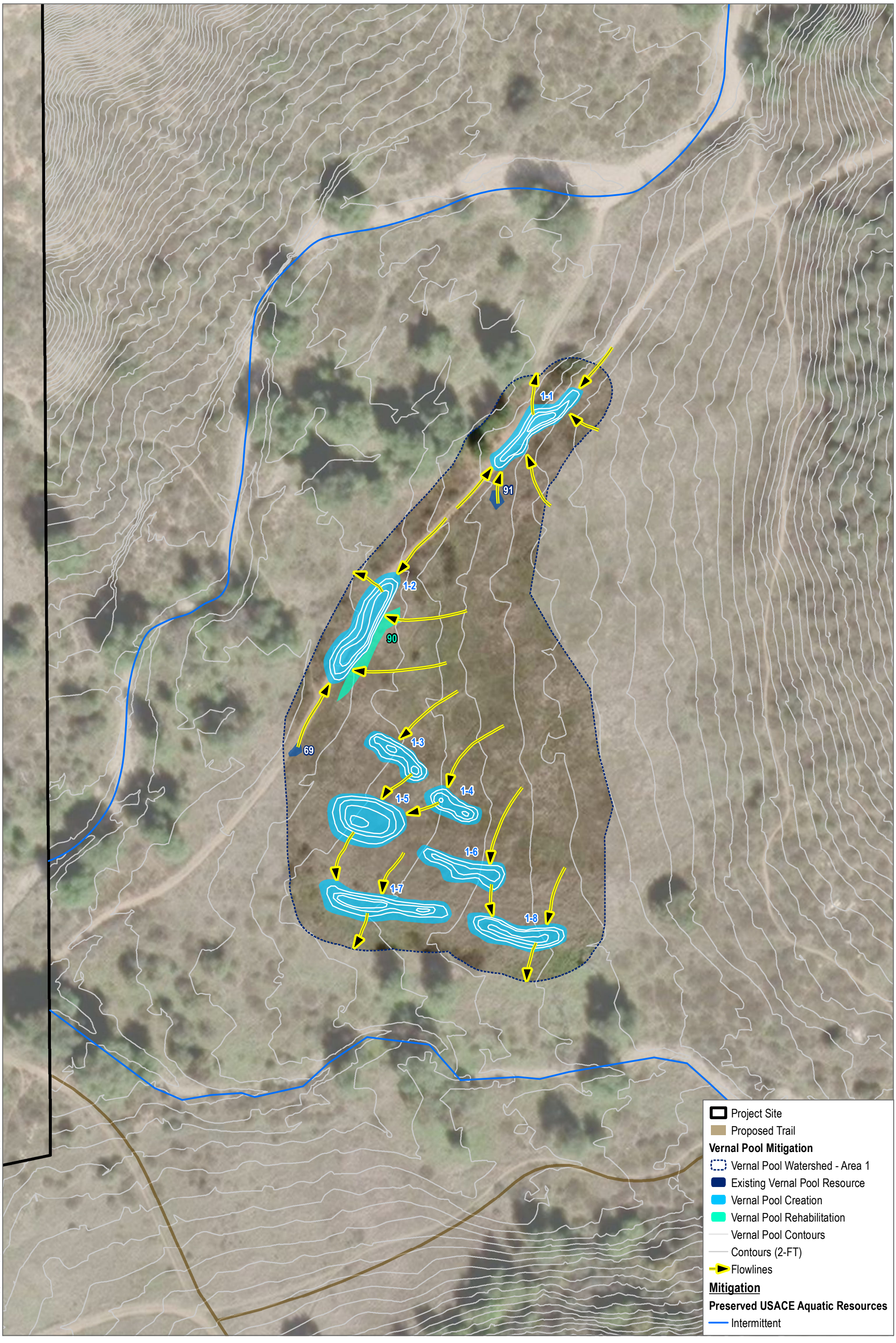


FIGURE 6

Mima Mound Habitat Example



SOURCE: Hunsaker 2022; ESRI World Imagery

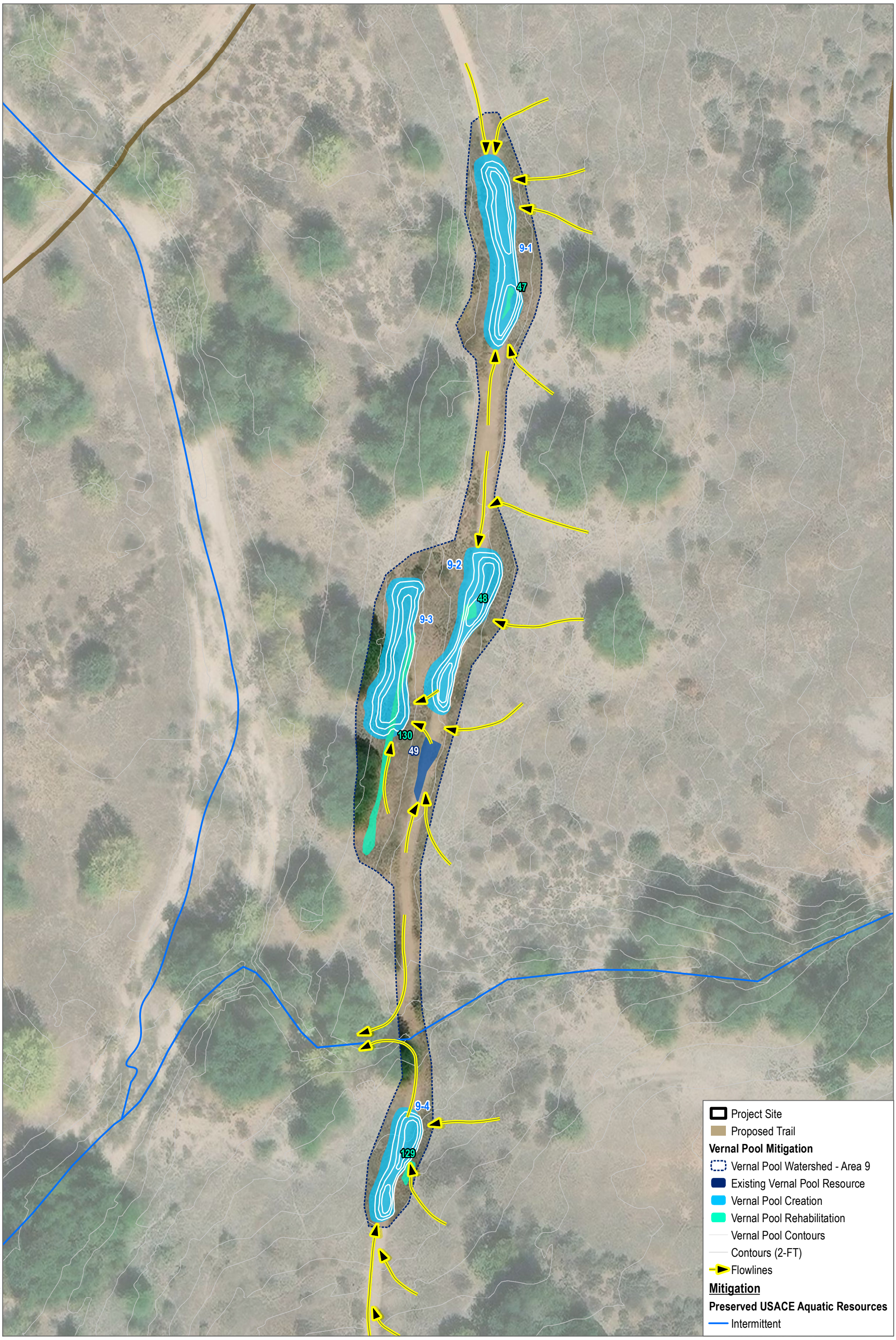
DUDEK

0 50 100 Feet

FIGURE 7A

Watershed Area 1 Grading Plan and Flow Paths

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project



SOURCE: Hunsaker 2022; SANGIS; ESRI World Imagery

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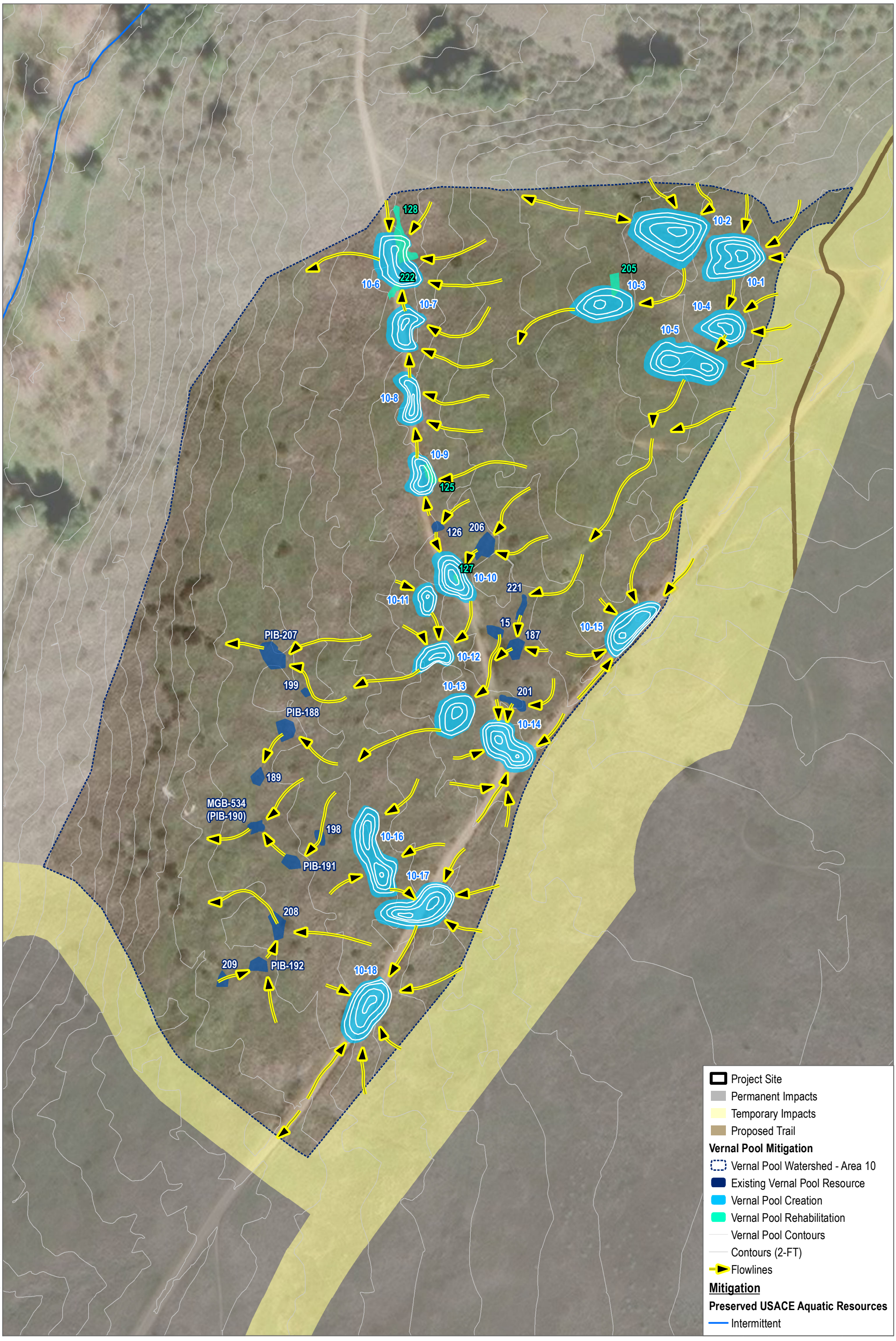
0 25 50 Feet

FIGURE 7B

Watershed Area 9 Grading Plan and Flow Paths

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project



SOURCE: Hunsaker 2022; ESRI World Imagery

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FIGURE 7C

Watershed Area 10 Grading Plan and Flow Paths

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project

SOURCE: Hunsaker 2022; SANGIS 2017, 2021

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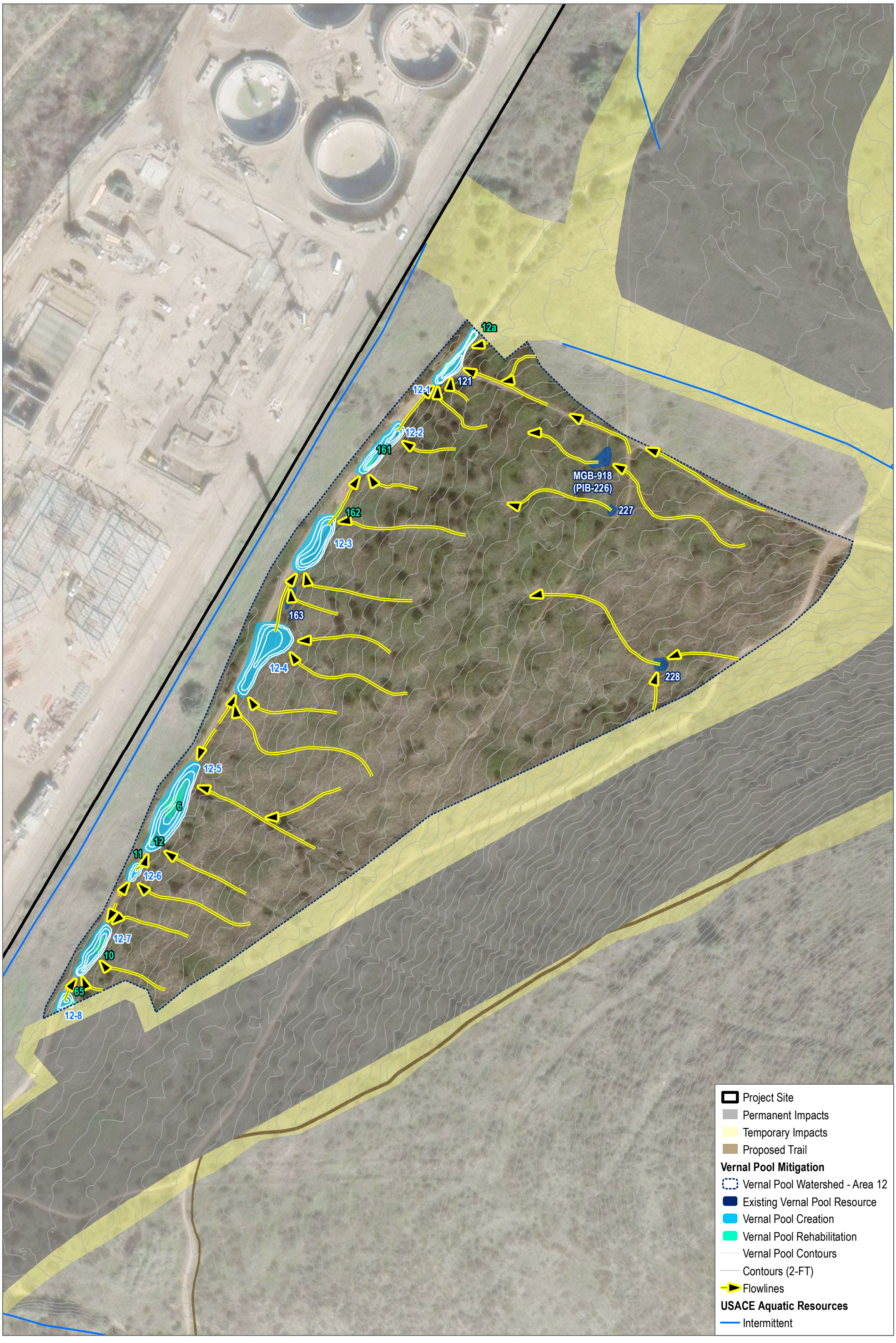
0 10 20 Feet

FIGURE 7D

Watershed Area 11 Grading Plan and Flow Paths

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project



SOURCE: Hunsaker 2022; ESRI World Imagery

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FIGURE 7E

Watershed Area 12 Grading Plan and Flow Paths

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project

2.9 Rationale for Success

2.9.1 Vernal Pools

The probability for successful restoration of vernal pools is increased when the pools to be restored are located near existing pools (USFWS 1997). The fact that the proposed vernal pool restoration locations are adjacent to and within existing vernal pool habitat provides assurance that the locations are suitable and also improves the likelihood that the appropriate vernal pool species will be able to persist at the mitigation site.

The vernal pools within the Habitat Preserve vernal pool complex experience seasonal inundation for a long enough period to support vernal pool habitat (e.g., depressions with vernal pool plant indicator species, San Diego fairy shrimp, and western spadefoot). However, many of these vernal pools are degraded due to anthropogenic disturbance, including road ruts. Soil type is a critical factor in the formation of vernal pools, and vernal pool soils generally contain a nearly impermeable surface or subsurface soil layer (USFWS 1997). Repairing and enhancing degraded vernal pool habitat has a high likelihood of success due to the presence of suitable soil conditions, including an impermeable clay layer.

The locations designated for vernal pool re-establishment/creation currently consist of insufficient depressions or have incurred too much disturbance to currently support inundation prolonged enough to develop vernal pool conditions. Some of the locations are believed to have existed as functioning vernal pools in the past prior to site disturbance. Although they are not currently functioning as vernal pools, they are part of the historical vernal pool landscape, which includes the overall topographic patterns of hummocks (mima mounds) and depressions on a soil type known to support vernal pools (e.g., Redding gravelly loam).

Surrounding these restored, enhanced, and preserved pools will be protection of the upland watershed areas. Efforts to restore vernal pools in Southern California over the last 25 years have shown that watershed support for pools is an important component. These past projects have demonstrated that watershed to vernal pool ratios can be as low as 5:1 and still provide the appropriate watershed input to not only restore vernal pool habitat but also maintain those pools over time (AECOM 2012; EDAW 2006, 2008). Field evaluation of the Habitat Preserve areas appropriate for vernal pool mitigation included analysis of the watershed areas and topography to determine watershed extent and drainage patterns. Figures 2A–2C show the existing vernal pools and the proposed pools for rehabilitation and creation. Table 7A demonstrates that the overall 7:1 watershed to vernal pool ratio proposed for this mitigation program is well within the known limits for supporting successful vernal pool habitat mitigation.

All 12 watershed areas occur entirely within the Habitat Preserve. Watershed Areas 1 and 9 are surrounded by 100 feet of open space area within the Habitat Preserve. Watershed Areas 2, 3, 4, and 5 are located either immediately adjacent to or within 100 feet of the northwestern Fanita Ranch boundary. The Fanita Ranch boundary occurs on the downstream portion of these four watersheds; the adjacent off-site property is MCAS Miramar, where the landscape, watershed, and habitats are expected to be preserved in perpetuity. Therefore, a 100-foot open space buffer is provided for these four areas. Watershed Areas 6, 7, and 8 are surrounded by a 100-foot buffer except for a small portion that is overlapped by the project development fuel modification zone, which is considered a permanent impact area consisting of 165 feet of brush management area at the edge of the development. Runoff from the fuel modification zone that overlaps the 100-foot buffer surrounding Watershed Areas 6, 7, and 8 would be directed downslope to the storm drain outfall south of these three areas and would not contribute to the hydrology of these watersheds. Watershed Areas 10, 11, and 12 are located within 100 feet of the Habitat Preserve, temporary impact areas, and permanent impact areas (i.e., pump station, detention basin, and Fanita Parkway). All

temporary impacts would be restored to preexisting conditions and once restored would become part of the Habitat Preserve and subject to long-term management. Therefore, temporary impacts within the 100-foot buffer surrounding these watersheds would be restored to open space. The portion of the 100-foot surrounding buffer for Watershed Areas 10, 11, and 12 adjacent to permanent impact areas would be protected from indirect effects through installation of stormwater infrastructure such as green sedimentation basins and a perimeter alignment of brow ditches. These brow ditches will physically separate the vernal pool watersheds from the development area by diverting any runoff from the development, keeping urban runoff and irrigation runoff out of the vernal pool watershed areas (Appendix B, Site Plan). Watershed Areas 10, 11, and 12 contain existing pools occupied by San Diego fairy shrimp, spadefoot toad, and vernal pool plant indicator species. Repairing and enhancing existing but degraded vernal pool habitat has a high likelihood of success with the proposed watershed preservation, and a 100-foot buffer surrounding the watershed composed of open space is not a necessary requirement for successful ponding (frequency and duration) and mitigation. A summary of the existing resources occurring within each watershed and the land uses within the 100-foot buffer surrounding each watershed is provided in Table 9 and shown on Figure 8, USACE Vernal Pool Watershed 100-foot Buffer.

Table 9. Vernal Pool Watershed Buffer (acres)

Watershed Area	Existing Resources[1]	Land Use within 100 feet of Watershed
Area 1	SDFS	Habitat Preserve (100 ft)
Area 2	Plants	Habitat Preserve, project site boundary abuts downstream edge of watershed
Area 3	SDFS, SPTO	Habitat Preserve, project site boundary occurs within 65 ft of downstream edge of watershed
Area 4	—	Habitat Preserve, project site boundary abuts downstream edge of watershed
Area 5	SDFS, USACE basin MGB-109 (PIB-36)	Habitat Preserve, project site boundary occurs within 70 ft of downstream edge of watershed
Area 6	SDFS, SPTO	Habitat Preserve, FMZ[2] occurs within 38 ft of watershed
Area 7	SDFS, SPTO, Plants, USACE basin PIB-27	Habitat Preserve, FMZ[2] occurs within 18 ft of watershed
Area 8	SDFS, SPTO, Plants, USACE vernal pool MGB-381 (PIB-193/194)	Habitat Preserve, FMZ[2] abuts edge of watershed
Area 9	SDFS	Habitat Preserve (100 ft)
Area 10	SDFS, SPTO, Plants, USACE basins (PIB-188, PIB-191, PIB-192, PIB-207) and vernal pool MGB-534 (PIB-190)	Habitat Preserve, temporary impact area[3] abuts portion of watershed, and a portion of the watershed occurs within 40–60 ft of detention basin
Area 11	SDFS, Plants	Habitat Preserve, pump station and temporary impact areas[3] within 30 ft of watershed
Area 12	SDFS, SPTO, Plants, USACE vernal pool MGB-918 (PIB-226)	Habitat Preserve, temporary impact area[3] abuts portion of watershed, permanent impact area abuts small portion of watershed

Notes: ft = feet; SDFS = San Diego fairy shrimp; SPTO = spadefoot toad; USACE = U.S. Army Corps of Engineers; MGB = USACE-jurisdictional basin or vernal pool identified by model during the 2020 delineation; PIB = USACE-jurisdictional basin or vernal pool previously identified during past focused San Diego fairy shrimp surveys; FMZ = fuel modification zone.

[1] Existing resource includes vernal pool indicator species (i.e., San Diego fairy shrimp, spadefoot toad, or vernal pool plants) and USACE-jurisdictional vernal pools and/or basins. Presence of vernal pool indicator species within each feature was based on the USACE Indicator Species for Vernal Pools list (USACE 1997).
[2] FMZ is considered a permanent impact but would consist of 165-foot brush management areas at the edge of the development. Runoff occurring within the FMZ would not be directed into the watershed.
[3] All temporary impacts occurring in upland habitat would be restored to preexisting conditions. All temporary impact areas, once restored, would become part of the Habitat Preserve and subject to long-term management.

The overall watershed to vernal pool ratio proposed for this project (7:1) has been calculated from the watershed areas on the preserved side of the brow ditches only and does not include any areas on the developed side of these brow ditches. This overall 7:1 ratio of watershed area will be more than adequate to support the vernal pool hydrology and potential to pond while protecting the pools from negative indirect effects.

The design of the topographic modification, including the range of size and depth of the pools, is based on the range for pools on MCAS Miramar, as the closest known vernal pool complexes that occur in similar landscapes and on similar soils are in the eastern portions of the base. Areas like the Miramar Mounds National Landmark on MCAS Miramar have pools that vary from just 100 square feet in size to well over 10,000 square feet in size, and these pools can vary in depth from as little as 2–4 inches to deeper than 12 inches (TetraTech 2018). Given the landscape and watershed support found in the Habitat Preserve areas, pools in the small to medium size class have been targeted (500–2,000 square feet).

Through topographical modification (mechanical and/or by hand), the drainage patterns within the restoration site will be altered sufficiently to help retain hydrological input within the restored basins consistent with appropriate vernal pool topography. Where vernal pools are to be created through excavation and recontouring, the goal will be to provide pools in the 4- to 6-inch depth range, with slopes that are gradual and allow for wide bands of different inundation levels. A typical vernal pool excavation and recontouring design is shown in Figure 9, Section of Typical Vernal Pool and Mima Mound Grading. The hydrological input to existing basins will not be significantly altered. Figures 7A–7E are provided to show the grading plans and flow paths in Watershed Areas 1, 9, and 12.

Vernal pools and watershed areas to be enhanced only (no topographic recontouring) will be delineated in the field with snow fencing and protected from any potential silting from recontoured areas with straw wattles along the borders. Grading will only be conducted when the soils are dry and the non-native grassland areas are dead and drying (August through October). Temporary construction paths will be established through the areas for topographic recontouring (creation or rehabilitation), and the grading will be conducted working back out from the furthest point of recontouring. The perimeter of graded areas will be protected against soil loss from the temporary disturbance of the ground with placement of straw wattles along the edges of the graded areas.

Prior to grading, enhancement areas will be surveyed for western spadefoot, and any detected individuals will be temporarily excluded from the recontouring area. This will require spotlight surveys during the rainy season prior to construction. The perimeter will be fenced with exclusion fencing to keep western spadefoot out during construction. As soon as recontouring is finished, the exclusion fencing will be removed so that the species can naturally recolonize.

Existing vernal pools to be rehabilitated and expanded in size and water capture potential will be graded from the edges out, leaving the existing pools as undisturbed as possible in the center. Any ruts or other minor topographic disturbance within the existing pools will be recontoured manually using hand tools only. A total of three pools under USACE, RWQCB, and CDFW jurisdiction (one vernal pool and two basins) would be subject to rehabilitation (recontouring to provide a larger, more functional vernal pool surface area). Table 10 summarizes the existing acreage and the proposed rehabilitation acreage for these three pools.

Table 10. USACE/RWQCB/CDFW Vernal Pools Proposed for Rehabilitation

Basin ID	Pool Type	Indicator Species Present[1]	Grading Depth (inches)[2]	Existing Acreage (square feet)	Creation Acreage (square feet)	Total Rehabilitated Acreage (square feet)
MGB-381 (PIB-193/194)	Vernal Pool	Plants	4-6	0.033 (1,437)	0.015 (693)	0.049 (2,130)
MGB-109 (PIB-36)	Basin	Plants, SDFS	4-6	0.001 (61)	0.023 (985)	0.024 (1,045)
PIB-27	Basin	Plants, SDFS	4-6	0.009 (409)	0.009 (376)	0.018 (785)
			Total	**0.044 (1,907)**	**0.047 (2,054)**	**0.091 (3,961)**

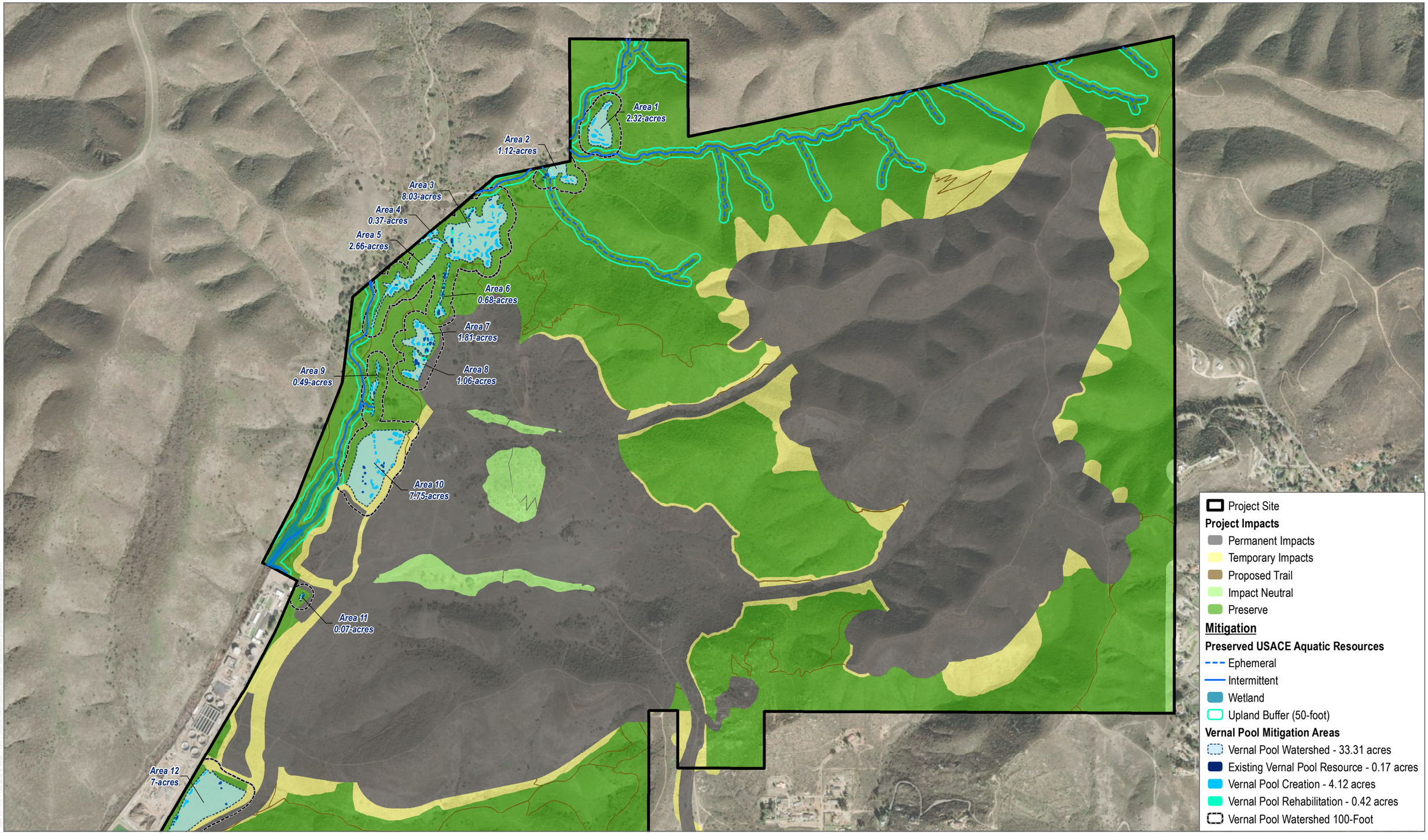
Notes: USACE = U.S. Army Corps of Engineers; RWQCB = Regional Water Quality Control Board; CDFW = California Department of Fish and Wildlife; MGB = USACE-jurisdictional basin or vernal pool identified by model during the 2020 delineation; PIB = USACE-jurisdictional basin or vernal pool previously identified during past focused San Diego fairy shrimp surveys; SDFS = San Diego fairy shrimp.
Totals may not sum due to rounding.

1 Presence of vernal pool indicator species within each feature was based on the USACE Indicator Species for Vernal Pools list (USACE 1997).

2 Depths will be finalized as part of the final grading plans.

The entire vernal pool complex will also be enhanced through weed management and native seeding to help improve the adjacent upland habitat areas. Figure 8 demonstrates that enhancement of the upland buffer area will help increase the success of the restored vernal pools by limiting the input of non-native plant propagules into the vernal pool complex. Enhancement of all additional areas will improve the biological function of the site and its value to wildlife.

Vernal pools are not homogeneous throughout the County due to differences in climate, topography, and soils (USFWS 1997). Therefore, the native plant species composition of the surrounding vernal pool habitat will be used as the model for the restoration effort. Native seed and inoculum will be collected from donor pools within the Habitat Preserve by the Habitat Restoration Specialist (Restoration Specialist). The donor pools will be the highest-functioning vernal pools within the complex of pools on site. Seed for the upland habitat enhancement will be collected from local sources within 25 miles of the coast. The use of local seed and inoculum improves the chances for successful restoration because the species are locally adapted to the conditions present at the site.



SOURCE: ESRI World Imagery

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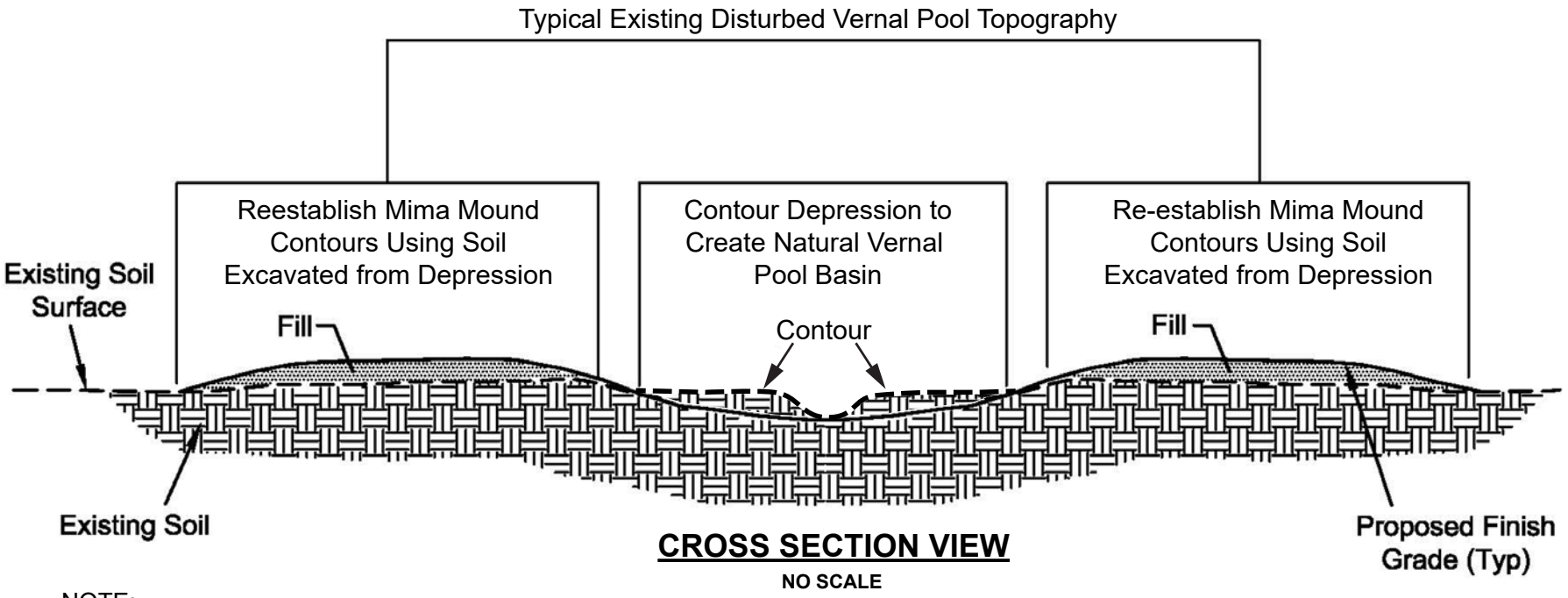
0 500 1,000 Feet

FIGURE 8

USACE Vernal Pool Watershed 100-foot Buffer

Habitat Mitigation and Monitoring Plan for the Fanita Ranch Project



NOTE:

1. Height of mima mound fill soil will be directly proportional to the depth and area of excavation.

FIGURE 9

Section of Typical Vernal Pool and Mima Mound Grading

2.9.2 Preservation Areas Associated with Sycamore Canyon Creek

Enhancement of the preserved wetland and non-wetland water habitats associated with Sycamore Canyon Creek also depends on adequate treatment of pervasive annual weeds to aid establishment of native annual and perennial species. Applied seed mixes will include an appropriate mix of annual and perennial native plant species to provide initial colonization of seeded areas with native plant species and long-term stability of native habitat generation.

Implementation of the requirements of this HMMP will commence during the dry season (fall) or concurrent with or immediately subsequent to the initiation of impacts for the project. Implementation will be conducted under the direction of a qualified biologist with at least 5 years of vernal pool restoration experience who is approved by the City.

2.10 Native Plant Communities to be Established

The compensatory mitigation project outlined in this HMMP will restore or enhance self-sustaining vernal pool, wetland, and non-wetland waters that are consistent with other analogous aquatic resources on the project site and in the immediate vicinity of the Habitat Preserve. Native vegetation communities to be established or enhanced include hardpan vernal pools, mulefat scrub, southern arroyo willow riparian forest, and southern willow scrub, along with buffer habitat of coastal live oak woodland and southern sycamore-alder riparian woodland. Target communities will be representative of the species diversity that typifies similar drainages within the project site.

2.11 Mitigation Site Current and Potential Wildlife Use

According to the Biological Technical Report for the Fanita Ranch Project (Dudek 2020a), a total of 18 special-status wildlife species are known to occur within the vernal pools, upland habitat, and wetland areas of the Habitat Preserve. Restoration of wetland vegetation within the Habitat Preserve would provide higher-quality habitat for special-status species known to occur within the Habitat Preserve, including least Bell's vireo (*Vireo bellii pusillus*), yellow warbler (*Setophaga petechial*), yellow-breasted chat (*Icteria virens*), and Cooper's hawk (*Accipiter cooperii*). Additionally, the preservation, rehabilitation/enhancement, and creation of vernal pools within the Habitat Preserve would increase suitable habitat for San Diego fairy shrimp, western spadefoot, and host plants for Quino checkerspot butterfly. Wet season surveys within the Habitat Preserve identified 38 pools (0.21 acres) containing San Diego fairy shrimp (Dudek 2020a). Western spadefoot toad has been observed by Dudek within 24 features located in the Habitat Preserve (Dudek 2020a).

2.12 Watershed Profile

The project and HMMP area fall entirely within the San Diego (Hydrologic Unit Code [HUC] 8) and Lower San Diego River (HUC 10) watersheds. These areas also have at least some overlap or downstream connection to three HUC 12 hydrologic regions, including 180703040701, 180703040703, and 180703040705. Because existing influences and effects on abundance, diversity, and condition in the San Diego (HUC 8) watershed are expansive and would not all apply to the project or HMMP area, the profile in this section focuses primarily on these effects within the 103,564-acre Lower San Diego (HUC 10) watershed, which is considered the ecologically meaningful unit, and includes additional details regarding the three HUC 12 subhydrologic regions. The Lower San Diego River (HUC 10) watershed overlaps with seven U.S. Geological Survey 7.5-minute quadrangles (Poway, San Vicente

Reservoir, El Cajon Mountain., La Jolla, La Mesa, El Cajon, and Alpine). The watershed provides habitat for various species, including 26 federal or state threatened and endangered wildlife species and 17 federal or state threatened and endangered plant species.

State Waters Abundance and Diversity

Data from the California Aquatic Resources Inventory were analyzed to determine the abundance and diversity of state waters within the Lower San Diego (HUC 10) watershed, which are summarized in Table 11.

Table 11. State Waters Abundance and Diversity in the Lower San Diego (HUC 10) Watershed (acres)

Wetland Type	Area within Watershed (acres)	% of Total Watershed Area	% of Area Protected within Watershed
Palustrine and Riverine Wetlands			
Pond and associated vegetation	1,122	1.1%	54.8%
Lake, reservoir, and associated vegetation	301	0.29%	87.8%
Wetlands			
Tidal marsh	43.3	0.042%	99.8%
Subtidal water	6	<0.01%	99.8%
Total	**1,472**	**1.432%**	—

Notes: % = percentage; HUC = Hydrologic Unit Code.

Although other state waters types (e.g., vernal pools) are not included in Table 11, the California Aquatic Resources Inventory database (EcoAtlas 2022) estimates that approximately 22% of the Lower San Diego River (HUC 10) watershed contains hydric soils. The hydric soils are primarily present immediately adjacent to the San Diego River or other substantial aquatic resources (e.g., Lake Jennings) and indicate the potential for additional state waters to be present.

Assessment of State Waters Condition

Intermittent/Ephemeral Non-Wetland Waters

Intermittent and ephemeral state waters provide important functions and services that contribute to the hydrological, biogeochemical, and ecological health of a watershed, including retention and transport of sediment and nutrients throughout native habitats, dissipation of stream energy and erosion control, and movement corridors for wildlife during dry periods. The California Stream Conditions Index (CSCI) scores stream conditions based on measurements of ecological structure and function and on benthic macroinvertebrate presence (i.e., taxonomic completeness). The CSCI scored streams within the Lower San Diego River (HUC 10) watershed at an average of 0.696; the score is calculated out of 1 (data accessed through EcoAtlas 2022). The minimum watershed CSCI score was 0.57 from the station in Forester Creek, and the maximum watershed score was 0.939 from the station in Los Coches Creek. From the 11 stations in the San Diego River (which Sycamore Canyon Creek is tributary to downstream of the project site), the average CSCI score was 0.674.

The state waters within the project site include both non-wetland waters and wetlands that would be impacted by the construction of the proposed project, as well as those that would be preserved and restored through the proposed on-

site mitigation. The non-wetland waters present (13.98 total acres) consist of ephemeral drainages and swales within existing hillside slopes and canyons and three larger intermittent drainage features that convey flows downstream to Sycamore Canyon Creek (Dudek 2020b). The quality of these non-wetland water features decreases from north to south within the site, with the northern features (much of which is proposed to be avoided by the project) being the highest quality due to their adjacency to contiguous native upland habitats with low disturbance. The more southerly situated non-wetland waters experience more disturbance and generally have a higher proportion of non-native species directly adjacent (e.g., non-native grasses). This is due to the current land use intensity of the southern sections of the project site, which have the highest density of off-highway-vehicle activity. The project would impact 4.81 acres of ephemeral and intermittent RWQCB non-wetland waters (including swale features) on the project site, primarily in the center, southern (with the exception of the southernmost Habitat Preserve area), and eastern sides of the project site. The remaining 7.88 acres would be preserved and/or restored (Figures 3A–3E). On-site drainage patterns would be maintained to the maximum extent practicable through proposed stormwater infrastructure design (Appendix B; Hunsaker & Associates 2020) and would also preserve key downstream sections of the two impacted intermittent drainages on site within the development area (the third northernmost intermittent drainage would not be impacted by the project) (Figures 3B and 3C). In addition, 1.08 acres of non-wetland waters would be created through the rehabilitation of these features within the Habitat Preserve (outside the development area) in the southernmost section of the project site (Figure 3E).

California Rapid Assessment Method (CRAM) index scores within the San Diego River, which Sycamore Canyon Creek is tributary to, range from 80 within more natural sections to 55 within more urban areas that experience more activity from people experiencing homelessness (California Wetlands Monitoring Workgroup 2013).

Wetlands

A total of 12 state wetland areas were identified within the project site (3.79 acres) where all three federal parameters required for USACE-jurisdictional wetlands (i.e., hydrophytic vegetation, hydric soils, and wetland hydrology) were observed (Dudek 2020b). Of that total, approximately 84% would be conserved (i.e., 2.78 acres [73%] included in the Habitat Preserve and 0.39 acres [10%] included in the Impact Neutral areas), and 16% would be permanently impacted by the project. Of the 2.78 acres conserved within the Habitat Preserve, approximately 2.55 acres are associated with Sycamore Canyon Creek.

Vernal Pools

A total of four vernal pools were identified within the project site (0.046 acres). Of that total, approximately 94% of the vernal pools would be conserved within the Habitat Preserve, and 6% of vernal pools would be impacted by the project. Additionally, 14 basins (0.051 acres) with hydrological connection to Sycamore Canyon Creek were identified (Dudek 2020b). Of that total, approximately 76% of the basins would be conserved within the Habitat Preserve, and 24% would be impacted by the project.

Conservation of State Waters in the Watershed

The Lower San Diego River (HUC 10) watershed overlaps with the San Diego metropolitan area and, as such, contains expansive sections of developed land already present, particularly in the downstream areas where development density increases. Based on 2010 Census data, there was a population of 546,940 persons present in the Lower San Diego River (HUC 10) watershed living in 1,402 housing units per square mile (EcoAtlas 2022). The 2011 National Land Cover Database (EcoAtlas 2022) further estimates that out of the 103,564 acres within the Lower San Diego River (HUC 10) watershed, approximately 56,900 acres contain some level of development, with low- to high-intensity

development making up 78% of that total (44,382) and the remaining 22% (12,518 acres) consisting of developed open space (e.g., parks).

There are 11 habitat projects within the Lower San Diego River (HUC 10) watershed that have either been completed (4 projects) or that are still in the planning stages (7 projects). The project types consist of mitigation and non-mitigation (or unknown) and contribute 2,103.3 acres of habitat within the watershed. Additionally, of the projects permitted since 2003, approximately 28.3 acres of creation/establishment and 3.4 acres of restoration/rehabilitation have been assigned as mitigation within the watershed.

The on-site mitigation areas would occur within the project site, which is bordered to the north (upstream) by the Sycamore Canyon Preserve. As such, downstream effects on mitigation would be unchanged from their natural conditions and are expected to support the mitigation areas as designed.

Summary

In summary, the proposed project and associated compensatory mitigation would not result in a net loss of the overall abundance, diversity, and condition of aquatic resources within the Lower San Diego River (HUC 10) watershed.

3 Mitigation Work Plan

This section describes in detail who will be responsible for the mitigation effort and how the proposed compensatory mitigation program will be accomplished, including implementation, maintenance, and monitoring. Implementation of the mitigation effort will be determined based on seasonal weather constraints and through coordination with the City and resource agencies.

3.1 Project Implementation Personnel

3.1.1 Permittee/Project Manager

HomeFed Fanita Rancho LLC (HomeFed) is the owner/permittee of the project. HomeFed (or subsequent legal owners) will be financially responsible for the implementation and management of this mitigation project. HomeFed will post a performance bond to ensure the success of the mitigation project during the construction and implementation phase and in accordance with applicable performance standards. Once the construction and implementation phases are completed, HomeFed will utilize a Community Facilities District (CFD), which will ensure a reliable funding mechanism for ongoing maintenance, monitoring, and reporting to meet USACE's requirements for a funding source in perpetuity.

Pursuant to the Mello-Roos Community Facilities Act of 1982 (California Government Code Sections 53311 and following), the City may establish a CFD or CFDs to finance certain limited public services, including management, maintenance, and monitoring of open space preserves. Within a CFD, a special tax is levied on property owners to generate a perpetual funding source for the required public service.

The CFD approach provides a secure and viable option to pay for, in full or in part, the management, maintenance, and monitoring of preserve lands included in the preserve network as part of the development review. When the CFD is created, the project developers would, as a condition of approval, agree to either form or annex the development area into the CFD. The funds generated annually through the CFD would then be used to manage, maintain, and monitor the conserved lands within the preserve area.

The formation of the CFD involves the following steps:

- **Application by property owner:** The property owner will submit a formal request to the City to establish a CFD and provide funding for the initial costs incurred by the City of processing of the proposed CFD.
- **Preparation of a rate and methodology for setting the special tax:** A Rate and Method of Apportionment (RMA) will be prepared by a qualified tax consultant to establish the parameters for setting the special tax on all properties within the CFD. The special tax rates set in the RMA will be based on a comprehensive annual budget (using Property Analysis Record [PAR] or PAR-equivalent analysis) using actual and/or estimated cost estimates for preserve management and monitoring activities. A maximum annual special tax rate is established at the time of district formation, based upon the anticipated budget needed to fund maintenance activities and to cover annual costs to administer the CFD. The special tax rates established in the RMA would be adjusted annually based on a cost index to ensure that future year special tax revenues would be sufficient to fund the annual budget.

- **Adoption by the City Council:** The formation of the CFD will require several actions by the city council and the property owners within the proposed CFD. First, the city council will adopt a resolution of intention that will include the RMA, the proposed boundary of the CFD, and the services to be funded. A minimum of 30 days after the adoption of the resolution of intention, the city council will adopt a resolution of formation, conduct a public hearing, and hold an election for the eligible voters on the CFD. The voters will be the property owners within the boundaries of the proposed CFD. Upon the approval of the property owners, the City will be authorized to levy the CFD special taxes in perpetuity.

A PAR or similar cost estimation method will be prepared to document the initial and ongoing annual funding for the perpetual long-term management, maintenance, and monitoring of the biological conservation easement area by an agency, non-profit organization, or other entity approved by the resource agencies. HomeFed will submit the final HMMP to the resource agencies and will also ensure funds go to contractors and/or the management entity within 60 days of receiving approval of the HMMP. HomeFed will not initiate project impacts until the HMMP is approved by the resource agencies and a funding mechanism acceptable to the resource agencies is in place.

3.1.2 Restoration Specialist

HomeFed will select a qualified Restoration Specialist who will review the environmental permits, documents, final HMMP, and mitigation construction documents, and help to ensure that all protective fencing, pre-work bird surveys, and any other required items are adequately performed prior to beginning mitigation work.

The Restoration Specialist will perform site monitoring during mitigation implementation and throughout the 6-year maintenance and monitoring period. The Restoration Specialist will prepare mitigation annual reports with required biological data and will submit reports to HomeFed and the regulatory agencies. The Restoration Specialist will have a degree in biology, ecology, or related field and be able to demonstrate at least 5 years' experience with similar wetland mitigation projects in Southern California.

3.1.3 Restoration Contractor

HomeFed will select a qualified Habitat Restoration Contractor (Restoration Contractor) to implement the mitigation installation work and provide subsequent mitigation area maintenance. Restoration installation work will be performed by a contractor possessing a valid California landscape contractor's license (Class C-27) who has previous experience with native riparian habitat restoration in the County and who can demonstrate at least three successful similar wetland restoration projects in Southern California. The Restoration Contractor must be able to identify California native plants and common weed species and demonstrate knowledge of habitat restoration techniques.

The Restoration Contractor will be responsible for conformance to this HMMP and regulatory agency permit requirements. The Restoration Contractor's responsibility for mitigation installation will continue until successful completion and final acceptance by HomeFed and the Restoration Specialist at the end of the initial 120-day plant establishment period (PEP). The Restoration Contractor will not be released from contractual obligations for installation until written notification is received from HomeFed that all required installation tasks as defined in the installation contract, final plans and specifications, this HMMP, and the project permits have been successfully completed.

After initial installation and completion of the PEP, HomeFed will contract for 5 years of maintenance services performed by a qualified maintenance contractor that specializes in the maintenance/management of habitat

restoration/natural lands. Maintenance work will be performed as indicated herein and per the Restoration Specialist's recommendations. HomeFed may choose to hire a maintenance contractor that is separate from the installation Restoration Contractor or relieve a contractor that fails to perform work satisfactorily.

3.2 Site Preparation

Site preparation will be conducted under direction from the Restoration Specialist. Specific site preparation tasks are outlined below.

3.2.1 Site Protection Measures

In accordance with the Draft Santee MSCP Subarea Plan, site-appropriate fencing and access controls will be installed to protect the resources on site. Exclusionary fencing will be installed and maintained prior to the commencement of Phase 1 grading to ensure the exclusion of disturbances, including off-road vehicles, foot traffic, transient activity, and/or mountain bikes, as well as indirect impacts from construction. Vernal pool restoration areas within 100 feet of permanent or temporary impact areas will be defined by temporary markers (staking, flagging, silt fencing, etc.) prior to initiation of all Phase I grading activities. Silt fencing will also be installed around the perimeter of existing vernal pools during construction to help protect the pools from indirect impacts during construction. The silt fencing will be removed after all grading is complete. Additional orange construction fencing and signage will be installed at the top or toe of slopes in the impact areas to protect the watersheds to the maximum extent practical during construction. When grading is completed, runoff from the permanent impact areas will be directed away from the vernal pool watersheds. All temporary impact areas will be restored with a native palette and will be become part of the Habitat Preserve open space.

Prior to completion of the planned 6-year mitigation program, the mitigation area, which is included in the Habitat Preserve, will be protected in place via recordation of a permanent conservation easement over the entire mitigation area. The protection mechanism will be adequate to demonstrate that the mitigation areas will be protected in place in perpetuity without threat of future development, disturbance, and/or encroachment. The conservation easement will prohibit all residential, commercial, industrial, institutional, and transportation development and any other infrastructure development that would not maintain or enhance the natural functions and values of the mitigation area. Utility lines, sewer lines, drainage lines, access roads, and other passive and/or active recreation areas will not be allowed in the mitigation/revegetation areas where these easements/uses do not currently exist. Upon meeting the final performance standards, the site will be managed by a qualified long-term (in-perpetuity) natural lands manager.

3.3 Implementation Procedures (Sequence of Tasks)

Implementation of this HMMP will commence prior to, or concurrent with, the initiation of the Phase 1 impacts for the project. The sequence of implementation tasks for vernal pool and upland habitats is outlined in Table 12. Initial treatment of target invasive species will occur during the growing season immediately following commencement of the project.

Table 12. Anticipated Vernal Pool and Upland Habitat Implementation Schedule

Site Preparation and Grading	Start	End
Spadefoot Toad Spotlighting and Exclusion	October 2025	February 2026
Inoculum/Seed Salvage and Collection	September 2026	October 2026

Table 12. Anticipated Vernal Pool and Upland Habitat Implementation Schedule

Site Preparation and Grading	Start	End
Vernal Pool Native Plant Seed Collection	March 2026	July 2026
Vernal Pool Native Plant Seed Bulking Program	June 2027	December 2027
Site Preparation (Fence Installation, Dethatching, Invasive Removal, etc.)	August 2026	September 2026
Debris and Trash Removal	September 2026	September 2026
Plant Salvage (As Needed)	September 2026	December 2026
Site Contouring and Grading	September 2026	November 2026
Installation	**Start**	**End**
Container Planting (Vernal Pool Watersheds and Uplands)	December 2026	March 2027
Upland Seeding	November 2026	January 2027
Hydrological Testing	November 2026	June 2027
Introduction of Vernal Pool Flora and Fauna (Inoculum) and Seed Application	TBD	TBD
120-Day Plant Establishment Period	December 2026	March 2027

Notes: TBD = to be determined based on the results of the hydrological testing and agency approval.

Implementation Tasks:

1. A preconstruction survey for spadefoot toad will be conducted prior to soil disturbance by a qualified biologist using methodology acceptable to the City and the CDFW. Any spadefoot toads encountered will be temporarily translocated from the project grading area. The perimeter of the work area will be delineated with exclusion fencing (e.g., trenched silt fence) to prevent spadefoot from reentering the grading area during grading. The exclusion fencing will be maintained until construction begins and through the duration of the construction period.
2. The Restoration Specialist will collect vernal pool inoculum from the donor pools at the project site. No more than 10% of the surface of each donor basin will be collected to a depth of no more than 2 inches. The collected soil from San Diego fairy shrimp–occupied donor pools will be kept separate. All other inoculum will be combined to increase the diversity of plant species within the inoculum. The intent of mixing the inoculum soil is to promote the maximum diversity of vernal pool endemic plant species to be expressed in the restored pools. The soil from each basin will be stored individually in labeled boxes that are adequately ventilated and kept dry. During grading activities, the boxes will be temporarily stored off site at an appropriate facility. The soil will be divided for inoculation based on the general size of the restoration pools. Thus, larger restoration pools will receive a greater quantity of inoculum soil than the smaller restoration pools. The City, CDFW, and U.S. Fish and Wildlife Service (USFWS) will approve grading prior to spreading inoculum. Inoculum from San Diego fairy shrimp–occupied pools will be spread only once pools are demonstrated to retain water for at least 21 to 28 days and have been surveyed for versatile fairy shrimp to the satisfaction of the City, CDFW, and USFWS. Inoculum soil will be spread evenly, no more than 0.25 inches deep, across the deeper portions of each restored pool. Inoculum will be placed into the bottoms of the restored/enhanced pools in a manner that preserves, to the maximum extent possible, the viability of plant seeds within the surface layer of soil (e.g., collected inoculum will be shallowly distributed within the pond so that seeds have the potential to germinate upon inundation).

3. Native seed collection from vernal pool indicator species will be conducted by the Restoration Specialist at the mitigation site prior to any dethatching, clearing, or grading of the site. The collected seed will be cleaned, dried, and temporarily stored until site preparation and grading are complete. At that point, the seed will be used to revegetate the mitigation site or to propagate plants in the greenhouse.
4. Perimeter fencing and signage will be installed as discussed in Section 3.2.1, Site Protection Measures.
5. Native vegetation within the limits of grading for the restored vernal pools will be salvaged and/or cut and mulched as deemed appropriate by the Restoration Specialist for reuse within the restoration area.
6. The entire mitigation site (uplands, vernal pools, etc.) will be weeded by the Restoration Contractor using chemical, mechanical, or other means approved by the Restoration Specialist and City prior to grading to control non-native plant species. Following initial weed control, non-native thatch and weed material will be removed and disposed of off site. Weed management procedures will be continued for the duration of project installation until deemed by the Restoration Specialist as being appropriately controlled for seeding.
7. Prior to any grading/excavation, temporary T-post and rope fencing and biodegradable fiber rolls will be installed around the perimeter of the existing vernal pools to prevent inadvertent disturbance and deposition of soil and dust within the existing vernal pools.
8. The reestablishment/creation basins will be excavated (mechanically and/or by hand), and the adjacent mima mound topography will be restored. The basins and mima mounds will be contoured to have a natural form as shown on the grading plans and construction documents, which is comparable to that of the existing basins and mima mounds on the project site.
9. The rehabilitation basins will be contoured to remove road ruts and slightly deepen and shape vernal pools to develop a natural form as shown on the grading plans.
10. Larger cobbles will be placed in basins to be used as stepping stones during monitoring.
11. The dirt access road and footpaths within the mitigation area will be ripped, except for the proposed vernal pool restoration sites. The soils will be ripped to a 12-inch depth, as possible, to facilitate decompaction and revegetation.
12. The silt fence barrier installed as part of spadefoot toad exclusions will be removed.
13. Container plants will be installed in uplands and on mima mounds in accordance with the planting plans.
14. Native seed mix will be applied, and container plants will be installed on newly restored mima mounds. Additionally, native seed mix will be applied within designated enhancement areas within the surrounding upland habitat.
15. The salvaged vernal pool inoculum will be applied to the restored vernal pools once ponding is observed for a minimum of 21 days.
16. Upon successful completion of the initial restoration phase, biological monitoring and maintenance will be initiated and continued for 5–6 years as described later in this HMMP.

The actual dates for implementation of these tasks will be determined based on seasonal weather constraints and through coordination with the City and resource agencies. All restoration work involving soil manipulation will be conducted during the dry season prior to the onset of the rainy season. See Table 12 for details on implementation of tasks.

3.4 Weed and Invasive Species Removal

Prior to grading or any restoration implementation, the Restoration Contractor will meet with the Restoration Specialist to determine the best way to access the areas and remove vegetation without damaging adjacent native habitat. Areas to be planted and/or seeded will be completely free of weeds and have only bare mineral soil exposed at the time of seeding. Weed control will include hand-pulling of weeds, use of hand tools, weed whips, and/or foliar treatments of appropriate herbicides as determined by the Restoration Specialist. Specific herbicide application rates and methods will be based on manufacturer specifications and will follow the general guidelines summarized below:

- Application methods will follow manufacturer specifications regarding application and safety procedures. Herbicide application will comply with state and local regulations. All application tasks will be performed by or under supervision of a licensed applicator with a Pest Control Business License for California and the County.
- Herbicide Application will consist of spot applications to individual plants where weed coverage is sparse and broadcast applications to dense patches of weed species. Applications should be uniform and complete. Contact with native species must be avoided; in the event of gusty winds or winds in excess of 5 miles per hour, application work will be temporarily discontinued to protect applicators and adjacent natural resources. Treatments should also be temporarily discontinued in the event of rainfall because rainfall reduces the effectiveness of the herbicide.
- Sprayed vegetation should be left undisturbed for 7 days to allow the herbicide to be distributed throughout the entire plant. Visible effects of herbicide application consist of wilted foliage, brown foliage, and disintegrated root material.
- Any non-native trees or shrubs will be cut and removed, and the stumps will be treated with a systemic herbicide approved for use in wetland areas.
- All dead weed materials will be removed from the soil surface and disposed of at an appropriate disposal facility.

3.5 Trail Restoration and Maintenance

As directed by the project's Preserve Management Plan (Dudek 2020a), special treatment will be required when enhancing old off-road trails that intersect preserved non-vegetated channels under USACE, RWQCB, and CDFW jurisdiction. These off-road trail areas are characterized by highly compacted soil that has lost most of the finer soil particles through erosion; vegetation is absent. Trail restoration would contribute to the overall benefit of the preserved non-vegetated channels and downstream waters because it would reduce soil disturbance, decrease vehicle and foot traffic, and provide enhancement of surrounding habitat. Reestablishment of native vegetation in these areas requires pretreatment as follows:

- Block access to the trail from adjoining trails or other access. This may be done using post-and-rail (or similar) fencing, boulders, native vegetation debris piles, or other means.
- Eliminate soil compaction using hand tools or a walk-behind rototiller.
- Amend soil or import topsoil to create surface grades that are flush with the adjacent native grade to reestablish sheet flow through the area. Care must be taken to not concentrate flow that can cause erosion.
- Install best management practices (BMPs) in the form of temporary erosion control, such as the use of bundled native organic debris, fiber rolls (that are made with weed-free straw and woven jute thread mesh), and 100% straw (weed-free) erosion control blankets (sewn with jute thread).

- Apply a native seed mix either by hand broadcast or using hydroseed methods. If hydroseeded, consider using a soil tackifier that will help hold seed to the soil and reduce erosion.
- Install container plants for species that do not establish well from seed or if seed is unavailable from local collections or commercial sources.

Boulder stepping stones or small puncheon bridges would be used where a trail crosses a stream channel that has a defined bed and bank. Maintenance of trails where they cross stream channels may be as simple as providing a rock surface at the low point to accommodate low flows during and shortly after storm events. Additionally, a drainage lens, which uses stones 2–4 inches in diameter wrapped in a geotextile "burrito" to form a surface 6 inches to 1 foot above the flow line of the swale, which is then topped by a 6-inch-thick wear surface, could serve as a stabilizing device. All trails within the Habitat Preserve will be highly managed and an improvement from existing conditions.

3.6 Topographic Reconstruction

The capacity to capture and store water has been compromised in locations proposed for vernal pool restoration. These areas will be contoured to enhance the attributes of vernal pool/mima mound topography. Surrounding topography will be left undisturbed. Figure 9 shows the approach to grading each pool, where slopes will be established that grade as evenly as possible from the low point to the outer margins of the basin.

Excavation (mechanical and/or hand) of the bottom of the vernal pool restoration areas will function to increase the water holding capacity of the individual basins. Mechanical grading using a small dozer or skid-steer will be used whenever possible and will be conducted by a grading contractor with experience grading vernal pools.

The qualified Restoration Specialist will supervise the restoration grading activities. Grading of the restoration site will be conducted during the summer and early fall to minimize soil disturbance during the rainy season, when vernal pools fill with water. The grading plans will identify the limits of grading and those areas of existing habitat that are not to be impacted by the restoration activities and that would be protected/preserved.

Vernal pool restoration areas will be defined by temporary markers (staking, flagging, silt fencing, etc.) prior to initiation of the grading activities. Silt fencing will be installed around the perimeter of adjacent existing vernal pools during construction and during the weed control procedures to help protect the pools from wind-blown seed invasion and siltation. The silt fencing will be removed after all initial weed control and installation procedures are complete.

3.6.1 Soil Amendment

No soil amendments are proposed for any of the mitigation areas.

3.6.2 Erosion Control Best Management Practices

Erosion control BMPs will be used where necessary to reduce the mobilization and transport of sediments and pollutants from the mitigation areas during installation and during the maintenance and monitoring period. In general, the native container planting and seeding will provide effective erosion control; however, additional BMPs such as burlap-encased straw wattles/fiber rolls or burlap gravel bags may be needed, as determined by the Restoration Specialist. BMPs with nylon netting will not be used in mitigation areas; all BMPs will be biodegradable. All straw wattles/fiber rolls will be certified free of noxious weeds.

3.7 Seeding

The contracting nursery and seed collectors will be given the maximum possible lead time (i.e., no less than 12 months prior to actual seed application) to salvage, collect seed, and store and prepare plant material for the project in order to assure availability and minimize cost. No more than 5% of seed will be collected from plants that will be undisturbed. In areas that will be disturbed due to proposed restoration activities (e.g., restored vernal pools and associated mima mound locations), 100% of native seed may be collected. Field coordination will be provided by the Restoration Specialist to verify the sources for plant material propagation and for construction of the restoration areas. Coordination also will be essential for successful salvage, storage, and eventual replanting of salvaged native plant materials.

The selection of species to be established within the Habitat Preserve is based on the known native plant species currently present within the site, as well as native species expected on site based on the site location. Species to be seeded in the restored coastal sage areas are shown on Table 13. Species to be seeded in valley needlegrass grassland and coastal sage scrub–valley needlegrass grassland areas are shown in Tables 14 and 15, respectively. Species to be seeded in vernal pools are shown in Table 16.

Table 13. Diegan Coastal Sage Scrub Seed Mix

Scientific Name	Common Name	Pure Live Seed	Pounds per Acre
Acmispon glaber	deerweed	24	2.0
Artemisia californica	California sagebrush	9	6.0
Castilleja exserta	purple owl's clover	25	1.0
Eriogonum fasciculatum	California buckwheat	7	5.0
Eriophyllum confertiflorum	golden yarrow	26	2.0
Eschscholzia californica	California poppy	71	4.0
Hazardia squarrosa	sawtooth goldenbush	2	2.0
Isocoma menziesii	coastal goldenbush	8	2.0
Peritoma arborea	bladderpod	58	2.0
Rhamnus crocea	redberry buckthorn	76	2.0
Salvia apiana	white sage	43	3.0
Salvia columbariae	chia	54	2.0
Salvia mellifera	black sage	40	4.0
Stipa pulchra	purple needlegrass	42	1.0
		Total	**38**

Note: The Diegan coastal sage scrub seed palette will be used in locations of upland enhancement within existing Diegan coastal sage scrub habitat.

Table 14. Valley Needlegrass Grassland Seed Mix

Scientific Name	Common Name	Pure Live Seed	Pounds per Acre
Stipa pulchra	purple needlegrass	24	2.0
Bloomeria crocea	common goldenstar	10	8.0
Bloomeria clevelandii	San Diego goldenstar	9	5.0
Sisyrinchium bellum	blue eyed grass	76	2.0
Plantago erecta	dot-seed plantain	54	3.0

Table 14. Valley Needlegrass Grassland Seed Mix

Scientific Name	Common Name	Pure Live Seed	Pounds per Acre
Lasthenia californica	goldfields	71	2.0
Antirrhinum coulterianum	Coulter's snapdragon	2	3.0
Cordylanthus rigidus	rigid bird's beak	57	1.0
Castilleja exserta	owl's clover	57	2.0
Collinsia concolor	Chinese houses	45	3.0
Collinsia heterophylla	purple Chinese houses	40	3.0
		Total	**34**

Table 15. Diegan Coastal Sage Scrub-Valley Needlegrass Grassland Seed Mix

Scientific Name	Common Name	Pure Live Seed	Pounds per Acre
Artemisia californica	California sagebrush	9	2.0
Eriogonum fasciculatum	California buckwheat	7	8.0
Eschscholzia californica	California poppy	71	2.0
Isocoma menziesii	coastal goldenbush	8	1.0
Lotus scoparius	deerweed	24	3.0
Salvia mellifera	black sage	40	2.0
Stipa pulchra	purple needlegrass	76	2.0
		Total	**20**

Table 16. Vernal Pool Seed Mix

Botanical Name	Common Name	Pounds per Acre[1]
Callitriche marginata	water starwort	1.0
Crassula aquatica	common pygmy-weed	0.5
Deschampsia danthonioides	graceful hairgrass	4.0
Elatine brachysperma	waterwort	1.0
Elatine californica	waterwort	1.0
Eleocharis macrostachya	pale spike-rush	0.5
Juncus bufonius	toad rush	0.1
Plantago elongata (*bigelovii*)	vernal pool plantain	0.5
Pogogyne abramsii	San Diego mesa mint	0.5
Psilocarphus brevissimus	woolly marbles	2.0
	Total	**11.1**

Note:

[1] Seed from vernal pool species will be collected locally and opportunistically. Therefore, seed purity and germination percentage will not be determined for these species. Additionally, the recommended pounds per acre should only be used as a guide, as not all of these species or quantities may be available on site or at approved locations nearby.

Inoculum from the project site donor vernal pools will be collected by the Restoration Specialist for redistribution within the restored vernal pools when the grading and contouring of the restored basins is complete. The inoculum is expected to contain propagules of vernal pool endemic plant species and vernal pool crustaceans. If initial seed

collections and inoculum are not sufficient to develop the target vernal pool flora, seed collection from native vernal pool indicator species and seed bulking programs will be implemented as an adaptive management measure. All seed collection from existing vernal pools will be overseen by a qualified biologist or habitat Restoration Specialist to ensure the collection of appropriate desirable species. The source and proof of local origin of all plant material and seed will be provided to the Restoration Specialist.

Planting at the site will be accomplished during the late fall of the implementation year prior to winter rainfall. Any native plant material salvaged prior to grading will be transplanted onto the new mima mounds and adjacent uplands. Organic mulch will be used around all salvaged/relocated plant material. The new and enhanced mima mounds will be seeded with seed collected from local sources within 25 miles of the coast (southwest San Diego County). The species list was compiled based on the composition of existing pools and adjacent native upland vegetation. Seeding, planting, and inoculum distribution will be timed to take advantage of seasonal rainfall patterns and will be performed ideally between November 1 and January 1.

A seed supplier specializing in native species, such as S&S Seeds in Carpinteria or an approved equal, will be contracted to supply the necessary upland plant species seed. The City or the designated Restoration Contractor will make these arrangements with sufficient lead time for the anticipated implementation date.

3.8 Supplemental Irrigation

A temporary aboveground irrigation system will be installed to help establish native vegetation within the restoration establishment areas. The temporary irrigation system will allow for planting and seeding work to occur outside of the optimal planting window and will help ensure planting and seeding is successful even if it occurs during a drought year.

All irrigation will be installed by the Restoration Contractor in accordance with this plan and the final mitigation construction documents. The irrigation system will be designed with aboveground components to facilitate removal once the system is decommissioned. Water sources and points of connection will be from on-site locations and use potable water.

The Restoration Specialist will consult with the Restoration Contractor regarding the watering schedule during the monitoring period, as well as the timing for ending irrigation. Irrigation will occur on a frequency and duration to optimize soil and water resources in concert with winter rainfall events. Irrigation should stop at the earliest possible date without risking significant planting mortality. The above-grade portions of the irrigation system will be removed prior to final project approval.

3.9 As-Built Conditions

An initial completion report documenting as-built conditions will be submitted to the City within 6 weeks of completion of the installation. The report will include a marked-up duplicate copy of the planting plan drawing showing the final configuration of the restoration area. Photographs will also be included to document the final as-built field conditions. A final GPS map showing the final boundaries of all restoration areas will also be provided. This map would also be used as a reference figure during the long-term maintenance and monitoring period.

4 Maintenance Plan

The purpose of the maintenance program is to provide guidelines for maintenance of the restored habitats during an initial 120-day PEP and then throughout the 6-year maintenance and monitoring period. Because the goal of the restoration program is to create a natural system that can ultimately support itself with minimal maintenance, the primary effort of the maintenance program is concentrated in the first few seasons of growth to control non-native plant species and to help the desired species become established. Maintenance will focus initially on addressing remedial measures to help achieve the success standards. Maintenance of the fencing and signage on the perimeter of the site will be required throughout the 6-year maintenance period.

4.1 120-Day Plant Establishment Period

During the first 120 days following completion of project installation, the Restoration Contractor will warranty and be responsible for the health and mortality of the installed plant material. The Restoration Specialist will visit the site at 30, 90, and 120 days during this PEP. At the 90-day visit, the Restoration Specialist will take inventory of any container plants that have died and will provide a punch list of replacement plants for the contractor. Generally, plants will be recommended for in-kind replacement; however, the Restoration Specialist may recommend alternative species if it is suspected that unsuitable growing conditions caused mortality. Plants noted for replacement will be installed prior to the 120-day walk-through with the Restoration Specialist. At the end of the PEP (i.e., 120 days), the installed plant material will have a 100% survival rate. A PEP schedule is shown in Table 17.

Table 17. Plant Establishment Period Maintenance Schedule

Work Task	1–30 Days	31–60 Days	61–90 Days	91–120 Days
Weed control	X	X	X	X
Plant replacement				X
Irrigation system scheduling/adjustment/ maintenance	X	X	X	X
Erosion control	X	X	X	X
Pest control	X	X	X	X
Trash removal	X	X	X	X

4.2 Weed and Pest Control

Non-native plant species are common within the proposed restoration area. The predominant maintenance work effort will be related to management and control of non-native plant species. Weed control efforts will include a combination of physical removal and herbicide applications, where appropriate and legal according to herbicide restrictions. Any weeding within or adjacent to vernal pools will be performed by hand. All workers conducting weed removal activities will be educated to distinguish between native and non-native species so that local native plants are not inadvertently killed by weed removal activities. Any herbicide use will occur under the direction of a licensed pest control advisor, applied by a licensed applicator, and coordinated with the Restoration Specialist to ensure that vernal pools and desirable vegetation is not inadvertently damaged from herbicide overspray. Any herbicide

use will be consistent with the standard restrictions, which require low-pressure application, restrict use when wind speed is greater than 5 miles per hour, and require a 10-foot buffer between concentrations of sensitive plant species. Additionally, the application of herbicide will not occur if rain is projected within 24 hours of the scheduled application. When vernal pools are ponding or close to saturation, only hand herbicide application (i.e., saturated glove technique) will be used in and around the edges of pools by specially trained herbicide applicators under the direct supervision of the vernal pool Restoration Specialist. When vernal pools are not ponding or close to saturation, herbicide may be sprayed, but applicators must stay at least 3 feet from the edges of the pools.

The non-native plant species within Table 18 are documented at the project site. Almost all of the non-native species documented in existing vernal pools are annuals; therefore, effective control will rely on minimizing seed production. Many of these species are ubiquitous, and complete control will not be feasible (e.g., filaree, rattail fescue). Although maintenance efforts will attempt to address all non-native species, the focus of the weed control efforts will be on those species that present the greatest threat to the success of the project. Those species include those listed on the California Invasive Plant Council's California Invasive Plant Inventory Database (Cal-IPC 2017) that have a moderate to high rating for threat to natural lands (Table 18).

Table 18. Non-Native Plant Species Documented within the Habitat Preserve

Scientific Name	Common Name	Cal-IPC Rating
Carpobrotus edulis	hottentot fig	High
Brassica nigra	black mustard	Moderate
Cynara cardunculus	artichoke thistle	Moderate
Dittrichia graveolens	stinkwort	Moderate
Festuca myuros	rattail sixweeks grass	Moderate
Foeniculum vulgare	fennel	Moderate
Nicotiana glauca	tree tobacco	Moderate
Bromus hordeaceus	soft chess brome	Limited
Erodium cicutarium	red stemmed filaree	Limited
Hypochaeris glabra	smooth cat's ear	Limited
Lythrum hyssopifolium	hyssop loosestrife	Limited
Polypogon monspeliensis	annual beard grass	Limited
Bromus madritensis	foxtail brome	Not Listed
Logfia gallica	narrow-leaf cottonrose	Not Listed

Note: Cal-IPC = California Invasive Plant Council.

Weed control efforts will be conducted early in the growing season prior to seed set and dispersal. Thus, the maintenance visits will be closely spaced during the winter and early spring, when the annual weed species are developing seed. Weed control efforts will likely be minimal in summer and fall, when the annual weeds have died.

Supplemental watering through the temporary irrigation system may occur in the uplands and vernal pool watershed areas. Supplemental watering to hydrate the vernal pools is not anticipated. However, in the event that natural rain is inadequate to support plant establishment, artificial watering of the restored/enhanced pools and their watersheds may be done upon approval by the City, CDFW, and USFWS in order to establish plants but not hydrate fairy shrimp. Any artificial watering will be done in a manner that prevents ponding in the pools. Any water to be used will be identified and documented to be free of contaminants that could harm the pools.

The fencing and signage will be checked and repaired as necessary, and any trash and debris present in the mitigation area will be removed on a quarterly basis.

4.3 General Site Maintenance

Pruning or clearing of native vegetation will generally not be allowed within the mitigation areas, except as directed by the Restoration Specialist. Dead biomass and plant litter will not be removed and will be left in place. Organic biomass and leaf litter provide valuable microhabitats for benthic and terrestrial invertebrates, reptiles, small mammals, and birds. In addition, the decomposition of plant material is essential for the replenishment of soil nutrients and minerals. Trash will be removed from the mitigation areas by the contractor on a regular basis. Trash consists of all anthropogenic materials, equipment, or debris dumped, thrown, washed, blown, and left within the mitigation areas. Fertilizers will not be used unless deemed necessary by the Restoration Specialist to rectify a specific nutrient deficiency.

4.4 Irrigation System Maintenance

Contractor maintenance will include adjustment and repair to the temporary irrigation system. This may include repair or replacement of broken or malfunctioning components. Adjustment of the irrigation system may be required to achieve 100% coverage. On the basis of monitoring observations, the Restoration Specialist may make recommendations to the contractor to increase or decrease watering time or scheduling.

4.5 Fence and Signage Maintenance

Contractor maintenance will include maintenance and repair of project fencing and signage.

4.6 Erosion and Sedimentation

The Restoration Contractor will maintain temporary BMPs such as burlap fiber rolls, silt fencing, and burlap gravel bags as needed for proper function until the site has obtained 70% vegetative cover. Once the site is stabilized by native vegetation, the contractor will remove and dispose of temporary BMPs. Burlap BMPs free of nylon netting may be left in place to decompose naturally. If, despite the container planting, seeding, and temporary erosion control devices, there is active erosion or sedimentation within the mitigation area, the Restoration Specialist will utilize the methods and protocol set forth under Section 5.6, Adaptive Management, of this plan.

5 Monitoring and Reporting Requirements

The Restoration Specialist will perform mitigation site monitoring during Years 1– 6 as indicated below. The impetus is to help ensure the site is progressing toward the annual performance standards and that site maintenance is being adequately performed by the maintenance contractor.

5.1 Monitoring Schedule

Qualitative biological monitoring will be performed monthly during the initial 120-day PEP and quarterly (seasonally) for 6 years thereafter (Table 19). Quantitative monitoring (transect data collection) will begin in Year 3 and be conducted in late spring during Years 3–6.

Table 19. Monitoring Schedule

Year	Frequency	Annual Report
1	At 30, 60, 90, and 120 days during the 120-day PEP, then quarterly	January
2	Quarterly	January
3	Quarterly	January
4	Quarterly	January
5	Quarterly	January
6	Quarterly	January

5.2 Reference Vernal Pools Site

Reference vernal pools within the eastern portions of MCAS Miramar at the Miramar Mounds National Landmark were selected because they have the same soil type (Redding soils) as the on-site pools, their proximity to the project site, and because they are naturally created pools and are known to have high CRAM physical and biotic structure attribute scores (i.e., they are high functioning). The pools within these sites represent the target vegetation, hydrology, and soils for the proposed vernal pool mitigation areas within the project site. San Diego fairy shrimp and vernal pool plant indicator species are known to occur in these reference pools. Data from the reference sites will be used to develop performance standards and to compare conditions with the project site mitigation pools.

5.3 Qualitative Monitoring

Qualitative monitoring of vernal pools, wetlands, and associated upland habitats will consist of general site assessments, inspection of vegetation health and establishment, special-status wildlife use, and documentation of disturbance. Qualitative monitoring will occur every 2 weeks during the 120-day PEP, monthly during the growing season (approximately February through June), and quarterly during the dormant season of Years 1 and 2. Qualitative monitoring will occur quarterly in Years 3 through 6.

Site assessments will include photo documentation from permanent photo documentation stations. Permanent photo documentation stations will be located at the reference pools and at all restored (reestablished and rehabilitated) pools and preserved wetland areas.

Color photographs will be included in the annual reports and will be taken throughout the 6-year monitoring period to record establishment in accordance with the following schedule:

- Prior to planting/seeding
- Immediately after planting/seeding
- After the first heavy rain leading to vernal pool ponding/inundation
- Once annually during the flowering period of vernal pool indicator species

Qualitative monitoring will also produce maintenance recommendations for the Restoration Contractor. Maintenance notes will include the health of container plants, status of seed mix establishment, status of ponding, pest problems, erosion issues, disturbance, and non-native species occurrence. The results of qualitative monitoring events and relevant maintenance observations and/or recommendations will be recorded in a site observation report and distributed to the City and the approved maintenance contractor. All significant observations will be included in the annual monitoring report.

5.4 Quantitative Monitoring

Quantitative monitoring will be used to assess vegetation establishment within the restored vernal pools and upland watershed areas, as well as the hydrological function of the restored vernal pools. Additionally, to ensure that the implementation of the restoration project does not adversely affect the existing vernal pools on site, monitoring will be conducted within the enhanced vernal pools to verify that avoidance measures were successful and determine whether the restoration project is negatively affecting the hydrology of, or causing erosion and sediment delivery to, the existing vernal pools (based on preconstruction conditions).

5.4.1 Vernal Pools

Species richness, presence of indicator species, and cover of native and non-native plant species will be monitored within the reference and restored/enhanced vernal pools on an annual basis during peak phenology of vernal pool plant species. Each pool will be assigned a unique code, marked in the field, and mapped using a GPS unit. Permanent transects will be established within each reference and restored/enhanced vernal pool, extending from one end to the other and passing through the deepest section. Quadrats will be placed every other meter along each transect to estimate percent cover by species to the nearest 5%. Annual monitoring of vernal pool plant species will be done at the peak of the vernal pool plant growing season once soils are dry enough that pedestrian traffic is unlikely to damage vernal pool microtopography.

5.4.1.1 Hydrology

A battery-operated electronic rain gauge will be installed on site to derive local precipitation data. Additionally, precipitation measurements will be determined from the closest reliable regional location to verify on-site results. The precipitation levels for each season will be calculated on an annual basis from October 1 through September 30. Daily precipitation measurements will be collected and recorded in a project database.

Water depth, ponding duration, frequency of inundation, and water quality (e.g., pH, temperature, total dissolved solids, and salinity) will be monitored within the reference pools and compared with the restored and enhanced pools. The restored/enhanced pools will be mapped with a GPS unit to determine the extent of potential water inundation. In addition, a depth gauge will be temporarily installed at the lowest elevation of the restored pools to measure maximum retained water depth. The gauge will be marked so that water depth can be read from the pool edge. Within 48 hours of each rainfall event of more than 0.5 inches, the pool water depth will be recorded, unless additional rainfall occurs within the 48-hour period. While the basins are inundated, the water depth will be recorded weekly until the pools dry out. Measurement instruments (e.g., thermochron iButtons) may be used to supplement physical site visits and water inundation data collection.

Each year, a water depth versus time graph will be prepared for each of the reference pools and the restored/enhanced vernal pools. This should provide an adequate comparison regarding the hydrological functioning of the existing and restored/enhanced vernal pools and provide an average of the period of typical inundation.

5.4.1.2 Fairy Shrimp

The baseline fairy shrimp population will be evaluated prior to the commencement of rehabilitation and enhancement of the occupied pools on site. During the wet season prior to disturbance, the fairy shrimp population in the occupied pools will be evaluated to determine the density of hatched fairy shrimp (per unit volume sampled) and the gravid female density (as a percentage of the total). Additionally, during the dry season prior to disturbance, dry season samples will be collected from within the occupied basins to estimate average density of viable cysts in the soils. These measurements will form the baseline estimate of the fairy shrimp presence. If the basins do not stay inundated for a long enough period for fairy shrimp to hatch, the baseline for fairy shrimp presence will be established from the dry season samples prior to implementation. These same measurements will be conducted at the six occupied pools each year of the monitoring program to document persistence of the fairy shrimp population.

Presence or absence of fairy shrimp in reestablishment/creation pools that receive inoculum from on-site San Diego fairy shrimp–occupied pools will be recorded during each wet season and included in each annual report.

5.4.2 Upland Watershed Areas

Point intercept transects will be used to collect species richness and cover of native and non-native plant species data. There will be 10 transects measuring 25 meters in length randomly placed throughout the upland restoration and enhancement areas (stratified by habitat type). Transects will be permanently marked in the field using T-posts or rebar stakes, and their endpoints will be recorded using GPS. All species occurring within a 4-meter species richness belt (2 meters on either side of the transect tape) will be recorded for inclusion in species richness data. Native cover, non-native cover, and species richness will be calculated for upland areas.

5.4.3 Wetland Drainage Areas

Point intercept transects will be used to collect species richness and cover of native and non-native plant species data. There will be 20 transects measuring 25 meters in length randomly placed throughout the upland restoration, wetland preservation areas, and preserved non-vegetated channel enhancement and rehabilitation areas (stratified by habitat type). Transects will be permanently marked in the field using T-posts or rebar stakes, and their endpoints will be recorded using GPS. All species occurring within a 4-meter species richness belt (2 meters on either side of the transect tape) will be recorded for inclusion in species richness data. Native cover, non-native cover, and species richness will be calculated for wetland drainage mitigation areas.

5.5 Reporting

Annual reports will include information regarding all persons involved in the collection of data and the preparation of the reports. Each report will include a copy of all pertinent permits that may be required, including any special conditions and/or modifications. The reports will contain analysis of all monitoring data relative to success criteria, photos from permanent photo documentation stations, and GPS maps/figures showing the mitigation site. The annual reports will be submitted at the anniversary of installation in each monitoring year, so there is adequate lead time to implement remedial recommendations prior to the next growing season.

5.6 Adaptive Management

If annual success criteria are not being met, or the Restoration Specialist observes that some aspect of the mitigation program requires attention, adaptive measures will be implemented by the Restoration Contractor. Adaptive measures for vernal pool restoration and preservation of wetlands and non-wetland waters may include but are not limited to the following: collecting and adding additional vernal pool and upland inoculum, recontouring non-functioning pools, continuing to emphasize weed control execution, and reseeding or replanting to improve cover and/or diversity. Any adaptive measures with potential impacts to vernal pools (i.e., recontouring) must be approved by the resource agencies prior to implementation. Adaptive measures not requiring agency approval will be implemented immediately and no later than 60 days after the recommendation by the Restoration Specialist.

5.7 Target Habitat Functions

The goal of the restoration and enhancement effort is to create self-sustaining vernal pools, associated vernal pool watersheds, and upland habitat that exhibit improved functions and services compared to the existing vernal pools and upland habitat within the Habitat Preserve. Upland habitat will be improved through initial removal of invasive plant species and continued maintenance to encourage development of higher-quality habitat dominated by native species. The mitigation program intends to modify topography on the mesa to support vernal pool hydrology and the intended vernal pool target species.

Measurement of the improved functions and services for vernal pools will be completed using the CRAM (California Wetlands Monitoring Workgroup 2013).

5.8 Target Vernal Pool Hydrological Regime

Previous habitat disturbances, including vehicular activity, illegal dumping, human visitation, and non-native plant invasion, have reduced the extent and biological functions of the assumed former vernal pool and mima mound area within the Habitat Preserve. The degraded areas at the intended restoration sites do not currently retain sufficient water or stay in an undisturbed condition for a sufficient period to support vernal pool plant species. As described previously, the existing depressions will be excavated to remove sediment, and the excavated material will be used to supplement or form new mima mounds adjacent to the restored vernal pools. It is anticipated that the restoration of the vernal pool basins and adjacent mima mound topography will result in improved hydrological conditions with better retention of surface water within the restored basins for greater than 14 days, a period sufficient to sustain the vernal pool target species.

5.9 Performance Standards

The variability of seasonal rainfall patterns in the project region and the dependence of the vernal pool communities on precipitation and inundation for an appropriate period to encourage plant growth make it likely that the vernal pools will progress toward the final performance standards on average, but with significant interannual variability during the 6-year program. The annual performance standards proposed herein are both quantitative and qualitative, with an emphasis on vernal pool hydrology and achievement of vernal pool plant associations similar to the conditions of the existing pools within the Habitat Preserve. At the completion of each field season, hydrology and species cover will be evaluated to determine the progress toward plant establishment and the achievement of the final success criteria. The final assessment of the success of the restored vernal pool and mima mound habitat will be based on the achievement of the target performance criteria/standards and a determination of plant establishment within the mitigation area. This approach represents an adaptive restoration strategy that would be responsive to natural variation. The mitigation, maintenance, and monitoring program would be altered as necessary to respond to changing conditions and to help guide the mitigation project in an appropriate direction to help assure success.

The following target performance standards are guidelines to assess the success of the restored vernal pool and mima mound habitat and adjacent upland habitat. These performance standards may be modified in coordination with the regulatory agencies, if needed. This program requires that all preserved vernal pools and their watersheds are enhanced, as deemed appropriate by CDFW and USFWS, to achieve the same success criteria or better as the restored pools. Therefore, the success criteria apply to all vernal pools that will be enhanced and restored.

5.9.1 Vernal Pool Habitat Performance Standards and Success Criteria

Performance standards for the vernal pool habitat will be evaluated with the CRAM (for ecological functions and services) and with traditional species composition and native cover goals. Ecological performance standards, species composition, and cover goals are provided in Table 20. These CRAM results for the vernal pools will be compared to vernal pool CRAM assessment data collected for the Miramar Mounds National Landmark vernal pool complex.

Table 20. Summary of Interim Performance Standards and Final Success Criteria for Restored Vernal Pools

Year	Average Minimum Number of Vernal Pool Indicator Species Present for Restored Pools (Species Richness)[1]	Average Native Cover Relative to Reference Pools for Restored and Enhanced Pools	Non-Native Species Cover
1	1	30%	▪ <5% total relative cover in pool basins ▪ <10% total relative cover in pool watersheds ▪ <1% Cal-IPC rated high or moderate

Table 20. Summary of Interim Performance Standards and Final Success Criteria for Restored Vernal Pools

Year	Average Minimum Number of Vernal Pool Indicator Species Present for Restored Pools (Species Richness)[1]	Average Native Cover Relative to Reference Pools for Restored and Enhanced Pools	Non-Native Species Cover
2	2	40%	▪ <5% total relative cover in pool basins ▪ <10% total relative cover in pool watersheds ▪ <1% Cal-IPC rated high or moderate
3	3	50%	▪ <5% total relative cover in pool basins ▪ <10% total relative cover in pool watersheds ▪ <1% Cal-IPC rated high or moderate
4	3	60%	▪ <5% total relative cover in pool basins ▪ <10% total relative cover in pool watersheds ▪ <1% Cal-IPC rated high or moderate
5	3	70%	▪ <5% total relative cover in pool basins ▪ <10% total relative cover in pool watersheds ▪ <1% Cal-IPC rated high or moderate
6	4	70%	▪ <5% total relative cover in pool basins ▪ <10% total relative cover in pool watersheds ▪ <1% Cal-IPC rated high or moderate

Notes: Cal-IPC = California Invasive Plant Council.

[1] A minimum of two vernal pool indicator species will be required within each restored pool by Year 6. Floral and faunal indicators are counted toward this criterion.

The pool hydrology (i.e., water retention and water depth) of the restored vernal pools will be similar to that of the highest-functioning existing vernal pools within the Habitat Preserve. The restored pools will pond for a period of time similar to reference vernal pools during an average rainfall year. At a minimum, the reestablished vernal pools must be documented to stay inundated for a period of 14 consecutive days for 3 years during the monitoring period, should a minimum of 3 years of average or above-average rainfall occur during the monitoring period.

The basis for the threshold quantity of vernal pool indicator species will be derived from analyzing the data from the existing on-site reference vernal pools and those on MCAS Miramar at the Miramar Mounds National Landmark. These will be determined during finalization of this HMMP.

For the vernal pools subject to enhancement efforts, performance standards are the same as the restored vernal pools in terms of percent native cover and percent non-native cover. Performance standards for vernal pool indicator species and hydrology do not apply to the vernal pools to be enhanced because enhancement actions are only expected to have a meaningful effect on native and non-native plant species cover.

The final success criteria are expected to be met by Year 5 of the maintenance and monitoring period. However, the maintenance and monitoring period extends through Year 6 as shown in Table 19. Therefore, the performance standards in Year 6 are the same as the final success criteria. The final year of maintenance and monitoring is intended to assure that the vernal pool mitigation is sustainable in accordance with requirements from the RWQCB.

5.9.2 San Diego Fairy Shrimp Performance Standards

San Diego fairy shrimp have been documented in 38 of the 131 basins within the Habitat Preserve. Five of these occur within a dirt road and have been identified for rehabilitation, and a sixth consists of a constructed trench, which has also been identified for rehabilitation. Therefore, San Diego fairy shrimp performance standards are included to address the vernal pools where San Diego fairy shrimp are present. In addition to the existing occupied pools, inoculum sourced from San Diego fairy shrimp–occupied pools on the project site will be spread within reestablished pools with suitable conditions to support San Diego fairy shrimp life history. Status of San Diego fairy shrimp in inoculated pools will be included in each annual report. Follow-up voluntary inoculation efforts may be performed at the discretion of the Restoration Specialist and City in coordination with the resource agencies.

Dry sampling will occur in the first year of the restoration monitoring program to establish a baseline and during the last year to identify changes to viable cyst density. After implementation of the vernal pool restoration, hatched fairy shrimp and gravid female density of the occupied vernal pools must not be significantly ($p < 0.05$) less than the baseline measurements of these parameters within these same pools for at least three wet seasons. Additionally, average viable cyst density of the occupied pools must not be significantly ($p < 0.05$) less than the baseline measurement of this same parameter at the end of the monitoring period.

5.9.3 Western Spadefoot Performance Standards

Western spadefoot have been documented in 24 of the 131 basins within the Habitat Preserve and in 14 of the 111 impacted basins. This translates into a maximum occupation of 16% of the basins, as not all basins were occupied every year. During the wet season prior to grading or contouring operations, biologists will collect western spadefoot adults from areas within 300 meters of known occupied pools. Adults will be relocated to another area on the project site that has suitable breeding habitat and few or no western spadefoot individuals. The goal is to maintain a breeding western spadefoot toad population within a similar ratio of basins by the end of the 6-year monitoring period (i.e., at least 16% of the basins).

Monitoring will include sampling of the basins during the yearly monitoring efforts. This is a simple occupation determination, and density determinations are not required. Adults, juveniles, larvae, and egg clutches are all indicators of use. If, after the survey, at least 16% of the filled basins are not used/occupied by western spadefoot, then a review of the pools will be made to determine the possible reasons for not meeting the goal. Measures will be taken to correct the perceived issue during that dry season, and monitoring will continue the following year. It may take some time for western spadefoot to locate and use the full extent of the basin area after enhancement and creations occur. Therefore, no actual management should occur until after the third year that the 16%

occupation criterion is not met. Success is identified after 16% of the basins are occupied for at least 2 years within a 6-year period.

Any basins that are found to support African clawed frogs (*Xenopus laevis*) or bullfrogs (*Lithobates catesbeianus*) will be immediately controlled. Control will include manual removal of non-native amphibian egg masses, larvae, and adults. Care will be taken to protect native amphibians The Preserve Manager will be responsible for the preparation of a non-native aquatic species control plan.

5.9.4 Upland Watershed Habitat Performance Standards

The stated performance standards for upland habitat are intended to be achieved with a 5-year maintenance and monitoring period. Upland habitat development, including the mima mounds forming vernal pool watersheds, will be evaluated annually to determine conformance to goals for species richness, native cover, and non-native cover. If upland performance standards are not achieved with a 5-year period, maintenance and monitoring will be extended until success criteria are achieved. Native species cover success criteria for transplant container planting areas are relevant to locations that receive transplant container planting in addition to seed. Native species cover criteria for seeding areas are relevant for locations that receive only native seed. Native species richness and non-native species cover requirements are relevant to all areas that receive seed or container plants. Success criteria are provided in Table 21.

Table 21. Summary of Upland Habitat Restoration Success Criteria

Year	Native Species Richness (number of species)	Native Species Cover (Absolute) Container Planting Areas	Native Species Cover (Absolute) Seeding Areas	Transplant Container Plant Survival	Non-Native Species Cover
1	5	20%	10%	100%[1]	<10% total relative cover 0% Cal-IPC rated high or moderate
2	6	30%	15%	100%[1]	<10% total relative cover 0% Cal-IPC rated high or moderate
3	7	40%	20%	90%	<10% total relative cover 0% Cal-IPC rated high or moderate
4	8	50%	25%	80%	<10% total relative cover 0% Cal-IPC rated high or moderate
5	8	60%	30%	80%	<10% total relative cover 0% Cal-IPC rated high or moderate

Notes: Cal-IPC = California Invasive Plant Council.

[1] Natural recruitment of native perennial species may be counted toward the survival goal if adequate replacement of container plant function has occurred.

5.9.5 Wetland Drainage Preserve Areas

The stated performance standards for wetland habitat are intended to be achieved with a 5-year maintenance and monitoring period. Wetland drainage preserve areas and non-vegetated channel preservation areas will be evaluated annually and compared to reference areas outside the mitigation drainage areas to determine conformance to goals for species richness, native cover, and non-native cover. Regardless of non-native cover at the reference areas, weed control cover goals are based on those shown below in Table 22. If wetland habitat or non-vegetated channel preservation areas' performance standards are not achieved within a 5-year period, maintenance and monitoring will be extended until success criteria are achieved. Native species richness and non-native species cover requirements are relevant to all areas that receive weed control and other habitat enhancements. Success criteria are provided in Table 22.

Table 22. Summary of Wetland Drainage Habitat Restoration Success Criteria

Year	Native Species Richness Relative to Reference Site	Native Species Cover (Absolute) Relative to Reference Site	Non-Native Species Cover
1	50%	50%	<25% total relative cover 0% Cal-IPC rated high or moderate
2	60%	60%	<20% total relative cover 0% Cal-IPC rated high or moderate
3	70%	70%	<15% total relative cover 0% Cal-IPC rated high or moderate
4	80%	80%	<10% total relative cover 0% Cal-IPC rated high or moderate
5	90%	90%	<10% total relative cover 0% Cal-IPC rated high or moderate

Notes: Cal-IPC = California Invasive Plant Council.

5.10 Mitigation Monitoring Report

Annual monitoring reports will be prepared and submitted to the permitting agencies during the 6-year maintenance and monitoring period. The monitoring reports will describe the existing conditions of the mitigation areas, referencing routine site observations and quantitative vegetation data collection. The reports will provide a comparison of annual performance standards with field conditions, identify all shortcomings of the mitigation, and recommend remedial measures necessary to reach mitigation goals and performance standards. Each annual report will provide a trend summary of the accumulated data. Annual reports will also include the following:

- A list of names, titles, and companies of all persons who prepared the content of the annual report and participated in monitoring activities
- A copy of the resource agency permits
- Prints of photos from the monitoring photo documentation stations
- Maps identifying seeding and transplanting zones, transect locations, and weed removal areas, as appropriate
- Quantitative data from transect measurements in Years 2–5 of the mitigation
- Analysis of project performance against performance standards

The annual monitoring reports will be submitted to the resource agencies by January 10 of each year after the conclusion of the prior year's maintenance and monitoring activities.

6 Completion of Mitigation

When monitoring indicates the mitigation project has met the final performance criteria for the site, HomeFed will notify the resource agencies upon submitting the last annual report and request written approval of the mitigation project. Any corresponding mitigation-related bonds will be requested to be released.

6.1 Agency Notification at the End of the Monitoring Period

Upon completion of the maintenance and monitoring period, if the target success criteria and performance standards have been achieved (6-year for vernal pool restoration areas and 5-year for upland restoration areas), notification of completion will be included within the final annual report submitted to the City. The final report also will include documentation that the vernal pool restoration success criteria have been met. The City will confirm if success criteria have been adequately achieved and if the maintenance and monitoring period can be discontinued. The City, CDFW, RWQCB, USACE, and USFWS will provide written concurrence of project completion, as appropriate.

If a performance criterion is not met for any of the restored/enhanced vernal pools or upland habitat in any year, or if the final success criteria are not met, the project proponent will prepare an analysis of the cause(s) of failure and, if deemed necessary by the City, CDFW, RWQCB, USACE, or USFWS, propose remedial actions for approval. If any of the restored/enhanced vernal pools or upland habitat has not met a performance criterion during the initial monitoring and maintenance period, the maintenance and monitoring obligations will continue until the City, CDFW, RWQCB, USACE, and USFWS deem the restoration/enhancement successful. Contingency measures may be required by the City, CDFW, RWQCB, USACE, and/or USFWS. Restoration/enhancement will not be deemed successful until success criteria are achieved. If contingency measures are required, restoration/enhancement will not be deemed successful until at least 2 years after any required contingency measures are implemented, as determined by the City, CDFW, RWQCB, USACE, and USFWS.

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7 Long-Term Management

Because the mitigation site is within the project's Habitat Preserve, which will be designated through a formal conservation easement as part of the Draft Santee MSCP Subarea Plan's open space, management activities within the Habitat Preserve will be conducted in perpetuity by the Preserve Manager in accordance with the Preserve Management Plan (Dudek 2020a). The Preserve Management Plan will describe the management actions to be taken to maintain the functions and values of the mitigation sites in perpetuity and define the costs associated with implementation. An estimate of long-term management costs will be prepared using PAR software or similar cost estimation method, which will form the basis for estimating the monetary value of the funding source. Enough funds will be created annually through appropriate investment to pay for management actions. A qualified easement holder approved by City, USFWS, USACE, and CDFW will hold the conservation easement. The Preserve Manager will be responsible for providing habitat management services and for the successful implementation of the long-term Preserve Management Plan.

The entire mitigation area within the Habitat Preserve is within the Draft Santee MSCP Subarea Plan hardline preserve area and requires long-term management. Long-term management will be conducted in accordance with the approved Preserve Management Plan for the Fanita Ranch Habitat Preserve and with the Draft Santee MSCP Subarea Plan, as summarized below.

7.1 Long-Term Management and Monitoring of Vernal Pool Habitats

The management and monitoring approach for vernal pools within the Habitat Preserve will be completed in a manner consistent with the methodologies established in the City of San Diego Vernal Pool Habitat Conservation Plan (City of San Diego 2017). To assess the status and need for management actions, the following standards will be implemented and monitored:

- Annually identify threats (invasive species, trampling, off-highway vehicle activity, etc.) to all pools monitored and to overall watershed integrity, and implement actions to prevent or reduce those threats.
- Prevent an average decline of at least one cover class of any covered plant species within vernal pools over 3 years for years having at least 55% average rainfall.
- Prevent a 20% decline in the density of the covered shrimp species over 3 years (average within complex).
- At complexes with 10% or greater average total non-native species cover, prevent an increase in one cover class for non-native cover over 3 consecutive years, regardless of rainfall.
- Maintain vernal pool watershed and hydrologic network (i.e., inlet and outlet features) and water storage (maximum depth within +/−10% of baseline) functions.

The Draft Santee MSCP Subarea Plan Vernal Pool Conservation Standards outlines a tiered three-level approach for adaptive monitoring and management of vernal pools and vernal pool complexes that are protected within the Draft Santee MSCP Subarea Plan Preserve System (see Appendix G of the Draft Santee MSCP Subarea Plan for more detail [City of Santee 2018]). The monitoring and management actions required at each level are determined by achievement of the Draft Santee MSCP Subarea Plan vernal pool standards and triggers.

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Appendix E
Vegetation Community Descriptions

1.1 Introduction

A comprehensive vegetation database was developed for the Subarea Plan Area and surrounding areas using multiple data sources. The Holland (1986) vegetation classification system, as updated by Oberbauer *et al.* (2008), was used consistently across the entire study area. In areas that were also mapped using the Vegetation Classification Manual for Western San Diego County (SANDAG 2011), that information was also retained. Though both systems provide methods to classify vegetation, Holland communities are described at a landscape scale and are currently used by the MSCP to plan conservation and mitigation. This appendix includes a description of the aggregated vegetation community types represented in the Subarea Plan Area and the Holland classifications that are included as part of the broader aggregated categories.

1.2 Vegetation Descriptions

The following are descriptions of the aggregated vegetation community classifications used in the Subarea Plan.

Maritime Succulent Scrub

Maritime succulent scrub is mapped as part of the offsite conservation area in the East Elliott component of the Plan Area. The habitat type is found on thin, rocky or sandy soils, often on steep slopes of the coastal headlands and bluffs within a few miles of the coast. It is characterized by drought deciduous species such as California copperleaf (*Acalypha californica*), coastal sagebush (*Artemisia californica*), cliff spurge (*Euphorbia misera*), barrel cactus (*Ferocactus viridescens*), prickly-pear, and lemonadeberry.

Coastal Sage Scrub

The predominant type of habitat within the Plan Area is coastal sage scrub. Coastal Sage Scrub is comprised of low, soft-woody subshrubs to about 1 meter (3 feet) high, many of which are drought-deciduous. Dominant plant species include California sagebrush (*Artemisia californica*), flat-top buckwheat (*Eriogonum fasciculatum* ssp. *fasciculatum*), laurel sumac (*Malosma laurina*), white sage (*Salvia apiana*), and black sage (*Salvia mellifera*). Other, less frequent, constituents of this community include spiny redberry (*Rhamnus crocea*) and deerweed (*Lotus scoparius*). A portion of the Plan Area is mapped a Baccharis-dominated (dominated by *Baccharis sarothroides* and/or *Baccharis p*ilularis).

The shrub layer in this community ranges from a continuous canopy and little understory to a more open canopy with widely-spaced shrubs and a well-developed understory. Native understory species present in this association frequently includes species such as purple needlegrass (*Nassela pulchra*),

foothill needlegrass (*Nassela lepida*), slender tarweed (*Hemizonia fasciculata*), common yarrow (*Achillea mellifolium*), golden yarrow (*Eriopyllum confertiflorum*), and California poppy (*Eschilozia californica*)

Chaparral

Chaparral is widely distributed throughout California on dry slopes and ridges at low and medium elevations where it occupies thin, rocky, or heavy soils. It is typically composed of broad-leaved, sclerophyllous shrubs, although species composition varies considerably with location. The plants of this community have developed the ability to survive recurrent fires by producing seeds that require a fire-related cue to stimulate germination and/or by stump sprouting after being burned. Species of the following genera are characteristic in chaparral associations: *Adenostoma*, *Arctostaphylos*, *Ceanothus*, *Cercocarpus*, *Heteromeles*, shrubby *Quercus*, and *Rhamnus.* Two distinct chaparral associations occur within the Subarea Plan Study Area: chamise chaparral, and southern mixed chaparral.

Chamise chaparral is characterized by nearly monotypic stands of chamise (*Adenostoma fasciculatum*) to 1-3 m (3-9 ft.) in height. Additional shrub species, such as mission manzanita (*Xylococcus bicolor*) and our Lord's candle (*Yucca whipplei*), may be present, but contribute little to the overall cover. The herbaceous component of this association is largely lacking. Chamise chaparral occurs on xeric slopes and ridges, and is found on shallower, drier soils or at somewhat lower elevations than southern mixed chaparral.

Southern mixed chaparral tends to occur on steeper, more mesic north-facing slopes than chamise chaparral. This vegetation community type is characterized by relatively high species diversity. Typical species include chamise, Eastwood manzanita (*Arctostaphylos glandulosa* ssp. *glandulosa*), scrub oak (*Quercus dumosa*), holly-leaf cherry (*Prunus ilicifolia*), toyon (*Heteromeles arbutifolia*), and winter currant (*Ribes indecorum*). The understory component is generally better-developed in this association than in chamise chaparral, and may include species such as mariposa-lily (*Calochortus* spp.), soap plant (*Chlorogalum* spp.), and bedstraw (*Galium* spp.), among others.

Grassland

Grasslands in the Plan Area are mostly non-native grassland with as small area mapped as native grasslands.

Non-native grassland generally occurs on fine-textured loam or clay soils which are moist or even waterlogged during the winter rainy season and very dry during the summer and fall. It is characterized by a dense to sparse cover of annual grasses, often with native and non-native annual forbs. This habitat is a disturbance-related community most often found in old fields or openings in native scrub habitats. Typical grasses include wild oat, soft chess (*Bromus mollis*), red brome, ripgutgrass (*Bromus diandrus*), and foxtail fescue (*Vulpia megalura*). Characteristic forbs include red-stem filaree (*Erodium cicutarium*), mustard (*Brassica* spp.), tarweed (*Hemizonia* spp.), California goldfields (*Lasthenia chrysostoma*), and owl's clover (*Orthocarpus purpurascens*).

Native grassland is characterized by a relatively low (>10 percent) to dense herbaceous cover of the perennial, tussock-forming species, valley needlegrass grassland (*Stipa pulchra*). Native and introduced annuals occur between the needlegrass, often actually exceeding the bunchgrass in cover. This association generally occurs on fine-textured clay soils that are moist or wet in winter, but very dry in summer. Shrubs are infrequent, probably due to the unstable clay soils. The degree of habitat quality in native grasslands varies greatly, depending on the history of grazing, cultivation, or other disturbance factors. In addition to valley needlegrass (*Stipa pulchra*), indicator species include blue-eyed grass (*Sisyrinchium bellum*), mariposa lily, and clarkia (*Clarkia* spp.), among others.

Coast Live Oak Woodland

Coast live oak woodland typically has one dominant tree coast live oak (*Quercus agrifolia*) and reaches 10-25 m in height. Coast live oak typically occurs on north-facing slopes or in shaded ravines, and intergrades with coastal sage scrub or chaparral on drier sites. The shrub layer is typically poorly-developed but may include toyon (*Heteromeles arbutifolia*), currant (*Ribes* spp.), laurel sumac (*Malosma laurina*), and desert elderberry (*Sambucus mexicana)*. The herbaceous component is continuous and often dominated by non-native, weedy species.

Englemann Oak Woodland

Englemann Oak is mapped at the Hermes Copper Butterfly offsite conservation area. Engelmann oak is a characteristic species of San Diego County. The greatest part of its range is within San Diego County though it does extend northward, but in lower numbers, to Los Angeles County. In the interior of San Diego County, Engelmann oak woodland forms a relatively common vegetation community; however, it is still one of the most limited oak trees in North America.

Riparian

Riparian habitat includes southern riparian forest, southern sycamore-alder riparian woodland, and southern riparian scrub.

Southern riparian forest includes southern cottonwood-willow riparian forest and southern arroyo willow riparian forest. Southern cottonwood-willow riparian forest is an open or closed canopy forest that is generally greater than 6 m (20 ft) high and occupies relatively broad drainages and floodplains supporting perennially wet streams. This community is dominated by mature individuals of winter deciduous trees, including Fremont's cottonwood (*Populus fremontii* var. *fremontii*) and several species of willows (*Salix gooddingii*, *S. lasiandra*, *S. lasiolepis*), and often has a dense understory of shrubby willows, mulefat (*Baccharis glutinosa*), and mugwort (*Artemisia douglasiana*). The dominant species require moist, bare mineral soil for germination and establishment. Southern arroyo willow riparian forest consists of dense, low, closed-canopy broadleafed riparian forests dominated by arroyo willow (*Salix lasiolepis*).

Southern sycamore-alder riparian woodland is a tall, open, broad-leafed, winter-deciduous streamside woodland dominated by California sycamore (*Platanus racemosa*) (and often also white alder (*Alnus rhombifolia*)). These stands seldom form closed canopy forests, and even may appear as trees scattered in a shrubby thicket of sclerophyllous and deciduous species. The understory

component is comprised primarily of forbs and non-native grasses, with shrub species accounting for only a small portion of the cover. Lianas include California blackberry (*Rubus ursinus*) and poison oak (*Toxicodendron diversilobum*). This association occurs in very rocky streambeds subject to seasonally high-intensity flooding. *Alnus* increases in abundance on more perennial streams, while *Platanus* favors more intermittent hydrographs. Often it may appear as a stand of scattered trees within a matrix of willows, mulefat, and other shrubby species.

Southern riparian scrub includes mule fat scrub and southern willow scrub. Mule Fat Scrub is an early seral vegetation community dominated by Mule fat (*Baccharis salicioflia*). This tall, herbaceous riparian scrub community occurs along intermittent stream channels with fairly course substrate and moderate depth to the water table. This community is maintained by frequent flooding, which keeps it from transitioning into sycamore or cottonwood dominated riparian woodland or forest. Other species often found in this association include broom baccharis (*Baccharis sarothroides*) and coyote bush (*Baccharis pilularis*). Understory vegetation is usually composed of non-native, weedy species or is lacking altogether. Southern Willow Scrub is a dense, broad-leafed, winter-deciduous association dominated by several species of willow (*Salix gooddingii*, *S. exigua*, *S. laevigata*, *S. lasiolepis, S. lucida* ssp. *lasiandra*), with scattered emergent Fremont cottonwood (*Populus fremontii*) and California sycamore (*Platanus racemosa*). This vegetation community is found on loose, sandy, or fine gravelly alluvium deposited near stream channels during floods.

Freshwater Marsh

Freshwater marsh is dominated by perennial, emergent monocots to 1.3 to 2 m (4.3 to 6.6 ft.) tall. Uniform stands of bulrushes (*Scirpus* spp.) or cattails (*Typha* spp.) often characterize this habitat. Freshwater marsh occurs in wetlands that are permanently flooded by standing fresh water. Examples of this habitat occur around smaller lakes, ponds, creeks, and reservoirs in the region.

Vernal Pools

Vernal pools may include road ruts and natural pools. In San Diego County, natural vernal pools are usually either San Diego mesa hardpan vernal pools or San Diego mesa claypan vernal pools. A number of federally- and/or state-listed plants and animals are restricted to these pool systems, including San Diego mesa mint (*Pogogyne abramsii*), Otay Mesa mint (*Pogogyne nudiuscula*), San Diego button celery (*Eryngium aristulatum* ssp. *parishii*), Riverside fairy shrimp (*Streptocephalus woottoni*), and San Diego fairy shrimp (*Branchinecta sandiegoensis*). Note: Vernal pool are often mapped separately as micro habitat features and not as vegetation community.

Disturbed Wetlands

Disturbed wetlands are a wetland community dominated by both perennial and annual herbs and forbs. This community is characterized by a high percentage of non-native riparian species, such as perennial pepperweed (*Lepidium latifolium*), salt cedar (*Tamarisk ramosissima*), and poison hemlock (*Conium maculatum*). This habitat is seasonally to permanently moist and often occurs in shallow swales or floodplain terraces. In addition to non-native pepperweed, salt cedar, and poison hemlock, the disturbed wetland vegetation community on the project site also contained limited

amounts of native herbaceous riparian species such as yerba mansa (*Anemopsis californica*), salt heliotrope (*Heliotropum curassavicum*), and salt grass (*Distichlis spicata*).

Freshwater (Open Water)
Open water includes reservoirs, lakes, ponds, and relatively large sloughs, channels, and rivers or streambeds that contain water throughout the year.

Non-Vegetated Channel/Floodway
Non-Vegetated Channel/Floodways are unvegetated or sparsely vegetated drainages. The lack of significant vegetative cover in such areas can be attributed to either natural processes, such as flooding, or to human activities, such as vegetation clearing, sand mining, or stream channelization.

Developed / Non Native

Eucalyptus Woodland
Non-native eucalyptus habitats supplant native habitats and range from single-species thickets with little or no shrubby understory to scattered trees over a well-developed herbaceous and shrubby understory. In most ases, eucalyptus (*Eucalyptus* spp.) forms a dense stand with a closed canopy. Eucalyptus species produces a large amount of leaf and bark litter, the chemical and physical characteristics of which limit the ability of other species to grow in the understory, decreasing floristic diversity. Overstory composition is typically limited to one species of the genus, or mixed stands composed of several eucalyptus species; few native overstory species are present within eucalyptus planted areas, except in small, cleared pockets.

Non-native Vegetation
Non-native vegetation include non-native vegetation, tamarisk scrub and Arundo-dominated riparian areas. Tamarisk scrub is a vegetation community comprised of monotypic or nearly monotypic stands of salt cedar (*Tamarisk ramossisima*).

Disturbed Habitat
Disturbed habitat is any land on which the native vegetation has been significantly altered by agriculture, construction, or other authorized land-clearing activities, and the species composition and site conditions are not characteristic of the disturbed phase of a plant association. Such habitat is typically found in vacant lots, roadsides, construction staging areas or abandoned fields, and is dominated by non-native annual species and perennial broadleaf species. Plant species typical of this association include Russian-thistle (*Salsola tragus*), sweet fennel (*Foeniculum vulgare*), horseweed (*Conyza* spp.), mustards, lamb's quarters (*Chenopodium album*), fountain grass (*Pennisetum setaceum*), and castor bean (*Ricinus communis*), among others. Non-native trees, such as eucalyptus, pepper-trees (*Schinus molle*, and *S. terebinthifolius*), Russian olive (*Olea europea*), and other ornamentals can also occur in this association.

Urban/Developed

Developed areas support no native vegetation and may be additionally characterized by the presence of man-made structures such as buildings or roads.

Appendix F
Science Advisor Reports

This appendix contains the following sub-appendices:

Appendix F.1, Revised Final Independent Scientific Advisory Report for the Conservation Strategy for Quino Checkerspot Butterfly in the City of Santee.

Appendix F.2, Revised Final Independent Scientific Advisory Report for the Conservation Strategy for Hermes Copper Butterfly in the City of Santee.

Appendix F.3, Draft[1] Final Western Spadefoot (*Spea hammondii*): Independent Scientific Advisor Report for the City of Santee Multiple Species Conservation Plan (MSCP) Subarea Plan.

[1] The Western Spadefoot Independent Science Advisor report was prepared by USGS Western Ecological Research Center. The publishing requirements of USGS require that the report is listed as Draft Final since the report was not published through the USGS.

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REVISED FINAL INDEPENDENT SCIENTIFIC ADVISORY REPORT FOR THE CONSERVATION STRATEGY FOR QUINO CHECKERSPOT BUTTERFLY IN THE CITY OF SANTEE

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CHAPTER 1.0
INTRODUCTION

1.1 BACKGROUND

The City of Santee (City) has prepared a draft Subarea Plan to address implementation of the Multi-Species Conservation Program (MSCP) Subregional Plan for southwestern San Diego County (County of San Diego 1998). The draft Subarea Plan has been prepared pursuant to the requirements of the MSCP Subregional Plan, the state Natural Community Conservation Planning (NCCP) Act of 1991, and the federal Endangered Species Act Section 10(a)(1)(B). Separate conservation strategies are required for each individual plant or animal species proposed for coverage under the draft Subarea Plan.

This Independent Scientific Report has been prepared to address conservation for the federally listed endangered Quino checkerspot butterfly (*Euphydryas editha quino*; Quino). This species was not covered by the original MSCP Subregional Plan because there were no predicted distribution models or conservation policies in that Plan to assess and provide for its conservation.

The Subarea Plan currently incorporates policies and predictive modeling to evaluate the conservation of the Quino within Santee. In addition, the Subarea Plan is intended to contribute to the regional conservation and recovery of the species by maintaining opportunities for recolonization (i.e., extant, but currently unoccupied breeding habitat) or reintroduction into Santee through the enhancement or restoration of habitat, and by actively participating in the Quino Recovery Plan (USFWS 2003) as specified in the conditions for coverage included in this Conservation Strategy.

This Independent Scientific Report was prepared to address conservation of Quino within Santee. The intent of this Report is to provide guidance to the City for the long-term conservation of Quino within Santee while allowing for public and private development.

Many of the programs and guidance that are recommended in this Report will need to be implemented at a regional level before the specific goals and objectives can be attained for Santee. The City's role in the regional conservation of Quino will be accomplished through two key objectives:

1) identify and evaluate potential Quino habitat in Santee for conservation consistent with the County's conservation policies (County of San Diego 2009) and the USFWS Recovery Plan (2003); and,

2) maintain habitat connectivity through conservation to provide for the long-term viability of Quino within Santee.

While the City will be responsible for many of the tasks that pertain directly to Santee and Fanita Ranch, some of the more regionally-focused tasks will be the responsibility of the Wildlife Agencies through their existing and/or future programs for the Quino. These regional programs will be an important part of the effort to provide adequate conservation for the Quino in Santee. Ultimately, the requirements for adequate conservation of Quino in Santee are subject to final determination by the Wildlife Agencies.

1.2 INDEPENDENT SCIENTIFIC REVIEW

Pursuant to Section 2830 of the NCCP, the City is required to facilitate an independent scientific review of the Subarea Plan's conservation analysis by independent science advisors. Accordingly, this Quino Conservation Strategy has been prepared by EDAW, Inc. (EDAW) technical experts. Those experts did not participate in preparation of the Subarea Plan and are, therefore, considered independent.

1.3 OVERVIEW OF THE CONSERVATION STRATEGY

Through implementation of the goals and objectives of this Conservation Strategy, the City will strive to: (1) maintain the existing known populations of Quino in accordance with the Narrow Endemic Policy of the City's Subarea Plan, (2) maintain the potential for natural recolonization of Quino by conserving large blocks of modeled habitat, and (3) support conservation efforts consistent with the Quino Recovery Plan (USFWS 2003). Through these three targeted efforts, the City will also have met the requirement that the Subarea Plan contributes to the recovery of Quino, a listed species.

This Conservation Strategy provides a framework for conservation of Quino within Santee and has been developed in coordination with the City and the Wildlife Agencies (collectively, the U.S. Fish and Wildlife Service [USFWS] and California Department of Fish and Game [CDFG]). The Conservation Strategy is structured based on four key components:

1. Guidelines for identifying existing and potential Quino populations and habitats (Section 2.0);
2. Goals and objectives for conservation of Quino within Santee (Section 3.0);
3. Goals and objectives for conservation of Quino within the Fanita Ranch Development (Section 4.0); and
4. An approval process for future development projects within Santee that have the potential to impact existing or potential Quino populations or habitat (Section 5.0).

The goals for conservation of Quino populations and habitat are defined, and then a series of objectives are identified to achieve each goal. Specific tasks must then be implemented on a project-by-project basis to accomplish each objective. The Conservation Strategy also provides a general prioritization for implementation of Preserve monitoring and management, as outlined in Section 7.2.1 of the City of Santee Subarea Plan, as well as estimated costs for implementation included in Section 6.0 of this document.

To meet the goals of this Conservation Strategy, each proposed project within Santee that has the potential to adversely impact Quino, as depicted on the Predicted Species Distribution Map (Conservation Analysis), must address and implement, to the maximum extent practicable, the applicable goal(s) and objective(s) described below. It is the City's responsibility, in coordination with the Wildlife Agencies, to review project applications to confirm that the goals and objectives stated above have been met. The intent is to allow for future development within Santee while simultaneously maintaining a viable Quino population and potential for recolonization of potential habitat, as well as allowing conservation and management of other species of concern in Santee.

This Conservation Strategy is intended to provide a framework for the approach to assessment, conservation, restoration, and management of Quino and its habitat. This strategy includes goals and objectives specific to Santee, as well as more regionally-focused efforts. It has been developed to allow for adaptive management decisions on a project-by-project basis based on coordination with developers, the City, other participating jurisdictions, and the Wildlife Agencies. As new or revised protocols and methodologies for assessment, conservation, restoration, and management of Quino are developed and/or approved by the Wildlife Agencies, the City will participate, subject to the availability of appropriated funds and in accordance with Section 10.3.4 (b2), the Implementing Agreement.

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CHAPTER 2.0
GUIDELINES FOR IDENTIFYING EXISTING AND POTENTIAL QUINO POPULATIONS AND HABITATS

2.1 IDENTIFYING EXISTING QUINO POPULATIONS

Existing Quino populations within Santee will be given the first priority for management and conservation. Thus, a key consideration of this Conservation Strategy is to identify when an observed Quino occurrence will be considered an existing population and not just a random event.

The Quino was once a very common butterfly species in southern California. Today this species has been reduced to a very limited number of occurrences, especially in the central portions of San Diego County, including Santee. Scientific understanding of Quino suggests that while this butterfly species can migrate to search for new host plant populations, nectar source populations, or potential mates, the species is more likely to stay close to the home ranges for each population (Murphy et al. 1990; Mattoni et al. 1997; Osborne and Redak 2000). If an occurrence of Quino is found within the City, it is possible that the individual(s) may have migrated from off-site populations. However, knowledge of the species behavior, range limitations, and other factors suggests that, in general, occurrences of Quino are existing populations and not migrant visitors.

If a Quino is found in the City and there is no scientific data to suggest migrant visitation (e.g., from a mark and recapture study), the occurrence will be considered an existing population. Any conclusion of migrant visitation without the scientific data to support it will be rejected.

2.2 QUINO POPULATION DELINEATION AND HABITAT ASSESSMENT

The preservation, enhancement, and restoration of Quino populations and potential habitat are essential to conservation of the species. Within southern California, Quino populations and habitat are assumed to have been impacted by numerous disturbance factors, including development (residential and commercial), off-road activity, recreational use, grazing, agriculture, increased fire frequency, and weed invasion.

Development of Quino habitat for residential and commercial use is the primary reason for the decline of the butterfly (Murphy et al. 1990; Mattoni et al. 1997; Osborne and Redak 2000), but

even in many areas where habitat remains, the Quino is unable to persist due to degradation of the habitat by off-road activity, grazing, fire, and weed invasion. This species is very closely associated with the numerous native annual plant species that are either larval host plants or nectar sources. These native annual species that the Quino depends upon are highly subject to weed invasion by nonnative grasses and other annuals. It is common to find the native annual species declining due to the invasion of nonnative annual species, even when there has not been an obvious disturbance of the habitat.

An accurate delineation of Quino populations and habitat (both existing and potential) is necessary for the assessment of impacts and conservation potential for specific projects, and to determine the specific management goals and objectives that can be applied. Currently, the USFWS Quino survey protocol (USFWS 2002) requires mapping and data collection of larval host plants, nectar sources, hilltopping sites, and field observations. The USFWS protocol does not include a requirement to associate these data in a formal manner that accurately delineates the Quino population or the habitat (occupied or not). EDAW, in cooperation with the USFWS and the County of San Diego, has developed a more detailed approach to Quino population and habitat assessment to accurately delineate existing and potential Quino habitat.

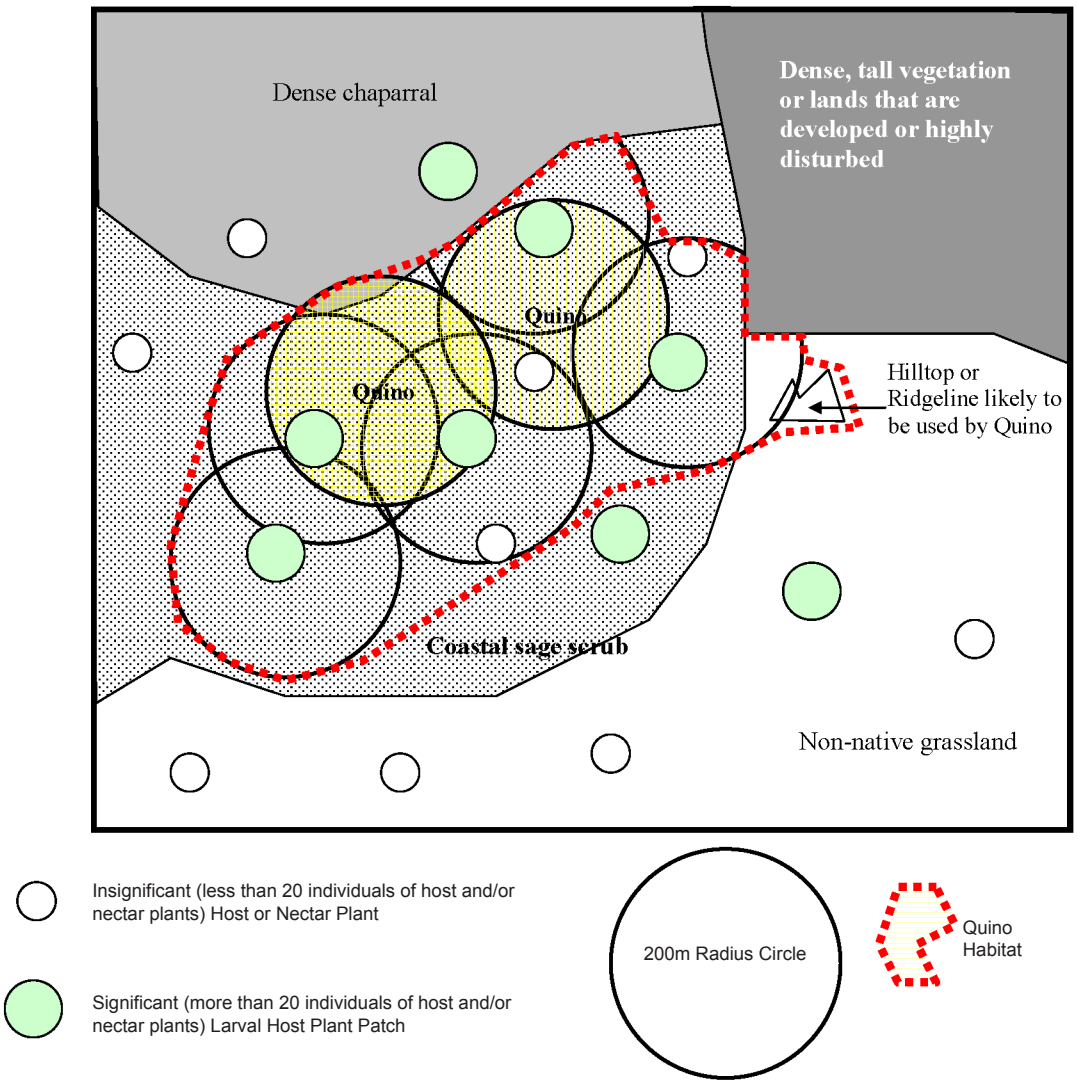
It is important to note that the specific survey methods for Quino outlined in the USFWS 2003 protocol and County's *MSCP Quino Checkerspot Butterfly Amendment Proposed Conservation Policies* (2009) will be implemented under this strategy. The habitat assessment methodology described below builds upon the County and USFWS protocols to improve the assessment of habitat and the delineation of population occurrences, specifically in Santee.

2.2.1 Population Occurrence

As specified in Section 2.1, any observation of Quino will be considered a potential existing population unless scientific data suggest otherwise. Any determination by the City that a Quino occurrence is not a population must have concurrence by the Wildlife Agencies. The methods of delineating the Quino population in association with the habitat (host plants, nectar sources, etc.) are described below.

2.2.2 Habitat Assessment Methodology

The section describes the methodology for assessing and delineating existing or potential Quino habitat. Figure 1 provides a visual illustration of how Quino habitat mapping and assessment will be conducted.



Source: County of San Diego 2008

Figure 1
Example of Occupied Quino Habitat Mapping

Survey periods and methods will follow the USFWS protocol, but will involve a more detailed assessment of the habitat. Surveys for habitat will concentrate on identifying and mapping (via a Global Positioning System with submeter accuracy) larval host plant populations, adult nectar source plant populations, and hilltop areas. Larval host plants are species that are a recognized food source for the larval stage (caterpillar) of Quino. Adult nectar source plants are species that are recognized as important food sources (nectar) for the adult butterflies. Table 1 lists some of the recognized larval host plants and adult nectar sources (Mattoni et al. 1990; USFWS 2003).

Table 1
Native Plant Species Important to the Quino

Scientific Name	Common Name
Larval Host Plants	
Plantago erecta	dot seed plantain
Plantago patagonica	wooly plantain
Plantago spp.	n/a (other plantain species)
Castilleja exserta	purple owl's clover
Antirrhinum coulterianum	snapdragon
Cordylanthus rigidus	bird's beak
Collinsia spp.	Chinese houses
Adult Nectar Sources	
Lasthenia spp.	goldfields
Layia spp.	tidy tips
Ericameria spp.	goldenbush
Asteraceae spp.	n/a (other sunflower species)
Cryptantha spp.	popcorn flower
Allium spp.	native onions

Hilltop areas are localized high points in the topography or ridgelines where the adult Quino butterflies will congregate to locate potential mates for breeding. Hilltop sites do not need to have larval host plants or adult nectar plants to attract the adult butterflies.

Larval host plant populations, nectar source plant populations, and hilltop areas will be mapped as polygons. For the host plant and nectar plant populations, individuals that are within 3 meters or less of each other will be mapped together in the same polygon and will therefore be considered a population. Any host or nectar plants that occur more than 3 meters away would be mapped as a separate polygon, and will be considered a separate population. Any population of Quino resources (i.e., host plants and/or nectar source plants) that has less than 20 individual will be considered insignificant, while populations with over 20 individuals will be considered significant. Both the host plant and nectar source species only need to be identifiable to be considered individuals, meaning they do not need to be mature plants that are flowering or

setting seed to be considered an individual. To determine density, a subsample count of individuals would be made for each polygon. Population sizes for each polygon would be extrapolated based on the density estimates and the area for the polygon.

The characterization of the host plant and nectar source polygons will include information on native species diversity (especially annual species), as well as nonnative plant species diversity and cover.

Studies of Quino populations throughout the species range indicate that the adult butterflies will travel a range of distances from host plant populations to find hilltopping locations or nectar resources. In populations where larval host plant populations, adult nectar resources, and hilltop areas are adjacent to each other, the movement of the Quino may be limited (less than 150 meters), while in populations where these various resources are more spatially distinct, butterflies may travel longer distances (between 200 and 1,000 meters) (Erhlich et al. 1980; Parmesan et al. 1995).

If Quino habitat (hilltop locations, host plant and nectar resources) is not associated with a known Quino occurrence (i.e., not within 200 meters of a Quino occurrence) then the habitat will be considered potential habitat that is unoccupied. Quino habitat with larval host plants, populations of nectar sources, or hilltop sites that are within 200 meters of a known Quino population/observation will be delineated as occupied habitat. Occupied habitat will extend out from the mapped population/observation location to each polygon of host plant, nectar source, or hilltop site that is within 200 meters until there is a gap in Quino observations or habitat that is greater than 200 meters. Quino observations or habitat that is more than 200 meters away will be considered separate areas of potential (no Quino found in these areas) or occupied (Quino found in these areas) habitat. Any polygons of host plant or nectar source plant populations that have less than 20 individuals (host plant and/or nectar source) will not be considered in the potential habitat assessment. This method will prevent mapping of occupied or potential habitat based on a few plants (or an individual) scattered in the landscape.

If the 200 meter circles extend into habitat that is not appropriate for Quino, these areas will not be considered Quino habitat (see Figure 1). Areas that are developed and highly disturbed will not be considered habitat for Quino, nor will native vegetation types that have dense, tall vegetation without open areas that can support annual understory species. Areas with dense coastal sage scrub, chaparral, mixed-chaparral, and riparian habitat will not be considered Quino habitat and will be subtracted from the Quino habitat acreage, even if these areas are mapped inside one of the 200 meter polygons.

The method above will be used for both the baseline Quino population and habitat assessment (impact assessments), as well as the assessment for habitat restoration and enhancement. The data from this assessment will also be used as a baseline for future monitoring programs.

CHAPTER 3.0
GOALS AND OBJECTIVES FOR CONSERVATION OF QUINO

The main goals for the Quino Conservation Strategy are to:

- Conserve and manage existing known populations;
- Preserve, enhance, and restore existing and potential Quino populations and habitat;
- Enhance the existing Quino population;
- Accumulate, manage, and disseminate existing and future Quino data and analyses; and
- Enhance public understanding and support for conservation goals for the Quino.

These goals are described in more detail in the following sections, with specific objectives to achieve the goals that must be implemented via discrete tasks. The goals, objectives, and tasks are a framework for conservation of Quino populations and habitat within Santee, as well as more regionally-focused efforts. These goals, objectives, and tasks have been developed in consultation with the Wildlife Agencies and are consistent with the USFWS Quino Recovery Plan (USFWS 2003).

3.1 CONSERVATION AND MANAGEMENT

The priority for conservation is to identify and promote conservation, restoration, and management activities that are implemented on both public and private lands both within Santee and the larger San Diego region. In the near-term (i.e., 1 to 3 years), priority will be given to identifying and conserving existing populations and habitat on private property, to the extent feasible, and mechanisms for protecting and improving existing or potential Quino populations and habitat on public property. In the long-term (i.e., 5 years or more), priority will be placed on implementing habitat enhancement and restoration in areas that provide habitat connectivity and continuity with known existing Quino populations (currently one known population occurs in Santee, located on Fanita Ranch, as identified in Figure 3-86 of Appendix C of the Subarea Plan).

Goal 1: Conserve and manage existing known populations of the Quino, as well as potential unoccupied habitat, within Santee, according to the Santee Subarea Plan Rare and Narrow Endemic Policy.

Objective 1.1: Promote conservation, restoration, and management on privately owned lands to protect known Quino populations and unoccupied potential habitat.

Task 1.1.1: Work with private land owners when development applications are submitted to the City for permits to conserve existing known populations within Santee (currently one known population in Santee, located on Fanita Ranch), including associated host plant and nectar source populations, as well as unoccupied potential habitat. Maintaining connectivity with off-site populations and potential habitat, to ensure gene flow and possible population expansion, is a priority.

Task 1.1.2: Work with private land owners when development applications are submitted to the City for permits to identify potential Quino habitat for restoration and enhancement programs designed to improve the distribution of known larval host plans, nectar sources, and other important site characteristics (hilltopping locations, etc.).

Task 1.1.3: Identify and pursue opportunities to reward private landowners for incorporating Quino habitat protection, restoration, and enhancement activities into land management and development projects and areas that, with willing landowners, can be protected by conservation easements or habitat management agreements.

Task 1.1.4: Assist private landowners and land managers to secure funding and technical assistance from government programs that support habitat protection, restoration and enhancement activities.

Task 1.1.5: Identify directives for the City's Preserve Steward to function as the City's Quino liaison to work with private landowners and land managers.

Task 1.1.6: Develop and implement performance standards and measurements of success for required habitat restoration and enhancement projects on private lands and develop an annual monitoring program that will evaluate the project successes.

Objective 1.2: Promote conservation and management on publicly owned lands that protect Quino habitat, including known populations.

Task 1.2.1: Work with public land owners to conserve existing known populations within Santee (including all associated host plant and nectar source populations), as well as unoccupied

potential habitat. Maintaining connectivity with off-site populations and potential habitat is a priority.

Task 1.2.2: Identify and pursue financial resources for public land managers to promote projects and practices that will protect, enhance, and restore known Quino populations. Public land management agencies may include USFWS, CDFG, U.S. Department of Defense, California Department of Transportation, County of San Diego, San Diego County Parks and Recreation, City of San Diego, City of San Diego Parks and Recreation, and the City of Santee Parks and Recreation.

Task 1.2.3: Identify high-priority areas for and undertake the restoration, enhancement, and management of existing Quino populations on public lands. Highest priority will be given to lands that support, or have connectivity to known Quino populations or existing unoccupied habitat.

Task 1.2.4: Identify directives for the City's Preserve Steward to function as the City Quino liaison that will work with public land managers to incorporate conservation practices and projects into public lands management.

Task 1.2.5: Participate in the annual reporting workshops and discuss, share, and document results of regional management efforts and best practices designed to benefit the Quino consistent with Section 7.9 of the City of Santee Subarea Plan.

Task 1.2.6: Develop and implement performance standards and measurements of success for habitat restoration and enhancement projects on public lands and develop an annual monitoring program that will evaluate the project successes.

Objective 1.3: Integrate conservation goals and objectives for the Quino into existing conservation programs that support habitat protection, restoration, and enhancement on public and private lands, including existing and draft Habitat Conservation Plans and Natural Community Conservation Plans.

Task 1.3.1: Work with managers of government conservation funding programs, such as Section 6 and Local Assistance grants, to incorporate the conservation and habitat needs for the Quino into program selection criteria.

3.2 HABITAT PRESERVATION, ENHANCEMENT, AND RESTORATION

Priorities for Quino habitat preservation, enhancement, and restoration are to:

- Preserve, enhance, and restore existing populations as well as potential habitat;
- In cooperation with the Wildlife Agencies and other jurisdictions, develop a better understanding of the Santee Quino population genetics; and
- Develop a captive breeding program for Quino in Santee.

The first priority for preservation, enhancement, and restoration will be focused on existing known populations of Quino, followed by potential Quino habitat. With only one known population of Quino in Santee (in Fanita Ranch), protection of this population through adequate preservation and habitat restoration and enhancement is a top priority for this Conservation Strategy (refer to Section 4.0).

Goal 2: Preserve, enhance, and restore existing and potential Quino populations and habitat in Santee.

Objective 2.1: Preserve, enhance, and restore existing Quino populations and habitat in Santee.

Task 2.1.1: Delineate known occupied habitat based on the assumptions and methods described in Section 2.0 for known Quino populations.

Task 2.1.2: Prioritize the occupied habitat areas for preservation by working with the public and private land managers to avoid existing populations consistent with the Rare and Narrow Endemic Policy during development or other activities that could result in adverse impacts to Quino.

Task 2.1.3: Establish a goal with public and private land managers of 80 percent preservation of occupied Quino habitat in Santee.

Task 2.1.4: Work with private and public land managers to establish a Quino habitat restoration program specific to the known occupied habitat. The restoration program will incorporate delineated occupied habitat and buffer zones where possible. The restoration program will include maintenance tasks, such as weed control, collection of seed from larval host plant and nectar plant species, seed bulking (i.e., propagation of plants in a greenhouse for the purpose of

collecting seed), seed dispersal, planting, and monitoring of the occupied habitat. Weed control will address both perennial and annual weed species, with specific discussion of the weed species documented in the occupied habitat.

Task 2.1.5: Develop a monitoring program for existing populations using the occupied habitat delineation as baseline data consistent with Section 7.4.2 of the Santee Subarea Plan "Guidelines for Ongoing Biological Monitoring." This program will include annual larval surveys and/or annual adult butterfly surveys, and delineation and assessment of Quino habitat. The habitat assessment portion of the monitoring program will be consistent with the methodology described in Section 2.0. The monitoring program will also include an assessment of nonnative cover and diversity so that the effects of habitat management methods (weed control, seeding, etc.) can be determined. As part of this monitoring program, success standards for the preservation and restoration of occupied habitat will be established so the effectiveness of the program can be evaluated over time.

Objective 2.2: Preserve, enhance, and restore potential Quino habitat in Santee.

Task 2.2.1: Delineate the potential Quino habitat in Santee based on the assumptions and methods described in Section 2.0.

Task 2.2.2: Develop a ranking system that evaluates and ranks potential Quino habitat based on the cover and density of larval host plants, cover and density of adult butterfly nectar sources, and potential for hilltopping. Habitat will be ranked on a project-by-project basis. This evaluation will include an assessment of the cover and density of weed species, especially the annual weeds that most directly compete with Quino resources, such as star thistle, filaree, and nonnative grass species. The ranking system will also include an assessment of preferred soil types, slope aspects, and other physiographic features. Based on the factors discussed above, the ranking system will evaluate the habitat for low, medium, and high potential for Quino. The following guidelines should be used for the ranking system:

- High Potential: Areas that have all three of the significant (greater than 20 individuals for plant species) parameters (host plant populations, nectar source populations, and ridgeline/hilltop areas) within 200 meters of each other. These areas should have less than 50 percent cover of nonnative plants.
- Medium Potential: Areas that have all three of the significant parameters within 200 meters of each other but have greater than 50 percent cover of nonnatives, or areas that

have only two of the significant parameters within 200 meters of each other and have less than 50 percent cover of nonnative plants.

- Low Potential: Areas that have only one of the three significant parameters within 200 meters of each other and have a nonnative plant cover less than 50 percent, or areas with two of the significant parameters within 200 meters but have greater than 50 percent cover of nonnatives.

Task 2.2.3: Work with the public and private land managers in Santee to prioritize areas of potential Quino habitat to avoid during development or other activities that could result in adverse impacts, especially the areas with a high potential for Quino. Utilize the ranking system described in Task 2.2.2 for this prioritization.

Task 2.2.4: Establish a goal with public and private land managers in Santee to preserve and manage 80 percent of Quino habitat with a high potential, 50 percent of habitat with a medium potential, and 30 percent of habitat with a low potential for Quino.

Task 2.2.5: Utilize the ranking system established in Task 2.2.2 to develop a prioritization matrix. This evaluation will also identify what potential habitat areas are closest to known occupied habitat within Santee as well as the closest occupied habitat outside of Santee (e.g., San Vicente Reservoir and Mission Trails Regional Park). Habitat areas with a high or medium potential for Quino that are closest to known occupied habitat will be given preference for enhancement and restoration programs. Conducting enhancement and restoration on the areas closest to known occupied habitat will provide the best opportunities for existing Quino populations to expand into high-quality habitat that has suitable populations of larval host plants and nectar sources, as well as low levels of weed species and other disturbance factors. If a proposed project site does not have occupied habitat to expand upon, then the habitat areas ranked with a high or medium potential for Quino will be evaluated for management defensibility (i.e., how buffered the areas are from factors that contribute to habitat decline, such as development, invasive species, trespassing, etc.), habitat connectivity within the preserve areas, and habitat connectivity to other preserve areas outside the project site and potentially outside Santee. Areas ranked with a high or medium potential for Quino and that have the greatest potential to make a direct connection to occupied habitat off-site will be given preference for enhancement and restoration programs. The objective for this approach is to not only maintain the current habitat corridor connections and linkages, but to also expand and enhance those corridors so that they are more likely to provide for sufficient movement and migration of the Quino and other wildlife species. When taking these factors into account, the

primary goal for identifying the most appropriate areas for enhancement and restoration will be to cluster the areas of management for Quino into the largest contiguous blocks of potential habitat, with some consideration given to establishing more than one core node of Quino occupation to guard against a stochastic event eliminating the Subarea population. The secondary goal will be to connect these contiguous blocks with other on-site (within the City of Santee) preserve areas across the City, as well as off-site (outside the City of Santee) preserve areas where possible. Overall, establishing large, contiguous blocks of potential habitat is believed to be the best strategy to establish and maintain Quino within the Santee Subarea. Therefore, this principle will be used to prioritize specific conservation actions.

Task 2.2.6: Work with private and public land managers in Santee to establish a Quino habitat restoration program specific to the areas of potential habitat that are to be preserved. This restoration program will consider delineated potential habitat and buffer zones (determined on a project-by-project basis in coordination with the Wildlife Agencies and consistent with the methodology in Section 2.2) where possible. The restoration program will be developed to include implementation maintenance tasks, such as weed control, seed collection from larval host plant and nectar sources, seed bulking, seed dispersal, planting, and/or monitoring of the potential habitat. The weed control program will address both perennial and annual weed species, with specific discussion of the weed species documented in the occupied habitat.

When assessing potential habitat areas for restoration, priority will be given to the areas that were assigned a medium potential using the ranking system described above in Section 2.2.2. In particular, the areas that are ranked as medium because they have at least two of the three important parameters within 200 meters of each other but have greater than 50 percent cover of nonnatives will be given the highest priority. These areas have the resources important to Quino but are likely undergoing habitat conversion due to the invasion of nonnative plant species and other disturbance factors (e.g., development). With a program of weed control and seeding (native seed collection, propagation, and dispersal for both larval host and nectar source species), these areas could become habitat that has a high potential for the Quino to colonize in the future.

Task 2.2.7: Develop a monitoring program with goals that can be evaluated for success for the preservation and restoration of potentially occupied habitat. To evaluate success, establish a monitoring program for areas that are being preserved and restored using the occupied habitat delineation as baseline data consistent with Section 7.4.2 of the Santee Subarea Plan "Guidelines for Ongoing Biological Monitoring." This program will include annual adult butterfly surveys and delineation and assessment of Quino habitat. The habitat assessment portion of the monitoring program will be consistent with the methodology described in Section 2.2. The

monitoring program will also include an assessment of nonnative cover and diversity so that the effects of habitat management methods (weed control, seeding, etc.) can be determined. As part of this monitoring program, success standards for the preservation and restoration of occupied habitat will be established so the effectiveness of the program can be evaluated over time.

Goal 3: Expand Quino populations in Santee.

Objective 3.1: Under the direction of the Wildlife Agencies, evaluate the genetic make-up of the existing Quino populations, including the closest population in proximity to Santee.

Task 3.1.1: Under the direction of the Wildlife Agencies, establish a Quino Working Group that includes the Wildlife Agencies, County of San Diego, City of Santee, City of San Diego, Department of Defense, and other private and public stakeholders to develop a genetic study of the Quino populations in and around Santee. The Quino Working Group will also be responsible for coordinating other regional issues with concerns to the Quino and Quino habitat. If appropriate, this Working Group may be expanded to address Quino populations from other portions of the MSCP Subregion or County of San Diego.

Task 3.1.2: Identify potential funding sources from Federal, State, and local entities to fund a genetic study of Quino populations in and around Santee. This would be part of a regionally-focused genetic study program for San Diego County.

Task 3.1.3: Implement a genetic study of the Quino populations in the San Diego region, including those in and around Santee to determine which of the surrounding populations is most related to the Santee Quino population to use as a donor source for a captive breeding program. This study will be part of a regional effort conducted under the direct supervision and guidance of the Wildlife Agencies.

Objective 3.2: Establish new Quino population within Santee.

Task 3.2.1: Evaluate the potential and the need to establish new Quino populations within Santee via the Quino Working Group (described under Task 3.1.1). This evaluation will be based on the status of current populations within Santee, as well as potential donor populations outside of Santee. Each potential donor population will be evaluated based on the results of the genetic study (described in Task 3.1.1) to determine if the population is genetically similar to the Santee Quino population. A donor population will be considered if it has the appropriate genetic makeup (i.e., genetically similar to the Santee population), as well as a population size and

density that will allow for collection of larvae without adverse effects to the existing population structure.

Task 3.2.2: Identify funding opportunities from Federal, State, and local sources to fund development and implementation of a captive breeding and release program.

Task 3.2.3: Evaluate the potential and the need to prepare a captive breeding and release plan for the Quino in Santee. The plan will provide details on the collection of larvae from a population outside of Santee, propagation of the butterfly with a captive breeding program, and the subsequent release of the larvae into potential Quino habitat in Santee. Potential recipient sites for the larvae release will include the areas with a high potential that are as close to known populations as possible, but also well protected within the matrix of the Subarea Plan preserve lands. This captive breeding plan will include a monitoring program that will track the success of the larvae and adult butterfly survival.

Task 3.2.4: Implement and monitor the captive breeding and release program for Quino under the direct supervision of the Wildlife Agencies.

3.3 DATA STORAGE AND MANAGEMENT

Documenting the current and historical distribution and abundance of Quino in Santee is essential for enhancing the scientific understanding of the species and its habitat, while informing applied conservation and management activities. Proper data storage and management are essential to long-term conservation efforts and ensure effective interpretation and dissemination of information.

Primary priorities regarding data storage and management are to:

- Accumulate, manage, and disseminate data in a consistent manner;
- Ensure data are generated using accepted and documented protocols, consistent will Table 7-2 of the Santee Subarea Plan, titled “Guidelines for Ongoing Biological Monitoring,” and Table 7-4, titled “Additional Species Specific Monitoring Requirements”; and
- Make appropriate data accessible to researchers, volunteers, and the general public.

Goal 4: Accumulate, manage, and disseminate existing and future Quino data and analyses for the City of Santee and provide this information to the Wildlife Agencies and/or a designated regional monitoring entity.

Objective 4.1: Compile data for Quino in a format and location easily accessible to agency, academic, and qualified collaborators, while protecting confidentiality to landowners with identified occupied and potential Quino habitat.

Task 4.1.1: The Wildlife Agencies select and coordinate with the agency or organization responsible for data entry, error checking, storage, and dissemination. Currently, the Wildlife Agencies have identified SANDAG to manage the MSCP gains and losses through the Habitrak system.

Task 4.1.2: Provide published Quino reports for the City to the Wildlife Agencies for posting on a website to be determined by the Wildlife Agencies.

Task 4.1.3: Land managers in Santee will compile documented data on Quino populations, larval host population size and density, nectar source population size and density, and ranking of potential habitats to the City and Wildlife Agencies

Task 4.1.4: Land managers in Santee will compile data on restoration and enhancement programs for the Quino in Santee, including information on planning, site selection, implementation, and monitoring. These data are provided to the City and Wildlife Agencies.

Objective 4.2: Develop standardized data collection methods and format to support long-term research and database management.

Task 4.2.1: Standardize the data to be collected on occupied and potential Quino habitat in Santee, utilizing the USFWS survey protocols (or other protocols that may subsequently be approved by the Wildlife Agencies) and the population and habitat assessments outlined in Section 2.0 above.

Task 4.2.2: Standardize the methods and format by which data are accumulated, stored, and queried by field personnel and others to ensure data compatibility and to facilitate data entry.

3.4 EDUCATION AND OUTREACH

The success of this Conservation Strategy for Santee will, in part, be based on the ability to foster awareness of the long-term population decline of the Quino in Santee and the greater San Diego region, the importance of conservation efforts on public and private land, species habitat requirements, laws currently protecting the butterfly, opportunities for participating in species recovery, and landowner responsibilities. Target audiences for education and outreach efforts may include private landowners, public land managers, policy makers, and the general public.

The primary education and outreach goals include:

- Improving understanding among developers and other landowners regarding the butterfly's history, the importance of conservation on private property, legal protections currently in place, habitat requirements, and opportunities for increased involvement in Quino conservation.
- Improving understanding among public land managers regarding the critical role of enhancing and maintaining habitat on public land for the long-term recovery of the species, and techniques for achieving this goal.
- Enhancing understanding of conservation opportunities on public and private land and encouraging stakeholder participation.
- Publicizing the Quino Working Group's efforts as a model for conserving species at risk that are formally listed by a state or federal agency.
- Promoting the progress made on the Quino Conservation Strategy (completion of the tasks outlined in this Strategy) and gaining support and funding for ongoing efforts.

Goal 5: Enhance public understanding and support for conservation goals for the Quino.

Objective 5.1: Build on existing education efforts (The City of Santee Subarea Plan) targeting private landowners, public land managers, and policy makers regarding the Quino's legal status and conservation needs, and opportunities for participation in species conservation.

Task 5.1.1: Develop an outreach program targeting affected private landowners, public land managers, resource specialists, funding agencies, conservation groups, and policy makers. Emphasize the biological and legal differences between Quino and other similar species, and

ongoing conservation efforts and land management information relating to the status and welfare of the Quino.

Task 5.1.2: Create a Quino page on the City's website with general natural history information and identification aids as well as a description of legal status and current conservation efforts. Provide links to related websites and published reports.

Task 5.1.3: Publicize the efforts to better manage and conserve the Quino, including restoration projects, public land management efforts, and research results, consistent with Section 7.9, titled "Public Outreach and Education."

Task 5.1.4: Conduct outreach and publicize the importance of the Quino, including information about habitat requirements and opportunities for landowners to participate in conservation efforts, consistent with Section 7.9, titled "Public Outreach and Education."

CHAPTER 4.0
CONSERVATION ACTIONS SPECIFIC TO THE FANITA RANCH DEVELOPMENT

The Fanita Ranch project is required to meet the conservation goals and objectives outlined in Section 3.0, as applicable. Below is a discussion of where the Fanita Ranch project has met the goals and objectives of this Conservation Strategy and where there is a need for additional information and evaluation in order to provide adequate coverage of the Quino within the Fanita Ranch project boundary. Specifically, the following goals and objectives from Section 3.0 should be applied to the Fanita Ranch project:

Goal 1: Conserve and manage existing known populations of Quino, as well as potential unoccupied habitat, within Santee, according to the Santee Subarea Plan Rare and Narrow Endemic Policy.

Objective 1.1: Promote conservation, restoration, and management on privately owned lands to protect known Quino populations and unoccupied potential habitat.

Objective 1.3: Integrate conservation goals and objectives for the Quino into existing conservation programs that support habitat protection, restoration, and enhancement on public and private lands, including existing and draft Habitat Conservation Plans and Natural Community Conservation Plans.

Goal 2: Preserve, enhance, and restore existing and potential Quino populations and habitat in Santee.

Objective 2.1: Preserve, enhance, and restore existing Quino populations and habitat in Santee.

Objective 2.2: Preserve, enhance, and restore potential Quino habitat in Santee.

4.1 CONSERVATION AND MANAGEMENT

The Fanita Ranch project developer completed a Quino survey in 2005, consistent with the USFWS survey protocol, and has prepared a habitat assessment for the Quino throughout the project site. This includes a predicted habitat modeling exercise that has been used to determine

the areas where potential Quino habitat is being protected and where it is being impacted within the current Fanita Ranch "development bubble." While these documents meet the requirements of typical biological impact assessments and there is a clear intent of the project applicant to provide conserved habitat for Quino, the only known occupied Quino habitat on the project (Dudek 2007) is not planned to be protected in its entirety.

Based on the guidelines outlined in Section 2.1, the Fanita Ranch project must assume that the observed Quino occurrence is a population because there is no scientific evidence to suggest otherwise. The site (the entire 2,600 acres) needs to be assessed for potential Quino habitat according to the guidelines outlined in Section 2.2. While the predictive habitat model is useful for a macro-scale approach to identifying potential Quino habitat, a detailed site assessment following the guidelines outlined in this Conservation Strategy is necessary to more accurately delineate potential habitat for conservation within Fanita Ranch.

Following an assessment of the occupied habitat consistent with Section 2.2, the project design must assess for impacts to the entire occupied Quino habitat area in addition to the hilltop location, including satellite populations of the host plant and nectar sources. Some of the host plant populations that are associated with the hilltop location are currently within the impact areas and are not planned to be preserved. These host plant resources must be linked with the hilltop spot and the surrounding open space design to create a more suitable habitat matrix that can be assessed for the 80 percent conservation of the existing Quino population.

4.2 HABITAT PRESERVATION, ENHANCEMENT, AND RESTORATION

The goals and objectives for habitat preservation require 80 percent preservation of occupied Quino habitat, as defined in Task 2.1.3. The Fanita Ranch project design does not include the associated host and nectar resources, and therefore currently does not provide for 80 percent preservation of the occupied site.

As a condition for permitting the Fanita Ranch project, the Wildlife Agencies should require the occupied habitat within Fanita Ranch to be assessed according to this Conservation Strategy and 80 percent of the delineated occupied habitat to be protected. This may require a redesign of the proposed Fanita Ranch development footprint.

In addition, the potential habitat is currently identified based on general factors (soil type, topography, and general vegetation mapping) that do not accurately define Quino habitat according to the guidelines outlined in this Strategy. The acreages of Quino habitat that are being

preserved are based on these general factors and are therefore difficult to accurately analyze for impacts and preservation. To more accurately analyze the project's impacts and preserved acreage of potential habitat, Fanita Ranch must delineate the occupied and potential Quino habitat over the entire site using the methods described in Section 2.2, including a ranking of all potential habitats (i.e., low, medium, and high). This more detailed assessment of the Quino habitat will allow for a more accurate determination of the impacts on Quino and Quino habitat due to the project.

In addition, the Quino management and restoration goals and objectives for the Fanita Ranch project have not yet been defined in detail as required by this Strategy. A detailed Quino habitat restoration plan must be prepared for the occupied habitat. This analysis will follow the guidelines under Tasks 2.2.6 and 2.2.7. In addition, this detailed plan should include the enhancement and restoration of the potential habitat areas within the hardline preserve. The plan will be specific to the areas targeted for the implementation of restoration, as well as specific to the methods and goals for this restoration.

4.3 MONITORING AND DATA STORAGE

Fanita Ranch must continue to work with the City and regulatory agencies to fulfill the goals and objectives outlined in Section 3.3, as applicable.

4.4 EDUCATION AND OUTREACH

Fanita Ranch must continue to work with the City and regulatory agencies to fulfill the goals and objectives outlined in Section 3.4, as applicable.

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CHAPTER 5.0
APPROVAL PROCESS FOR FUTURE DEVELOPMENT PROJECTS

The goals and objectives of this Conservation Strategy are in place so that the Quino and its habitat are given adequate consideration and coverage in project planning during implementation of the Santee Subarea Plan. In general, new projects submitted for approval under the Santee Subarea Plan will need to demonstrate consistency with the five goals outlined above in Section 3.0 of the Conservation Strategy in order to obtain project approvals by the City. Both the City and the Wildlife Agencies will be responsible for the review of all environmental assessment and planning documents, including California Environmental Quality Act (CEQA) documents, habitat management plans, and restoration and enhancement plans. These plans and reports must document any occupied and potential Quino habitat according to the methods described in Section 2.0 and demonstrate that the five goals and associated objectives identified in Section 3.0 will be met by performing the tasks associated with each objective (as applicable), or by performing a substitute task that is approved by the City and the Wildlife Agencies.

The following project approval process will be followed to demonstrate project consistency with the Conservation Strategy.

1. Determine if potential Quino habitat occurs on the project site based on existing data (e.g., California Natural Diversity Database), previous surveys or documentation, and a habitat assessment of the project site (see Section 2.1).

2. If potential Quino habitat occurs on the project site, conduct USFWS protocol surveys to determine presence of Quino.

3. If Quino is observed, assume there is an existing population on-site unless there is scientific evidence to suggest otherwise (refer to Section 2.1). Conduct habitat assessment per the methodology described in Section 2.2 to determine the area of occupied habitat.

4. If no Quino is observed, but suitable habitat conditions exist (e.g., host or nectar plants, appropriate soils, hilltops, etc.), conduct a habitat delineation per the methodology described in Section 2.2 to determine the potential habitat.

5. Rank identified potential habitat on-site using the ranking system developed under Objective 2.2 (Section 3.2).

6. Identify habitat for preservation within the project site based on the assigned rank, consistent with the preservation goals identified in Task 2.2.4 (80 percent preservation of potential Quino habitat with a high potential, 50 percent preservation of habitat with a medium potential, and 30 percent of the habitat with a low potential). All occupied habitat will be 80 percent conserved. Preserved areas will be established with the largest and most continuous blocks of habitat as possible, consistent with the methodology described in Task 2.2.5. Priority will be given to habitat with a high potential.

7. Proposed preserve areas must be approved by the City and the Wildlife Agencies prior to project permitting.

8. If a proposed project is determined to be unable to provide the required occupied and potential Quino habitat preservation, off-site mitigation may be considered. Off-site mitigation will only be considered when there is no other alternative (on-site mitigation or a boundary adjustment). Off-site mitigation within Santee will be required unless it is not feasible, in which case areas outside of Santee will be considered. Off-site mitigation may be considered for the entire preservation requirement or for a portion if the proposed project can provide a portion of the on-site preservation. Off-site mitigation will require a 4:1 ratio of land preservation for the acreage that would have been required for on-site preservation. Any off-site mitigation must be approved by the City and the Wildlife Agencies prior to project permitting.

CHAPTER 6.0
CONSERVATION STRATEGY IMPLEMENTATION

6.1 PRIORITIZATION OF CONSERVATION STRATEGY GOALS AND OBJECTIVES

The specific implementation of the Conservation Strategy can occur in a number of ways depending on the timing of a project, the specific habitats that occur and the condition of the habitats, and the presence of Quino, as well as a number of other factors. Given a typical project in Santee that has potential or known Quino populations and resources, there are some general guidelines that will be followed with concern to the prioritization of goals and objectives, as outlined in Table 2.

A timeframe for completion is identified for each of the tasks listed in Table 2. The timeframe is either short term (1 to 3 years), mid-term (3 to 5 years), or long term (longer than 5 years). Tasks will be implemented once the implementing agreement for the plan is executed by all parties.

Each task is also defined based on the categories given in the Subarea Plan, which identifies the entity responsible for each task. As defined in the Subarea Plan, Category 1 is the responsibility of the private landowners, Category 2 is the responsibility of the City, and Category 3 is the responsibility of the Wildlife Agencies to organize with all participating jurisdictions to accomplish the task.

Each task listed in Table 2 is assigned a priority rank. The task is either mandatory for the City to get coverage for Quino (Mandatory), or the task is one for which the City will work with the Wildlife Agencies to accomplish throughout the life of the Plan, but is not mandatory for the City to get coverage of Quino (Discretionary). General guidelines used to determine these priorities include the need for Wildlife Agency guidance and direction; the obligation of the property owner to provide the data, assessment, and funding; and the responsibility of the City to ensure that the Subarea Plan is being implemented on all projects within Santee.

It is important to note that goals, objectives, and tasks listed in Table 2 have been developed for the City of Santee, but many of these objectives and tasks are intended to be more regional in application and in responsibility. It will be at the Wildlife Agencies' discretion to determine which objectives and tasks are the responsibility of the City of Santee.

Table 2
Prioritization of Goals and Objectives

Task No.	Task Summary	Timeframe	Category	Priority
CONSERVATION & MANAGEMENT				
GOAL 1: Conserve and manage existing known populations of the Quino, as well as potential unoccupied habitat, within Santee, according to the Santee Subarea Plan Rare and Narrow Endemic Policy.				
Objective 1.1 *Promote conservation, restoration, and management on privately owned lands to protect known Quino populations and unoccupied potential habitat.*				
1.1.1	Work with private land owners to conserve existing known populations within Santee (currently one known population on Fanita Ranch), including associated host plant and nectar source populations, as well as unoccupied potential habitat. Maintaining connectivity with off-site populations and potential habitat is a priority.	1 to 3 years	1	Mandatory
1.1.2	Work with private land owners when development applications are submitted to the City for permits to identify potential Quino habitat for restoration and enhancement programs designed to improve the distribution of known larval host plans, nectar sources, and other important site characteristics (hilltopping locations, etc.).	1 to 3 years	1	Mandatory
1.1.3	Identify and pursue opportunities to reward private landowners for incorporating Quino habitat protection, restoration, and enhancement activities into land management and development projects and areas that, with willing landowners, can be protected by conservation easements or habitat management agreements.	1 to 3 years	1,2	Mandatory
1.1.4	Assist private landowners and land managers to secure funding and technical assistance from government programs that support habitat protection, restoration, and enhancement activities.	1 to 3 years	1,2	Mandatory
1.1.5	Identify directives for the City's Preserve Steward to function as the City's Quino liaison to work with private landowners and land managers.	3 to 5 years	2	Mandatory
1.1.6	Develop performance standards and measurements of success for voluntary habitat restoration and enhancement projects on private lands and develop an annual monitoring program that will evaluate the project successes.	1 to 3 years	1,2,3	Mandatory
Objective 1.2: *Promote conservation and management on publicly owned lands that protect Quino habitat, including known populations.*				
1.2.1	Work with public land owners to conserve existing known populations within Santee (including all associated host plant and nectar source populations) as well as unoccupied potential habitat. Maintaining connectivity with off-site populations and potential habitat is a priority.	1 to 3 years	1	Mandatory
1.2.2	Identify and pursue financial resources for public land managers to promote projects and practices that will protect, enhance, and restore known Quino populations.	1 to 3 years	1,2	Mandatory

Task No.	Task Summary	Timeframe	Category	Priority
1.2.3	Identify high-priority areas for and undertake the restoration, enhancement, and management of existing Quino populations on public lands. Highest priority will be given to lands that support, or have connectivity to known Quino populations or existing unoccupied habitat.	1 to 3 years	2,3	Mandatory
1.2.4	Identify directives for the City's Preserve Steward to function as the City Quino liaison that will work with public land managers to incorporate conservation practices and projects into public lands management.	1 to 3 years	2	Mandatory
1.2.5	Participate in the annual reporting workshops and discuss, share, and document results of regional management efforts and best practices designed to benefit the Quino consistent with Section 7.9 of the City of Santee Subarea Plan.	3 to 5 years	2,3	Discretionary
1.2.6	Develop and implement performance standards and measurements of success for habitat restoration and enhancement projects on public lands and develop an annual monitoring program that will evaluate the project successes.	1 to 3 years	2,3	Mandatory
***Objective 1.3**: Integrate conservation goals and objectives for the Quino into existing conservation programs that support habitat protection, restoration, and enhancement on public and private lands, including existing and draft Habitat Conservation Plans and Natural Community Conservation Plans.*				
1.3.1	Work with managers of government conservation funding programs, such as Section 6 and Local Assistance grants, to incorporate the conservation and habitat needs for the Quino into program selection criteria.	1 to 3 years	2,3	Discretionary
GOAL 2: Preserve, enhance, and restore existing and potential Quino populations and habitat in Santee.				
***Objective 2.1**: Preserve, enhance, and restore existing Quino populations and habitat in Santee.*				
2.1.1	Delineate known occupied habitat based on the assumptions and methods for known Quino populations.	1 to 3 years	1	Mandatory
2.1.2	Prioritize the occupied habitat areas for preservation by working with the public and private land managers to avoid existing populations consistent with the Rare and Narrow Endemic Policy during development or other activities that could result in adverse impacts to Quino.	1 to 3 years	1	Mandatory
2.1.3	Establish a goal with public and private land managers of 80 percent preservation of occupied Quino habitat in Santee.	1 to 3 years	1	Mandatory
2.1.4	Work with private and public land managers to establish a Quino habitat restoration program specific to the known occupied habitat.	1 to 3 years	1,2,3	Mandatory
2.1.5	Develop a monitoring program for existing populations using the occupied habitat delineation as baseline data consistent with Section 7.4.2 of the Santee Subarea Plan "Guidelines for Ongoing Biological Monitoring."	1 to 3 years	2,3	Mandatory

Task No.	Task Summary	Timeframe	Category	Priority
Objective 2.2: *Preserve, enhance, and restore potential Quino habitat in Santee.*				
2.2.1	Delineate the potential Quino habitat in Santee.	1 to 3 years	1	Mandatory
2.2.2	Develop a ranking system that evaluates and ranks potential Quino habitat based on the cover and density of larval host plants, cover and density of adult butterfly nectar sources, and potential for hilltopping. Habitat will be ranked on a project-by-project basis.	1 to 3 years	1	Mandatory
2.2.3	Work with the public and private land managers to prioritize areas of potential Quino habitat to avoid during development or other activities that could result in adverse impacts, especially the areas with a high potential for Quino.	1 to 3 years	1,2,3	Mandatory
2.2.4	Establish a goal with public and private land managers of 80 percent preservation of potential Quino habitat with a high potential, 50 percent preservation of habitat with a medium potential, and 30 percent of the habitat with a low potential for Quino.	1 to 3 years	1,2,3	Mandatory
2.2.5	Utilize the ranking system established in Task 2.2.2 to develop a prioritization matrix. This evaluation will also identify what potential habitat areas are closest to known occupied habitat.	3 to 5 years	2,3	Mandatory
2.2.6	Work with private and public land managers in Santee to establish a Quino habitat restoration program specific to the areas of potential habitat that are to be preserved.	3 to 5 years	1,2,3	Mandatory
2.2.7	Develop a monitoring program with goals for the preservation and restoration of potentially occupied habitat that can be evaluated for success.	3 to 5 years	1,2,3	Mandatory
GOAL 3: Expand Quino populations in Santee.				
Objective 3.1*: Evaluate the genetic make-up of the existing Quino populations including the closest population in proximity to Santee.*				
3.1.1	Under the direction of the Wildlife Agencies, establish a Quino Working Group that includes the Wildlife Agencies, County of San Diego, City of Santee, City of San Diego, Department of Defense, and other private and public stakeholders to develop a genetic study of the Quino populations in and around Santee.	3 to 5 years	2,3	Discretionary
3.1.2	Identify potential funding sources from Federal, State, and local entities to fund a genetic study of Quino populations in and around Santee. This would be part of a regionally-focused genetic study program for San Diego County.	3 to 5 years	2,3	Discretionary
3.1.3	Implement a genetic study of the Quino populations in the San Diego region, including those in and around Santee to determine which of the surrounding populations is most related to the Santee Quino population to use as a donor source for a captive breeding program. This study will be conducted as part of a regional effort under the direct supervision and guidance of the Wildlife Agencies.	Longer than 5 years	2,3	Discretionary

Task No.	Task Summary	Timeframe	Category	Priority
Objective 3.2: **Establish new Quino population within the City of Santee.**				
3.2.1	Evaluate the potential and the need to establish new Quino populations within Santee via the Quino Working Group (described under Task 3.1.1).	Longer than 5 years	2,3	Discretionary
3.2.2	Identify funding opportunities from Federal, State, and local sources to fund development and implementation of a captive breeding and release program.	Longer than 5 years	3	Discretionary
3.2.3	Prepare a captive breeding and release plan for the Quino in Santee.	Longer than 5 years	3	Discretionary
3.2.4	Implement and monitor the captive breeding and release program for Quino under the direct supervision of the Wildlife Agencies.	Longer than 5 years	2,3	Discretionary
DATA STORAGE AND MANAGEMENT				
GOAL 4: Accumulate, manage, and disseminate existing and future Quino data and analyses for the City of Santee and provide this information to the Wildlife Agencies and/or designated regional monitoring entity.				
Objective 4.1: *Compile data for Quino in a format and location easily accessible to agency, academic, and qualified collaborators, while protecting confidentiality to landowners with identified occupied and potential Quino habitat.*				
4.1.1	The Wildlife Agencies select and coordinate with the agency or organization responsible for data entry, error checking, storage, and dissemination. Currently, the Wildlife Agencies have identified SANDAG to manage the MSCP gains and losses through the Habitrak system.	3 to 5 years	2,3	Discretionary
4.1.2	Provide a reference library of published Quino reports for use on a Wildlife Agency approved website.	3 to 5 years	2,3	Discretionary
4.1.3	Land managers in Santee will compile documented data on Quino populations, larval host population size and density, nectar source population size and density, and ranking of potential habitats to the City and Wildlife Agencies.	3 to 5 years	2,3	Mandatory
4.1.4	Compile data on restoration and enhancement programs for the Quino in Santee, including information on planning, site selection, implementation, and monitoring.	Longer than 5 years	2,3	Mandatory
Objective 4.2: *Develop standardized data collection methods and format to support research and database management.*				
4.2.1	Standardize the data to be collected on occupied and potential Quino habitat in Santee, utilizing the USFWS survey protocols and the population and habitat assessments.	1 to 3 years	2,3	Mandatory
4.2.2	Standardize the methods and format by which data are accumulated, stored, and queried by field personnel and others to ensure data compatibility and to facilitate data entry.	1 to 3 years	2,3	Mandatory

Task No.	Task Summary	Timeframe	Category	Priority
EDUCATION AND OUTREACH				
GOAL 5: Enhance public understanding and support for conservation goals for the Quino.				
Objective 5.1: *Build on existing education efforts (The City of Santee Subarea Plan) targeting private landowners, public land managers, and policy makers regarding the Quino's legal status and conservation needs, and opportunities for participation in species conservation.*				
5.1.1	Develop an outreach program targeting affected private landowners, public land managers, resource specialists, funding agencies, conservation groups, and policy makers. Emphasize the biological and legal differences between Quino and other similar species, and ongoing conservation efforts and land management information relating to the status and welfare of the Quino.	3 to 5 years	1,2,3	Discretionary
5.1.2	Create a Quino page on the City's website with general natural history information and identification aids as well as a description of legal status and current conservation efforts. Provide links to related websites and published reports.	3 to 5 years	2	Discretionary
5.1.3	Publicize the efforts to better manage and conserve the Quino, including restoration projects, public land management efforts, and research results, consistent with Section 7.9, titled "Public Outreach and Education."	3 to 5 years	2,3	Discretionary
5.1.4	Conduct outreach and publicize the importance of the Quino, including information about habitat requirements and opportunities for landowners to participate in conservation efforts, consistent with Section 7.9, titled "Public Outreach and Education."	3 to 5 years	1,2,3	Discretionary

6.2 COST ESTIMATE FOR ENHANCEMENT AND RESTORATION ACTIVITIES

This section provides general cost estimates to develop and implement the enhancement and restoration activities discussed in this document. The costs provided are estimates based on Quino checkerspot butterfly habitat restoration that was conducted in the last five years by native habitat restoration companies (e.g., EDAW AECOM and RECON). It is important to note that more specific cost estimates can and should be developed, but only when more detailed information is available on the specific site conditions, requirements for success, and other project-specific details.

To develop a more detailed cost estimate, a detailed Restoration and/or Enhancement Plan will be necessary for any project where occupied Quino habitat or potential Quino is to be enhanced or restored. The detailed Restoration and/or Enhancement Plan should discuss the specific site conditions, mitigation requirements, and success criteria, and should include detailed implementation recommendations that address these mitigation and success criteria needs.

For the purposes of providing general cost estimates, the efforts to rehabilitate and stabilize habitat for the Quino are divided into two categories: enhancement and restoration.

Enhancement

Habitat enhancement can be implemented when the existing site conditions have most, if not all, of the important characteristics for Quino (i.e., host plants, nectar sources, etc.), but the habitat has some disturbance factors (i.e., weed invasion, off-road activity, etc.) that contribute to a decline in habitat quality or quantity. Sites that are determined to be occupied habitat or have been assigned a high potential (according to Section 3.2, Task 2.2.2), and have some disturbance factors, should be considered for enhancement. Habitat enhancement methods and actions typically include the following:

- road closures, trail closures, or other changes to site access;
- signage and fencing;
- dethatching; and
- seed collection and reseeding.

Dethatching is the removal of dead organic material (usually nonnative plant material) from the understory and open cover areas of a site. This activity may include some line trimming and mowing, but is primarily the raking and disposal of dead thatch that is suppressing the native understory and soil crust species. This method is usually conducted in the early summer to late fall when the plants are done flowering and have dried. If dethatching is conducted after seed set but before seed has dropped, it can be very effective at removing the above-ground nonnative seed bank from a site.

Prior to conducting dethatching on a site, it is important to collect all of the above-ground native seed that exists so that the seed is not removed with the nonnative thatch. Once the site has been dethatched, native seed can be immediately placed back on site. Seed is typically stored for a few weeks prior to re-dispersal on site.

Restoration

Typically, habitat restoration is conducted when an existing site is not only disturbed, but the site is missing one or more of the important characteristics (i.e., host plant, nectar sources, etc.) for high-quality Quino habitat. Sites that are determined to have moderate or low potential for Quino (according to Section 3.2, Task 2.2.2) should be considered for restoration. Restoration includes all of the methods covered under Enhancement (dethatching, etc.), as well as the following:

- seed bulking and seeding,
- container planting, and
- herbicide treatment.

Seed bulking differs from seed collection in that with seed bulking the seed is taken to a native greenhouse or nursery where it is propagated for the purpose of seed production. With seed bulking, a large amount of seed can be placed on the restoration site, even though only a small amount of seed was collected.

For most of the important Quino plants, seed bulking is preferred over container planting. Typically, container planting is used with perennial native plants like grasses, shrubs, and cactus species. Most of the important Quino plants are annual species. However, there may be a need to provide container plants if seed bulking does not provide a suitable quantity of seed.

The most important difference between enhancement and restoration is to the approach to weed control. While restoration includes more aggressive methods of weed control than enhancement, all restoration efforts should start with the same baseline dethatch effort described above. With a dethatch effort, the more intensive methods of weed control (herbicide, etc.) are much more effective and efficient. A site that has been dethatched can be treated with herbicides much more effectively because the site is open, the weeds are easier to target, and the important native plant species are easier to avoid.

Table 3 below lists generalized estimated costs for Quino checkerspot habitat enhancement and restoration.

Table 3
General Estimated Cost for Quino Checkerspot Restoration and Enhancement

Activity	One-Time Cost	One-Time Cost per Acre or Linear Foot (LF)	Annual Cost/Acre
Enhancement			
Restoration and Enhancement Plan	$50,000–$100,000	-	-
Fencing	-	Split rail - $27/LF Pilar log - $18/LF	-
Signage		$150/acre	
Seed Collection/Temporary Storage/Seed Dispersal	-	-	$500–$1,500
Dethatching			$2,500–$3,500
Restoration			
Seed Bulking/Seed Dispersal	-	-	$1,500–$5,000
Container Planting	-	-	$1,000–$3,500
Herbicide Treatment (5 visits per year)	-	-	$3,000–$6,000

The estimated costs that are provided in Table 3 represent a general range of efforts. These costs assume that the restoration crew is specifically trained in native habitat restoration and species identification and will be led by an experienced restoration ecologist. The cost for herbicide treatment assumes a site would be dethatched first and then followed with five treatment site visits. The detailed costs for individual projects will depend on the requirements of the project-specific Restoration and/or Enhancement Plan.

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INDEPENDENT SCIENTIFIC ADVISORY REPORT FOR THE CONSERVATION STRATEGY FOR HERMES COPPER BUTTERFLY IN THE CITY OF SANTEE

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October 2009

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CHAPTER 1.0
INTRODUCTION

1.1 BACKGROUND

The City of Santee (City) has prepared a draft Subarea Plan to address implementation of the Multi-Species Conservation Program (MSCP) Subregional Plan for southwestern San Diego County (County of San Diego 1998). The draft Subarea Plan has been prepared pursuant to the requirements of the MSCP Subregional Plan, the state Natural Community Conservation Planning (NCCP) Act of 1991, and the federal Endangered Species Act Section 10(a)(1)(B). Conservation strategies are required for each individual plant or animal species proposed for coverage under the Subarea Plan.

This Conservation Strategy has been prepared for the narrow endemic Hermes copper butterfly (*Lycaena hermes*, Hermes). This species was not covered by the MSCP Subregional Plan because there were no predicted distribution models or conservation policies to assess and provide for its conservation.

The Subarea Plan currently incorporates policies and predictive modeling to evaluate the conservation of Hermes within Santee. In addition, the Subarea Plan is intended to contribute to the regional conservation and recovery of the species by maintaining opportunities for recolonization (i.e., extant, but currently unoccupied breeding habitat) or reintroduction into Santee through the enhancement or restoration of habitat in the Preserve, as specified in the conditions for coverage included in this Conservation Strategy.

This Independent Scientific Report was prepared to address conservation of Hermes within Santee. However, many of the programs and guidance that are recommended in this Report will need to be implemented at a regional level before the specific goals and objectives can be attained for Santee. While the City will be responsible for many of the tasks that pertain directly to Santee, some of the more regionally focused tasks will be the responsibility of the Wildlife Agencies through their existing and/or future programs for the Hermes. These regional programs will be an important part of the effort to provide adequate conservation for the Hermes in Santee. Ultimately, the requirements for adequate conservation of Hermes in Santee are subject to final determination by the Wildlife Agencies.

1.2 INDEPENDENT SCIENTIFIC REVIEW

Pursuant to Section 2830 of the NCCP Act, the City is required to facilitate an independent scientific review of the Subarea's Plan conservation analysis by independent science advisors. Accordingly, this Conservation Strategy has been prepared by EDAW AECOM (AECOM) technical experts, with technical assistance provided by Hermes copper expert Michael Klein. Those experts did not participate in preparation of the Subarea Plan and are therefore considered independent.

1.3 OVERVIEW OF THE CONSERVATION STRATEGY

Through implementation of the goals and objectives of this Conservation Strategy, the City will strive to (1) find existing populations of Hermes in accordance with the Narrow Endemic Policy of the City's Subarea Plan, (2) maintain the potential for natural recolonization of Hermes by conserving large blocks of modeled habitat and (3) support conservation efforts consistent with current sound science. Through these three targeted efforts, the City will also have met the requirement that the Subarea Plan contributes to the recovery of Hermes.

This Conservation Strategy provides a framework for conservation of Hermes within Santee and has been developed in coordination with the City and the Wildlife Agencies (collectively, the U.S. Fish and Wildlife Service [USFWS] and California Department of Fish and Game [CDFG]). The Conservation Strategy is structured based on four key components:

1. Guidelines for identifying existing and potential Hermes populations and habitats (Chapter 2.0);
2. Goals and objectives for conservation of Hermes within Santee (Chapter 3.0);
3. Goals and objectives for conservation of Hermes within the Fanita Ranch Development (Chapter 4.0); and
4. An approval process for future development projects within Santee that have the potential to impact existing or potential Hermes populations or habitat (Chapter 5.0)

The goals for conservation of Hermes populations and habitat are defined, and then a series of objectives are identified to achieve each goal. Specific tasks are then implemented on a project-by-project basis to accomplish each objective. The Conservation Strategy also provides a general prioritization for implementation of Preserve monitoring and management, as outlined in Section

7.0 of the City of Santee Subarea Plan, as well as estimated costs for implementation included in (Section 6.0) of this document.

To meet the goals of this Conservation Strategy, each proposed project within Santee that has the potential to adversely impact Hermes as depicted on the Predicated Species Distribution Map (Conservation Analysis) must address and implement to the maximum extent practicable the applicable goal(s) and objective(s) described below. It is the City's responsibility, in coordination with the Wildlife Agencies, to review project applications to confirm that the goals and objectives stated above have been met. The intent is to allow for future development within Santee while simultaneously maintaining a viable Hermes population and potential for recolonization of potential habitat, as well as allowing conservation and management of other species of concern in Santee.

This Conservation Strategy is intended to provide a framework for the approach to assessment, conservation, restoration, and management of Hermes and its habitat. This strategy includes goals and objectives specific to Santee, as well as more regionally-focused efforts. It has been developed to allow for adaptive management decisions on a project-by-project basis based on coordination with developers, the City, other participating jurisdictions, and the Wildlife Agencies. As new or revised protocols and methodologies for assessment, conservation, restoration, and management of Hermes are developed and/or approved by the Wildlife Agencies, the City will participate, subject to availability of appropriated funds and in accordance with Section 10.3.4 (b2) of the Implementing Agreement.

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CHAPTER 2.0
GUIDELINES FOR IDENTIFYING EXISTING AND POTENTIAL HERMES POPULATIONS AND HABITATS

2.1 IDENTIFYING EXISTING HERMES POPULATIONS

Existing Hermes populations within Santee will be given the first priority for management and conservation. Thus, a key consideration of this Conservation Strategy is to identify when an observed Hermes occurrence will be considered an existing population.

The Hermes is not a common species in San Diego County. A review of specimens from the San Diego Natural History Museum (SDNHM) as well as observational reports from those who have donated their specimens to the SDNHM indicate that reported numbers of specimens donated and/or observed was generally 10 or less per collection event (USFWS FOIA Records Search – Hermes Copper Capture Records January 1999). Two exceptions have been noted. One is from June 16, 1971, from the Spring Canyon area, Mission Gorge, San Diego, California, resting on spiny redberry (*Rhamnus crocea*). The record notes that one specimen was deposited to the Los Angeles County Museum of Natural History (LACM) with a parenthetical comment of observing 200-plus individuals midday. The other record from June 26, 1971, from Big Rock Road, Fletcher Hills, reported four specimens deposited at the LACM and again a parenthetical comment of 200-plus individuals observed. It is important to note that both of these populations with 200-plus specimens can be placed either in the City of Santee (Spring Canyon area), or along the borders of the City (Big Rock Road).

The limited scientific understanding of Hermes suggests the species is sedentary and more likely to stay close to its host plant and nectar patch, forming "colonies" (Thorne 1963). One study of Mark-Release-Recapture (MRR) indicated that this idea may be valid. However, that study also concluded that there were other variables not evaluated in the study and, therefore, concluded more MRR studies needed to be done (Marschalek and Deutschman 2008). Because there is limited knowledge of the Hermes copper's distribution, biology, and ecological constraints, a single occurrence of Hermes found within Santee must be considered an existing population and not migrant unless scientific data can suggest otherwise.

2.2 HERMES POPULATION DELINEATION AND HABITAT ASSESSMENT

The preservation, enhancement, and restoration of Hermes populations and potential habitat are essential to conservation of the species. Within San Diego County, Hermes populations and habitat have been impacted by numerous factors, including development (residential and commercial), off-road activity, recreational use, and increased fire frequency, which can result in habitat conversion to nonnative invasive plants (Brown 1991, Comstock 1927, Marschalek and Deutschman 2008, Murphy 1991, Thorne 1963, Wright 1930). A significant amount of time is necessary for the recovering vegetation to naturally return to some semblance of pre-fire density of vegetation, host plant, and nectar sources. Preservation, enhancement, and restoration of occupied and potential Hermes habitat are necessary for the species to persist in Santee.

An accurate delineation of Hermes populations and habitat (both existing and potential) is necessary for the assessment of impacts and conservation potential for specific projects, and to determine the specific management goals and objectives that can be applied. Currently there is no survey protocol in place. There is also no standardized manner to assess and determine suitable habitat for the butterfly. Based on existing scientific literature (Thorne 1963; Marschalek and Deutschman 2008) as well as interviews with other lepidopterists' who have observed and documented the occurrence of the butterfly over the years, a protocol for both assessing habitat suitability and presence/absence surveys has been developed for the San Diego Gas and Electric (SDG&E) Sunrise Powerlink Project (Michael Klein is a co-author). That protocol will optimize the potential for mapping suitable habitat as well as confirming those mapped habitats as being occupied or not.

Even though the SDG&E Sunrise Powerlink Project Hermes Copper Protocol (SDG&E Protocol) was designed for Sunrise Powerlink Project specifically, it was left generic enough to develop a region-wide protocol for the butterfly. Adult flight season generally begins around the middle of May, depending on annual rainfall (Faulkner and Klein 2008), and terminates sometime between the end of June to the first week of July (Faulkner and Klein 2008). The SDG&E Protocol recommends four visits during the adult flight season at approximately 10-day increments, with visit 1 between May 20 and 30, visit 2 between May 31 and June 9, visit 3 between June 10 and 20, and visit 4 between June 21 and 30. Minimum weather conditions to begin surveys are noted, as well as weather conditions that would suspend surveys. The Wildlife Agencies should consider modifying the SDG&E Protocol for a region-wide Hermes survey protocol.

2.2.1 Population Occurrence

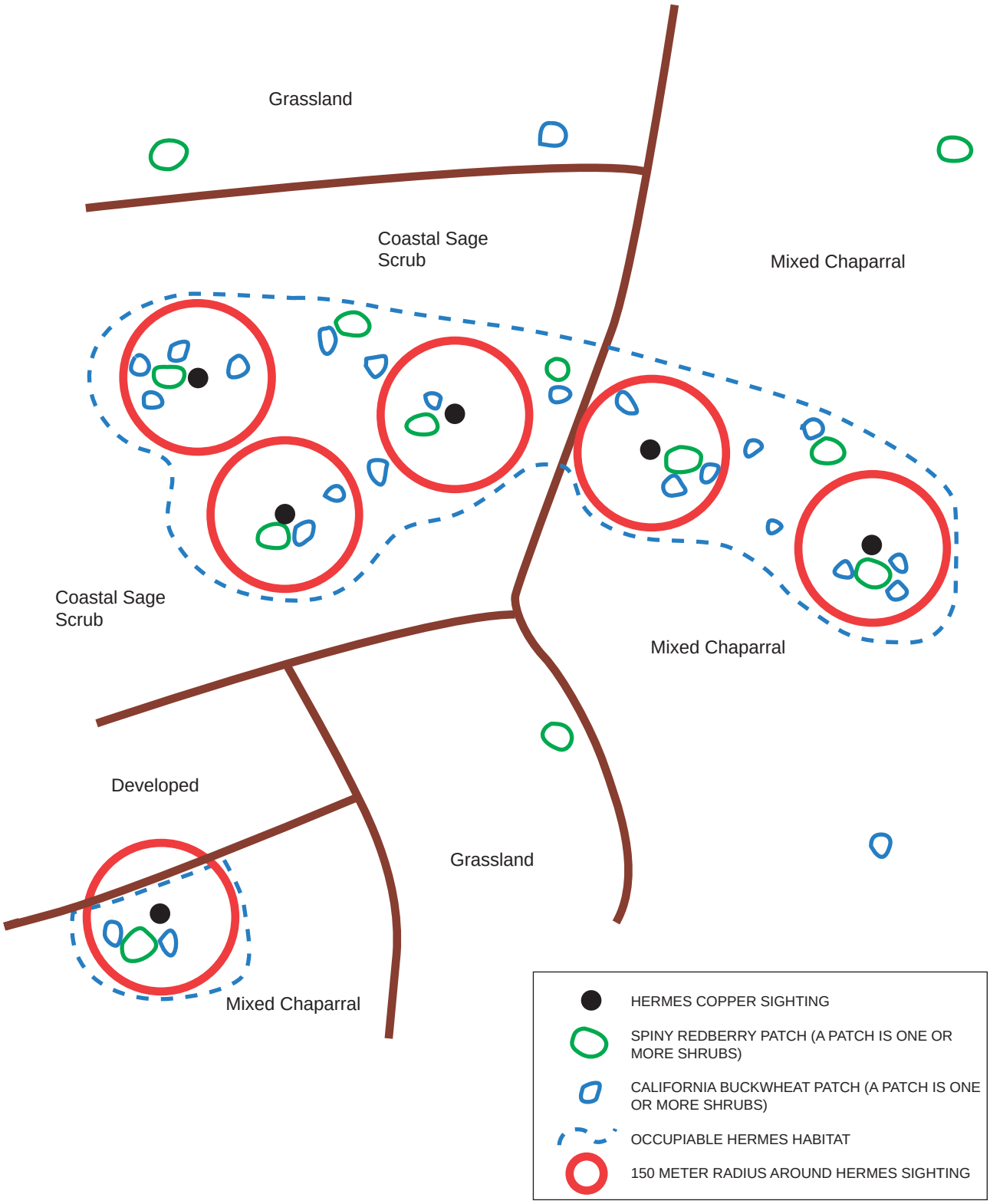
As mentioned in Section 2.1, any observation of Hermes will be considered an existing population since they are predominantly a sedentary species. The methods of delineating the Hermes population in association with the habitat (host plants, nectar sources, etc.) are described below.

2.2.2 Habitat Assessment Methodology

The section describes the methodology for assessing and delineating existing or potential Hermes habitat. Figure 1 provides a visual illustration of how Hermes habitat mapping and assessment will be conducted. Appropriate Hermes habitat consists of continuous stands of mixed chaparral/sage scrub in well-drained soil. This soil type is usually found on canyon bottoms or on hillsides with a northern exposure (Marschalek and Deutschman 2008). However, other exposures should not be excluded when mapping if the vegetation type and soil type are appropriate. Hermes is closely associated with its only host plant, spiny redberry, and preferred nectar source, California buckwheat (*Eriogonum fasciculatum*). These plants are concentrated within the coastal sage scrub or mixed chaparral vegetation communities. Density of the habitat is key for the butterfly to persist (Thorne 1963).

Suitable habitat density for Hermes has not been systematically studied. Mature, dense habitat adjacent to open dirt roads is considered most suitable for maintaining Hermes populations. Vegetation densities for most occupied Hermes habitat appears to be 60 to 95 percent, of which 50 percent is composed of redberry and California buckwheat (Klein personal observation, 2009). Mature redberry is generally at least 15 percent of the vegetation in suitable Hermes habitat (Thorne 1963; Murphy 1991; Brown 1991; Faulkner and Klein 2008). California buckwheat is typically no more than 3 meters from redberry shrubs. If a single redberry shrub is surrounded by nonnative grasses and forbs, and no buckwheat is present, the likelihood of it being occupied is very low.

Survey periods and methods for Hermes habitat assessments will be based on historical observations as well as recent published papers (Marschalek and Deutschman 2008). Surveys for habitat will concentrate on identifying and mapping (via a Global Positioning System) the perimeter of the Hermes larval host plant species, spiny redberry and the primary adult nectar source California buckwheat (Thorne 1963; Marschalek and Deutschman 2008; Brown 1991). While adult Hermes Coppers have been observed nectaring on chamise (*Adenostoma*



NOT TO SCALE

Figure 1
Example of Occupied Hermes Habitat Mapping

fasciculatum), California sunflower (*Encelia californica*), and poison oak (*Toxicodendron diversilobum*) (Thorne 1963; Marschalek and Deutschman 2008; Brown 1991; Faulkner and Klein 2008), based on historical and published papers, these nectar sources had California buckwheat present if they were occupied by Hermes. If these nectar sources were adjacent to redberry and buckwheat was not present, the area was not occupied by Hermes (per. comm. D. Falkner, D. Marschalek). In addition to mapping the perimeters of these resource populations, the density of the various plant species (nectar sources and other native shrub species) will be recorded for each mapped area. Historical and published papers indicate optimum Hermes habitat consists of redberry and buckwheat in proximity to each other, where shrubs are no more than 3 meters apart (Faulkner and Klein 2008; Marschalek and Deutschman 2008).

Occupied Hermes habitat patches are usually close to each other to allow for "intercolony" movement to maintain genetic integrity within the clustered colonies (Thorne 1963). A study of Hermes populations within a limited range indicated that the adult butterflies will travel a limited distance from their habitat, i.e. up to 83 meters (Marschalek and Deutschman 2008). Mapping of Hermes populations conducted at the Crestridge Ecological Reserve showed occupied habitat patches clustered with a distance of no more than 150 meters between occupied patches (California Department of Fish and Game 2002). No currently published study is available to indicate whether movement would exceed the 150-meter distance between occupied clustered habitat patches.

Redberry and buckwheat areas will be mapped as polygons during surveys. For the redberry and buckwheat populations, individuals that are within 3 meters or less of each other will be mapped together in the same polygon and will, therefore, be considered a population. Any redberry or buckwheat plants that occur more than 3 meters away from each other would be mapped as a separate polygon, and will be considered a separate population. Both the host plant and nectar source species only need to be identifiable to be considered individuals, meaning they do not need to be mature plants that are flowering or setting seed to be considered an individual. To determine density, a subsample count of individuals will be made for each polygon. Population sizes for each polygon would be extrapolated based on the density estimates and the area for the polygon. The characterization of redberry and buckwheat polygons will include information on native species diversity (especially other potential nectar species), as well as nonnative plant species diversity and cover.

If Hermes habitat (host plant and nectar resources) is not associated with a known Hermes occurrence (i.e., not within 150 meters of a Hermes occurrence), then the habitat will be considered potential habitat that is unoccupied. Hermes habitat with larval host plants and

populations of nectar sources that are within 150 meters of a known Hermes population/observation will be delineated as occupied habitat. Occupied habitat will extend out from the mapped population/observation location to each polygon of host plant or nectar sources that are within 150 meters until there is a gap in Hermes observations or habitat that is greater than 150 meters. Hermes observations or habitat that is more than 150 meters away will be considered separate areas of potential (no Hermes found in these areas) or occupied (Hermes found in these areas) habitat.

If the 150-meter circles extend into habitat that is not appropriate for Hermes, these areas will not be considered Hermes habitat (see Figure 1). Areas that are developed and highly disturbed will not be considered habitat for Hermes, nor will nonnative vegetation types that do not have the appropriate native species components. Native vegetation areas that do not have the larval host plant or nectar source shrub species, such as native grasslands or riparian habitats, will be subtracted from the Hermes habitat acreage, even if these areas are mapped inside one of the 150-meter polygons.

The method above will be used for both the baseline Hermes population and habitat assessment (impact assessments), as well as the assessment for habitat restoration and enhancement. The data from this assessment will also be used as a baseline for future monitoring programs.

CHAPTER 3.0
GOALS AND OBJECTIVES FOR CONSERVATION OF HERMES

The main goals for the Hermes Conservation Strategy are to:

- Conserve and manage existing known populations;
- Preserve, enhance, and restore existing and potential Hermes populations and habitat;
- Enhance the existing Hermes population;
- Accumulate, manage, and disseminate existing and future Hermes data and analyses; and
- Enhance public understanding and support for conservation goals for Hermes.

These goals are described in more detail in the following sections, with specific objectives to achieve the goals that must be implemented via discrete tasks. The goals, objectives, and tasks are a framework for conservation of Hermes populations and habitat within Santee, as well as more regionally-focused efforts. These goals, objectives, and tasks have been developed in consultation with the Wildlife Agencies and are consistent with historical data and published papers (Thorne 1963; Marschalek and Deutschman 2008; Faulkner and Klein 2008).

3.1 CONSERVATION AND MANAGEMENT

The priority for conservation is to identify and promote conservation, restoration, and management activities on both public and private lands within Santee and the larger San Diego region. In the near term (i.e., 1 to 3 years), priority is given to identifying and conserving the existing populations and habitat on private property, to the extent feasible, and mechanisms for protecting and improving existing or potential Hermes populations and habitat on public property. In the long term (i.e., 5 years or more), priority will be placed on implementing habitat enhancement and restoration in areas that provide habitat connectivity and continuity with known existing Hermes populations (currently, two historical records occur on Fanita Ranch [Dudek 2007]).

Goal 1: Conserve and manage existing known records of the Hermes as well as potential unoccupied habitat, within Santee, according to the Santee Subarea Plan and Rare and Narrow Endemic Policy.

Objective 1.1: Promote conservation, restoration, and management on privately owned lands to protect known Hermes colonies and unoccupied potential habitat.

Task 1.1.1: Work with private landowners when development applications are submitted to the City to conserve existing known colonies within Santee (currently, two historical records occur on Fanita Ranch), including associated host plant and nectar source populations, as well as unoccupied habitat. Maintaining connectivity with off-site colonies and potential habitat to ensure gene flow and possible colony expansion is a priority.

Task 1.1.2: Work with private landowners when development applications are submitted to the City to identify potential Hermes habitat for restoration and enhancement programs designed to improve the distribution of spiny redberry and California buckwheat, and other important site characteristics. Other important site characteristics include, but are not limited to, augmenting recovering post-fire habitat, expanding redberry and buckwheat densities within unoccupied areas, and limiting or removing invasive exotic plant species that would compete with native vegetation.

Task 1.1.3: Identify and pursue opportunities to reward private landowners for incorporating Hermes habitat protection, restoration, and enhancement activities into land management and development projects, as well as areas that, with willing landowners, can be protected by conservation easements or habitat management agreements.

Task 1.1.4: Assist private landowners and land managers to secure funding and technical assistance from government programs that support habitat protection, restoration, and enhancement activities.

Task 1.1.5: Identify directives for the City's Preserve Steward to function as the City's Hermes liaison and work with private landowners and land managers.

Task 1.1.6: Develop and implement performance standards and measurements of success for required habitat restoration and enhancement projects on private lands, and develop an annual monitoring program that will evaluate project successes.

Objective 1.2: Promote conservation and management on publicly owned lands that protect Hermes habitat, including known colonies.

Task 1.2.1: Work with public landowners to conserve existing known colonies within Santee, including redberry and buckwheat populations, as well as unoccupied potential habitat. Maintaining connectivity with off-site colonies and potential habitat is a priority.

Task 1.2.2: Identify and pursue financial resources for public land managers to promote projects and practices that will protect, enhance, and restore known or historical Hermes colonies. Public land management agencies may include USFWS, CDFG, U.S. Department of Defense, California Department of Transportation, County of San Diego, San Diego County Parks and Recreation, City of San Diego, City of San Diego Parks and Recreation, and the City of Santee Parks and Recreation.

Task 1.2.3: Identify high-priority areas to undertake the restoration, enhancement, and management of existing Hermes colonies on public lands. Highest priority will be given to lands that support or have connectivity to known or historical Hermes colonies or existing unoccupied habitat. Priority will be based on the habitat assessment ranking system discussed in Section 3.2 (Task 2.2.2) below.

Task 1.2.4: Identify directives for the City's Preserve Steward to function as the City's Hermes liaison that will work with public land managers to incorporate conservation practices and projects into public lands management.

Task 1.2.5: Participate in the annual reporting workshops and discuss, share, and document results of regional management efforts and best practices designed to benefit Hermes consistent with Section 7.0 of the City of Santee Subarea Plan.

Task 1.2.6: Develop and implement performance standards and measurements of success for habitat restoration and enhancement projects on public lands and develop an annual monitoring program that will evaluate project successes.

Objective 1.3: Integrate Hermes conservation goals and objectives into existing conservation programs that support habitat protection, restoration, and enhancement on public and private lands, including existing and draft Habitat Conservation Plans and Natural Community Conservation Plans.

Task 1.3.1: Work with managers of government conservation funding programs, such as Section 6 and Local Assistance grants, to incorporate Hermes conservation and habitat needs into program selection criteria.

3.2 HABITAT PRESERVATION, ENHANCEMENT, AND RESTORATION

Priorities for Hermes habitat preservation, enhancement, and restoration are to:

- Preserve, enhance, and restore existing populations and potential habitat;
- In cooperation with the Wildlife Agencies and other jurisdictions develop a better understanding of the Santee Hermes population genetics; and
- Develop a captive breeding program for Hermes for the City.

The first priority for preservation, enhancement, and restoration is identifying and mapping redberry patches, and redberry/buckwheat patches, then assessing these for suitability for Hermes, and conducting presence/absence surveys for the butterfly in accordance with an approved protocol by the Wildlife Agencies. There are two historical records of Hermes in Santee (both at Fanita Ranch). Both locations were impacted by the Cedar Fire of 2003 and it is unknown whether Hermes has recolonized either location. However, habitat restoration and enhancement of these historical records is key for this Conservation Strategy unless other populations can be found (refer to Section 4.0). Preserving as many populations as possible is necessary because they will be the base genetic stock for restoration habitats within proximity to occupied areas.

Goal 2: Preserve, enhance, and restore existing and potential Hermes colonies and habitat in Santee.

Objective 2.1: Preserve, enhance, and restore existing Hermes colonies and habitat in Santee.

Task 2.1.1: Delineate known occupied habitat based on the assumptions and methods described in Section 2.0 for known Hermes colonies.

Task 2.1.2: Prioritize the occupied habitat areas for preservation by working with the public and private land managers to avoid existing colonies consistent with the Rare and Narrow Endemic Policy during development or other activities that could result in adverse impacts to Hermes.

Task 2.1.3: Establish a goal with public and private land managers of 90 percent preservation of occupied Hermes habitat in Santee. This preservation goal is necessary for two reasons: the sedentary nature of Hermes and the substantial loss of viable colonies following the 2005 and

2008 fires that burned much of San Diego County's back country open spaces. The continual loss of occupied habitat can create openings greater than 150 meters to adjacent colonies and compromise genetic integrity of the species.

Task 2.1.4: Work with private and public land managers to establish a Hermes habitat restoration program specific to the known occupied habitat. The restoration program will incorporate delineated occupied habitat and buffer zones of up to 100 feet, where possible. The restoration program will include maintenance tasks, such as weed control, collection of seed from redberry and buckwheat, seed bulking (i.e., propagation of plants in a greenhouse for the purpose of collecting seed), seed dispersal, planting, and monitoring of the occupied habitat. Weed control will address both perennial and annual weed species, with specific discussion of the weed species documented in the occupied habitat.

Task 2.1.5: Develop a monitoring program for existing colonies using the occupied habitat delineation as baseline data consistent with Section 7.0 of the Santee Subarea Plan, "Guidelines for Ongoing Biological Monitoring." This program will include annual adult butterfly surveys in the preserve areas, as well as delineation and assessment of Hermes habitat. Annual surveys are important to maintain baseline data to verify the continued occupation of the butterfly. It is also important since butterflies from these preserved areas may be needed as donor stock for restored habitat on public and private lands. The habitat assessment portion of the monitoring program will be consistent with the methodology described in Section 2.0. The monitoring program will also include an assessment of vegetation cover and diversity (percent redberry and buckwheat within the habitat patch) so that the effects of habitat management methods can be determined. As part of this monitoring program, success standards for the preservation and restoration of occupied habitat will be established so that the effectiveness of the program can be evaluated over time.

Objective 2.2: Preserve, enhance, and restore potential Hermes habitat in Santee.

Task 2.2.1: Delineate the potential Hermes habitat in Santee based on the assumptions and methods described in Section 2.0.

Task 2.2.2: Develop a ranking system that evaluates and ranks potential Hermes habitat based on density of the vegetation, the cover and density of spiny redberry, cover and density of California buckwheat, proximity of buckwheat to the redberry and proximity to other potential Hermes habitat. Based on the factors discussed above, the ranking system will evaluate the habitat as low, medium, and high potential for Hermes. The following guidelines will be used for ranking:

- High Potential: Vegetation cover greater than 75 percent, 15 percent of that vegetation is redberry, 5 percent of that vegetation is buckwheat within 3 meters of all redberry, and within 150 meters of potential Hermes habitat.
- Medium Potential: Vegetation cover at least 60 percent, 15 percent of that vegetation is redberry, 5 percent of that vegetation is buckwheat within 5 meters of 50 percent of the redberry, and within 150 meters of potential Hermes habitat.
- Low Potential: Vegetation cover less than 60 percent, redberry is less than 15 percent of that vegetation, no buckwheat present or if present greater than 5 meters from any redberry, and greater than 150 meters of potential Hermes habitat.

Task 2.2.3: Work with the public and private land managers in Santee to prioritize areas of potential Hermes habitat to avoid during development or other activities that could result in adverse impacts, especially the areas with a high potential. Utilize the ranking system described in Task 2.2.2 for this prioritization.

Task 2.2.4: Establish a goal with public and private land managers in Santee to preserve and manage 80 percent of Hermes habitat with a high potential, 60 percent preservation of habitat with medium potential, and 30 percent of the habitat with low potential. Due to the sedentary nature of Hermes. These goals are dependent on proximity to occupied source colonies, i.e., less than 150 meters. If potential habitat is adjacent to occupied source colonies then preservation goals would increase to 90 percent for high, 70 percent for medium, and 40 percent for low.

Task 2.2.5: Utilize the ranking system established in Task 2.2.2 to develop a prioritization matrix. This evaluation will also identify what potential habitat areas are closest to known occupied habitat within Santee as well as the closest occupied habitat outside of Santee (e.g., Mission Trails Regional Park, Miramar Marine Corp Air Station). Habitat areas with a high or medium potential for Hermes that are closest to known occupied habitat will be given preference for enhancement and restoration programs. Conducting enhancement and restoration on the areas closest to known occupied habitat will provide the best opportunities for existing Hermes populations to expand into high-quality habitat that has suitable populations of redberry and buckwheat. If a proposed project site does not have occupied habitat to expand upon, then the habitat areas ranked with a high or medium potential for Hermes will be evaluated for management defensibility (i.e., how buffered the areas are from factors that contribute to habitat decline such as fire and development), habitat connectivity within the preserve areas, and habitat connectivity to other preserve areas outside the project site and potentially outside Santee. Areas

ranked with a high or medium potential for Hermes that have the greatest potential to make a direct connection to occupied areas off-site will be given preference for enhancement and restoration programs. The objective for this approach is to not only maintain the current habitat corridor connections and linkages, but to also expand and enhance those corridors so that they are more likely to provide for sufficient movement and migration of the Hermes and other wildlife species. When taking these factors into account, the primary goal for identifying the most appropriate areas for enhancement and restoration will be to cluster the areas of management for Hermes into the largest contiguous blocks of potential habitat. The secondary goal will be to connect these contiguous blocks with other onsite (within the City of Santee) preserve areas across the City, as well as off-site (outside the City of Santee) preserve areas where possible. Overall, establishing large, continuous blocks of potential habitat is believed to be the best strategy to establish and maintain Hermes within the Santee Subarea. Therefore, this principle will be used to prioritize specific conservation actions.

Task 2.2.6: Work with private and public land managers in Santee to establish a Hermes habitat restoration program specific to the areas of potential habitat that are to be preserved. This restoration program will consider delineated potential habitat and buffer zones (determined on a project-by-project basis in coordination with the Wildlife Agencies and consistent with the methodology in Section 2.2) where possible. The restoration program will be developed to include implementation maintenance tasks such as weed control, seed collection of redberry and buckwheat, seed bulking, seed dispersal, planting, and monitoring of the potential habitat. A weed control program will address both perennial and annual weed species, with specific discussion of the weed species documented in the occupied habitat. If left uncontrolled, especially after fires, non-native grasses and mustards will compete with native shrubs and grow taller than many of those native shrubs, discourage Hermes to colonize or re-colonize areas.

When identifying potential habitat areas for restoration, priority will be given to low potential using the ranking system described in Section 2.2.2. Vegetation cover can be increased to medium or high potential with nonnative weed removal and planting of native shrubs, including redberry and buckwheat to the 15 percent and 5 percent requirements for medium or high potential. Low potential habitat is greater than 150 meters from potentially suitable Hermes habitat. Designing a corridor to connect this restored low potential habitat to adjacent potential Hermes habitat with buckwheat allows for the potential of Hermes to move to the restored habitat. The corridor needs to be no wider than a maintenance road (approximately 15 feet) lined with the buckwheat or other shrubs suitable for shelter. The shrubs used would be consistent with the plant mix within the adjacent potential Hermes habitat or in the restored habitat.

Task 2.2.7: Develop a monitoring program with goals that can be evaluated for success for the preservation and restoration of potentially occupied habitat. To evaluate success, establish a monitoring program for areas that are being preserved and restored using the occupied habitat delineation as baseline data consistent with Section 7.0 of the Santee Subarea Plan "Guidelines for Ongoing Biological Monitoring." This program will include annual adult butterfly surveys and delineation and assessment of Hermes habitat. The habitat assessment portion of the monitoring program will be consistent with the methodology described in Section 2.2. The monitoring program will also include an assessment of non-native cover so that the effects of habitat management methods (weed control, seeding, etc.) can be determined. This is especially important for areas impacted by recent fires so as to evaluate potential type conversion. As part of this monitoring program, success standards for the preservation and restoration of occupied habitat will be established so the effectiveness of the program can be evaluated over time.

Goal 3: Expand Hermes colonies in Santee.

Objective 3.1: Under the direction of the Wildlife Agencies evaluate the genetic make-up of the Santee Hermes colonies, as well as the closest colonies to Santee.

Task 3.1.1: Under the direction of the Wildlife Agencies establish a Hermes Working Group that includes the Wildlife Agencies, County of San Diego, City of Santee, City of San Diego, Department of Defense, and other private and public stakeholders to develop a genetic study of the Hermes colonies in and around Santee. This Working Group will also be responsible for coordinating other regional issues with concerns to Hermes and its habitat. If appropriate, this Working Group may be expanded to address Hermes colonies from other portions of the MSCP Subregion or County of San Diego.

Task 3.1.2: Identify potential funding sources from Federal, State, and local entities to fund a genetic study of Hermes colonies in and around Santee. This would be part of a regionally focused genetic study program for San Diego County.

Task 3.1.3: Implement a genetic study of the Hermes colonies in the San Diego region, including those in and around Santee, to determine which of the surrounding colonies is most related to the Santee Hermes colonies for use as a donor source for a captive breeding program. This study will be part of a regional effort conducted under the direct supervision and guidance of the Wildlife Agencies.

Objective 3.2: Establish new Hermes colonies within Santee.

Task 3.2.1: Evaluate the potential and the need to establish new Hermes colonies within Santee via the Hermes Working Group (described under Task 3.1.1). This evaluation will be based on the status of current colonies within Santee as well as potential donor colonies outside Santee. Each potential donor colony will be evaluated based on the results of the genetic study (described in Task 3.1.3) to determine if the colony is genetically similar to the Santee Hermes colonies. A donor colony will be considered if it has the appropriate genetic makeup (genetically similar to the Santee colony(ies)), as well as a colony size and density that will allow for collection of larvae without adverse affects to the existing colony structure.

Task 3.2.2: Identify funding opportunities from Federal, State, and local entities to fund development and implementation of a captive breeding and release program.

Task 3.2.3: Evaluate the potential and the need to prepare a captive breeding and release plan for the Hermes in Santee. The plan will provide details on the collection of larvae from a colony outside of Santee, propagation of the butterfly with a captive breeding program, and the subsequent release of the larvae into potential Hermes habitat in Santee. Potential recipient sites for the larvae release will include the areas with high potential that are as close to known colonies as possible, but also well protected within the matrix of the Subarea Plan preserve lands. This captive breeding plan will include a monitoring program that will track the success of the larvae and adult butterfly survival.

Task 3.2.4: Implement and monitor the captive breeding and release program for Hermes under the direct supervision of the Wildlife Agencies.

3.3 DATA STORAGE AND MANAGEMENT

Documenting the current and historical distribution and abundance of Hermes in Santee is essential for enhancing the scientific understanding of the species and its habitat, while informing applied conservation and management activities. Proper data storage and management is essential to long-term conservation efforts and ensures effective interpretation and dissemination of information.

Primary priorities regarding data storage and management are to:

- Accumulate, manage, and disseminate data in a consistent manner;

- Ensure data are generated using accepted and documented protocols consistent with Table 7-2 of the Santee Subarea Plan, titled, "Guidelines for Ongoing Biological Monitoring" and Table 7-4 titled, "Additional Species Specific Monitoring Requirements"; and
- Make appropriate data accessible to researchers, volunteers, and the general public.

Goal 4: Accumulate, manage, and disseminate existing and future Hermes data and analyses for Santee, and provide information to the Wildlife Agencies and/or a designated regional monitoring entity.

Objective 4.1: Compile data for Hermes in a format and location easily accessible to agency, academic, and qualified collaborators, while protecting confidentiality of landowners with identified occupied and potential Hermes habitat.

Task 4.1.1: The Wildlife Agencies select and coordinate with the agency or organization responsible for data entry, error checking, storage, and dissemination. Currently the Wildlife Agencies have identified SANDAG to manage the MSCP gains and losses through the Habitrak system.

Task 4.1.2: Provide published Hermes reports for the City to the Wildlife Agencies for posting on a website to be determined by the Wildlife Agencies.

Task 4.1.3: Land managers in Santee will compile documented data on Hermes colonies, redberry population size and density, buckwheat population size and density, and ranking of potential habitats to the City and Wildlife Agencies.

Task 4.1.4: Land managers in Santee will compile data on restoration and enhancement programs for the Hermes in Santee, including information on planning, site selection, implementation, and monitoring which will be provided to the City and Wildlife Agencies.

Objective 4.2: Develop standardized data collection methods to support long-term research and database management.

Task 4.2.1: Standardize the data to be collected on occupied and potential Hermes habitat in Santee, utilizing an approved Wildlife Agency's survey protocol, and the colony and habitat assessments outlined in Section 2.0 above.

Task 4.2.2: Standardize the methods by which data are accumulated, stored, and queried by field personnel and others to ensure data compatibility and to facilitate data entry.

3.4 EDUCATION AND OUTREACH

The success of this Conservation Strategy for Santee will, in part, be based on the ability to foster awareness of the long-term population decline of Hermes in Santee and the greater San Diego region, the importance of conservation efforts on public and private land, species habitat requirements, laws currently protecting the butterfly, opportunities for participating in species recovery, and landowner responsibilities. Target audiences for education and outreach efforts may include private landowners, public land managers, policy makers, and the general public.

The primary education and outreach goals include:

- Improving understanding among developers and other landowners regarding the butterfly's history, the importance of conservation on private property, legal protections currently in place, habitat requirements, and opportunities for increased involvement in Hermes conservation.
- Improving understanding among public land managers regarding the critical role of enhancing and maintaining habitat on public land for the long-term recovery of the species, and techniques for achieving this goal.
- Enhancing the understanding of conservation opportunities on public and private land and encouraging stakeholder participation.
- Publicizing the Hermes Working Group's efforts as a model for conserving species at risk.
- Promoting the progress made on the Hermes Conservation Strategy and gaining support and funding for ongoing efforts.

Goal 5: Enhance public understanding and support for conservation goals for Hermes.

Objective 5.1: Build on existing education efforts targeting private landowners, public land managers, and policy makers regarding Hermes' legal status and conservation needs, and opportunities for participation in species conservation.

Task 5.1.1: Develop an outreach program targeting affected private landowners, public land managers, resource specialists, funding agencies, and policy makers. Emphasize the biological and legal differences between Hermes and other similar species, and ongoing conservation efforts and land management information relating to the status and welfare of the Hermes.

Task 5.1.2: Create a Hermes page on the City's website with general natural history information and identification aids as well as a description of legal status and current conservation efforts. Provide links to related websites and published reports.

Task 5.1.3: Publicize the efforts to better manage and conserve Hermes, including restoration projects, public land management efforts, and research results consistent with Section 7.9 titled, "Public Outreach and Education."

Task 5.1.4: Conduct outreach and publicize the importance of Hermes, including information about habitat requirements and opportunities for landowners to participate in conservation efforts consistent with Section 7.9 titled, "Public Outreach and Education."

CHAPTER 4.0
CONSERVATION ACTIONS SPECIFIC TO THE FANITA RANCH DEVELOPMENT

The Fanita Ranch project is required to meet the conservation goals and objectives outlined in Section 3.0, as applicable. Below is a discussion of where the Fanita Ranch project has met the goals and objectives of this Conservation Strategy and where there is a need for additional information and evaluation in order to provide adequate coverage of Hermes within the Fanita Ranch project boundary. Specifically, the following goals and objectives from Section 3.0 will be applicable to the Fanita Ranch Project:

Goal 1: Conserve and manage existing known populations of the Hermes within Santee as well as potential unoccupied habitat according to the Santee Subarea Plan Rare and Narrow Endemic Policy.

Objective 1.1: Promote conservation, restoration, and management on privately owned lands to protect known Hermes populations and unoccupied potential habitat.

Objective 1.3: Integrate Hermes conservation goals and objectives into existing conservation programs that support habitat protection, restoration, and enhancement on public and private lands, including existing and draft Habitat Conservation Plans and Natural Community Conservation Plans.

Goal 2: Preserve, enhance, and restore existing and potential Hermes colonies and habitat in Santee.

Objective 2.1: Preserve, enhance, and restore existing Hermes colonies and habitat in Santee.

Objective 2.2: Preserve, enhance, and restore potential Hermes habitat in Santee.

4.1 CONSERVATION AND MANAGEMENT

The Fanita Ranch project has not prepared a habitat assessment for protection and management for Hermes. A predicted habitat modeling exercise should be conducted to determine the areas

where potential Hermes habitat is being protected and where it is being impacted within the Fanita Ranch project footprint.

Based on the guidelines outlined in Section 2.1, the Fanita Ranch project must assume that the observed Hermes occurrences are true populations because there is no scientific evidence to suggest otherwise. The site needs to be assessed for potential Hermes habitat according to the guidelines outlined in Section 2.2. A detailed site assessment following the guidelines outlined in this Conservation Strategy is necessary to accurately delineate potential habitat for conservation within Fanita Ranch.

Following an assessment of the historically occupied habitat, the project plan must take into account the entire occupied habitat area, including satellite populations of the host plant and nectar sources. The host plant populations that are within the impact areas are not planned to be preserved. These host plant resources must be linked with the surrounding open space design to create a more suitable habitat matrix for conservation of the existing Hermes population.

4.2 HABITAT PRESERVATION, ENHANCEMENT, AND RESTORATION

The goals and objectives for habitat preservation require 90 percent preservation of occupied Hermes habitat, as defined in Task 2.1.3. This preservation goal is necessary for two reasons: the sedentary nature of Hermes and the substantial loss of viable colonies following the 2005 and 2008 fires that burned much of San Diego County's back country open spaces. The continual loss of occupied habitat can create openings greater than 150 meters to adjacent colonies and compromise genetic integrity of the species. Since the only known records of currently viable Hermes colonies in Santee occur on Fanita Ranch, preservation of these colonies is critical unless other colonies can be found within the City of Santee. The Fanita Ranch project design does not include the associated host and nectar resources and therefore currently does not provide for 90 percent preservation of the occupied site.

As a condition for permitting the Fanita Ranch project, the Wildlife Agencies must require that the occupied habitat within Fanita Ranch be assessed according to this Conservation Strategy, and not less than 90 percent be protected.

In addition, the potential habitat is currently identified based on general factors that do not accurately define Hermes habitat according to the guidelines outlined in this Strategy. The acreages of Hermes habitat that are being preserved are based on these general factors and are therefore difficult to accurately analyze for impacts and preservation.

To more accurately analyze the project's impacts and preserved acreage of potential habitat, Fanita Ranch must delineate the occupied and potential Hermes habitat over the entire site using the methods described in Section 2.2, including a ranking of all potential habitats (i.e. low, medium and high). This more detailed assessment of Hermes habitat will allow for a more accurate determination of the impacts on Hermes and its habitat due to the project.

In addition, the Hermes management and restoration goals and objectives for the Fanita Ranch project have not been defined in detail as required by this Strategy. A detailed Hermes habitat restoration and enhancement plan must be prepared for the occupied habitat. This analysis will follow the guidelines under Tasks 2.2.6 and 2.2.7. In addition, this detailed plan should include the enhancement and restoration of the potential habitat areas within the hardline preserve. The plan will be specific to the areas targeted for the implementation of restoration, as well as specific to the methods and goals for this restoration.

4.3 MONITORING AND DATA STORAGE

Fanita Ranch must continue to work with the City and regulatory agencies to fulfill the goals and objectives outlined in Section 3.3, as applicable.

4.4 EDUCATION AND OUTREACH

Fanita Ranch must continue to work with the City and regulatory agencies to fulfill the goals and objectives outlined in Section 3.4, as applicable.

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CHAPTER 5.0
APPROVAL PROCESS FOR
FUTURE DEVELOPMENT PROJECTS

The goals and objectives of this Conservation Strategy are in place so that Hermes and its habitat are given adequate consideration and coverage in project planning during implementation of the Santee Subarea Plan. In general, new projects submitted for approval under the Santee Subarea Plan will need to demonstrate consistency with the five goals outlined above in Section 3.0 of the Conservation Strategy in order to obtain project approvals by the City. Both the City and Wildlife Agencies will be responsible for the review of all environmental assessment and planning documents, including California Environmental Quality Act (CEQA) documents, habitat management plans, and restoration and enhancement plans. These plans and reports must document any occupied and potential Hermes habitat according to the methods described in Section 2.0, and demonstrate that the five goals and associated objectives identified in Section 3.0 will be met by performing the tasks associated with each objective (as applicable), or by performing a substitute task that is approved by the City and the Wildlife Agencies.

The following project approval process demonstrates project consistency with the Conservation Strategy.

1. Determine if potential Hermes habitat occurs on the project site based on existing data (e.g., California Natural Diversity Database), previous surveys or documentation, and a habitat assessment of the project site (see Section 2.1).

2. If potential Hermes habitat occurs on the project site, conduct Wildlife Agency approved protocol surveys to determine presence of Hermes (see Section 2.2 for general guidelines). Ultimately, the Wildlife Agencies must come up with a protocol.

3. If Hermes is observed, it is considered an existing population and not migrant unless there is scientific evidence to suggest otherwise (refer to Section 2.1). This is due to its sedentary nature (Marschalek and Deutschman 2008).

4. If no Hermes is observed but suitable habitat conditions exist (e.g., vegetation cover, redberry with buckwheat within 3 meters of the redberry), conduct a habitat delineation per the methodology described in Section 2.2 to determine the size of the potential habitat.

5. Rank identified potential habitat onsite using the ranking system developed under Objective 2.2 (Section 3.2).

6. Identify habitat for preservation within the project site based on the assigned rank, consistent with the preservation goals identified in Task 2.2.4 (80 percent of Hermes habitat with a high potential, 60 percent of habitat with medium potential, and 30 percent of the habitat with low potential). Occupied habitat will be conserved at not less than 90 percent. Preserved areas will be established with the largest and most continuous blocks of habitat as possible, consistent the methodology described in Task 2.2.5. Priority will be given to habitat with high potential.

7. Proposed preserve areas must be approved by the City and the Wildlife Agencies prior to project permitting.

8. If a proposed project is determined to be unable to provide the required occupied and potential Hermes habitat preservation on-site, off-site mitigation may be considered. Off-site mitigation will only be considered when there is no other alternative (i.e., on-site mitigation or a boundary adjustment). Off-site mitigation within Santee will be required unless it is not feasible, in which case areas outside of Santee will be considered. Off-site mitigation may be considered for the entire preservation requirement or for a portion if the proposed project can provide a portion of the mitigation on-site. Off-site mitigation will require a 3:1 ratio of land preservation for the acreage that would have been required for an on-site preservation. Any off-site mitigation must be approved by the City of Santee and the Wildlife Agencies prior to project permitting.

CHAPTER 6.0
CONSERVATION STRATEGY IMPLEMENTATION

6.1 PRIORITIZATION OF CONSERVATION STRATEGY GOALS AND OBJECTIVES

The specific implementation of the Conservation Strategy can occur in a number of ways depending on the timing of a project, the specific habitats that occur and their condition, the presence of Hermes, as well as other factors. Given a typical project in Santee that has potential or known Hermes colonies and resources, there are some general guidelines that will be followed concerning the prioritization of goals and objectives, as outlined in Table 1.

A timeframe for completion is identified for each of the tasks listed in Table 1. The timeframe is either short term (1 to 3 years); mid-term (3 to 5 years); or long term (longer than 5 years). Tasks will be implemented once the Implementing Agreement for the Plan is executed by all parties.

Each task is also defined on the categories given in the Subarea Plan, which identifies the entity responsible for each task. As defined in the Subarea Plan, Category 1 is the responsibility of the private landowners; Category 2 is the responsibility of the City; and Category 3 is the responsibility of the Wildlife Agencies to organize, with all participants to accomplish the task.

Each task listed in Table 1 is assigned a priority rank. The task is either for the City to get coverage for Hermes (Mandatory), or the task is one for which the City will work with the Wildlife Agencies to accomplish throughout the life of the Plan, but is not mandatory for the City to get coverage for Hermes (Discretionary). General guidelines used to determine these priorities include the need for Wildlife Agency guidance and direction; the obligation of the property owner to provide the data, assessment, and funding; and the responsibility of the City to ensure that the Subarea Plan is being implemented on all projects within Santee.

It is important to note that goals, objectives, and tasks listed in Table 1 have been developed for the City of Santee, but many of these objectives and tasks are intended to be more regional in application and in responsibility. It will be at the Wildlife Agencies' discretion to determine which objectives and tasks are the responsibility of the City of Santee.

Table 1
Prioritization of Goals and Objectives

Task No.	Task Summary	Timeframe	Category	Priority
CONSERVATION AND MANAGEMENT				
	GOAL 1: Conserve and manage existing known records of the Hermes within Santee as well as potential unoccupied habitat.			
	Objective 1.1: *Promote conservation, restoration, and management on privately owned lands that protect known Hermes colonies and unoccupied potential habitat.*			
1.1.1	Work with private landowners when development applications are submitted to the City to conserve existing known colonies within Santee (currently, two historical records occur on Fanita Ranch), including associated host plant and nectar source populations, as well as unoccupied habitat. Maintaining connectivity with off-site colonies and potential habitat to ensure gene flow and possible colony expansion is a priority.	1 to 3 years	1	Mandatory
1.1.2	Work with private landowners when development applications are submitted to the City to identify potential Hermes habitat for restoration and enhancement programs designed to improve the distribution of spiny redberry and California buckwheat, and other important site characteristics. Other important site characteristics include, but are not limited to, augmenting recovering post-fire habitat, expanding redberry and buckwheat densities within unoccupied areas, and limiting or removing invasive exotic plant species that would compete with native vegetation.	1 to 3 years	1	Mandatory
1.1.3	Identify and pursue opportunities to reward private landowners for incorporating Hermes habitat protection, restoration, and enhancement activities into land management and development projects, as well as areas that, with willing landowners, can be protected by conservation easements or habitat management agreements.	1 to 3 years	1, 2	Mandatory
1.1.4	Assist private landowners and land managers to secure funding and technical assistance from government programs that support habitat protection, restoration, and enhancement activities.	1 to 3 years	1, 2	Mandatory
1.1.5	Identify directives for the City's Preserve Steward to function as the City's Hermes liaison and work with private landowners and land managers.	3 to 5 years	2	Mandatory

Task No.	Task Summary	Timeframe	Category	Priority
1.1.6	Develop performance standards and measurements of success for required habitat restoration and enhancement projects on private lands and develop an annual monitoring program that will evaluate project successes.	1 to 3 years	1, 2, 3	Mandatory
	Objective 1.2: *Promote conservation and management on publicly owned lands that protect Hermes habitat, including known colonies.*			
1.2.1	Work with public landowners to conserve existing known colonies within Santee (including redberry and buckwheat populations), as well as unoccupied potential habitat. Maintaining connectivity with off-site colonies and potential habitat is a priority.	1 to 3 years	1	Mandatory
1.2.2	Identify and pursue financial resources for public land managers to promote projects and practices that will protect, enhance, and restore known or historical Hermes colonies.	1 to 3 years	1, 2	Mandatory
1.2.3	Identify high-priority areas for and undertake the restoration, enhancement, and management of existing Hermes colonies on public lands. Highest priority should be given to lands that have connectivity to known or historical Hermes colonies or existing unoccupied habitat. Priority will be based on the habitat assessment ranking system discussed in Section 3.2 (Task 2.2.2) below.	1 to 3 years	2, 3	Mandatory
1.2.4	Identify directives for the City's Preserve Steward to function as the City's Hermes liaison that will work with public land managers to incorporate conservation practices and projects into public lands management.	1 to 3 years	2	Mandatory
1.2.5	Participate in the annual reporting workshops and discuss, share, and document results regional of management efforts and best practices designed to benefit the Hermes consistent with Section 7.0 of the City of Santee Subarea Plan.	3 to 5 years	2, 3	Discretionary
1.2.6	Develop and implement performance standards and measurements of success for habitat restoration and enhancement projects on public lands and develop an annual monitoring program that will evaluate project successes.	1 to 3 years	2, 3	Mandatory
	Objective 1.3: *Integrate conservation goals and objectives for the Hermes into existing conservation programs that support habitat protection, restoration, and enhancement on public and private lands, including existing and draft Habitat Conservation Plans and Natural Community Conservation Plan.*			
1.3.1	Work with managers of government conservation funding programs such as Section 6 and Local Assistance grants, to incorporate Hermes conservation and habitat needs into program selection criteria.	1 to 3 years	2, 3	Discretionary

Task No.	Task Summary	Timeframe	Category	Priority
	GOAL 2: Preserve, Enhance, and Restore existing and potential Hermes colonies and habitat in Santee.			
	Objective 2.1: *Preserve, enhance, and restore existing Hermes colonies and habitat in Santee.*			
2.1.1	Delineate the known occupied habitat based on the assumptions and methods for known Hermes colonies.	1 to 3 years	1	Mandatory
2.1.2	Prioritize the occupied habitat areas for preservation by working with the public and private land managers to avoid existing colonies consistent with the Rare and Narrow Endemic Policy during development or other activities that could result in adverse impacts to Hermes.	1 to 3 years	1	Mandatory
2.1.3	Establish a goal with public and private land managers of 90 percent preservation of occupied Hermes habitat in Santee. This preservation goal is necessary due to two reasons: the sedentary nature of Hermes and the substantial loss of viable colonies following the 2005 and 2008 fires that burned much of San Diego County's back country open spaces. The continual loss of occupied habitat can create openings greater than 150 meters to adjacent colonies and compromise genetic integrity of the species.	1 to 3 years	1	Mandatory
2.1.4	Work with private and public land managers to establish a Hermes habitat restoration program specific to the known occupied habitat.	1 to 3 years	1, 2, 3	Mandatory
2.1.5	Develop a monitoring program for existing colonies using the occupied habitat delineation as baseline data consistent with Section 7.04.2 of the Santee Subarea Plan, "Guidelines for Ongoing Biological Monitoring." This program will include annual adult butterfly surveys in the preserve areas, as well as delineation and assessment of Hermes habitat.	1 to 3 years	2, 3	Mandatory
	Objective 2.2: *Preserve, enhance, and restore potential Hermes habitat in Santee.*			
2.2.1	Delineate the potential Hermes habitat in Santee.	1 to 3 years	1	Mandatory
2.2.2	Develop a ranking system that evaluates and ranks potential Hermes habitat based on density of the vegetation, the cover and density of spiny redberry, cover and density of California buckwheat, proximity of buckwheat to the redberry and proximity to other potential Hermes habitat. Based on the factors discussed above, the ranking system will evaluate the habitat as low, medium, and high potential for Hermes.	1 to 3 years	1	Mandatory
2.2.3	Work with the public and private land managers to prioritize areas of potential Hermes habitat to avoid during development or other activities that could result in adverse impacts, especially the areas with a high potential for Hermes.	1 to 3 years	1, 2, 3	Mandatory

Task No.	Task Summary	Timeframe	Category	Priority
2.2.4	Establish a goal with public and private land managers in Santee to preserve and manage 80 percent of Hermes habitat with a high potential, 60 percent preservation of habitat with medium potential, and 30 percent of the habitat with low potential. Due to the sedentary nature of Hermes. These goals are dependent on proximity to occupied source colonies, i.e., less than 150 meters. If potential habitat is adjacent to occupied source colonies then preservation goals would increase to 90 percent for high, 70 percent for medium, and 40 percent for low.	1 to 3 years	1, 2, 3	Mandatory
2.2.5	Utilize the ranking system established in Task 2.2.2 to develop a prioritization matrix. This evaluation will also identify what potential habitat areas are closest to known occupied habitat.	3 to 5 years	2, 3	Mandatory
2.2.6	Work with private and public land managers in Santee to establish a Hermes habitat restoration program specific to the areas of potential habitat that is to be preserved.	3 to 5 years	1,2, 3	Mandatory
2.2.7	Develop a monitoring program with goals for the preservation and restoration of potentially occupied habitat that can be evaluated for success.	3 to 5 years	1, 2, 3	Mandatory
	GOAL 3: Expand Hermes colonies in Santee.			
	Objective 3.1: *Evaluate the genetic make-up of the Santee Hermes colonies including the closest colonies to Santee.*			
3.1.1	Under the direction of the Wildlife Agencies establish a Hermes Working Group that includes the Wildlife Agencies, County of San Diego, City of Santee, City of San Diego, Department of Defense, and other private and public stakeholders to develop a genetic study of the Hermes colonies in and around Santee.	3 to 5 years	2, 3	Discretionary
3.1.2	Identify potential funding sources from Federal, State, and local entities to fund a genetic study of Hermes colonies in and around Santee. This would be part of a regionally-focused genetic study program for San Diego County.	3 to 5 years	2, 3	Discretionary
3.1.3	Implement a genetic study of the Hermes colonies in the San Diego region, including those in and around Santee, to determine which of the surrounding colonies is most related to the Santee Hermes colonies for use as a donor source for a captive breeding program. This study will be part of a regional effort conducted under the direct supervision and guidance of the Wildlife Agencies.	Longer than 5 years	2, 3	Discretionary

Task No.	Task Summary	Timeframe	Category	Priority
	Objective 3.2: *Establish new Hermes colonies within Santee.*			
3.2.1	Evaluate the potential and the need to establish new Hermes colonies within Santee via the Hermes Working Group (described under Task 3.1.1).	Longer than 5 years	2, 3	Discretionary
3.2.2	Identify funding opportunities from Federal, State, and local entities to fund development and implementation of a captive breeding and release program.	Longer than 5 years	3	Discretionary
3.2.3	Prepare a captive breeding and release plan for the Hermes in Santee.	Longer than 5 years	3	Discretionary
3.2.4	Implement and monitor the captive breeding and release program for Hermes under the direct supervision of the Wildlife Agencies.	Longer than 5 years	2,3	Discretionary
	DATA STORAGE AND MANAGEMENT			
	GOAL 4: Accumulate, manage, and disseminate existing and future Hermes data and analyses for the City of Santee and provide information to the Wildlife Agencies and/or a designated regional monitoring entity.			
	Objective 4.1: *Compile data for Hermes in a format and location easily accessible to agency, academic, and qualified collaborators, while protecting confidentiality to landowners with identified occupied and potential Hermes habitat.*			
4.1.1	The Wildlife Agencies will select and coordinate with the agency or organization responsible for data entry, error checking, storage, and dissemination. Currently the Wildlife Agencies have identified SANDAG to manage the MSCP gains and losses through the Habitrak system.	3 to 5 years	2,3	Discretionary
4.1.2	Provide a reference library of published Hermes reports for use on a Wildlife Agency approved website.	3 to 5 years	2,3	Discretionary
4.1.3	Land managers in Santee will compile documented data on Hermes colonies, redberry population size and density, buckwheat population size and density, and ranking of potential habitats to the City and Wildlife Agencies.	3 to 5 years	2,3	Mandatory
4.1.4	Compile data on restoration and enhancement programs for Hermes in Santee, including information on planning, site selection, implementation, and monitoring.	Longer than 5 years	2,3	Mandatory
	Objective 4.2: *Develop standardized data collection methods to support long-term research, and database management.*			
4.2.1	Standardize the data to be collected on the occupied and potential Hermes habitat in Santee, utilizing an approved Wildlife Agency's survey protocols, and the population and habitat assessments.	1 to 3 years	2,3	Mandatory

Task No.	Task Summary	Timeframe	Category	Priority
4.2.2	Standardize the methods and format by which data are accumulated, stored, and queried by field personnel and others to ensure data compatibility and to facilitate data entry.	1 to 3 years	2,3	Mandatory
EDUCATION AND OUTREACH				
GOAL 5: Enhance public understanding and support for conservation goals for Hermes.				
Objective 5.1: *Build on existing education efforts targeting private landowners, public land managers, and policy makers regarding Hermes' legal status and conservation needs, and opportunities for participation in species conservation.*				
5.1.1	Develop an outreach program targeting affected private landowners, public land managers, resource specialists, funding agencies, conservation groups, and policy makers. Emphasize the biological and legal differences between Hermes and other similar species, and ongoing conservation efforts and land management information relating to the status and welfare of the Hermes.	3 to 5 years	1, 2, 3	Discretionary
5.1.2	Create a Hermes page on the City's website with general natural history information and identification aids as well as a description of legal status and current conservation efforts. Provide links to related websites and published reports.	3 to 5 years	2	Discretionary
5.1.3	Publicize the efforts to better manage and conserve Hermes, including restoration projects, public land management efforts, and research results consistent with Section 7.9 titled, "Public Outreach and Education."	3 to 5 years	2,3	Discretionary
5.1.4	Conduct outreach and publicize the importance of Hermes, including information about habitat requirements and opportunities for landowners to participate in conservation efforts consistent with Section 7.9 titled, "Public Outreach and Education."	3 to 5 years	1, 2,3	Discretionary

6.2 COST ESTIMATE FOR ENHANCEMENT AND RESTORATION ACTIVITIES

This section provides general cost estimates to develop and implement the enhancement and restoration activities discussed in this document. Because no historical costs estimates are available for Hermes habitat restoration, the costs provided are estimates based on Quino checkerspot butterfly habitat restoration that was conducted in the last five years by native habitat restoration companies (e.g., EDAW AECOM and RECON). Since there are no historical cost estimates established for the Hermes Copper butterfly, cost estimates for Quino are used because enhancement and restoration activities required for the two species are comparable. Once a regional cost estimate has been developed for Hermes, the estimated costs will be

revised. It is important to note that more specific cost estimates can and should be developed, but only when more detailed information is available on the specific site conditions, requirements for success, and other project-specific details.

To develop a more detailed cost estimate, a detailed Restoration and/or Enhancement Plan will be necessary for any project where occupied Hermes habitat or potential Hermes is to be enhanced or restored. The detailed Restoration and/or Enhancement Plan should discuss the specific site conditions, mitigation requirements, and success criteria, and should include detailed implementation recommendations that address these mitigation and success criteria needs.

For the purposes of providing general cost estimates, the efforts to rehabilitate and stabilize habitat for Hermes are divided into two categories: enhancement and restoration.

Enhancement

Habitat enhancement can be implemented when the existing site conditions have most, if not all, of the important characteristics for Hermes (i.e., Spiny Redberry, California buckwheat, vegetation cover, etc.), but the habitat has some disturbance factors (i.e., weed invasion, off-road activity, etc.) that contribute to a decline in habitat quality or quantity. Sites that are determined to be occupied habitat or have been assigned a high potential (according to Section 3.2, Task 2.2.2), and have some disturbance factors, should be considered for enhancement. Habitat enhancement methods and actions typically include the following:

- road closures, trail closures, or other changes to site access;
- signage and fencing;
- dethatching; and
- seed collection and reseeding.

Dethatching is the removal of dead organic material (usually nonnative plant material) from the understory and open cover areas of a site. This activity may include some line trimming and mowing. This method is usually conducted in the late summer to late fall when the plants are done flowering and have dried. If dethatching is conducted after seed set but before seed has dropped, it can be very effective at removing the above-ground nonnative seed bank from a site.

Prior to conducting dethatching on a site, it is important to collect all of the above-ground native seed that exists so that the seed is not removed with the nonnative thatch. Once the site has been

dethatched, native seed can be immediately placed back on site. Seed is typically stored for a few weeks prior to re-dispersal on site.

Restoration

Typically, habitat restoration is conducted when an existing site is not only disturbed, but when the site is missing one or more of the important characteristics for high-quality Hermes habitat (i.e., spiny redberry, California buckwheat, proximity of the buckwheat to the redberry, etc.). Sites that are determined to have moderate or low potential for Hermes, or lands which are required to have restoration as part of the mitigation requirements for that project (according to Section 3.2, Task 2.2.2), would be considered for Hermes habitat restoration. Restoration includes all of the methods covered under Enhancement (dethatching, etc.), as well as the following:

- inventory of plants prior to restoration work,
- percentage of native shrubs within the restoration area prior to restoration work,
- seed bulking and seeding,
- container planting, and
- herbicide treatment.

Part of what makes Hermes habitat suitable for the species are the types of shrubs and the density of the shrubs that makes up the vegetation community. Prior to implementation of restoration activities, an assessment to determine the existing plant species and percentage of shrub cover would be required within the restoration area. This will assist in determining the amount of seeding and containers required for the restoration. Spiny redberry and California buckwheat are critical for the restoration. Also, buckwheat must be within 3 meters of any redberry plants. Other shrubs are important for the vegetation community to support Hermes to provide perching or refuge from the elements or predators for Hermes.

Another important consideration for planting redberry is that it is dioecious shrub and male shrubs would need to be planted in close proximity to female shrubs. No study has been conducted to determine the distance male and female shrubs must be to each other to allow for successful pollen transference. Therefore, a botanist who has expertise in dioecious shrubs should be consulted.

Seed bulking differs from seed collection in that with seed bulking the seed is taken to a native greenhouse or nursery where it is propagated for the purpose of seed production. With seed

bulking, a large amount of seed can be placed on the restoration site, even though only a small amount of seed was collected.

For most of the important Hermes plants, container planting is preferred over seed bulking. Typically, container planting is used with perennial native plants like grasses, shrubs, and cactus species.

The most important difference between enhancement and restoration is the approach to weed control. While restoration includes more aggressive methods of weed control than enhancement, all restoration efforts should start with the same baseline dethatch effort described above. With a dethatch effort, the more intensive methods of weed control (herbicide, etc.) are much more effective and efficient. A site that has been dethatched can be treated with herbicides much more effectively because the site is open, the weeds are easier to target, and the important native plant species are easier to avoid.

Table 2 below lists generalized estimated costs for Hermes Copper habitat enhancement and restoration.

Table 2
General Estimated Cost for Hermes Copper Restoration and Enhancement

Activity	One-Time Cost	One-Time Cost per Acre or Linear Foot (LF)	Annual Cost/Acre
Enhancement			
Restoration and Enhancement Plan	$50,000–$100,000	-	-
Fencing	-	Split rail - $27/LF Pilar log - $18/LF	-
Signage		$150/acre	
Seed Collection/Temporary Storage/Seed Dispersal	-	-	$500–$1,500
Dethatching			$2,500–$3,500
Restoration			
Seed Bulking/Seed Dispersal	-	-	$1,500–$5,000
Container Planting	-	-	$1,000–$3,500
Herbicide Treatment (5 visits per year)	-	-	$3,000–$6,000

The estimated costs that are provided in Table 2 represent a general range of efforts**.** These costs assume that the restoration crew is specifically trained in native habitat restoration and species identification and will be led by an experienced restoration ecologist**.** The cost for herbicide treatment assumes a site would be dethatched first and then followed with five treatment site

visits**.** The detailed costs for individual projects will depend on the requirements of the project-specific Restoration and/or Enhancement Plan.

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CHAPTER 7.0
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Draft Final Western Spadefoot (*Spea hammondii*): Independent Scientific Advisor Report for the City of Santee Multiple Species Conservation Plan (MSCP) Subarea Plan

Prepared for:
City of Santee

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
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Draft Final Western Spadefoot (*Spea hammondii*): Independent Scientific Advisor Report for the City of Santee Multiple Species Conservation Plan (MSCP) Subarea Plan

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Suggested citation:
Rochester, C. J., K. L. Baumberger, and R. N. Fisher. 2017. Draft Final Western Spadefoot (*Spea hammondii*): Independent Scientific Advisor Report for the City of Santee Multiple Species Conservation Plan (MSCP) Subarea Plan. 53 pp.

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Introduction

The City of Santee is preparing a Subarea Plan under the Multiple Species Conservation Plan (MSCP) Subregional Plan in southwestern San Diego County. The Santee MSCP Subarea Plan (Plan) is a Natural Communities Conservation Plan (NCCP) and a Habitat Conservation Plan (HCP) to support the issuance of incidental take permits from the California Department of Fish and Wildlife (CDFW) and the United States Fish and Wildlife Service (USFWS) under the State and Federal Endangered Species Acts (ESA), respectively. Input from independent scientists is required for the completion of a NCCP, and the Santee MSCP has had independent scientific input on all species covered by the plan except for the western spadefoot (*Spea hammondii*).

The United States Geological Survey (USGS) is serving as the Independent Science Advisor (ISA) to the City to provide independent scientific input on the western spadefoot. The role of the ISA is to establish science-based conservation and management standards that will inform the preparation of the Plan and assist the Wildlife Agencies in their permitting responsibilities. The ISA's role includes clarifying the current state of scientific knowledge relevant to the Plan Area, but not answering policy questions. Sound scientific advice is critical to creating a strong and durable Plan, and guidance from the ISA is expected to provide the scientific underpinnings of plan development. The USGS has conducted wildlife surveys within San Diego County and southern California over the past two decades, including reptiles, amphibians, small mammals, birds, ants, and large mammals. As such, the USGS has the background to help address some of the issues related to the western spadefoot.

The City of Santee requested that USGS:

- Review existing data on species/habitat relationships, presence/absence, landscape features, important ecological processes, natural disturbance regimes, and other ecological factors relevant to the Plan Area
- Assess ecological requirements, life history characteristics, population size and status, genetics, and other attributes of western spadefoot relevant to the Plan Area
- Review GIS factors used for modeling of potentially suitable habitat
- Identify important data gaps and additional research needs
- Propose principles that could guide the conservation and recovery of western spadefoot in the Plan Area
- Formulate potential strategies for reserve management
- Evaluate scientific uncertainty and levels of risks
- Suggest strategies and targets for monitoring and adaptive management

Study Area

For purposes of this report, the City of Santee, the Study Area and the MSCP Subarea Plan Area (Plan Area) are one in the same and include all properties within the City of Santee's jurisdiction. This description of the Plan Area was developed for the Santee MSCP Subarea Plan and was provided by ICF. The City of Santee is bordered on the southwest by the East Elliott Community Plan Area in the City of San Diego, on the northwest by Marine Corps Air Station (MCAS) Miramar, on the east and north by the

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County of San Diego, and on the south by the City of El Cajon and Gillespie Field. Almost all of the lands to the north and west on MCAS Miramar, the Mission Trails Regional Park, and the County's Sycamore Canyon Park are covered by natural vegetation; while large portions of the lands to the south and east include the urbanized portions of the City of El Cajon and community of Lakeside (Figure 1).

The regionally important biological resources include the coastal sage scrub and chaparral-covered hills on the north and south sides of the Plan Area and the riparian corridor along the San Diego River and Sycamore Creek. These biological resource areas are divided into five Subunits within the Plan Area (Figure 1). The San Diego River Subunit includes the undeveloped lands along the San Diego River; the Rattlesnake Mountain Subunit includes the undeveloped lands in the southeastern portion of the Plan Area east of State Route (SR) 67; the Mission Trails Subunit includes lands adjacent to the Cowles Mountain section of Mission Trails Regional Park; the Magnolia Subunit includes the undeveloped lands east and west of Summit and North Magnolia Avenues (not including the Fanita Ranch Subunit); and the Fanita Ranch Subunit includes the undeveloped lands in the far north and northwest portions of the Plan Area.

The native vegetation in the Plan Area occurs throughout the five subunits. The vast majority of coastal sage scrub occurs on the Fanita Ranch and Magnolia Subunits, with smaller amounts in the Mission Trails and Rattlesnake Mountain Subunits (Figure 2). All of the chaparral is on the Fanita Ranch Subunit or on the north slope of Cowles Mountain in the Mission Trails Subunit. Almost all of the general grassland mapped in the Plan Area occurs on the Fanita Ranch Subunit. The general grassland habitat type is typically non-native grassland, but includes some native grassland. The riparian habitat types occur primarily along the San Diego River, with the exception of southern sycamore-alder riparian woodland, which occurs in Sycamore Canyon on the west edge of the Fanita Ranch Subunit. Several small patches of oak woodland occur within the Fanita Ranch and Magnolia Subunits. Most of the areas mapped as disturbed habitat occur in the central portion of the Plan Area, but several sizable patches also occur in the Fanita Ranch Subunit, along the San Diego River, and near Mission Trails Park. The areas covered by each vegetation community in the Plan Area are shown in Table 1.

The San Diego River Subunit consists of open water and discontinuous riparian vegetation running from the western edge of the Plan Area, near Mission Trails Regional Park, to the eastern edge of the Plan Area, near SR 67 (Figure 1). There are areas of disturbed habitat adjacent to the primary riparian corridor that may have potential for future restoration and enhancement. Past sand mining operations along the San Diego River have left large ponds of permanent water. Forester Creek joins the San Diego River south of the Santee Lakes. Restoration and enhancement projects have been completed along much of the portion of Forester Creek within the Plan Area (via the Forester Creek Improvement Project). A patch of coastal sage scrub dominates a hilltop on the east end of the San Diego River Subunit near the eastern boundary of the Plan Area.

The Rattlesnake Mountain Subunit occurs in the southeast portion of the Plan Area. Native habitat within this subunit is composed of one medium sized patch of native habitat (south of Shadow Hill Road and East of Graves Avenue) and a small patch southeast of Woodside Avenue (Figure 1). Both are dominated by coastal sage scrub. Portions of the larger patch have been developed into housing, which

is not reflected in the vegetation map (Figure 2). A substantial amount of disturbed habitat also occurs adjacent to the patch at Woodside Avenue. The preserved habitat within this subunit is managed by the Center for Natural Lands Management (CNLM). Neither of the two habitat patches in the Rattlesnake Mountain Subunit connects to any significant native habitat beyond the boundaries of the Plan Area.

The Mission Trails Subunit includes a large block of contiguous habitat in the southwestern corner of the Plan Area (Figure 1). This block is largely composed of chaparral and coastal sage scrub, with native and non-native grasslands occurring on a smaller portion of the subunit (Figure 2). There is a vernal pool complex embedded in the matrix of coastal sage scrub, but it has a history of disturbance from off-road vehicle activity. Outside of the Plan Area, the Mission Trails Subunit is contiguous with the Cowles Mountain region of Mission Trails Regional Park, connecting the subunit to a landscape larger than that in the Plan Area.

The Magnolia Subunit occurs in the north-central part of the Plan Area between the border with San Diego County to the east and the Fanita Ranch Subunit to the north and west (Figure 1). This area is almost entirely covered by coastal sage scrub, but also includes some unmapped residences and fields (Figure 2). Native habitat within the Magnolia Subunit connects to similar habitat within the Fanita Ranch Subunit and beyond, representing a large, contiguous landscape extending from Interstate 15 to SR 67. Outside of the Plan Area to the east, the Magnolia Subunit is continuous habitat with the Lakeside Downs managed by the Endangered Habitats Conservancy (EHC).

The Fanita Ranch Subunit occurs at the north end of the Plan Area and is the largest of the five subunits (Figure 1). It is dominated by chaparral and coastal sage scrub (Figure 2), with a mix of native and non-native grasslands on the western slopes leading into Sycamore Canyon. There are stretches of riparian forest along Sycamore Canyon at the western boundary of the Plan Area. The Fanita Ranch Subunit is contiguous with the Magnolia Subunit to the east and south and MCAS Miramar to the west. As the largest subunit, the Fanita Ranch Subunit is further divided into the Fanita Ranch-Upper and Fanita Ranch-Lower Subunits. The Fanita Ranch-Upper Subunit includes the portion of the subunit north of the Magnolia Subunit and the Fanita Ranch-Lower Subunit is the portion west and southwest of the Magnolia Subunit.

Species Biology

The western spadefoot is a small, semi-fossorial amphibian species native to California and northern Baja California. During the long, dry months of summer and fall, the adults seek shelter underground. Early in the rainy season, they emerge to forage and reproduce, making use of temporary pools to lay their eggs. Western spadefoot typically breed in standing water that collects in shallow depressions within the upland habitat rather than in flowing streams or creeks. In addition to using naturally forming pools within the landscape, western spadefoot will breed in the pools forming along dirt roads within their habitat. Western spadefoot tadpoles can develop quickly if the pools begin to dry, but they do have limits on the minimum length of time that the breeding pool must persist. Although the species was distributed widely across the landscape, their current populations are limited by development and loss of habitat. Within the Plan Area, western spadefoot are known to live and breed at multiple sites in

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the Fanita Ranch Subunit. In 2005, Dudek (2017) documented the presence of western spadefoot across the grassland and lower foothills of the Fanita Ranch Subunit and mapped out many additional potential breeding sites.

There is limited information on the population dynamics for western spadefoot across its range or from year to year. As such, there are no estimates on the minimum population size required to sustain the species as its habitat is disturbed and broken into smaller and smaller pieces. Within the Fanita Ranch Subunit, there is a breeding population with breeding documented in at least 2005 (Dudek, 2017) and 2017 (USGS). This is likely a self-sustaining population at this time with connectivity to the larger surrounding habitat patch / meta-population and into the Magnolia Subunit. For the other areas with potential western spadefoot habitat, the Mission Trails and Rattlesnake Mountain Subunits, there are no known western spadefoot records within the data provided by Dudek (2017), USGS surveys (2017), the California Natural Diversity Database (CNDDB), iNaturalist, or the Herpetological Education & Research Project database (HERP: B. Hinds pers. comm.). The genetics project described below is the best effort to determine the population connectivity within the Fanita Ranch Subunit for the western spadefoot.

Genetic work is underway to characterize the western spadefoot, with samples collected from the Fanita Ranch Subunit (K. Neal, PhD Candidate, UCLA Department of Ecology and Evolutionary Biology). The goal is to determine if the populations and ponds on the Fanita Ranch Subunit that were occupied by the western spadefoot were genetically connected or not, as this would inform management objectives and corridor design between populations. The data will be utilized to develop a rough effective population size estimate which will provide an approximate number of breeding adults in the population that was sampled. Unfortunately for some of the pools, all of the tadpoles had completed metamorphosis and dispersed prior to the genetic sampling; genetic samples were only collected from 10 pools during the visit on 13 March, 2017. The distribution for the pools that were sampled will be sufficient to start the genetics work. Next year a more targeted sampling of the missing pools would be beneficial to the analysis, if possible. Additionally, the results will be compared to the sampling done elsewhere in Southern California in 2017 to see how these genetic metrics compare across the landscape.

Threats and Limiting Factors

Roads and trails

Western spadefoot have a complicated relationship with roads and trails, benefiting from these features in some cases and being negatively impacted by them at other times. Pools forming along dirt roads often provide breeding habitat but can also result in off-road vehicle related mortality directly or through a faster drying period. Many of the sites in the Fanita Ranch Subunit where western spadefoot have successfully bred in both 2005 and 2017 were road ruts. The soil compaction and depressions created along the dirt roads often results in pools suitable for reproduction. However, continued vehicle traffic through the pools while egg masses, tadpoles, and metamorphs are present results in direct mortality or may lead to increased siltation of the egg masses and faster drying. There are few data on the impacts of paved roads directly related to western spadefoot, but looking at other reptile and

amphibian studies, paved roads act as barriers and result in direct mortality. Amphibian mortality rates on roads are highest on wet nights (Ervin et al. 2001) based on work done elsewhere in Southern California. Dodd et al. (2004) looked at the use of raised roadbeds, with a barrier wall and culverts, to connect two sides of a preserve in Florida. The eastern spadefoot was documented only rarely on the road surface or in the culverts under the road. In the post-construction data, only 1 eastern spadefoot was documented to have used one of the eight culverts under the road (culvert size = 1.8 m x 1.8 m). Seven eastern spadefoot were reported as roadkill going around the end of the protective barrier wall. The barrier wall and culvert system did greatly reduce the number of roadkill through the habitat of interest for reptiles and amphibians on the whole. Overall in the Florida study, the culverts were very small for the total length (44 m): 2 culverts were 1.8 m X 1.8 m, 2 were 2.7 m X 2.7 m, and 4 were 0.9 m in diameter. In a study specifically designed to look at amphibian use and selection of culverts based on dimensional cross-section and length, Woltz et al. (2008) showed that different reptile and amphibian species have a range of tolerances to culvert diameter and length, and some species show a preference to the type of substrate through the structure. The study species also had different abilities to climb over barrier fences. This might be a worthwhile study to repeat for western spadefoot since there doesn't seem to be much on the topic for this species. One potential shortcoming of their design was that they didn't allow for the subjects to not choose one of the test pipe diameters or lengths. The study design forced the animal to pick a culvert with no option to not go through one. Given an option, animals may choose to remain on one side of the culvert and not cross the barrier. Other impacts of roads may include increased contaminants associated with vehicles, avoidance of artificial light, and habitat fragmentation.

Patch size

The minimum area of habitat or patch size required by the western spadefoot to maintain a long term, viable population is unknown but likely is dependent on having both upland and aquatic / vernal pool habitats. Western spadefoot require periodic wetlands for breeding purposes and upland, terrestrial habitats for foraging and aestivating during the hot, dry summers, one of these habitat elements without the other would not be sustainable in the long term. Although there are no direct estimates of a minimum patch requirement for western spadefoot, it is possible to make some estimates based on existing research. Baumberger's radio telemetry efforts (2013) documented that western spadefoot moved as far as 262 meter (860 feet) from the breeding pool site with an average distance from the pool of 40 meters (131 ft). The western spadefoot in her study had home ranges that ranged from 469 m^2 to 2,094 m^2 (Baumberger, 2013).

From the long term reptile and amphibian surveys conducted by the USGS, the patterns of western spadefoot captures in pitfall traps can be compared to the size of the patch in which each is found. In an effort to standardize the evaluation of patch size, a parameter was developed for each of the pitfall arrays based on what the habitat patch would have been in 1995 because of the extensive development throughout southern California over the last two decades. Although the USGS trapping efforts were not specifically designed to address western spadefoot toad response to patch size and sustainability, it may be useful baseline data for consideration in conservation planning for the species. Using the pitfall captures for western spadefoot from San Diego, Orange, and Riverside Counties, the patch size for 351

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western spadefoot records from 106 study plots can be evaluated. The smallest patch where western spadefoot were found was Carmel Mountain Preserve at 217 hectares (ha), followed by Spring Canyon at 892 ha, near the international border with Mexico and SR-905. The USGS pitfall records for western spadefoot are summarized in Figures 3 and 4. Figure 3 shows the distribution of the sample plots within each of the patch size categories along with the number of western spadefoot detected within patches of the given size. The sample plots were not systematically distributed across the range of patch sizes. More arrays were sampled in the largest patches with only a very few arrays in the smallest patch size ranges. Larger patches can accommodate more study plots, but more western spadefoot records are also found within the larger patches.

Figure 4, the graph of the western spadefoot detections in the pitfall sample plots, shows that not only were more western spadefoot found in the larger patches, but that they were found at more individual plots. No western spadefoot were found in the three smallest patch categories. Seven out of 89 study plots (7.8 %) in patches between 100 and 1,000 ha had western spadefoot. In the next largest patch bin, 33 out of 171 (19.2 %) had western spadefoot. For study plots in patches between 10,000 and 100,000 ha, western spadefoot were found at 21.9 % of the plots. Larger patches tended to have western spadefoot in more of the sampled habitat than smaller patches.

A common conservation technique is to design the conservation area based on a buffer around a known resource. In the case of the western spadefoot, the sensitive resource would be the known breeding sites. Based on Baumberger's research (2013), 200 m, 300 m, and 400 m buffers around the 2005 western spadefoot breeding sites reported by Dudek (2017; Figures 5 and 6) were considered.

A 200 meter buffer around the known western spadefoot records would result in four discrete patches. If development completely surrounded all four patches, all would be smaller than any of those suggested by the preceding pitfall results. Only the patch around the western spadefoot sites at the north end of the Fanita Ranch Subunit would potentially connect to the habitat outside of the Plan Area. Without connectivity and potential management actions, the smaller sites are likely insufficient to support western spadefoot population in the long term. The four patches are described here and can be seen in the following maps. The 200 m buffers are shown as the blue bubbles in Figures 5 and 6.

- 200-A: 74.2 ha. This would be the only habitat patch that would connect out to the larger patch represented by MCAS Miramar. As such, the actual patch size would be larger than given here and would depend on the future development within MCAS Miramar.
- 200-B: 30.8 ha.
- 200-C: 12.6 ha.
- 200-D: <12.6 ha. A portion of a 200 m buffer around this location would be excluded from the patch due to urban development on the west side.

With a 300 meter conservation buffer around the known breeding sites at the north end of the Fanita Ranch Subunit, the habitat would be divided into three patches. Again, if these patches were all that remained, they would likely be too small to support western spadefoot population in the long term

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without additional, perpetual management actions. The 300 m buffers are shown as the green bubbles in the following maps. The following labels match those in Figure 5 and 6.

- 300-A: 120.0 ha. This would provide breeding habitat and a connection to the larger patch represented by MCAS Miramar.
- 300-B: 81.1 ha.
- 300-C: <28.3 ha. A portion of a 300 m buffer would be excluded from the patch size estimate due to development on the west and southeast edges.

Research on other species of spadefoot have shown that they tend to stay within 400 m of the breeding sites (Pearson, 1957; U.S. Fish and Wildlife Service, 2005; Garner et al., 2012) A 400 m buffer around the known breeding sites on the Fanita Ranch Subunit would result in two patches. The buffer would unite all of the pools in the Fanita Ranch-Upper Subunit.

- 400-A: 286.4 ha. Even without connectivity out to Miramar, conserving a patch of this size begins to approach patch sizes consistent with long term populations observed in two decades of USGS pitfall trapping.
- 400-B: <50.2 ha. This may not be suitable for long term viability of western spadefoot without additional management. Large portions along the west and south of this buffer would include urban development.

Edge effects

Along the perimeters of conserved lands where they adjoin urban landscapes, the proximity of development can impact the function of the natural systems beyond just the immediate interface. These edge effects include aseasonal flow, altered watershed dynamics, introduced species, increased recreational use, and increased fire risk. The extent that each of these impacts reaches into the open habitat varies with the landscape and the degree to which they impact western spadefoot may not be fully understood.

Aseasonal flow occurs when water is added to areas upstream of a site, typically as landscape irrigation and runoff, and then makes its way into the natural environment either through natural ground seepage or through artificial drains. Aseasonal flow is also typically characterized as occurring at a time of year inconsistent with the natural weather patterns. The result is that streams and creeks which naturally have surface water for only a few weeks or months during the winter (the nature wet cycle in San Diego County) hold water year round. Many of the species native to the region, including western spadefoot, are adapted to this cyclical wet and dry pattern, breeding in the temporary pools in the winter and then moving into the dry uplands during the rest of the year. Aseasonal flow can result in permanent year round water that can support non-native aquatic species such as fish, crayfish, bullfrog, and African clawed frogs. Work within San Diego County has documented the ability of bullfrogs to consume large quantities of individuals of native species. On Camp Pendleton, bullfrogs are known to consume arroyo toads as the toads move to the streams to breed. The hypothesis is that the bullfrogs listen for the male toads to call from the breeding site and then track them down by the calls. Western spadefoot calling from their breeding ponds may be subject to similar predation. Although the western spadefoot

breeding sites are usually temporary pools, the call of the western spadefoot carries for a long distance and may attract bullfrogs to sites otherwise unsuited to the bullfrog (Hayes, 1985). Aseasonal flow allows potential predators to survive in a landscape otherwise inhospitable to them.

In addition to aseasonal flow, there is the further potential for the watershed dynamics to be altered along the edge of urban development. Increased impermeable surfaces within the developed areas can result in a more rapid transfer of rain into the aquatic system within the conserved area rather than the gradual accumulation of water as it seeps into the ground and makes its way through the system naturally. Runoff may also contain a higher contaminant load from "upstream" vehicles, pet waste, and landscape activities. Altered hydrology has the potential to lead to increased sediment transport into the aquatic system covering egg masses with silt. Western spadefoot breeding sites are not typically within flowing drainages and may not be impacted directly, but contaminants can be carried through the food chain and increased flows can alter the available habitats.

The Argentine ant (*Linepithema humile)* is an introduced invertebrate that will often take advantage of increased moisture levels within and along the edge of the urban development. Research by Mitrovich et al. (2010) showed a high likelihood that Argentine ants will extend from the urban edge into the first 200 m of undeveloped habitat. Where streams and creeks extend into the habitat, Argentine ants may also follow. Argentine ants have been documented to alter both the native ant community and the overall invertebrate community when the invasive becomes established. Western spadefoot feed mostly on insects. Zack and Johnson (2008) showed that the closely related Great Basin spadefoot (*Spea intermontana*) fed on a wide variety of insects with a high concentration of ants and beetles. If Argentine ants disrupt the local invertebrate community, the western spadefoot may be impacted by changes to its food supplies. Additionally, as Argentine ants first invade a new area, they tend to be more carnivorous, feeding on animal based materials, until they deplete the resources and must switch to a diet higher in plant based materials (Tillberg et al., 2007). Western spadefoot metamorphs, small and recently out of the breeding pond, could be vulnerable to attack as Argentine ants search for food.

Open spaces adjacent to urban areas quickly draw the attention of outdoor enthusiasts and, intentional or not, this can impact the local native species, including western spadefoot. Outdoor recreation in the form of hiking, cycling, and motorized off-road activity often includes an increase in the presence of trash and dogs, both on and off-leash. Although most recreationalists are not intending to harm the environment, our presence can have unintended consequences such as disturbing wildlife, including scaring western spadefoot off of breeding sites, increased sedimentation as breeding pools are disturbed, and decreased pool longevity as bikes and animals cross through the pools. Off-road vehicles can result in direct mortality of western spadefoot in the form of road-kill of adults out foraging along roads at night and the death of tadpoles where vehicles drive through pools pushing tadpoles and water out of the pool.

Recent fire studies have shown that with the increased density of development comes an increase in ignition sources, potentially resulting in a shorter fire return interval. Syphard et al. (2007) showed that fire density increased along with an increase in population density up to about 40 people/km2, and then began to decrease, possibly related to the built up of infrastructure and reduced response time. It is

unknown how western spadefoot will respond to more frequent fire. The western spadefoot was at too low of a detection rate within the USGS pitfall fire study to draw any conclusions (Rochester et al., 2010). Based on life history pattern of the species, they would be underground at the time of year that the majority of wildfires occur in San Diego. The insulating properties of soil should shield estivating animals underground as the fire passes overhead. The potential that the breeding pools will be altered is high; there may be chemical signal in the subsequent water as it fills the pool the following year; drying of the landscape with the removal of leaf litter/duff resulting in increased direct sunlight hitting the ground but also reduced evapotranspiration. The creeks at Elliott Chaparral Reserve at the west end of this larger patch did not hold water for almost 10 years after the 2003 Cedar Fire, but there was also a significant drought during that time. Vernal pool studies have shown a positive response of the native plant species following fires. The north end of the Fanita Ranch Subunit is within the perimeter of the 2003 Cedar Fire and was characterized as a low to moderate fire severity. Dudek detected western spadefoot at the vernal pools in this area in 2005 (Dudek, 2017); the western spadefoot did not seem to be too heavily impacted by the fire, if at all. The fire perimeter data for the Plan Area goes back to 1910, with the most recent, the Cedar Fire, in 2003. Most of what didn't burn in 2003 burned in 1994 in the Rocoso Fire. The majority of the north end of the Fanita Ranch Subunit has burned two or three times in the documented time span (Figure 7). Portions of the south end of the Fanita Ranch Subunit have burned four or five times in that period. The US Forest Service produced a GIS layer (Safford et al., 2011) to estimate how much fire is on the landscape compared to pre-European conditions, called the Fire Return Interval Departure (FRID). The estimate takes into account the vegetation type and fire history. Much of the Fanita Ranch Subunit where western spadefoot have been documented was not classified in this process; the non-native grasslands that currently exist were not part of the pre-European landscape and cannot be calculated (Figure 8). The central portions of the Fanita Ranch Subunit are estimated to have burned more frequently in recent history (light green and dark green) than in pre-European conditions. As mentioned above, western spadefoot response to fire is an unknown as would be their response to an increased fire frequency. Although the Cedar Fire was over 13 years ago, the area should still be considered as recently burned. When fire management plans are developed for the remaining open spaces, they could include instructions/guidelines for the fire suppression teams which provide simple instructions or maps on where staging areas and command operations could be set up to avoid impacting vernal pools and potential western spadefoot breeding sites. Biologically significant sites could be identified on resource maps provided to fire suppression crews the same as culturally significant resources are identified. Informing fire suppression crews of the locations of western spadefoot sites may help in the conservation of the species within the Plan Area when fire crews can safely consider such resources.

The presence of western spadefoot within a site has been tied to the level of urban development around the site, which could be thought of as the accumulation of edge effects and other urban impacts. Urban development has a negative association with western spadefoot presence. Davidson et al. (2002) found that sites with western spadefoot had an average of 4% urban development at a 5,000 m radius around the site compared to sites where western spadefoot were not detected. The sites where western spadefoot were not found had an average of 23% urban development in the surrounding 5,000 m radius. As an approximation of their analysis, the NLCD_2011 land cover dataset were used to estimate

the level of development around four areas within the Plan Area where western spadefoot habitat was modeled: The Mission Trails Subunit (Figure 9), the Rattlesnake Mountain Subunit (Figure 10), the Fanita Ranch-Upper Subunit (Figure 11), and the Fanita Ranch-Lower Subunit (Figure 12). The two regions of the Fanita Ranch Subunit are known to have western spadefoot, but the species has not been confirmed at the other two. The same data were generated for the USGS pitfall sites within San Diego County (Table 2). In the attempt to repeat this characterization, "Developed, Low Intensity", "Developed, Medium Intensity", and "Developed, High Intensity" were grouped together for the developed category and all other land cover classifications were left separate. Both the Fanita Ranch-Lower Subunit(41%) and Fanita Ranch-Upper Subunit (14%), where western spadefoot are present, are already well above the average level of development that Davidson et al. (2002) found for sites with the species. There are however multiple USGS pitfall sites with higher levels of development where western spadefoot have been detected over the past two decades. Western spadefoot were not detected at the USGS pitfall sites with development levels comparable to the Mission Trails (60%) and Rattlesnake Mountain (73%) Subunits (Table 2).

Corridor width and habitat connectivity

Maintaining connectivity between the various pieces of modeled habitat within the Plan Area is complicated by the level of urban development that already exists. Maintaining connectivity within the Fanita Ranch Subunit could increase the likelihood that western spadefoot will persist here, and it could be one of the conservation goals for the species. There is little existing data on the connectivity and movement requirements for western spadefoot, but looking at research on other species may be helpful. Coster et al. (2013) looked at movements of radio tracked wood frogs (*Lithobates sylvaticus*) and spotted salamanders (*Ambystoma maculatum*) to estimate the corridor width needs for those species. They recommended a minimum width of 50 m with the note that corridors may need to be wider for longer linkages. Baumberger's radio tracking (2013) may have insufficient observations to do the same kind of analysis for western spadefoot. The eastern spadefoot (*Scaphiopus holbrookii*) in Florida (Dodd et al., 2004) did not frequently use long, narrow culverts and seemed to go around the barrier more than through. Of the eight eastern spadefoot observed during that study, seven were dead on the road and one was detected while using a culvert (1.8 m H X 1.8 m W X 44 m L, dry, earthen substrate). The seven dead animals had gone around the end of the barrier and culvert system to enter the roadway. If the same behaviors hold for the local spadefoot species, connectivity between the sites in the Fanita Ranch Subunit will require corridors a minimum of 50 m wide. Culverts under roads may be adequate, but they will need to be large enough not to exclude the western spadefoot. Further study may be needed to determine the minimum culvert dimensions necessary to maintain connectivity for the local spadefoot.

As for connectivity between the patches of modeled habitat within the Plan Area, it is unlikely that the dis-contiguous areas are connected to one another. The Fanita Ranch Subunit, the only area known to have western spadefoot, is not connected to the habitat at the Mission Trails Subunit or the Rattlesnake Mountain Subunit. The Fanita Ranch Subunit and the Magnolia Subunit have no barriers to western spadefoot movement. Although western spadefoot have not been detected in the Magnolia Subunit, they should be able to move into the area from the Fanita Ranch Subunit with few restrictions.

Urbanization, major roads and lack of suitable habitat isolates each of these areas from the Mission Trails and Rattlesnake Mountain Subunits. Western spadefoot in the Fanita Ranch Subunit should be connected to western spadefoot in Mission Trails Regional Park thanks to the two large bridges and open habitat that continues to exist between the two areas. However, the Mission Trails Subunit is separated from Mission Trails Regional Park by Mission Gorge Road. The breeding sites in the Fanita Ranch Subunit are currently part of a habitat patch that extends from Interstate 15 on the west to State Route 67 on the east, State Route 52 to the south and the City of Poway to the north (11,961 ha): a 400 m buffer around these sites would maintain connectivity to the larger patch. A 300 m conservation buffer would split these breeding sites into two units. If a conservation buffer less than 400 m is preserved around the known breeding pools in the Fanita Ranch Subunit, the cluster of pools to the southeast would become isolated from those in the northwest. Without a sufficient habitat linkage to the pools to the northwest, the southeast patch is likely insufficient in size to sustain a population of western spadefoot. Based on the current conditions, there is no means to improve the connectivity between the Fanita Ranch / Magnolia Subunits and any of the other patches of modeled habitat within the Plan Area.

The Mission Trails Subunit may have an isolated population of western spadefoot. Any western spadefoot population on this habitat patch is probably not connected to any population outside of the patch. There is potential breeding habitat at this site but no confirmed western spadefoot occurrences. The habitat patch, which extends outside of the Plan Area over to Cowles Mountain, was estimated at 775 ha. In the event of extirpation of western spadefoot, there will be no outside source population to recolonize. While there is little potential to improve the connectivity of this site, there may be potential to improve the habitat if it can be shown that there are still western spadefoot at the site or adjacent lands outside this Subunit.

The Rattlesnake Mountain Subunit is not connected to any other patch with no reasonable means to improve the connectivity. Based on our review of the available imagery, there are no water sources for breeding at this location. Any historical western spadefoot population has likely died out by now with the level of isolation and lack of potential breeding sites.

Current conditions along the San Diego River Subunit will not provide western spadefoot connectivity to any other patch. The dense vegetation through most of this area is not suitable for western spadefoot. The modeled habitat up the sides of the Santee Lakes is not suitable and would not connect the San Diego River Subunit to the Fanita Ranch Subunit population. Additionally, the modeled habitat along Forester Creek is not suitable due to dense vegetation and would not serve for any connectivity. There could be remnant western spadefoot in the habitat near Mast Park. This would depend on the availability of breeding pools, but this is likely too small to function as a self-sustaining patch; it is less than 15 ha. There could be remnant western spadefoot in the open habitat along the river between Cuyamaca Street and Magnolia Avenue, near the sports facilities. It may not be ideal, but there is some scrubland mixed in with the surrounding upland habitat. This looks reminiscent of El Monte Valley in Lakeside, also along the San Diego River. The limiting factor would be the availability of breeding pools. Any population in this patch would be subject to extirpation with no recolonization. Any habitat improvements would need to be thought of in the context of all of the surrounding roads and urban

impacts associated with this level of development and the potential that the patch as a whole is still too small. At most, this habitat patch is only 50 ha. The San Diego River Subunit will not provide a movement linkage for the western spadefoot known to be in El Monte Valley and those in Mission Trail Regional Park. The dense vegetation and deep waters with a lack of upland habitats will block western spadefoot movement.

Species Distribution Model

In an effort to identify sites with habitat characteristics where western spadefoot might be found, a draft species distribution model (SDM) was developed for the Plan Area by ICF. A species distribution model attempts to identify habitat and landscape variables that are suitable for the given species. In a previous effort, USGS and Dr. J. Franklin (University of Arizona) used the pitfall capture records for western spadefoot to make a SDM for the species that covered all of coastal Southern California, as well as the Plan Area. These two models will be compared and considered for the suitability of the areas identified as potential western spadefoot habitat.

The draft model provided by ICF included basically two parameters: vegetation type and slope. For vegetation, the following categories were included: coastal sage scrub, mixed chaparral, grassland, riparian, oak woodland, chamise chaparral, freshwater marsh, and vernal pools. For the slope variable, flat and moderate were included. In general, the predicted western spadefoot habitat model is reasonably accurate: most of the areas modeled as suitable habitat do look like western spadefoot habitat, with a few exceptions. The San Diego River was identified as western spadefoot habitat and it is likely not serving this function. The dense riparian forest, deep open water, and thick shoreline vegetation are not typically occupied by western spadefoot. If the vegetation type that resulted in the inclusion of the San Diego River and Forester Creek can be isolated, it might be useful to remove it from the model. The provided SDM appears to exclude dirt roads through the Fanita Ranch Subunit. Many of the known breeding pools are along the dirt roads. These road rut pools may be important to the persistence of the western spadefoot within the occupied habitat. These roads should be included in the modeled habitat if possible. Baumberger (2013) also reported that western spadefoot preferred soils with less clay than what was typically found in the area surrounding her study area. She also noted that western spadefoot were never found on slopes greater than 30 degrees, but reported that there were no areas with slopes greater than this in the area around her study. These considerations may help to tighten the SDM to more representative habitats for the western spadefoot.

The SDM developed by Dr. J. Franklin (unpublished) was based on USGS pitfall capture results for western spadefoot across all of Southern California. She developed two models: one based on a General Additive Model (GAM) and a second based on the Random Forest technique (RF). Based on 102 locations where the species was found, the GAM identified that western spadefoot prefer sites with moderately high values of January minimum temperature, higher values of July maximum temperature, lower values of precipitation, on flatter slopes, at low soil available water, shallower minimum soil depth, and are associated with certain soil orders (Figure 13). The RF also included these same variables but also identified summer radiation as an important variable.

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The model provided by ICF and Franklin's GAM model agree on several of the predicted areas of suitable habitat. Both models predict habitat at the south side of the Plan Area in the Mission Trail Subunit, in the Fanita Ranch Subunit, and in the Rattlesnake Mountain Subunit. The Franklin model over-predicts habitat; it includes large areas that are currently developed. The models disagree on the suitability of the habitat along the San Diego River Subunit as it runs through the Plan Area. The Franklin model predicts the probability of presence for western spadefoot as 0-0.1 for the dense vegetation along the river and 0.1-0.17 for the adjacent floodplain (much of which is now developed and is unsuitable). The provided SDM predicts habitat along the San Diego River through areas of thick riparian vegetation and deep standing, bodies of water.

Data Gaps and Additional Research Needs

Based on the literature search for this species, there is an extensive lack of basic information for the western spadefoot. There is more available for the southern spadefoot (*Spea multiplicatus*) and Great Plains spadefoot (*Spea intermontanus*), but very little for the western spadefoot within its range in Southern California. Additional research is needed to fill in the knowledge gaps on the dispersal of metamorphs from the breeding pond, feeding behavior, breeding cycles and success, survivorship across all age classes, and the overall longevity of the species.

Although Baumberger (2013) looked at the movement of adult western spadefoot around two breeding sites, there is little known about how far metamorphs disperse from breeding pools and how much this contributes to connectivity for the species. Baumberger's thesis showed that the 15 adults that were tracked didn't move far from the breeding pond. Metamorph dispersal may represent more significant movement and dispersal to new pools but there are limited ways to track such small animals. Some metamorphs are known to simply burrow into their natal pool, remaining at a breeding site that has been successful at least once. Current radio telemetry equipment has limitations in this application: metamorphs are too small for transmitters with any significant power and battery life span. Other methods may be suitable to tracking metamorph movement and could be investigated.

Survivorship across all age classes is unknown. Although 1,000's of eggs may be laid and 100's of metamorphs make it out of the breeding pool, the number that actually make it to adulthood and contribute to subsequent generations is complicated. Survivorship is highly variable across years and sites for all age classes. Insufficient rains may result in a complete lack of breeding or the desiccation of tadpoles before they can leave the pool. Extended drought may result in the deaths of even adults buried deep underground. Understanding the dynamics of western spadefoot survivorship would require years of research in order to include good years, bad years, and average years, following multiple age classes and animals in different environmental settings. Knowing how much the species can withstand would provide information as to what represents a sustainable population and how to identify when a population might be at risk of extirpation.

The ability to survive between years is critical to the species in an environment where breeding may not succeed every year. The longevity of the adults and the ability to persist through the lean times has allowed western spadefoot to survive on this landscape. The typical lifespan of the western spadefoot is

currently unknown. From the USGS pitfall trapping data, recapture records are rare but there is one potential animal with a 7.75 year recapture trapping history. The majority of western spadefoot are not seen after the first time they are trapped. Twenty-three recaptures were within the same 4 or 10 day sample period. Six were within the same year and six were between 1 and 3 years. If droughts become extended in the future, adult western spadefoot must live long enough to make it from one successful breeding opportunity to the next.

Species Conservation

Patch size and upland habitat buffers

Based on the results from the USGS pitfall trapping within San Diego County over the past two decades, there are several potential impacts to consider in the conservation of the western spadefoot in the Plan Area. Western spadefoot were not found in habitat patches less than 217 ha (Table 2). An 830 m buffer of habitat around a single breeding pool would be needed to begin to approach the minimum patch size required by western spadefoot based on the USGS capture records. A 400 m buffer around the known western spadefoot breeding sites in the Fanita Ranch-Upper Subunit merge together and begin to approach this size of area (286 ha). A 400 m buffer around the breeding pools in the Fanita Ranch-Upper Subunit would also provide connectivity to the potential habitat outside of the Plan Area. A 300 m buffer would split the breeding pools in the Fanita Ranch-Upper Subunit, resulting in the southern set of pools being in a patch that is likely too small (81 ha) to sustain the species if all surrounding lands outside the buffer are developed and there is no means of connectivity provided. A 400 m buffer would not result in a minimum patch size compatible with western spadefoot for the breeding pond in the Fanita Ranch-Lower Subunit. Development surrounding and isolating the western spadefoot breeding pools on the Fanita Ranch-Lower Subunit from the rest of the Fanita Ranch Subunit, even with a 400 m conservation buffer around the pool, would likely result in too small a habitat patch to sustain the species. The Magnolia Subunit represents a patch of habitat approximately 225 h in area but is connected to habitat in the Fanita Ranch Subunit all along the north and west, representing a much larger patch of habitat. The Mission Trails Subunit is in a 775 ha habitat patch extending out to Mission Gorge Road, beyond the boundaries of the Plan Area. A 400 m buffer around the potential pools in the Mission Trails Subunit likely would be insufficient to maintain a western spadefoot population if all surrounding habitat were lost. The habitat in the Rattlesnake Mountain Subunit was estimated at 160ha but would be divided into several smaller patches based on the roads and housing developments now present in the area. There are no known breeding pools within the Rattlesnake Mountain Subunit. Even if breeding pools did exist within the Rattlesnake Mountain Subunit, the habitat patch is already smaller than the minimum predicted for western spadefoot based on the USGS pitfall findings. If potential future development limits the available habitat to the minimum 400 m conservation buffer around the known localities, the Fanita Ranch-Upper, Magnolia, and Mission Trails Subunits would be at the lower limits of the size and connectivity compatible with western spadefoot persistence, any smaller and the habitat fragment may be insufficient to sustain the species.

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Urbanization, connectivity, and edge effects

Based on the Davidson et al. (2002) findings, all of the subunits would be estimated to be too heavily developed to support western spadefoot, but with the inclusion of the USGS pitfall data, it can be seen that western spadefoot can persist in areas with levels of development consistent with that found in the Plan Area currently. The 5,000 m buffer around the Fanita Ranch-Upper, Fanita Ranch-Lower, and Magnolia Subunits are between 14 and 40% developed, with western spadefoot confirmed in the Fanita Ranch Subunit. Further urbanization and development within the 5,000 m buffer around these sites would push each further out of the suitable range for western spadefoot occupation. The Mission Trails and Rattlesnake Mountain Subunits have between 60 and 73% development within the 5,000 m buffer and may be unsuitable for western spadefoot based on Davidson et al. (2002) and the USGS pitfall results for San Diego (Table 2).

The potential edge effects and the degree to which each extends into the natural landscape are highly variable and their impacts on western spadefoot may not be fully understood. The potential for increased fire frequency with increased development and a departure from the natural fire regime exist but with increased development also comes increased fire suppression resources. One edge effect that has been measured is the spread of Argentine ants: 200 m into the habitat from the urban edge. A 200 m interior buffer within the Rattlesnake Mountain Subunit would include nearly the whole property; only minute portions of the subunit are more than 200 m from the urban edge. All of the known breeding pools in the Fanita Ranch Subunit are currently more than 200 m from the urban edge but since Argentine ants often follow water and stream courses, these breeding pools may be susceptible to invasion as well if a source for Argentine ants becomes established nearby. The Mission Trails and Magnolia Subunits also have urban edge, but would also contain some area outside of the 200 m range of the Argentine ant.

The exact level of connectivity and the specifics of those connections are unknown for western spadefoot, but it is safe to estimate that there is no connectivity between the Mission Trails Subunit and any other subunit. The same applies to the Rattlesnake Mountain Subunit. Currently, the Fanita Ranch-Upper, Fanita Ranch-Lower, and Magnolia Subunits are estimated to be fully connected to each other and to the larger western spadefoot population in the habitat areas beyond the Plan Area. Multiple routes past any potential future barriers could be included in planning to provide multiple options for western spadefoot and other wildlife movement. Providing wildlife with multiple options to find movement routes that work best for their specific needs could increase the likelihood for success. Eastern spadefoot have been documented moving through culverts previously but additional information may be needed to determine the optimal dimensions of such structures.

Management Considerations

If the objective is to maintain western spadefoot within the Plan Area, maintaining and protecting breeding sites and adjacent upland foraging habitat, minimizing direct mortality, and providing opportunities for movement into and out of the population could be beneficial to the long-term persistence of western spadefoot. To help increase the probability of western spadefoot success, the following actions are identified for consideration:

- Maintaining connectivity between the known breeding sites within the Fanita Ranch Subunit as informed by the results of the genetic analysis currently underway could increase the likelihood of western spadefoot persistence. Actions that could be taken include:
    - Providing access to upland habitats between the breeding pools.
    - Minimizing barriers to movement between breeding sites.
    - Allowing for redundant routes. Limiting movement to one route runs the risk of complete failure if that route becomes compromised or is somehow unsuitable.
    - Incorporating the widest corridors possible. The wider the corridor the better. 50 m has been recommended for other amphibian species.
- Suitable breeding sites could be created or enhanced as evidenced by the use of road rut pools.
    - Where pools are lost or disturbed during development, compensate where possible.
    - Limiting potential breeding sites to just a few or one pool could be detrimental to the species. Redundant pools provide options and a failsafe for the potential that some may fail while others succeed.
    - Surveys could be performed to determine locations with soil characteristics compatible with the formation of breeding pools and water retention if artificial pools are created. Soil types within the Plan Area are variable and not all may be suitable for breeding pools. Within the Plan Area, western spadefoot were found on five soil categories (Figure 14), but have been documented to use additional soil categories by the USGS pitfall efforts (Table 3). Combined, these soil categories cover large portions of the Fanita Ranch, Magnolia, and Mission Trails Subunits.
    - The Mission Trails Subunit is a potential restoration site. The soil types along the upper mesa are consistent with those in the Fanita Ranch-Upper Subunit where western spadefoot have successfully bred in recent years. If existing pools are enhanced or new pools are built, public access and disturbance will need to be directed away from sensitive areas. The high levels of development surrounding this site may preclude it from being suitable, an important consideration before any restoration at the site.
    - Within the Fanita Ranch-Lower Subunit, only one significant pool is known, but it is the nicest quality vernal pool habitat onsite. Other locations along the ridgelines and dirt roads could also potentially be modified to act as new breeding pools. The western spadefoot habitat model and soil types are consistent with western spadefoot presence across the Fanita Rancho-Lower Subunit.
    - No western spadefoot or western spadefoot breeding sites were mapped in the Magnolia Subunit although there is suitable habitat based on the SDM and soil types. Several western spadefoot occurrences within the Fanita Ranch Subunit are just outside of the Magnolia Subunit. Artificial pools built on the Magnolia Subunit have the potential to be colonized naturally from the surrounding population.
- Translocation efforts may help establish additional populations of western spadefoot within the Plan Area.
    - Investigating existing genetic structure within the area is important before translocation efforts begin. If any genetic divergence exists within the region, efforts could be taken to maintain the genetic distinctiveness of the populations. If animals are moved, efforts

could be taken to ensure that they are not moved into areas of differing genetic signatures.
    - In spring 2017, several small pools at the Mission Trails Subunit held small amounts of surface water. The duration of water in these pools and the presence of any resident western spadefoot should be evaluated before considering translocating any western spadefoot to the site. If the existing pools do not hold water continuously for six to eight weeks, western spadefoot may not be able to successfully reproduce. The level of development surrounding the Mission Trails Subunit and its isolation from any other suitable habitat may exclude the site as a potential translocation site.
    - Translocations within the Fanita Ranch Subunit may be appropriate where known breeding pools will be disturbed. The high levels of breeding success may qualify these pools as donor sites from which tadpoles can be harvested and moved to other locations out of the way of development.
    - The Rattlesnake Mountain Subunit could be insufficient to support western spadefoot and is not recommended for any translocation efforts. Although there are patches of modeled habitat estimated to be suitable for the species and there are soil types commonly used by the species, there is no connectivity to any larger habitat patches, limited sources of water, and development levels well above those suitable for the species.
    - Monitoring any tadpoles translocated to either natural pools or artificial pools through metamorphosis or desiccation of the pool would provide evidence of success and / or possibly lessons learned for the future. Surveys are best done every two to three weeks to document the progress of the tadpoles and the condition of the pool. Pools that dry before the tadpoles are able to metamorphose may be lacking in some feature and are best reconsidered before future translocation efforts.
- Minimizing long term disturbance to breeding sites could be beneficial for western spadefoot. Actions that could be taken include:
    - Erecting barriers on public access trails near breeding sites to prevent direct access to pools while still allowing wildlife access to the resource, and closing trails during rain events and several days afterwards, if possible.
    - Avoiding light pollution near breeding sites. Street lamps, parking lots, and flood lights at sport fields can be disruptive to the nocturnal breeding behaviors and activities of western spadefoot.
    - Including western spadefoot breeding sites in the fire management plan developed for the open lands. Providing fire suppression crews with information on the biological values. Meeting with fire command personnel to review suitable staging areas for suppression efforts.
- Reducing direct mortality of adults from roads could help the long-term persistence of western spadefoot within the Plan Area. Actions that could be taken include:
    - Providing movement routes for western spadefoot that will keep them out of harm's way: culverts, bridges, and barriers along the edges of roadways.

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- Determining where western spadefoot are entering the road and considering whether the situation can be modified to reduce access to the road surface.
- During the time of year that metamorphs are dispersing from the breeding pools, consider ensuring that they also have the means to safely cross roads and move past barriers.

Monitoring Considerations

Monitoring the western spadefoot can ensure continued persistence and help with evaluation of whether goals are being met. It is not typically difficult to determine if western spadefoot are present. During the winter, western spadefoot tadpoles can be observed in the breeding pools for up to eight to ten weeks after breeding, but it can be as little as 40 days. Surveys for western spadefoot can begin within a week of the first significant winter rain, as early as October or November. Surveys for western spadefoot eggs and tadpoles can be done during the day and do not require nighttime surveys. If western spadefoot are not detected after the first rains, surveys should be repeated with the next rain event. Once breeding has been confirmed, surveys can be repeated at four to six week intervals to document the success or failure of the breeding effort. It is not uncommon for western spadefoot to fail to breed every year. Nighttime surveys for adult western spadefoot can be done at the onset of the rainy season if desired or if breeding pools do not fill. Listening for calling males is a fast way to determine whether the species is present or not. The presence of eggs and tadpoles is also a positive sign that adults are present.

Summary

Western spadefoot are only known to occur in the Fanita Ranch Subunit of the Plan Area. Based on observations in 2005 by Dudek (2017) and USGS in 2017, the Fanita Ranch-Upper Subunit has a self-sustaining population with 100's of metamorphic western spadefoot making it out of the breeding pools in 2017. The pitfall trapping efforts over the past two decades across Southern California indicate that western spadefoot do better in larger patches, with more captures and a higher distribution within those patches. Drawing from the current knowledge of western spadefoot movement, a buffer of 300 to 400 m around the breeding sites will also protect the upland habitat needs for the species. Western spadefoot tend to be found in areas with low levels of urban development within a 5,000 m radius, but results within Southern California indicate that they can persist at intermediate levels as well. Existing development levels around the western spadefoot sites within the Fanita Ranch Subunit are within those observed at other locations with western spadefoot in San Diego County, but the Rattlesnake Mountain and Mission Trails Subunits may already have too much development within the adjacent landscape. Edge effects may include a-seasonal flow, other alterations to the watershed dynamics, increased risk of fire and departure from the traditional fire pattern, and direct mortality due to roads. There is currently little connectivity between the widely dispersed habitat patches as predicted in the species distribution model: only the Fanita Ranch and Magnolia Subunits appear to be connected at any larger landscape level to surrounding western spadefoot habitat or populations.

The greatest risk to western spadefoot survival is twofold, lack of reproduction and adult mortality. The absence of breeding success in any single year at a given pool may be negligible to the long term survival

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of the species. Western spadefoot are adapted to an arid environment with intermittent and variable rainfall. As long as the adults survive across multiple years, they will have the opportunity to breed in a subsequent year. How long a population of western spadefoot can go without successful breeding is unknown. As long as there are pools to breed in and there are enough adults, the western spadefoot will try again. Without breeding pools, the presence of adults is irrelevant, and without adult western spadefoot, the presence of breeding pools is irrelevant. Between environmental hardship, predators, and foraging, an adult western spadefoot represents a very small proportion of those that started out. Exact survivorship is unknown but explosive breeders like western spadefoot, where 1,000's of offspring are produced at once, typically have a low survivorship. Only a few individuals make it to adulthood to contribute to the next generation. Losing 10, 20, 30, or 100 tadpoles in a year to unnatural causes, as tragic as that might be, would not compare to needlessly losing 10 or 20 breeding adults in a population in a year. Without sufficient breeding sites, a population cannot survive. Without the breeding adults, a population cannot survive.

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Tables

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Table 1. Vegetation types in the Plan Area.

Vegetation Type	Area, ha	Percent
Urban, Disturbed Habitat, Agriculture, Eucalyptus Woodlands	2321.974	54.225%
Coastal Sage Scrub	1118.388	26.118%
Chaparral	335.620	7.838%
Grassland	310.097	7.242%
Water	80.625	1.883%
Riparian Scrub	74.568	1.741%
Riparian Forest	32.058	0.749%
Marsh	6.343	0.148%
Other Woodlands	2.326	0.054%
Riparian Woodland	0.129	0.003%

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Table 2. The four shaded sites below are areas within the Plan Area that were modeled as potential western spadefoot habitat. The level of developed and undeveloped habitat within a 5,000 m radius of each site, along with that of USGS pitfall sites in San Diego County, shows that, while development levels are high, western spadefoot do manage to persist.

Site	Undeveloped	Developed	Captures[c]
Chula Vista 1	19.24%	80.76%	0
Rattlesnake Mountain Subunit	27.46%	72.54%	
Torrey Pines 2[a]	39.36%	60.64%	0
Torrey Pines 1[a]	39.93%	60.07%	0
Mission Trail Subunit	40.29%	59.71%	
Torrey Pines 3[a]	41.23%	58.77%	0
Cabrillo National Monumenta	42.65%	57.35%	0
Chula Vista 2	44.49%	55.51%	1
Tijuana Estruary[ab]	45.32%	54.68%	4
Del Mar Mesa	49.01%	50.99%	4
Carmel Mountain	49.34%	50.66%	9
Cowles Mountain	50.17%	49.83%	0
Spring Canyon[b]	54.62%	45.38%	8
Fanita Ranch-Lower Subunit	59.11%	40.89%	
Elliott	63.23%	36.77%	11
San Diego National Wildlife Refuge	69.57%	30.43%	32
Crestridge Ecologial Reserve	81.54%	18.46%	0
Fanita Ranch-Upper Subunit	85.90%	14.10%	
Camp Pendleton-3[a]	90.64%	9.36%	3
Camp Pendleton-1	96.48%	3.52%	19
Wild Animal Park	96.76%	3.24%	44
Camp Pendleton-2	98.29%	1.71%	11
Rancho Jamul ER	98.95%	1.05%	44
Little Cedar Ridge	99.74%	0.26%	0
Marron Valley	99.81%	0.19%	51
Japatul Valley	99.90%	0.10%	0
Santa Ysabel OSP	99.93%	0.07%	2

a - excludes open ocean
b - excludes undescribed land in Mexico
c - raw number of spadefoot captures without any correction for the number of pitfall arrays or sample days

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Table 3. Western spadefoot occurrences within the Plan Area occur on five different soil categories. From the USGS pitfall surveys, western spadefoot have been found on several additional soil categories within San Diego County, many of which are also found in the Plan Area. Western spadefoot occurrence records in the Plan Area are from Dudek (2017).

Soil Category	USGS Pitfall Site													
	Carmel Mountain	Camp Pendleton	Chula Vista 2	Del Mar Mesa	Elliott	Marron Valley	Rancho Jamul ER	Spring Canyon	San Diego National Wildlife Refuge	Santa Ysabel OSP	Tijuana Estruary	Wild Animal Park	Santee Plan Area Spadefoot Occurences	Soil Categories within the Santee Plan Area
Carlsbad gravelly loamy sand	X													
Cieneba coarse sandy loam							X							X
Cieneba rocky coarse sandy loam		X											X	X
Cieneba very rocky coarse sandy loam		X							X					X
Cieneba-Fallbrook rocky sandy loams												X		X
Crouch rocky coarse sandy loam										X				
Diablo clay		X												X
Escondido very fine sandy loam							X							
Fallbrook sandy loam		X							X			X		X
Friant rocky fine sandy loam						X	X		X					X
Hambright gravelly clay loam		X												
Holland stony fine sandy loam										X				
Las Flores loamy fine sand		X												X
Las Posas fine sandy loam							X							
Las Posas stony fine sandy loam							X							X
Linne clay loam								X					x	X
Loamy alluvial land-Huerhuero complex	X													
Olivenhain cobbly loam								X						
Redding cobbly loam					X									X
Redding cobbly loam dissected					X								X	X
Redding gravelly loam	X			X	X								X	X
San Miguel-Exchequer rocky silt loams			X											
Sckpen gravelly clay loam								X						
Terrace escarpments				X							X			X
Tidal flats											X			
Visalia sandy loam							X							X
Vista coarse sandy loam									X			X		X
Wyman loam													X	X

Figures

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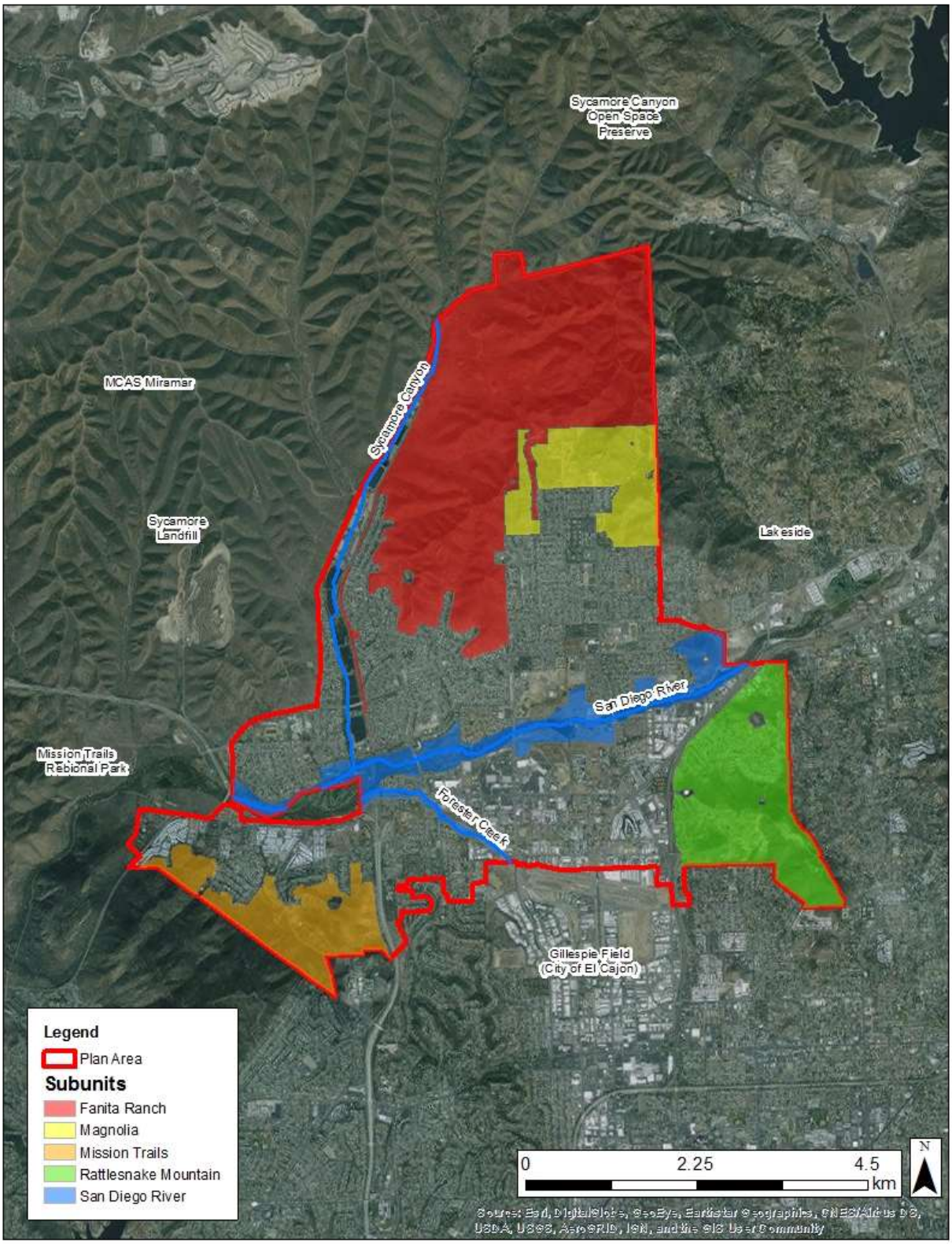

Figure 1. The five subunits within the Plan Area.

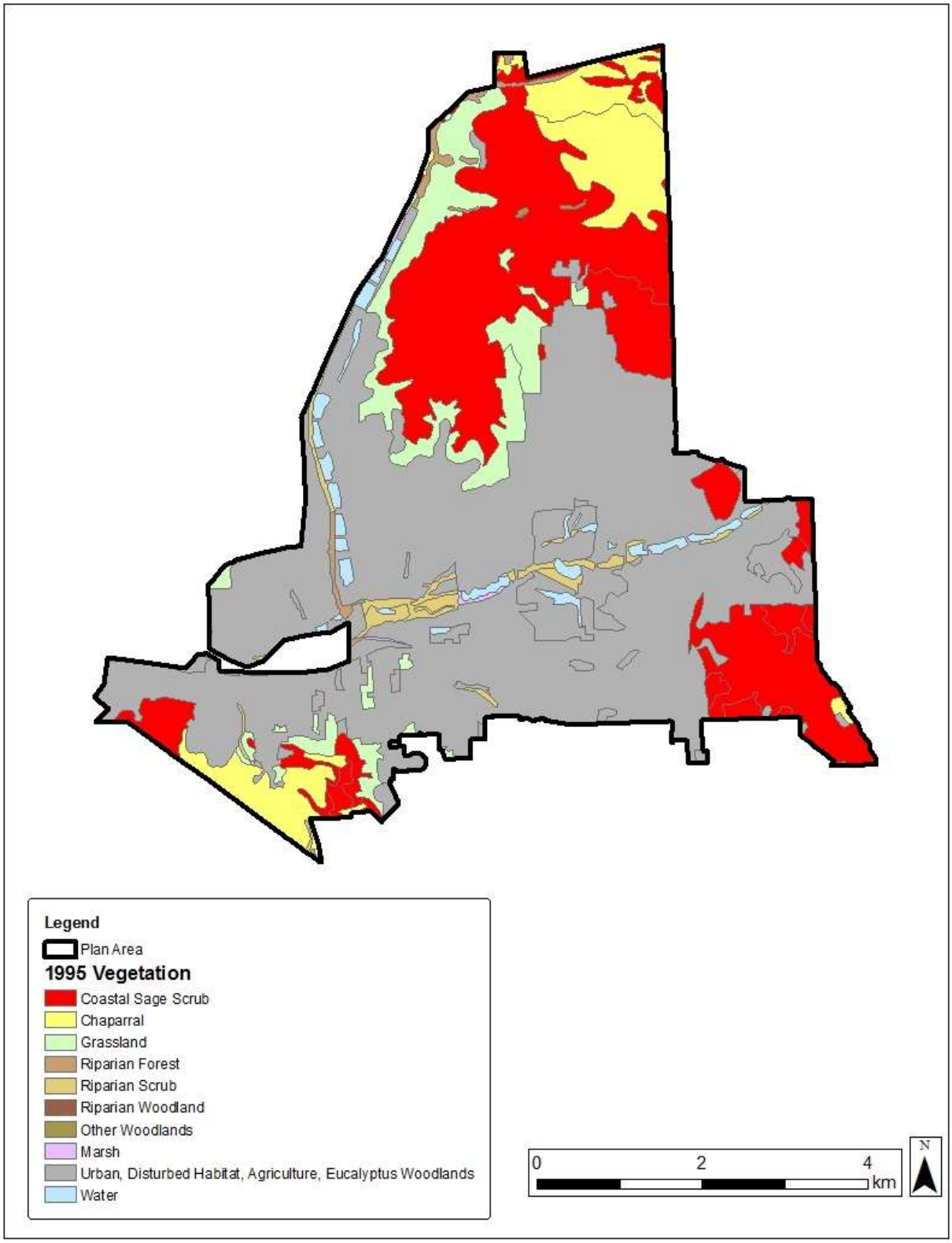

Figure 2. Vegetation within the Plan Area based on 1995 data. The Rattlesnake Mountain Subunit has been developed since this time and is now a mix of urban and coastal sage scrub.

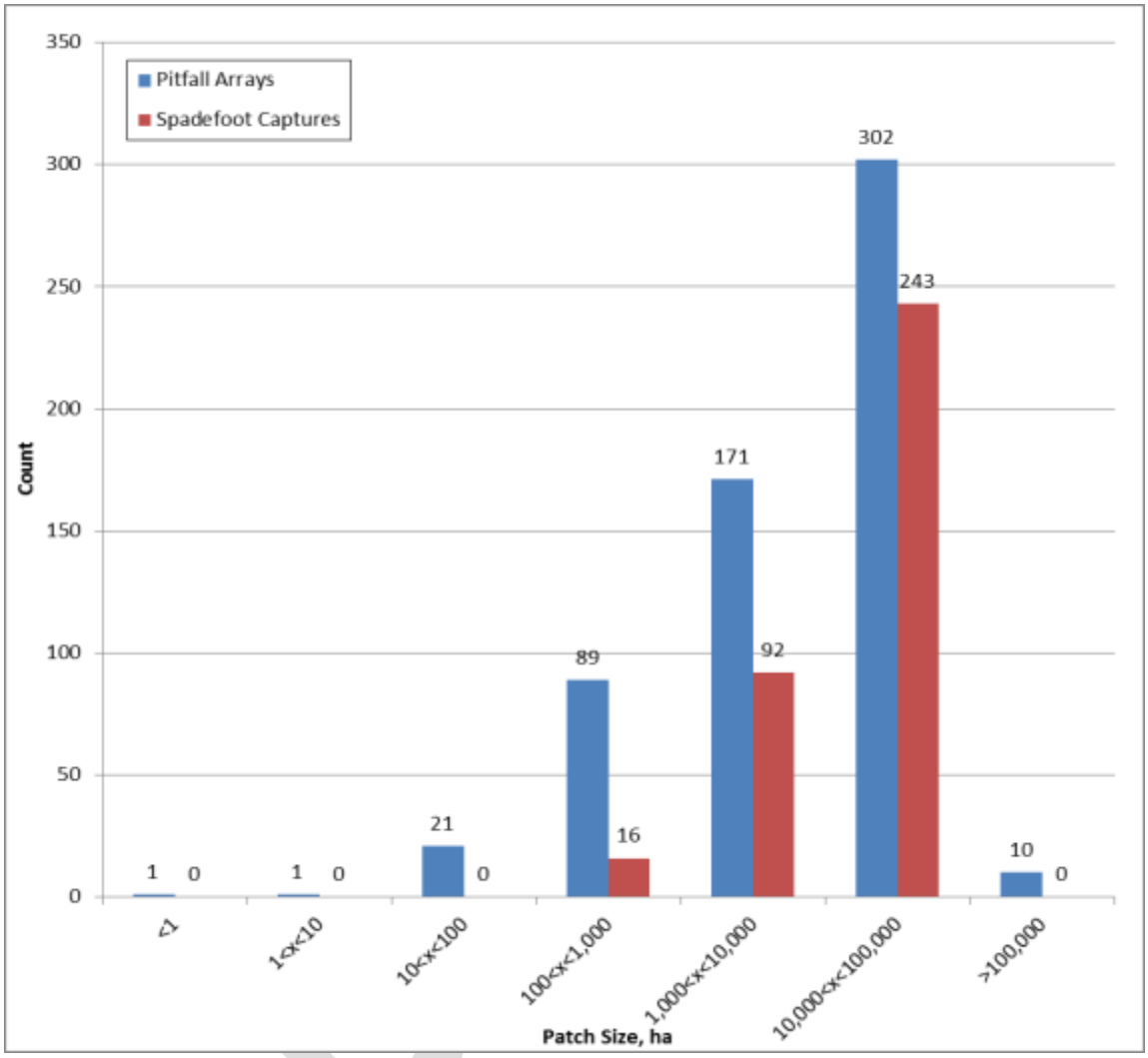

Figure 3. Western spadefoot captures within habitat patches of different sizes and the number of pitfall arrays within each patch size.

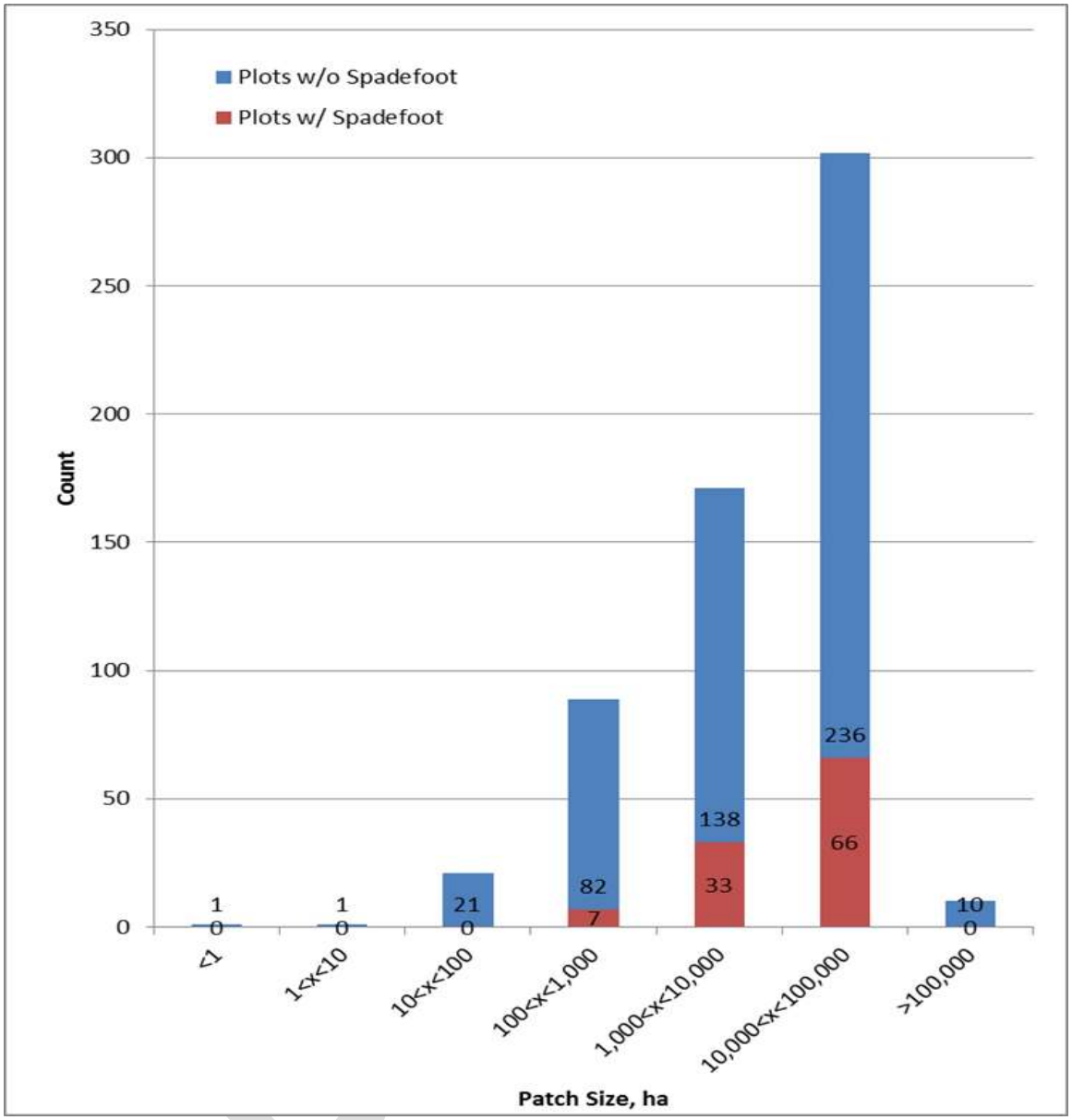

Figure 4. The number of pitfall arrays with and without western spadefoot captures based on patch size.

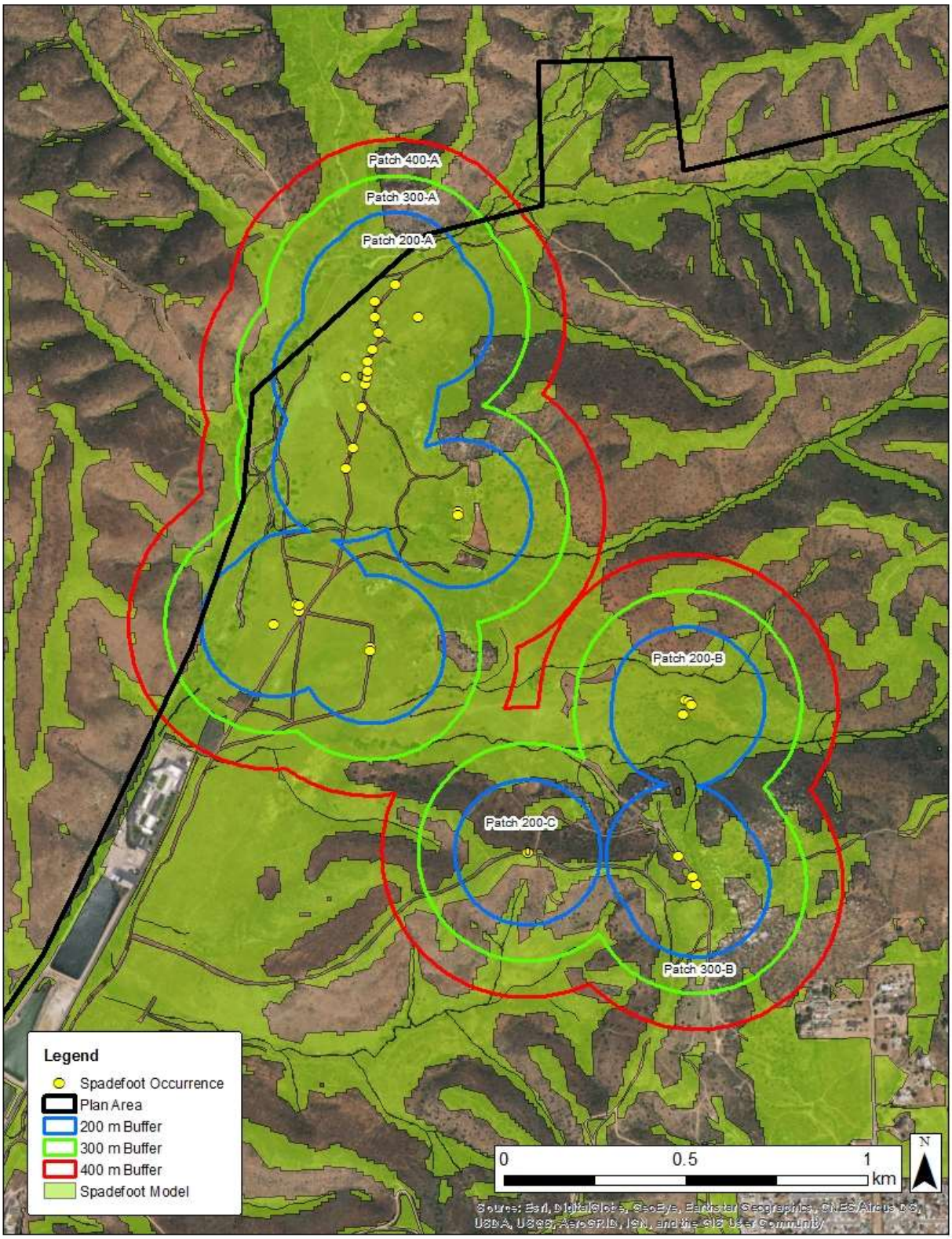

Figure 5. Western spadefoot localities within the Fanita Ranch-Upper Subunit with three levels of buffers: 200 m, 300 m, and 400 m. Western spadefoot occurrence records are from Dudek (2017).

Figure 6. Western spadefoot locality within the Fanita Ranch-Lower Subunit with three levels of buffers: 200 m, 300 m, and 400 m. Western spadefoot occurrence records are from Dudek (2017).

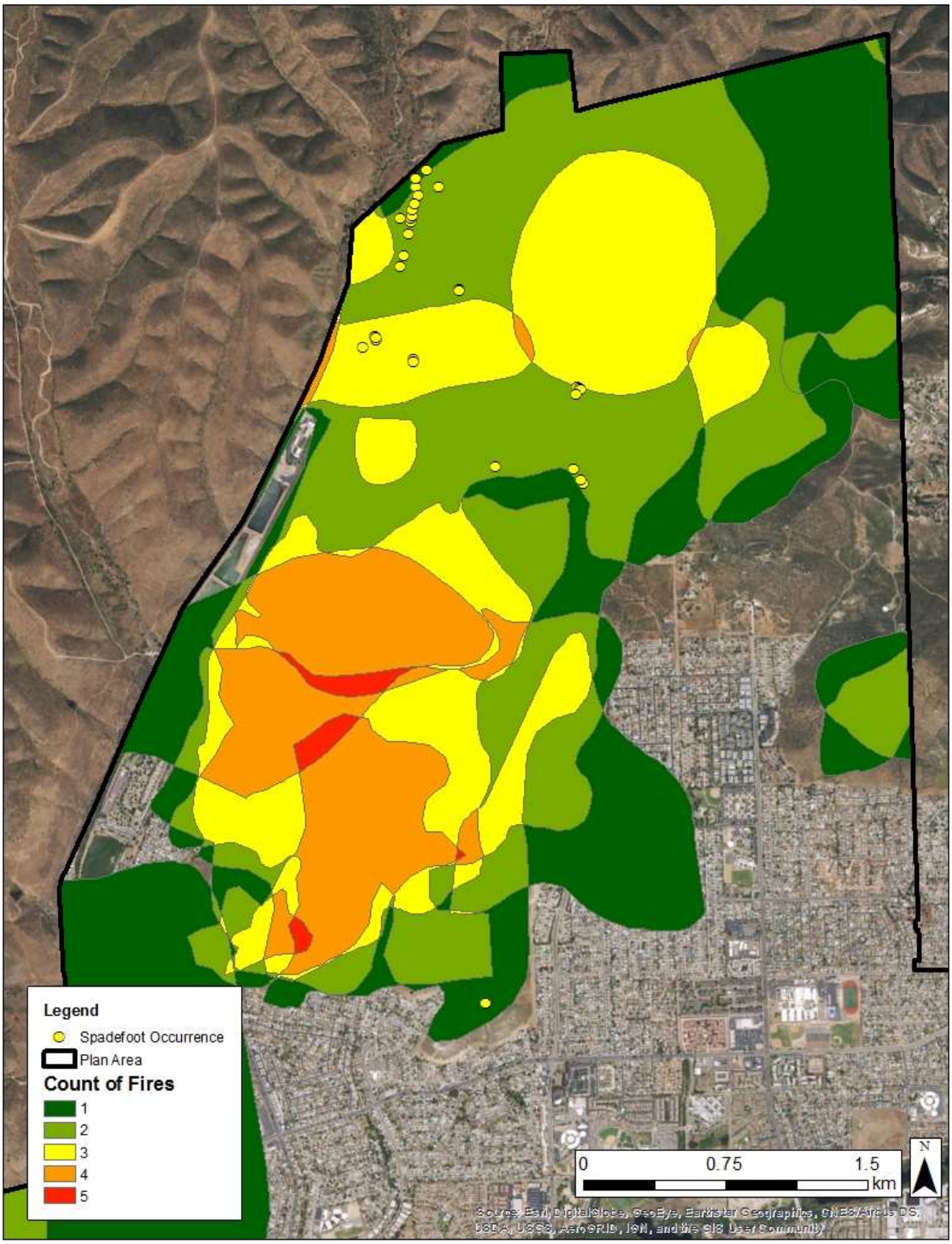

Figure 7. Western spadefoot localities within the Fanita Ranch and Magnolia Subunits and the number of overlapping fires that have occurred since 1910. Western spadefoot occurrence records are from Dudek (2017).

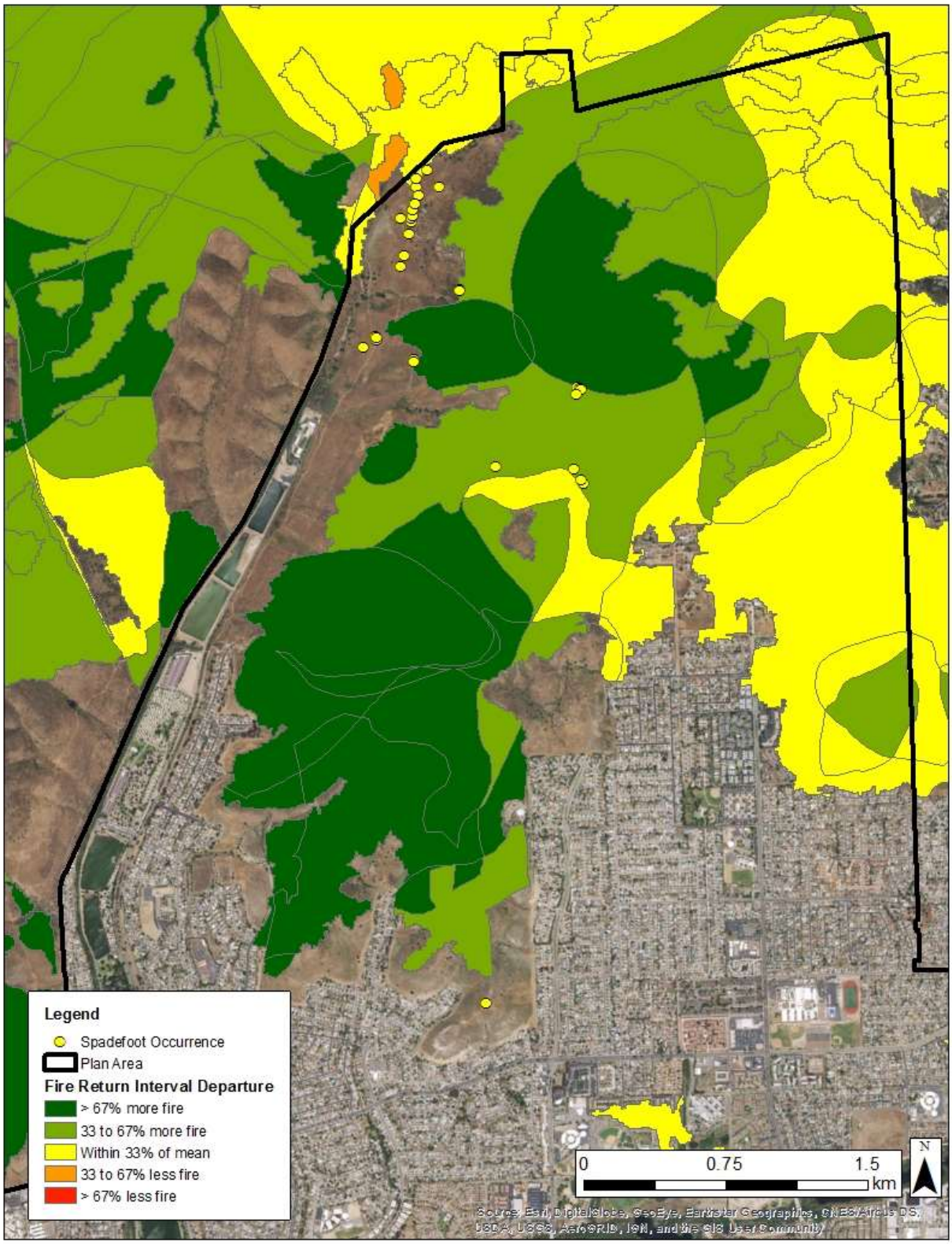

Figure 8. Western spadefoot localities within the Fanita Ranch and Magnolia Subunits and the Fire Return Interval Departure rating based on pre-European fire patterns and vegetation type. Western spadefoot occurrence records are from Dudek (2017).

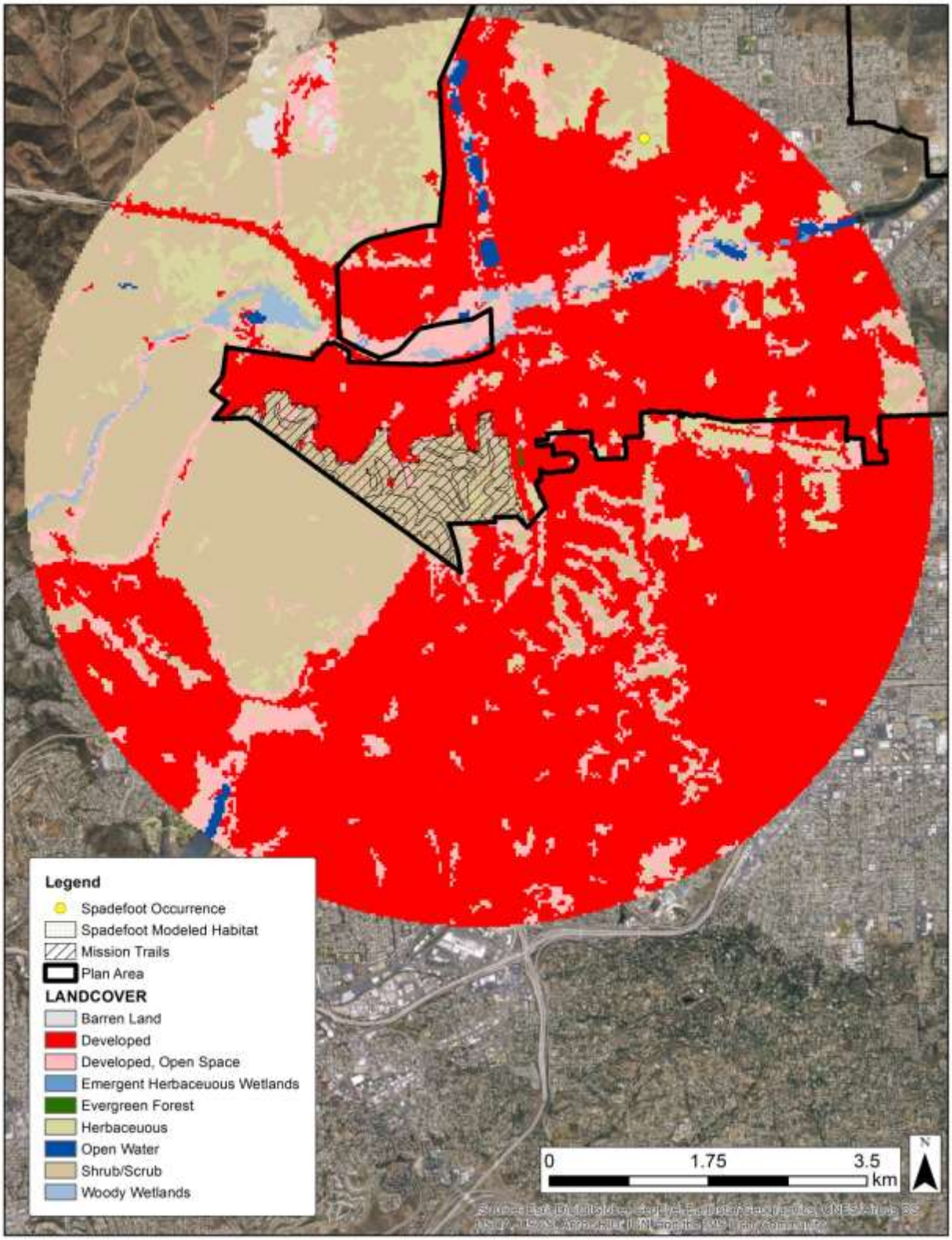

Figure 9. Land cover characterization in the Mission Trails Subunit within a 5,000 meter buffer around the predicted habitat suitable for western spadefoot. Nearly 60% of the area is developed. Western spadefoot occurrence records are from Dudek (2017).

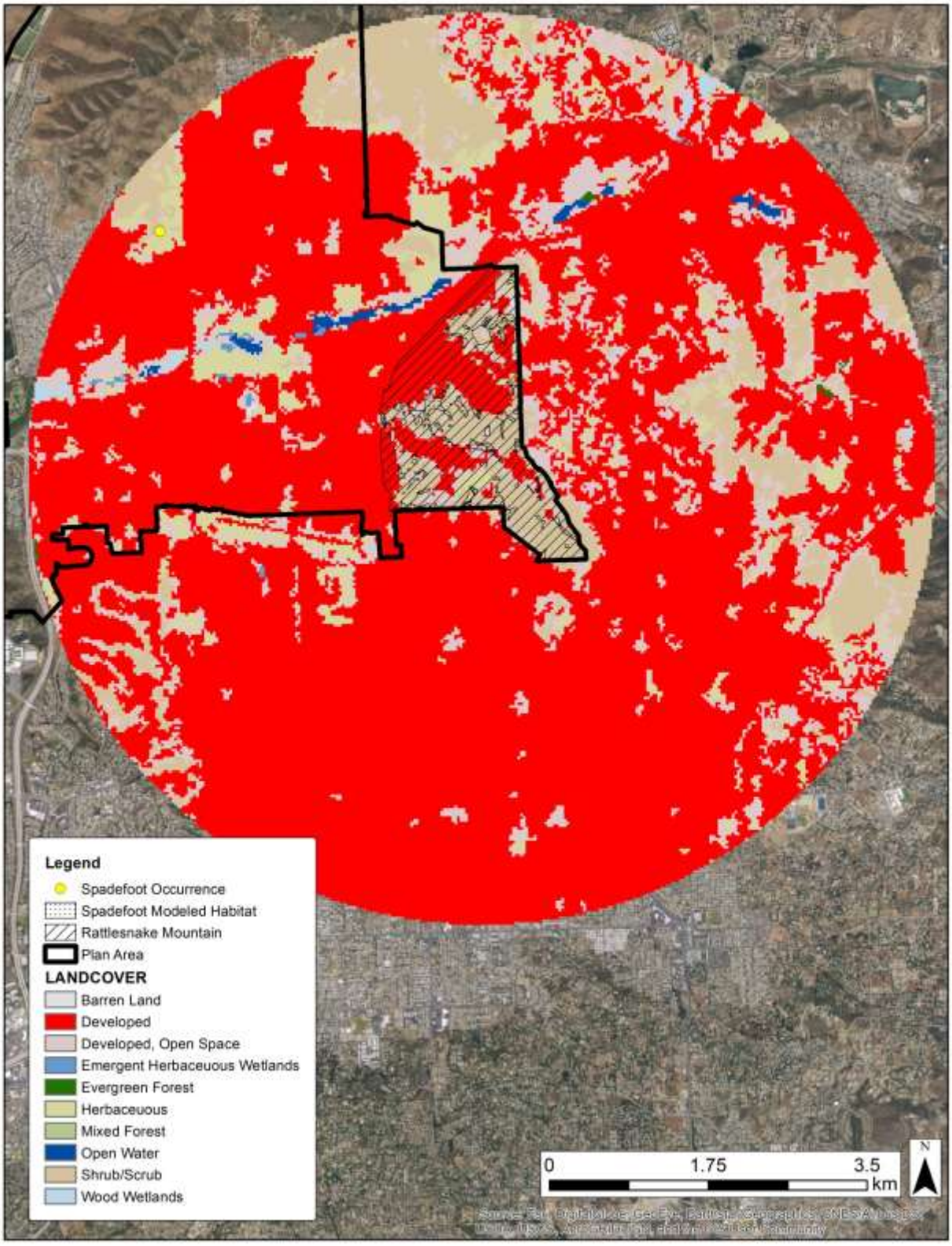

Figure 10. Land cover characterization near the Rattlesnake Mountain Subunit within a 5,000 meter buffer around predicted suitable habitat for western spadefoot. Within the 5,000 m buffer, 73% of the area is developed. Western spadefoot occurrence records are from Dudek (2017).

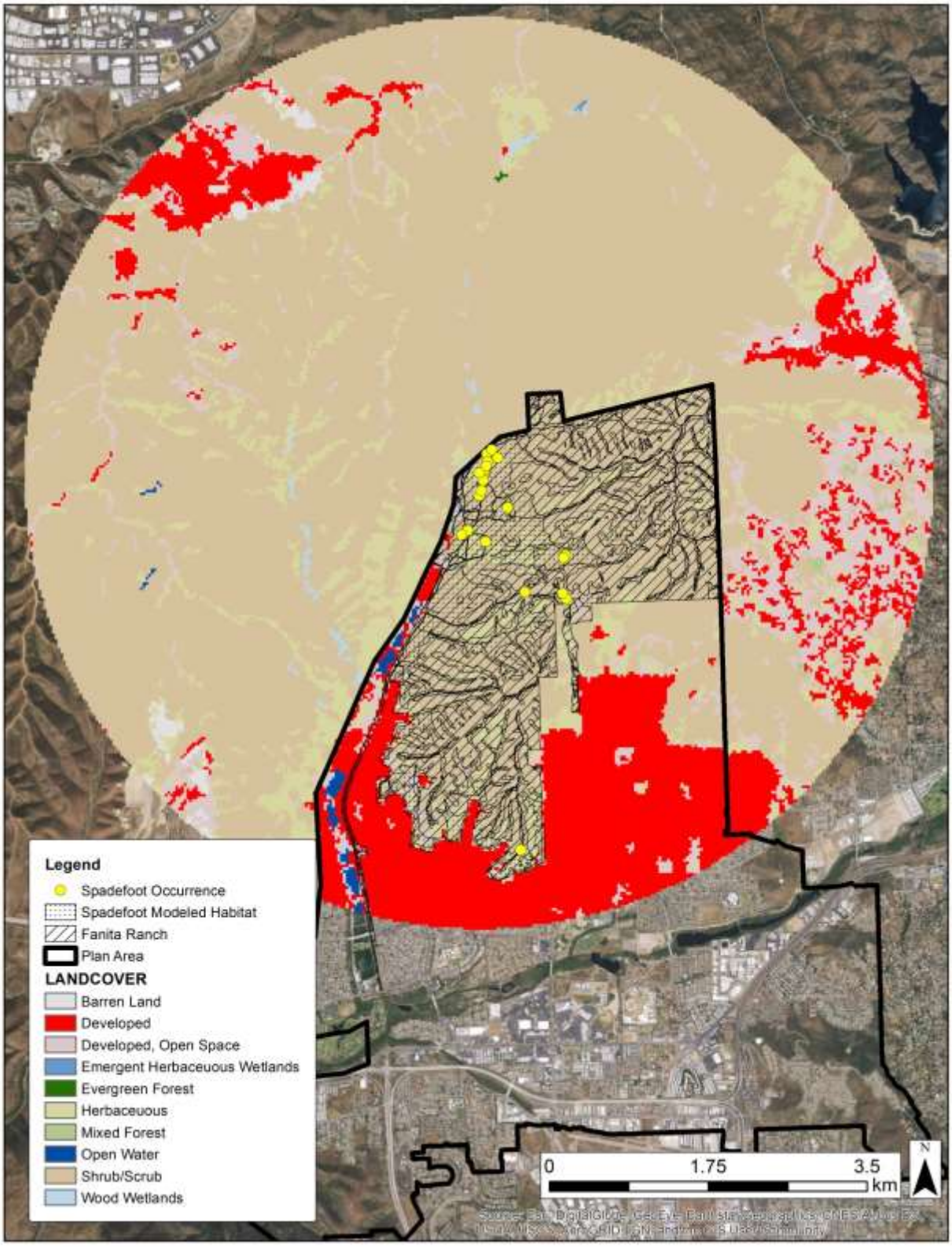

Figure 11. Land cover characterization of the northwest corner of the Fanita Ranch-Upper Subunit within a 5,000 meter buffer around predicted suitable habitat for western spadefoot. Only 14% of the area within the 5,000 m buffer is developed. Western spadefoot occurrence records are from Dudek (2017).

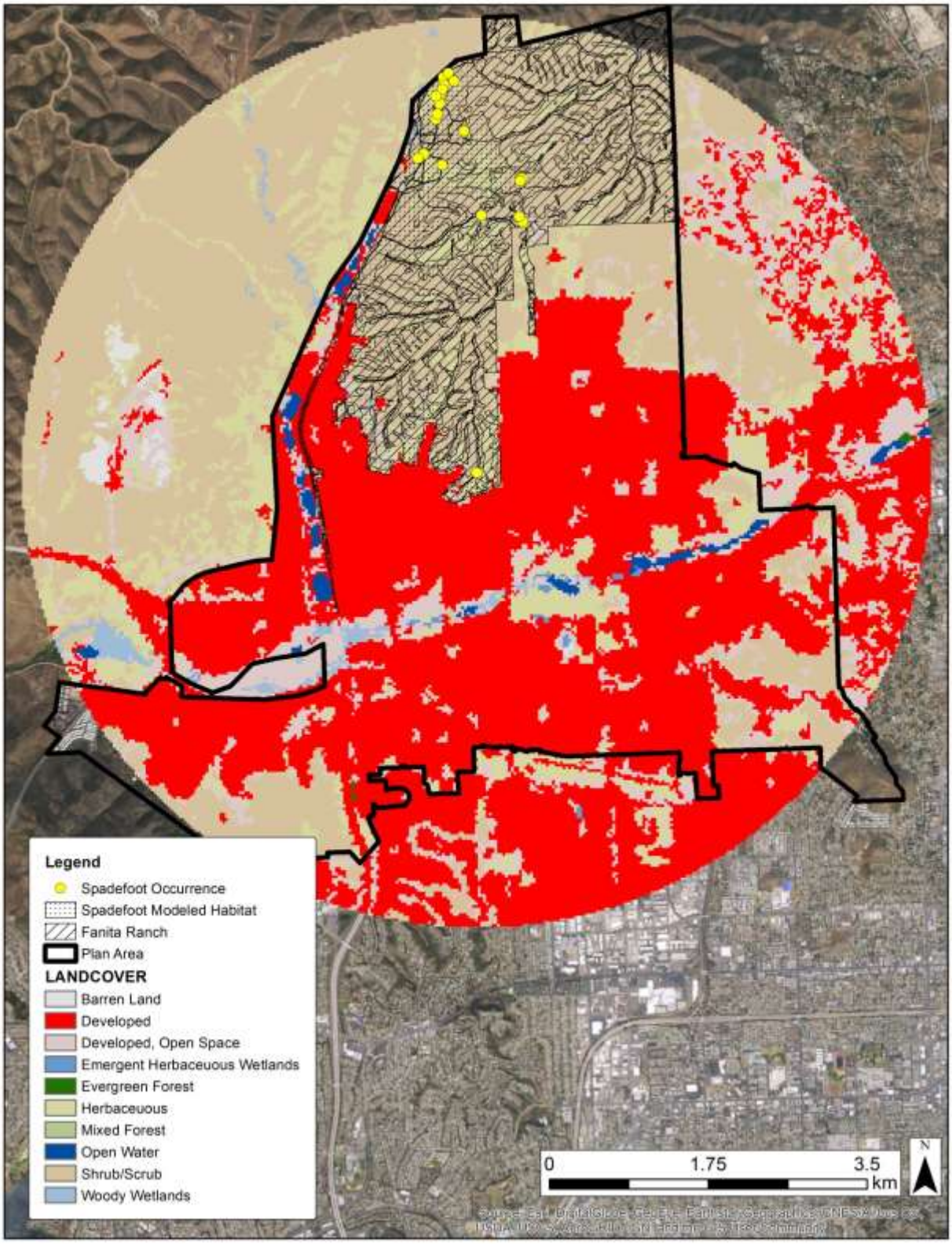

Figure 12. Land cover characterization of the south end of the Fanita Ranch-Lower Subunit within a 5,000 meter buffer around predicted suitable habitat for western spadefoot. Nearly 41% of the surrounding area is developed. Western spadefoot occurrence records are from Dudek (2017).

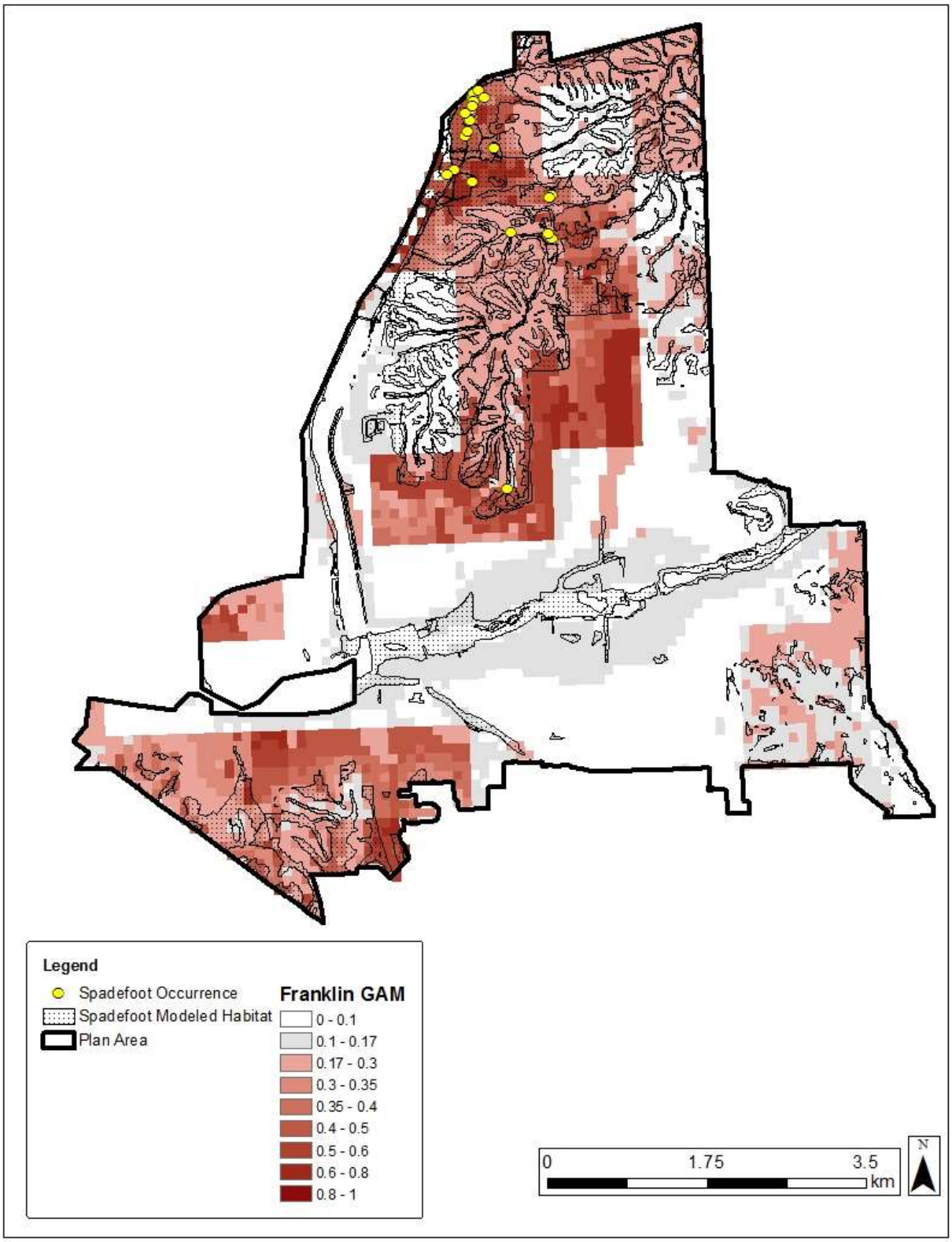

Figure 13. Species distribution model for western spadefoot provided by ICF and that provided by Dr. J. Franklin developed based on the USGS pitfall captures of the species. The General Additive Model (GAM) predicts the probability of western spadefoot occupying the cell. Western spadefoot occurrence records are from Dudek (2017).

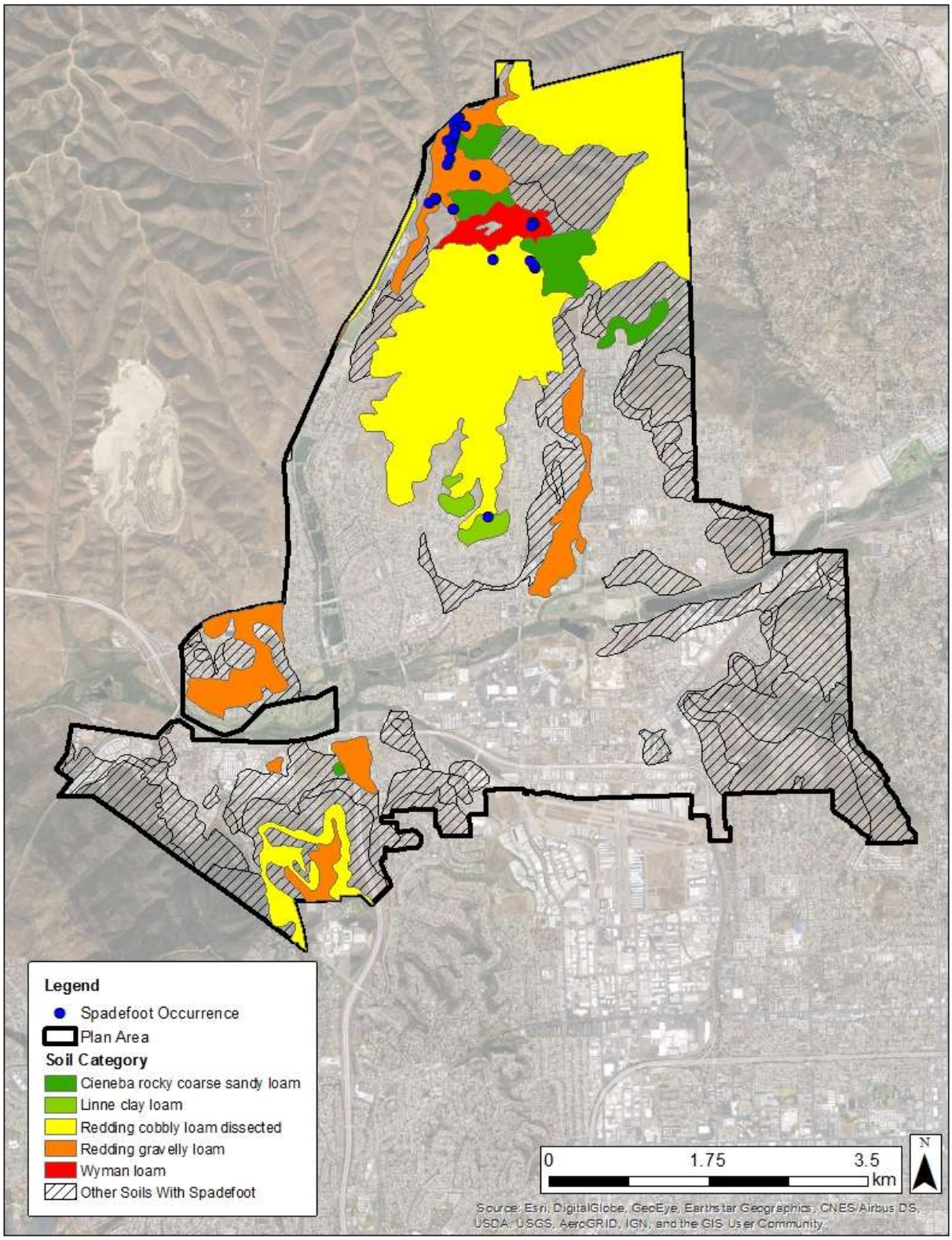

Figure 14. Within the Plan Area, western spadefoot have been found on five different soil categories which exist in the Fanita Rancho, Magnolia, and Mission Trails Subunits. Other soil categories used by spadefoot, based on the USGS pitfall surveys, are also shown. Western spadefoot occurrence records are from Dudek (2017).

Appendix 1

Dudek Data

The previous round of data on western spadefoot within the Plan Area was collected and provided by Dudek (2017). The data provided by Dudek appear accurate based on recent visits to the sites. 243 pools were mapped by Dudek, consisting of both natural pools and road rut pools (Figure 1.1). Western spadefoot were only documented in the Fanita Ranch Subunit (Figure 5 through Figure 13). The vernal pools that Dudek mapped in the north end of the Fanita Ranch Subunit are consistent with those found during the 2017 visits. The western spadefoot occurrence and pool mapped near the south end of the Fanita Ranch Subunit was also visited in 2017, but no western spadefoot were detected, they had already metamorphosed and left the pool by the time the pool was visited in 2017. One additional occupied road-rut pool was detected, which was not surprising as there was another 12 years of disturbance on the dirt roads since the last survey, so additional pools could form over this time.

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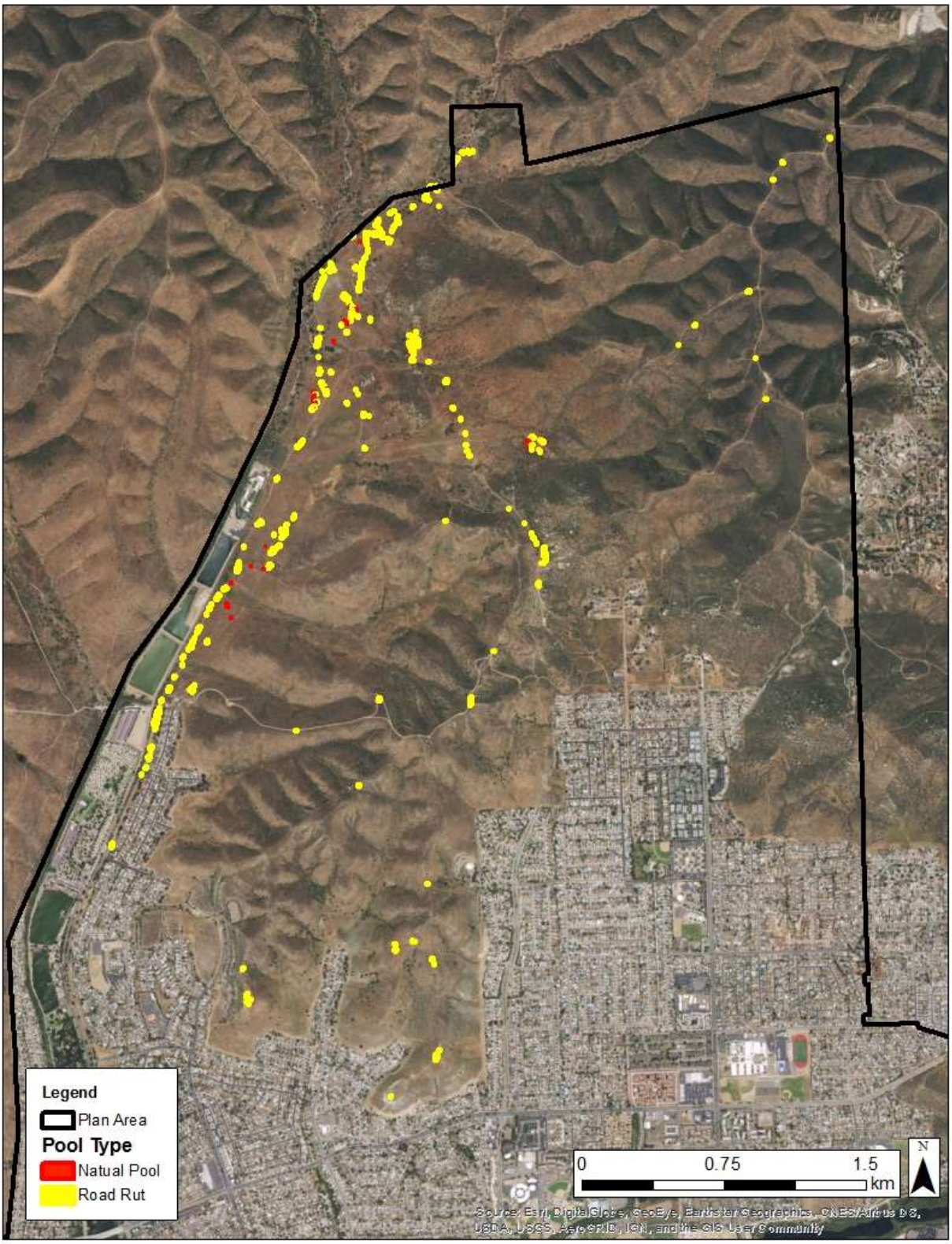

Figure 1.1 Potential western spadefoot breeding pools documented by Dudek (2017) in the Fanita Ranch Subunit. Both natural and road rut pools were mapped.

Appendix 2

USGS Site Visit: 9 Feb, 2017

The USGS, City of Santee, and ICF visited the modeled habitats in the Mission Trails Subunit and the northwest side of the Fanita Ranch Subunit. The habitat in the Mission Trails Subunit did seem like suitable habitat as modeled, but no western spadefoot were observed. There were several small pools of water but no sign that western spadefoot had bred at the site this year. Adjacent habitat outside the Plan Area might support pools and adults could be present within the Plan Area at this site. At the Fanita Ranch Subunit, multiple pools (road ruts) contained western spadefoot tadpoles (SCHA). Baja chorus frogs (HYRE), western skinks (EUSK), and fairy shrimp were also documented.

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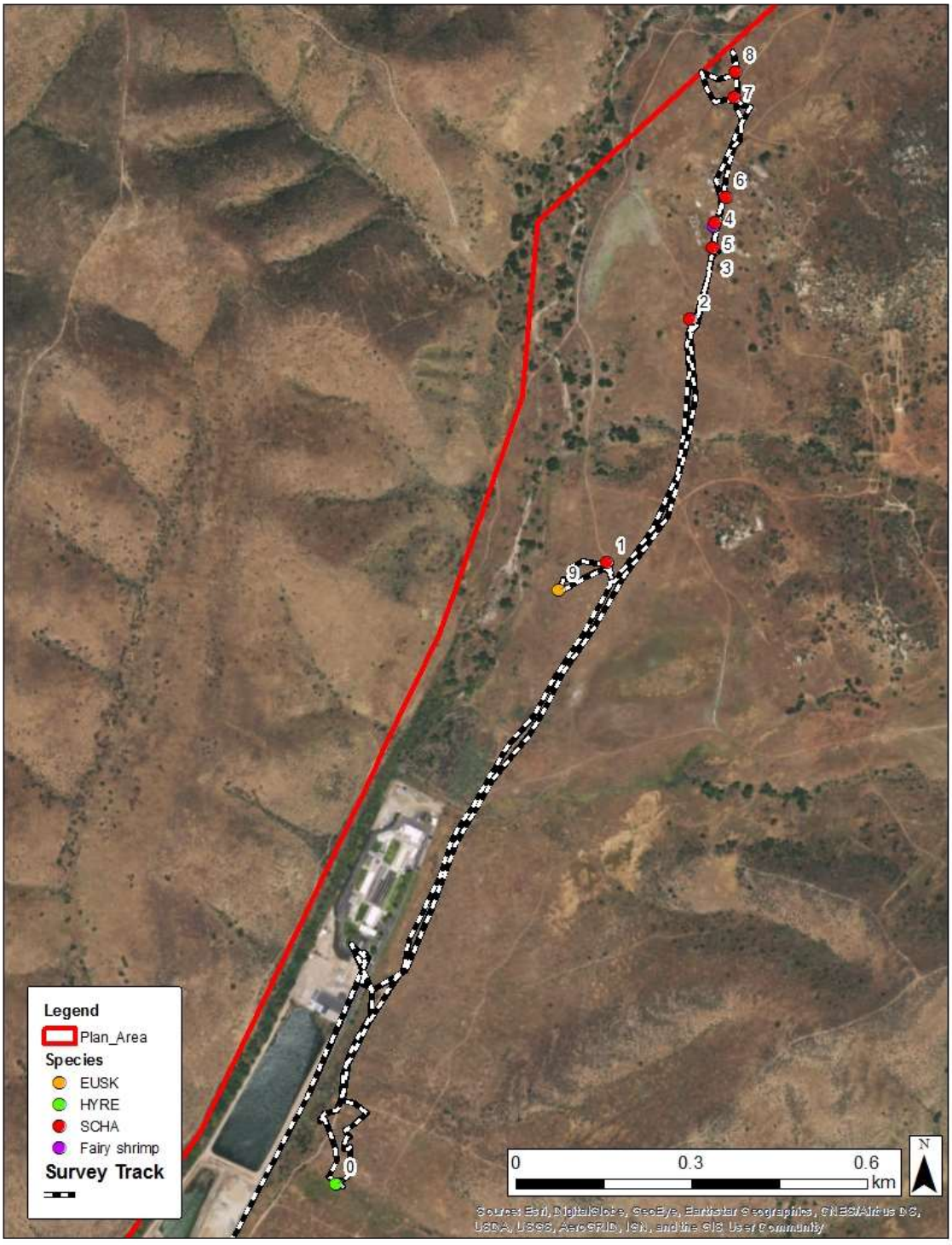

Figure 2.1 GPS track and species records from the north end of the Fanita Ranch Subunit (Points correspond to Table 2.1 below). Species are: EUSK – western skink, HYRE – Baja chorus frog, and SCHA – western spadefoot.

Figure 2.2 Western spadefoot tadpoles in a roadside pool.

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Table 2.1 Summary table for species observations on 9 February, 2017. Species are: EUSK – western skink, SCHA – western spadefoot, and HYRE – Baja chorus frog.

Point	Species	Age	Number observed
0	HYRE	Adult	1
1	SCHA	Tadpole	100
2	SCHA	Tadpole	200
3	SCHA	Tadpole	300
4	SCHA	Tadpole	300
5	Fairy shrimp	Adult	30
6	SCHA	Tadpole	200
7	SCHA	Tadpole	200
8	SCHA	Tadpole	50
9	EUSK	Adult	2

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Appendix 3

USGS Site Visit: 13 March, 2017

USGS visited the site to assess the developmental progress of the tadpoles and to collect tissue for genetic analysis. The same area at the north end of the Fanita Ranch Subunit was visited and an effort was made to get to the western spadefoot sites identified by Dudek in 2005(Dudek, 2017). The western spadefoot location at the south end of the Fanita Ranch Subunit was also surveyed.

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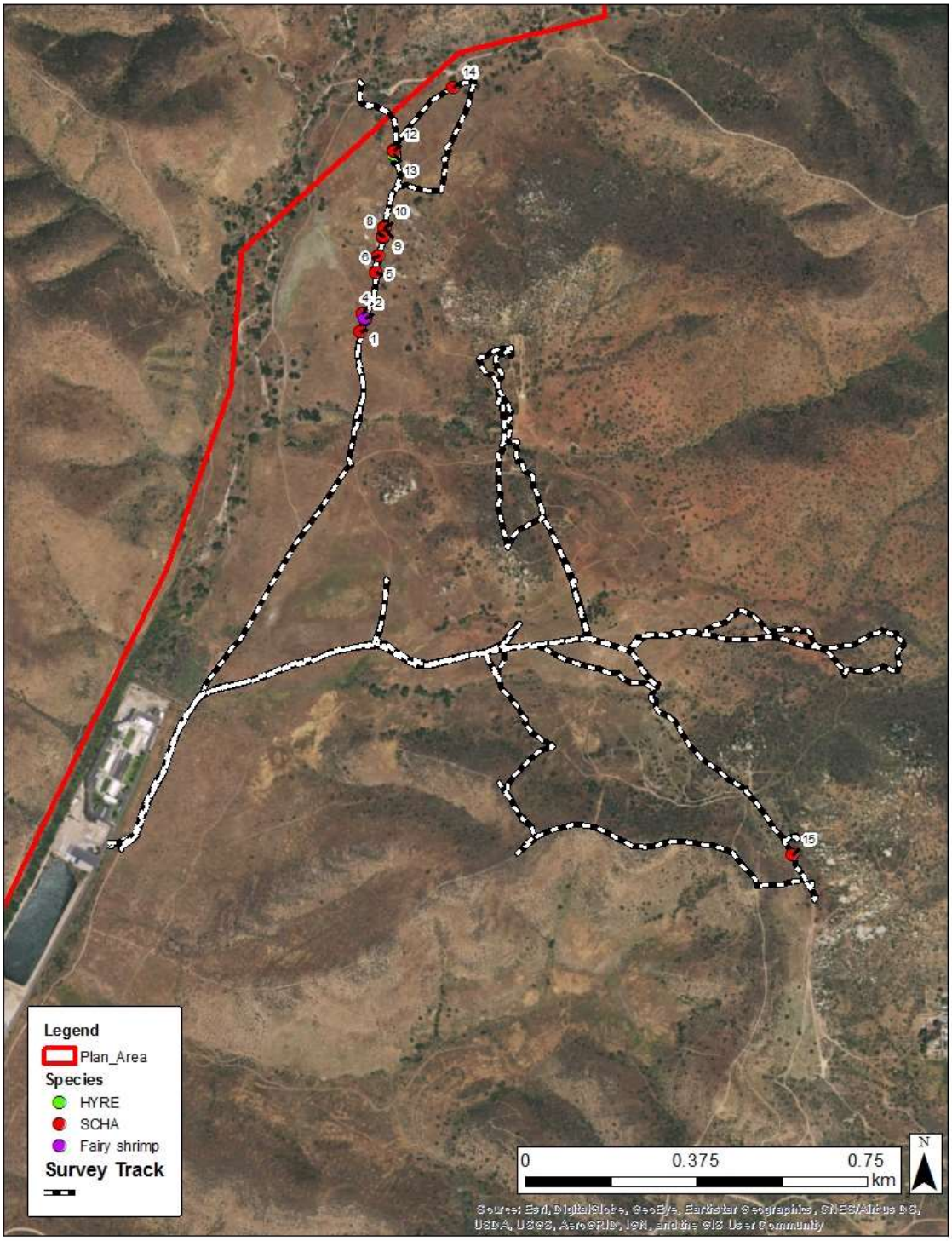

Figure 3.1 GPS track and species records for the north end of the Fanita Ranch Subunit. (Points correspond to Table 3.1 below.) Species are: HYRE- Baja chorus frogs and SCHA – western spadefoot.

Figure 3.2 GPS track and species records for the south end of the Fanita Ranch Subunit.

Figure 3.3 Western spadefoot tadpoles almost ready to leave the pool.

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Figure 3.4 Western spadefoot tadpoles.

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Figure 3.5 Pool at the southernmost western spadefoot record in the Fanita Ranch Subunit, looking south.

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Table 3.1 Summary table for 13 March, 2017 site visit to the Fanita Ranch Subunit. Species are: SCHA – western spadefoot and HYRE – Baja chorus frog.

Point	Species	Age	Number Observed
1	SCHA	Tadpole	4
2	Fairy shrimp		1
3	SCHA	Tadpole	20
4	SCHA	Tadpole	2
5	SCHA	Tadpole	22
6	SCHA	Tadpole	20
7	SCHA	Tadpole	21
8	SCHA	Metamorph	6
9	SCHA	Tadpole	20
10	SCHA	Metamorph	1
11	SCHA	Metamorph	1
12	SCHA	Tadpole	21
13	HYRE	Tadpole	1
14	SCHA	Tadpole	20
15	SCHA	Tadpole	6

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Appendix G
Vernal Pool Conservation Standards

1.1 Introduction

The Vernal Pool Conservation Standards (Standards) for the Santee MSCP Subarea Plan (Plan) provide the framework and requirements for the activities intended for the protection, enhancement, and management of vernal pool resources within the Plan Area associated with the implementation of future Covered Activities. The Standards build on the requirements within the Plan. These Standards are also expected to streamline the environmental permitting process for Covered Activity potential impacts to Covered Species associated with vernal pools, seasonal basins, and similar ephemeral wetlands. These Standards closely follow the definitions and requirements included in the Revised Final City of San Diego Vernal Pool Habitat Conservation Plan (VPHCP) (City of San Diego 2020). The project evaluation, requirements, management, and monitoring provisions in these Standards will be in addition to any relevant measures in the Plan.

All subarea plans within the San Diego Multiple Species Conservation Planning (MSCP), including the Santee Subarea Plan, will require conservation of vernal pool habitats to ensure no net loss of acreage and habitat functions and values, and will require avoidance of impacts to vernal pools to the maximum extent practicable both inside and outside the preserve planning areas. Under the Santee Subarea Plan, impacts to vernal pools that cannot be avoided will be minimized and mitigated.

Implementation of these Standards will preserve a network of vernal pool natural communities and their watersheds in a matrix of legally protected preserves; protect the biodiversity of these unique wetlands; and provide a strategy and requirements for their long-term conservation, management, and monitoring. The lands within the Plan Area contain important vernal pool resources. The vernal pools contain species that are protected, or may be protected in the future, under the California Endangered Species Act (CESA) and/or the Federal Endangered Species Act (FESA). The purpose of the Standards processes, associated with the Wildlife Agencies' permits, is to ensure there is adequate minimization and mitigation for the effects of the authorized incidental take of state and federal protected vernal pool resources. These Standards were developed to provide for the long-term conservation, management, and monitoring of these species and avoid costly delays and uncertainty associated with a project-by-project approach toward vernal pool conservation.

1.2 Background

Southern California vernal pools are wetlands that occur in soils with low permeability in bedrock depressions, inland valleys, and coastal or inland mesas (Bauder and McMillan 1998). Vernal pool hydrology is entirely dependent on precipitation (as compared to springs), and pools cycle between annual periods of flooding and drying (Zedler 2003). Vernal pools in California are at a small fraction of their historical abundance (Holland 1998). An estimated 95 to 97 percent of vernal pools in the San Diego County have been permanently loss due to agriculture and urbanization (Bauder and

McMillan 1998). Given the unique ecology of vernal pools, temporal / spatial partial isolation, and geologic requirements, many of the species inhabiting vernal pools are uniquely adapted to conditions of these ephemeral environments.

Vernal pools are seasonal wetlands that result from a unique set of physical parameters and support a specific biological assemblage of plant and animal species. Vernal pools form under specific physical conditions when small, shallow depressions collect precipitation from a modest-sized surrounding watershed and create a seasonally perched water table, often holding surface water for limited time periods. Vernal pools typically occur in landscapes that, at a broad scale, are shallowly sloping or nearly level, but on a fine scale may be quite "bumpy." Complex micro-relief results in shallow, undrained depressions that form vernal pools. The pool features are often associated with small hillocks known as mima mounds; however, sometimes these wetlands can occur on former landslide areas and are then referred to as "slump" pools. Vernal pools are primarily associated with clay soil series, and the basins are sealed either by subsurface layers of impervious hardpan, or clay that expands to seal the basin when saturated (Greenwood and Abbot 1980). In San Diego County, vernal pool basins are generally oval to circular in shape and one to several hundred square feet in size (Zedler 1987).

Vernal pool ecosystems are defined by seasonal hydrologic extremes: desiccated pool basins during the dry months followed by variable lengths of saturation and inundation during the rainy season. In southern California, the natural interannual variation in precipitation augments the inconsistent moisture conditions within any year. The drastic changes during a year between vegetated moist or standing-water basin and dry mostly unvegetated basin defines a vernal pool and separates them from other wetland ecosystems with less extreme moisture variability (Zedler 1987). During extended droughts, the desiccated condition of vernal pools can last several years.

Vernal pools annually undergo four distinct phases throughout a year: (1) the wetting phase occurs in the fall and early winter with the first rains of the wet season; (2) the aquatic phase when persistent inundation of the basin or pool occurs; (3) the drying phase, when many plants flower and produce seed and many associated animals disperse away from the pool or basin (water evaporates from these pools during the spring and early summer); and finally (4) the drought phase when the soil of the pool or basin dries, and the plants go dormant, as seed or underground roots (Zedler 1987).

Vernal pools experience extreme climatic pressures: winter rains followed by summer drought. The organisms found in vernal pools are those capable of withstanding both weeks of inundation and months of extreme aridity. Truly aquatic plants are excluded because pools are not wet long enough through the year. Surrounding terrestrial upland vegetation is held back from vernal pools because it cannot tolerate prolonged soil saturation (limited inundation tolerance). Vernal pool species have substantial inundation tolerance (Bauder 2000). In San Diego County, water often remain in the vernal pools for forty-five days or more (California Chaparral Institute 2024). This inundation period is also important for the lack of persistence of many non-native plants within vernal pools, due to their limited tolerance to prolonged standing water.

Many plants and animals rely on ephemeral ecosystem features such as vernal pools to complete their life cycles. For example, many rare plants and invertebrates persist as seeds, eggs, or cysts that

only sprout or hatch when inundated by seasonal rains filling shallow pools (King et al. 1996, Montrone et al. 2019). Several amphibian species also are adapted to breed in ephemeral pools, where a short hydroperiod importantly limits the occurrence and abundance of predators of eggs and larvae (Wilbur 1997). In arid ecosystems such as occur in the Plan Area, resistant life stages, including seeds, eggs, or aestivating adults, allow ephemeral pool-dependent species to persist during dry periods. The length of droughts must be less than the duration of the desiccation-resistant stages if these species are to persist (Fisher et al. 2018). Even when species persist, however, climate variability might affect essential hydroperiods or the duration of conditions that allow acquisition of resources for future reproduction or for dispersal and connectivity among ephemeral pools (Montrone et al. 2019). Because of the nature of ephemeral resources, many species that depend on habitats with ephemeral features also have complex life histories.

Effective conservation of species with complex life histories is challenging. For example, many amphibians lay their eggs in aquatic habitats, where larvae develop before metamorphosing into terrestrial adults (Semlitsch 1998, Semlitsch and Jensen 2001, Semlitsch and Bodie 2003, Crawford and Semlitsch 2007). Ensuring species persistence requires that adequate terrestrial habitats are extant and connectivity among aquatic habitats remain to allow exchange of individuals and genes to promote metapopulation dynamics and ensure genetic connectivity (Attum et al. 2008, Semlitsch 2008, Marshall et al. 2009, Muths et al. 2018, Bailey and Muths 2019). The upland area surrounding vernal pools provide essential core habitats for many species that utilize the pools (Semlitsch and Jensen 2001). For example, western spadefoot typically select friable, sandy/loam soils (with significantly less clay than would otherwise randomly be expected) for their burrow locations, within grassland or shrub/scrub natural communities that are often well away from breeding pools (Baumberger et al. 2019; Rose et al. 2022).

Field experiments and modelling have shown that multi-natural community landscapes support higher species and interaction evenness, more complementary species interactions and more consistent robustness to species loss (Hackett et al. 2024). Compared to isolated natural communities, these network properties drive improved pollination success in landscapes with more habitats/natural communities, and are not explained by simply summing component habitat/community webs. Linking landscape composition, through community structure, to ecosystem function, highlights mechanisms by which several contiguous natural communities often support landscape-scale ecosystem services (Hackett et al. 2024). The upland areas surrounding vernal pools provide four main essential functions to the vernal pool ecosystem: (1) buffers to the pools and their watersheds from nearby potential impacts and stressors; (2) core habitats for some vernal pool species and the species that support the vernal pool ecosystem; (3) plant and wildlife connectivity between pool complexes and core ecosystem areas; and (4) hydrology of the vernal pool ecosystems.

The entire vernal pool complex associated with pools of the region, including the pools, swales, and associated uplands, is essential to support the aquatic functions of vernal pool habitats (USFWS 2002). Although the uplands surrounding a vernal pool (the watershed that drains into the vernal pool) are typically not actually occupied by many vernal pool species, these uplands are nevertheless essential to the conservation of vernal pool habitats and associated ecosystem because they maintain the appropriate aquatic phase of vernal pools and swales (USFWS 2002). Associated

upland watersheds are also essential to provide nutrients that form the basis of the vernal pool food chain, for example, providing a primary food source for the vernal pool crustaceans (fairy shrimp) (USFWS 2002).

Western spadefoot tadpoles commonly develop within vernal pools (during wet and aquatic pool phases) and are also dependent upon the vermal pool food chain; western spadefoot tadpoles consume planktonic organisms, algae, and fairy shrimp within a vernal pool, and are also carnivorous (Bragg 1964) and consume dead aquatic larvae of amphibians (Simovich et al. 1992; CDFW 2000). Juvenile western spadefoots (recently metamorphed) often utilize vernal pools during the noted drying phase, utilizing moist micro-environments (e.g., cracks in mud within drying pools). Successful spadefoot metamorphosis was observed in some studied vernal pools that were filled for 36-133 days (Morey 1998). Western spadefoots are almost completely terrestrial, entering water only to breed; they are able to inhabit hot dry environments by burrowing underground (Nafis 2024). Western spadefoots spend most of their life buried underground in earth-filled burrows and are active for only a short period each year, depending on rainfall (Nafis 2024). Their burrows are typically away from breeding pools. Conservation strategies for amphibians in urban and suburban landscapes need to include actions to prevent further loss and degradation of both terrestrial and aquatic habitats, and to reconnect/maintain connections within the landscape to facilitate dispersal and long-term regional persistence of amphibian subpopulations (Hamer and McDonnell 2008).

Vernal pools are highly sensitive to hydrological changes from artificial changes in the watershed and/or climate change (Pyke 2002; Montrone et al. 2019; EcoAdapt 2017). Within semi-arid regions such as southern California, vernal pools are extremely sensitive to changes in the amount, source, and duration of water within a system, which can alter vernal pool hydrologic and ponding regimes (EcoAdapt 2017). Ecosystems such as vernal pools that rely solely on precipitation are most sensitive to changes in the amount or timing of rain or runoff (EcoAdapt 2017). Drought conditions have widespread effects on vernal pools, and an increase in the repetition or extension of droughts compared to natural conditions may shift pool species composition towards vegetation that can tolerate drier conditions (Shin and Kneitel. 2019). Climate vulnerabilities in vernal pools are further exacerbated by ecosystem degradation or loss due to anthropogenic stressors (Pyke 2005). Changes in the timing of precipitation or watershed runoff will likely affect the timing and duration of wet and dry periods in vernal pools, which play a key role in the composition of biological communities (Keeley and Zedler 1998; Zedler 2003). Many native species are adapted to predictable cycles of flooding and desiccation, and changes in these patterns could impact the reproduction and larval development of amphibians and invertebrates (Comer et al. 2012; Zedler 2003). Species composition in vernal pools could also be affected by changes in the timing of precipitation and/or runoff, which could alter germination, flowering, and seed set (Bartolome et al. 2014; Comer et al. 2012; Perry et al. 2012; Poff et al. 2002).

Vernal pool creation measures are comparatively challenging compared to restoration of most other wetland types, and they often fail to accomplish replacement of lost vernal pool functions and values (Leidy and White 1996; Calhoun et al. 2014; Buse 2012), For example, restoration efforts in vernal pool ecosystems in the long-term are often hindered because many restored vernal pools exist within a grassland matrix that is highly invaded by exotic annual grasses and forbs, and these invasive exotics often continue to degrade restored pools following a typical restoration

establishment period (Tang et al. 2023). As such, avoidance of impacts to vernal pools is of high importance. Similarly, mitigation of remaining impacts needs to occur a relatively high ratios, be diligently planned, and effectively managed in the long-term in order to offset effects and conserve pool ecosystems. The unique habitats created by vernal pool ecosytems support a number of sensitive species in the Plan Area and regionally. Table G-1 includes a list of Covered Species under the Subarea Plan that are considered "vernal pool species". The City of Santee has developed the Vernal Pool Conservation Standards to define the long-term minimization, mitigation, protection, management, and monitoring requirements of Covered Activities in order to attain Plan and permit coverage of these Covered Species.

Table G-1. Santee Subarea Plan Vernal Pool Species

Type	Common Name	Scientific Name
Plants	San Diego button-celery	*Eryngium aristulatum* var. *parishii*
	San Diego mesa mint	*Pogogyne abramsii*
Wildlife	Riverside fairy shrimp	*Streptocephalus woottoni*
	San Diego fairy shrimp	*Branchinecta sandiegonensis*
	Western spadefoot	*Spea hammondii*

1.2.1 Vernal Pool Definitions

For the purposes of the Santee MSCP Subarea Plan Section 5.5.7 and the Standards herein, the following definitions and categorization of vernal pools will be used:

- **Vernal Pools** -- Seasonal, depression-type wetlands that result from a unique set of physical parameters and support a specific biological assemblage of plant and animal species that are typically indicators of vernal pools. Functional vernal pool ecosystems form under specific physical conditions when small, shallow depressions collect precipitation to create a seasonally perched water table.

- **Natural vernal pools** – a seasonally flooded depression is herein considered a natural vernal pool if ponding is predominantly a result of natural conditions and topography (i.e., ponding is not primarily based on anthropogenic disturbance such as the grading (construction/maintenance) and compaction (ongoing use) of a dirt road) and includes one or more of the vernal pool covered species (see Table G-1) or vernal pool indicator plant species (USACE 1997), which are listed in Exhibit A. In addition, if a natural vernal pool does not have covered or indicator species but is part of a larger vernal pool complex and located adjacent other natural vernal pools with covered and/or indicator vernal pool species, it will be considered a natural vernal pool.

- **Man-made vernal pools with indicator plant species** – If a seasonally flooded depression is formed primarily as a result of anthropogenic disturbance (e.g., road ruts) and includes vernal pool indicator plant species or covered-plant species, it will be treated as a vernal pool.

- **Man-made pools with covered wildlife species** - If a seasonally flooded depression formed primarily through anthropogenic disturbance (e.g. road ruts created and maintained by road maintenance and use on Plan-covered roads) does not include indicator plant species, but includes or supports covered vernal pool wildlife species (i.e., San Diego fairy shrimp, Riverside fairy shrimp, and/or western spadefoot

- **Man-made vernal pools without indicator plant species or covered plant/wildlife species** – If a seasonally flooded depression is formed primarily as a result of anthropogenic disturbance and does not include or would likely not support vernal pool indicator plant species or covered plant/wildlife species, it will not be treated as a vernal pool. It will be treated as a seasonally flooded depression that does not need specific coverage under the Plan.

- **Vernal Pool Watershed** -- A topographically defined catchment area from which surface water typically flows to a vernal pool or pools.

- **Vernal pool complex** – A vernal pool complex is an assemblage of vernal pools, swales and associated uplands within a defined area (e.g., micro-watershed). Groups of vernal pools are sometimes referred to as vernal pool complexes that may include two to several hundred individual vernal pools (Keeler-Wolf et al. 1998). Vernal pool complexes are (or were before permanent losses in the area) typically part of a series of similarly situated pools that have a similar influence on the physical, chemical and biological integrity of downstream waters and are similarly situated on the landscape. These pools often have hydrologic (surface or subsurface) or ecological connection between pools, from processes including overflow, animal vectors, and/or wind dispersal. The groups of vernal pools and the associated watersheds within a vernal pool complex often have soils, topography, and landscape positions that are similar. The uses of complexes are a helpful tool for planning and management, but it is recognized that what constitutes a complex can be subjective.

- **Function** - Function refers to the natural processes that are necessary for the maintenance of an ecosystem (Leidy and White 1996).

- **Preservation** - Setting aside of existing natural resources that are then managed and protected in perpetuity.

- **Restoration** - Return of natural community or ecosystem to a close approximation of its previously existing condition (NRC 1992). Restoration attempts to emulate or return to former condition, the processes, structure, function, and diversity of a specified ecosystem.

- **Enhancement** - Manipulation of a natural community or ecosystem in order to improve one or more of its natural structural or functional attributes (NRC 1992).

- **Creation** - Construction of a natural community or ecosystem that previously did not exist on a site (NRC 1992).

1.2.2 Vernal Pool Field Survey Protocols

If a Covered Activity project site has potential for vernal pools or for man-made pools that could support covered species, field surveys will be required by the City as part of its project review process, to be completed by the Covered Activity project proponent following the current protocols described in the USFWS "Survey Guidelines for the Listed Large Branchiopods" (USFWS 2015), or any subsequent revisions. Key details from the Survey Guidelines include:

- A complete survey for fairy shrimp (Federally- or State-listed large branchiopods) consists of one wet season survey and one dry season survey.
- Wet season surveys involve checking vernal pools after appropriate inundation occurs and inspecting for presence of fairy shrimp.
- Appropriate habitats within a vernal pool are considered sufficiently inundated for the wet season survey when a pool holds greater than 1.2 in (3 cm) of standing water 24 hours after a rain event.
- During the wet season survey. all potential habitats must be sampled at 7-day intervals after initial inundation. Sampling will be reinitiated within 7 days of an individual pool drying and becoming re-inundated during the same wet season.
- Each wet season survey visit will include using a dip net to sample representative portions of the bottom, edges, and vertical water column of each vernal pool for presence of fairy shrimp. Specific sampling procedures are provided in the USFWS Survey Guidelines.
- Vernal pool surveyors must possess a recovery permit from the USFWS to sample for fairy shrimp and a scientific collecting permit to handle western spadefoot. Notification for such surveys must be provided to the USFWS following the Survey Guidelines, including pre-survey notification, notification within 24-hours of new observations of listed fairy shrimp, and a post-survey report (90-Day Report).
- Per the Survey Guidelines, additional wet season surveys may be required if a survey season is considered unreliable; this could result from moderate to extreme drought, or if no branchiopods are found and subsequent dry season survey detects fairy shrimp cysts.
- During wet season survey sampling, surveys of pools will be performed by a qualified biologist that will inspect for presence of Covered Species and vernal pool indicator species (USACE 1997); this data will be used for determining vernal pool habitat function and associated species distribution.
- Fairy shrimp produce distinctive resting eggs called "cysts", which persist in the soil of the pool until appropriate environmental conditions trigger hatching. Per the Survey Guidelines, Dry season fairy shrimp surveys are designed and implemented to collect, isolate, and identify these cysts. Dry season fairy shrimp surveys will include collection of soil substrate when pools are dry, to avoid damaging or destroying cysts (which would preclude identification). Soil substrate samples will be collected from designated locations within

each pool, with increasing numbers of samples from larger pools. Soil samples will then be processed and analyzed by a specialist who holds an appropriate recovery permit specifically for conducting processing, isolation, and identification of fairy shrimp cysts. The procedure will involve hydrating the soil sample, washing aliquots[1] through specific sieves and collecting a particular fraction, and examining the washed-and-sieved fraction through a stereo dissecting microscope to locate and identify cysts.

1.3 Avoidance, Minimization, Mitigation, and Protection of Vernal Pools

The Santee Subarea Plan includes measures to be required by the City of Covered Activities to avoid, minimize, and mitigate the likely impacts to covered species and disturbance of sensitive habitats. The City will require as part of project review and approval that direct and indirect impacts from Covered Activities shall be designed and implemented to avoid, minimize, and mitigate impacts to vernal pool habitats to the maximum extent practicable. In review and approving Covered Activities, the City will ensure conservation of the targeted vernal pool complexes in a configuration that maintains vernal pool ecosystem function and viability of the vernal pool Covered Species within the Plan Area, consistent with the USFWS Vernal Pool Recovery Plan (USFWS 1998). These avoidance, minimization, mitigation, and protection measures are described in the following sections.

1.3.1 Avoidance and Minimization of Vernal Pools

The City will ensure avoidance of impacts (as compared to minimization and mitigation) to vernal pools, watersheds, and their supporting ecosystems is the primary goal when review and approving Covered Activities that may affect vernal pools. The City under the Subarea Plan will require during the City's project review and approval process that Covered activities will be designed and implemented to avoid and minimize impacts to natural vernal pools and their watersheds to the maximum extent practicable. The City will also ensure that impacts from Covered Activities to man-made vernal pools with indicator species or covered plant/wildlife species and their watersheds will be minimized to maximum extent practicable.

1.3.2 Mitigation and Protection of Vernal Pools

If impacts cannot be avoided, then minimization and compensatory mitigation will be required by the City. The City will ensure that impacts to natural and man-made (occupied by indicator or covered species) vernal pools that would result from Covered Activities under the Plan will be fully mitigated, and where these pools are to be preserved the City will ensure they are legally protected and managed in perpetuity. The City will ensure "no net loss" of ecological functions and values associated with potential impacts to vernal pools with the implementation of Covered Activities.

[1] An aliquot is a piece or a sub-sample of a larger whole, particularly one extracted for chemical analysis or other treatment. Each smaller component of the sample is referred to as an aliquot, and it has the same properties as the original sample.

If existing vernal pools in the Plan Area are to be protected by Covered Activities through onsite protection under the Subarea Plan, the City will ensure that the Covered Activity proponents will provide appropriate and adequate physical protection for vernal pools and their watersheds, and add lands to the Managed Preserve that will include the vernal pools, associated pool watersheds, functional buffers (from surrounding potential impacts) around pool/watershed/ upland areas, and uplands surrounding these watersheds (e.g., for western spadefoot life history needs) to meet the Plan's required tenets of appropriate and functional reserve design and protection of the ecosystem that support these vernal pools. The City will ensure that the relevant preserve areas will be configured and protected to maintain vernal pool and associated watershed ecosystem function and viability of the vernal pool Covered Species. with these vernal pools will implement appropriate long-term management of these pool-associated areas in perpetuity. The preserve areas that will be set aside to protect vernal pools will be included in the overall Managed Preserve, following the Subarea Plan preserve requirements including:

- Preparation of a Resource Management Plan (RMP) – The City will require during the project review and approval process that each project proponent shall develop and implement a perpetual management, maintenance, protection, and monitoring plan for their respective biological conservation easement areas. The City will require development and implementation of a RMP that will provide for long-term protection, management, and enhancement of vernal pool habitats, associated watersheds, and the vernal pool Covered Species. The RMP, which shall be reviewed/approved by the City and Wildlife Agencies before initiation of project clearing and grading activities, and the funding source for implementation of the RMP must be established prior to project clearing and grading (e.g., at time of issuance of grading permit by the City). The RMP will include, but not be limited to, monitoring schedule, measures to prevent human, pet, and exotic species encroachment, funding mechanism, and contingency measures should substantial problems occur outside the RMPs management specifications. In addition, the RMP shall include the name of the responsible land management entity (Preserve Manager) contracted for the site, as well as qualifications, business address, and contact information. The site-specific RMPs will consider parcel ownership, size and shape, land use history, joint uses, adjacent land uses, and other factors regarding the site parcels. In general, the RMPS for preserves should restrict access (vehicles, humans, or domestic animals) to vernal pool watersheds; prohibit or redirect recreational activities; regulate use of toxic substances (herbicides, pesticides, hydrocarbons, and other chemicals) and dumping; prevent water pollution or altered hydrology; and control exotic plant and animal species. Contingency plans for the protection of pools and their watersheds will be specified within RMPs for emergencies or situations such as fire and fire-fighting activities, toxic spills, law enforcement activities, and road or trail erosion. Covered Activity design and RMP measures will place particular emphasis on ensuring that the watersheds of the pools and the complexes in which they reside are maintained in a functioning state. Required minimization measures will be specified within RMPs for actions near or within pool watersheds and their potential effects (e.g., runoff, erosion, turbidity) that may compromise or conflict with pool hydrology,

- Long-term legal protection - The City will require that habitat preserves under the Plan that include vernal pools will be protected in perpetuity through covenant of easement dedication to the City, or a deed restriction or other conservation mechanism consistent with California Civil Code Section 815, et seq. and/or Government Code Section 65870 and acceptable to the City.

- Long-term monitoring and management – The City will require that habitat preserves under the Plan will be managed as outlined here and based on the guidelines and requirements set forth in the Subarea Plan that define general ecological stewardship and species monitoring. Vernal pool resources within preserves will be protected, monitored, and managed following the guidance set forth in Section 1.5 of this appendix. Vernal pools to be restored will include quantitative monitoring evaluations for aquatic invertebrates (O'Brien et al. 2024). Bullfrogs are recognized predators (Morey 1996; Simovich et al. 1996) of vernal pool species and eradication of any larvae, post-metamorphic, and adult bullfrogs will be a management task item in all RMPs. The effects of various nonnative control regimes, the containment of toxins and pollution, and potential vehicular use in preserved areas will be addressed in RMPs. RMPs will address protection of pools and their watersheds from runoff, spills, and mosquito abatement and landscaping activities that involve the use of herbicides, pesticides, mulch, and fertilizers. Petroleum byproducts, detergents, fire retardants, and insecticides are examples of substances that can be lethal or toxic to vernal pool organisms (Simovich et al. 1996). All trash and refuse should be removed from pools on a regular basis.

- Funding for monitoring and management – The City will require that the project proponent establish a nonwasting endowment or equivalent secure funding method, in an amount approved by the City based on a Property Analysis Record[2] (PAR; Center for Natural Lands Management ©1998), or equivalent cost estimation method, for the initial and ongoing protection, management, maintenance, and monitoring of the site. The City will require that this nonwasting funding be secured and a Preserve Manager approved before a grading permit for the Covered Activity is granted. The ongoing funding will appropriately provide for the perpetual long-term protection, management, maintenance, and monitoring of the biological conservation area, with this work to be performed by an approved Preserve Manager. See Section 8.3, *Plan Funding*, of the Subarea Plan.

1.3.3 Protection Vernal Pools Watersheds

The complex hydrology of vernal pools is supported by both surface flows within a pool's topographic watershed (i.e., the surface area in which rainwater falls and runoff water drains into a

[2] A Property Analysis Record (PAR) is a software analysis program that prompts the provision of detailed information on the conservation land acquisition transaction, conservation functions/values and stewardship tasks, and unit costs of items and services involved in providing initial and ongoing stewardship management, monitoring, protection, etc. of a conservation site. The stewardship services and costs are necessarily influenced by the intended land manager (i.e., the Preserve Manager's estimated service and item costs). The PAR software then calculates the average annual stewardship costs. Using financial parameters provided by the user (e.g., predicted inflation and rates of return), that average annual cost is also parlayed into a perpetual stewardship amount (the endowment amount). The PAR report or product provides a detailed and transparent justification for the stewardship endowment (https://www.cnlm.org/par/).

vernal pool) and subsurface flows that may extend from and to areas beyond the surface watershed for a pool. Surface and subsurface lateral flows between vernal pools typically occurs, and the surrounding uplands influence the onset and level of inundation within pools and the timing of seasonal drying of vernal pools (Hanes and Stromberg 1998). Therefore, modifications to the uplands surrounding a vernal pool can negatively affect the pool's hydrology, even if such modifications occur outside the pool's surface watershed. For example, grading cuts near pools can accelerate the flow of water out of the subsoil in the watershed (Bauder 1987).

Modifications to the hydrology of vernal pools can alter the distribution and diversity of vernal pool flora and fauna that are influenced by the length and frequency of water inundation (Bauder 1987, 2000). For instance, exotic plant species can become more prevalent in disturbed vernal pools when the periods of water inundation are reduced, while freshwater marsh species can expand into disturbed vernal pools when the periods of inundation are increased. Changes in duration of inundation may also alter fairy shrimp distribution as the San Diego fairy shrimp require a shorter inundation period to complete their reproductive cycle than Riverside fairy shrimp (Eng et al. 1990, Hathaway and Simovich 1996, Eriksen and Belk 1999). As such, Riverside fairy shrimp are limited to deeper vernal pools and/or those that have a longer period of inundation. Decreasing the inundation period in a pool may also prevent fairy shrimp, western spadefoot, Pacific tree frogs, and some other species from completing their life cycles in many or all years. Similarly, increasing inundation in a pool may provide suitable habitats for non-native predators and competitors such as bullfrogs (*Lithobates catesbeianus*), African clawed frogs (*Xenopus laevis*), fish, and some other exotic as well some native march species.

Complete protection of the entire watershed of a vernal pool is important. Without precise hydrological monitoring and accurate modeling on a pool complex-scale, the determination of potential long-term indirect effects potentially resulting from alterations to sub-watershed hydrology would be very difficult. Therefore, under the Subarea Plan the City will provide for the protection and conservation of vernal pool watersheds as part of the project review process for Covered Activities. For any Covered Activity projects affecting vernal pools, the City will require a site-specific assessment of the hardpan or claypan conditions for the entire vernal pool watershed (see below for definition). The City will ensure that this watershed plus a 100-foot buffer will be avoided by the construction and operational footprint of Covered Activities to ensure the hydrologic conditions of the watershed are not disturbed by project construction.

Because of the potential indirect impacts and important ecological and hydrological processes discussed above, vernal pool preserves will be designed on a case-by-case basis to minimize the edge-to-area ratio (USFWS 1998) and to include: known and potential upland habitats and functional connectivity for amphibians and pollinators of vernal pools plants; sufficient connection between vernal pools to maximize use by herbivores and their predators, as well as avian species; and the surface watershed and sufficient area to preserve subsurface flows. The City will ensure a minimum 100-foot wide ecological buffer will be preserved around vernal pools and their watersheds as part of Covered Activity review and approvals to limit the more immediate indirect edge effects caused by surrounding development and other activities. However, the City-required area to be preserved to maintain the larger ecological and hydrological processes will extend beyond the surface watershed of vernal pools and the minimum 100-foot buffer (to avoid, minimize,

and mitigate impacts) to the maximum extent practicable. The City will require that the preserves will be designed to limit indirect impacts for all potential onsite and adjacent uses and protect ecological and hydrological processes, in order to help ensure the long-term viability of the vernal pool ecosystem. If encroachment into the 100-foot watershed buffer is unavoidable, the project applicant must develop and implement a City-approved construction/operation minimization, ecological enhancement, and long-term management plan to minimize and offset any direct or indirect impacts created by encroachment into the watershed buffer. Such a plan will identify and provide full funding for a contracted preserve manager to implement the management plan in perpetuity. However, in no case shall the ecological buffer zone fail to include all areas within 50 feet of the watershed boundary without specific concurrence of the project by City and Wildlife Agencies, as part of the City's project approval process.

1.3.4 General Avoidance and Minimization to Protect Vernal Pool Resources

The City will ensure that the following general avoidance and minimization measures will be implemented during construction and operation of Covered Activities:

1. The City will ensure as part of project approvals and implementation that Covered Activity construction and operation footprints avoid vernal pools and their watersheds to the maximum extent practicable. Any development or related temporary or permanent activities/structures/features (e.g., roads, brow ditches, trails, stockpiles, etc.) adjacent to or within open space preserves with vernal pools shall be constructed and operated to slope and direct runoff water away from the extant pools (or pools to be restored) and their watersheds to be avoided, to ensure that runoff from the project footprint does not flow into the pools and/or the associated watersheds.

2. The City will ensure that Covered Activity projects are designed with and will implement best management practices to avoid and minimize the water-related mobilization of sediment and silt off of construction footprints. The City will require the temporary fencing (with silt barriers) along the limits of project footprint (including all construction staging areas, access routes, stockpile areas, etc.) to minimize additional vernal pool impacts and prevent the spread of silt from the construction zone into adjacent vernal pools and/or the associated watersheds. Fencing shall be installed in a manner that does not impact habitats or ecological features to be avoided. Final construction plans for Covered Activities will be provided to the City before grading plan approval and shall delineate (map) the full project direct footprint, the locations where construction boundary fencing at the edge of the direct footprint,, and the locations of all nearby vernal pools and the associated watershed boundaries with mapped polygons indicating areas that would be directly affected or avoided by the construction/operation footprint. The City will ensure that final construction plans require the installation of all construction boundary fencing before clearing and grubbing at a site would occur, and will include requirements to provide relevant photographs to the City showing the location of the fences immediately after installation. If construction or operation activities inadvertently occurs beyond the fenced or demarcated direct footprint (limits of impacts), all related project work shall cease until the

problem has been remedied to the satisfaction of the City, including mitigation measures. Temporary construction fencing shall be removed upon project construction completion.

3. The City will ensure that any potential impacts to biological resources from fugitive dust that may occur during construction grading shall be avoided and minimized through the implementation of best management practices, including construction footprint watering and other appropriate measures.

4. The City will ensure that Covered Activity compliance and effectiveness monitoring of vernal pools and covered species is conducted to evaluate implementation of the Standards, and to track the status of the vernal pools and Vernal pool covered species. The City will ensure that a qualified monitoring biologist that has been approved by the City shall be on-site during Covered Activity project construction activities to ensure compliance with all avoidance, minimization, and mitigation measures identified in the CEQA environmental document and any additional City project approval requirements. The biologist shall be appropriately knowledgeable of vernal pool species biology and ecology. The biologist shall perform the following duties as part of the noted monitoring:

    a. Oversee installation of and periodically inspect the fencing and erosion control measures within or upslope of vernal pool restoration and/or preservation areas a minimum of once per week and daily during all predicted and occurring storm/rain periods to ensure that any failures in the fence or erosion control measures are repaired immediately.

    b. Periodically monitor the work area to ensure that work activities do not generate excessive or considerable amounts of dust into adjacent natural areas.

    c. Provide training to all contractors and construction personnel that will be working on the site, regarding the biological resources associated with the project and ensure that training is implemented by construction personnel. At a minimum, training shall include (1) the purpose for ecological resource protection measures; (2) a description of the vernal pool species and their habitats; (3) the conservation measures that must be implemented during project construction to protect the vernal pool species and associated ecosystem, including strictly limiting activities, and vehicles, equipment, and construction materials to the fenced project footprint to avoid sensitive biological resources in adjacent areas(i.e., avoided areas delineated on maps or on the project site by fencing and/or flagging); (4) environmentally responsible best management construction practices as outlined in measures 5, 6 and 7; (5) the protocol to resolve conflicts that may arise at any time during the construction process; and (6) the general provisions of the project's mitigation monitoring and reporting program (MMRP), the need to adhere to the provisions of FESA and project requirements stipulated by the City, and the penalties associated with violating FESA.

    d. Halt work, if necessary, and confer with the City to ensure the proper implementation of species and habitat protection measures. The biologist will monitor and ensure that the site project footprint is properly fenced or otherwise demarcated, and that employees

and site visitors shall strictly limit their activities, vehicles, equipment, and construction-related materials to the fenced or demarcated (e.g., flagged) project footprint. The biologist shall report any violation to the City within 24 hours of its occurrence.

e. Submit weekly letter reports to the City during project activities and a final report following completion of project, regarding the results of the required monitoring. The final report shall include as-built construction drawings with an overlay of the natural areas that were affected by the direct footprint of project activities and the areas that were avoided, photographs of natural areas that were avoided, and other relevant summary information documenting whether authorized impacts were or were not exceeded and whether general and specific compliance with all conservation measures was achieved.

5. The City will ensure the following conditions shall be implemented during Covered Activity project construction and operations:

    a. Employees, contractors, and agents shall strictly limit their activities, vehicles, equipment, and construction materials to within the fenced or demarcated project footprint approved by the City as part of its project approval process.

    b. The project site shall be kept as clean of debris as possible. All food-related trash items shall be enclosed in sealed containers and regularly removed from the site.

    c. Disposal or temporary placement of excess fill, brush, or other debris shall be limited to areas within the fenced or demarcated project footprint approved by the City.

6. The City will ensure that all equipment maintenance, staging, and dispensing of fuel, oil, coolant, or any other such activities shall occur in designated areas within the fenced or demarcated project footprint and follow best management practices. These designated areas shall be located in previously compacted and disturbed areas to the maximum extent practicable, and shall include spill containment measures in such a manner as to prevent any runoff or spill-related contamination from entering the vernal pools or their watersheds, and shall be shown on the construction plans approved by the City. Fueling of equipment shall take place within existing paved areas greater than 100 feet from the vernal pools or their watersheds. Contractor and project-related equipment shall be checked for leaks prior to operation each week and repaired as necessary. A spill kit for each piece of construction equipment shall be on-site and must be appropriately used in the event of a spill. “No-fueling zones” shall be designated on construction plans approved by the City.

7. The City will ensure that clearing, grubbing, and/or grading activities immediately nearby or adjacent to vernal pools or their watersheds shall be timed to avoid wet weather to minimize potential impacts (e.g., erosion, siltation, sedimentation) to the vernal pools or their watersheds unless the area to be graded is at an elevation below the pools and their watersheds. To achieve this requirement, the City will ensure that clearing, grubbing, and grading nearby to vernal pools or their watersheds to be avoided pools shall comply with the following:

a. Clearing, grubbing, or grading in the noted areas shall occur only when the soil is dry to the touch both at the surface and 1 inch below. A visual check for color differences (i.e., darker soil indicating moisture) in the soil between the surface and 1 inch below additionally indicates whether the soil is dry.

b. After a rain of greater than 0.2 inch, clearing, grubbing, or grading shall occur only after the soil surface has dried sufficiently as described above, and no sooner than 2 days (48 hours) after the rain event ends.

c. To prevent erosion, sedimentation, and/or siltation from water runoff due to rains, best management practices (e.g., silt fences, sandbags, etc.) shall be implemented as needed during clearing, grubbing, or grading activities.

d. If rain occurs during clearing, grubbing, or grading, Covered Activity work shall stop and resume only after soils are dry, as described above.

e. Covered Activity grading and project plans will be inherently designed to avoid surface water runoff (during both project construction and operations) from being directed towards or reaching the City-approved project footprint boundaries that are nearby to vernal pools or their watersheds to be preserved or protected. Clearing, grubbing, and grading shall be done in a manner to prevent water runoff from entering vernal pools or their watersheds to be preserved or protected.

f. As necessary, water spraying (e.g., water truck, dust suppression hose, etc.) shall be conducted at a level and frequency sufficient to control fugitive dust but not to cause runoff or overspray off the project footprint boundaries into vernal pools or their watersheds.

g. If mechanized clearing, grubbing, or grading is necessary for a Covered Activity, such activity shall be performed in a manner to minimize soil compaction (e.g., , use the smallest type of equipment needed to feasibly accomplish the work, perform the work or access in manner or season that minimizes compaction, etc.).

8. The City will ensure as part of Covered Activity project approvals and compliance monitoring that prior to project construction activities, topsoil shall be salvaged from any vernal pools or depressions (e.g. road ruts) occupied with fairy shrimp that will be subject to approved impacts, consistent with the requirements of a City-approved vernal pool restoration plan for the project (e.g., pools to be subject to salvage have been appropriately surveyed and determined to be free of versatile fairy shrimp [*Branchinecta lindahli*]). Vernal pool soil to be salvaged (inoculum for pools to restored) shall be collected when pools soils are dry to avoid damaging or destroying fairy shrimp cysts and plant seeds. Hand tools (i.e., shovels and trowels) shall be used to remove the first (top) 2 inches of soil from the entirety of the pools. Whenever possible, the trowel shall be used to pry up (for transport/storage) intact chunks of soil from the pool surface, rather than loosening the soil by raking and shoveling, which can damage the cysts. The soil inoculum collected from each pool shall be stored individually by pool in labeled boxes that are adequately ventilated, and kept dry and out of direct sunlight in order to prevent the occurrence of fungus or excessive heating of the soil, and stored offsite at an appropriate facility for vernal

pool inoculum. Soil inoculum from different source pools shall not be mixed for seeding/inoculating any restored pools, unless otherwise approved by the City and Wildlife Agencies. When appropriate for restoration purposes, the collected soils shall be spread out and raked into the bottoms of the pools being restored at appropriate depths. Topsoil and plant materials will also be effectively salvaged from the upland watershed areas of pools to be directly disturbed by Covered Activities; this topsoil and plant materials shall be transplanted to, and/or used as a seed/cutting and topsoil source for, the upland watershed portions of the restoration/creation vernal pool areas to the maximum extent practicable, as required and approved by the City.

9. The City will ensure that Covered Activities install and maintain permanent protective fencing, and/or use other measures approved by the City, to adequately deter human and pet entrance into on- or offsite (nearby) vernal pools or associated watershed areas. Such fencing and/or other measures shall be placed along any natural area developed area interface zones. Such fencing shall have sufficient details specified (e.g., height, type, etc.) and the locations will be shown on the development plans approved by City as part of project approvals. This fencing will have no gates, except to allow access for maintenance and monitoring of the biological conservation easement areas, and be designed to prevent intrusion by pets and humans. Signage for the biological conservation easement area indicating the reason for protection of the area and prohibited activities, shall be posted and maintained at conspicuous locations along the natural area/development boundary. The specific designs for fencing, signage, management, and other preventative/protection measures for the vernal pools and associated watersheds shall be included in the project's mitigation program subject to review and approval by the City before any grading plan for relevant Covered Activities is issued.

1.4 Compensatory Mitigation of Impacts to Vernal Pools

The City will ensure that impacts to vernal pools from Covered Activities will be avoided to the maximum extent practicable. If a Covered Activity project includes impacts to vernal pools, the City will ensure as part of project review and approval that following measures will be implemented as mitigation to offset impacts:

- Mitigation ratios to offset impacts will be based on size and type of vernal pools based on the following:

Vernal Pool Type	Mitigation Ratio
Natural vernal pools	4:1
Man-made vernal pools with indicator plant species	3:1
Man-made pools with covered wildlife species	2:1

- Vernal pool mitigation must be implemented to meet a 'no net loss' criterion that includes at least 1:1 creation of new vernal pool acreage in areas that are not currently vernal pools.

Additional mitigation credits will typically be achieved through restoration and enhancement of existing but ecologically degraded vernal pools that are not subject to Covered Activity impacts.

- All vernal pools and their watersheds/buffers within a Covered Activity project parcel ownership boundary that are not to be subject to direct impacts from the project per the City-approved plans must be included in a Preserve and included in the required vernal pool long-term management and monitoring plan for the project.

- If an existing vernal pool or pool watershed/buffer is to be disturbed by a Covered Activity (e.g., the pool and/or watershed is within the project footprint reviewed and approved by the City), restoration and enhancement of the existing pool to ecologically better than pre-impact condition can be implemented to provide up to a 1:1 mitigation credit. Enhancement actions would include remediation of project impacts, and may include exotic plant control, ecological improvements to watersheds (e.g., exotics control, disturbance or trespass control, artificial runoff control, etc.), and upland restoration. A determination of restoration and enhancement efforts to achieve mitigation credits in this scenario will be determined on a case-by-case basis by the City and Wildlife Agencies. The project applicant and/or contractor will remove all spoil and borrow material resulting from the construction or restoration of vernal pools from the mitigation or preserve site.

- The vernal pool mitigation plan must include the locations of the mitigation vernal pools and where they are in relationship to any existing pools on site. In addition, the mitigation plan must clearly identify the areas of existing or proposed cut or fill that are adjacent or within preserve or mitigation areas.

- Mitigation measures performed at a site will result in a net gain in the vernal pool and watershed ecological functions and values when considering the vernal pool resources that would be affected by the project as compared to the function and values levels of improvement and enhancement within the vernal pool mitigation site. Examples of potential increased functions and values include, but are not limited to, an increase in the availability or occupation of habitats for native vernal pool fauna, an increase in native vernal pool flora diversity, an increase in vernal pool sensitive plant or wildlife diversity and/or occupation, a decrease in vernal pool exotic species, restoration of vernal pool hydrology, vernal pool water quality improvements, enhancement of ecological functions within a vernal pool watershed, and restoration or enhancement of natural sedimentation/siltation deposition rates within vernal pools to more natural conditions. Adequate baseline data for the mitigation site will be acquired or developed by the project applicant. Appropriate success criteria for site enhancement and/or restoration measures will be based on the best available information for the mitigation site ecological features, and shall be required as part of the restoration or enhancement plan to be review and approved by the City before issuance of a Covered Activity grading permit.

- Mitigation for project impacts to vernal pools shall include salvage of soil, inoculum, native seeds/propagules, and sensitive plant and wildlife species, when appropriate (e.g., a high function vernal pool with no occupation by versatile fairy shrimp), from vernal pools that

would be affected by Covered Activities. Salvaged materials will be placed into vernal pools to be restored in a manner and where appropriate (e.g., same vernal pool series). The salvaged material will be appropriately established, maintained, and managed as part of the successful restoration measures for the vernal pools. Use of salvaged materials shall be determined by the City on a project specific basis during the City's project-level review and approval phase. Salvaged material shall not be introduced to existing vernal pools containing the same species outside the vernal pool series unless approved by the City and Wildlife Agencies.

- The mitigation sites shall include preservation of the appropriate area of watershed and a buffer based on functions and values and a hydraulic analysis that evaluates surface and subsurface flows; there shall be a default of a minimum 100-foot buffer from the watershed. The analysis report shall be provided to the City as part of project review and approval, and it will present a review of hydrogeologic evidence and technical reports to assess the nature of groundwater-surface water interactions for the subject vernal pools and watersheds. The mitigation site will provide and maintain in perpetuity a buffer of at least 100 feet around all vernal pool preserves and mitigation sites. Buffers will consist of native vegetation or regionally characteristic annual grassland without cut or fill as a result of adjacent development, developed recreation facilities, roads, trails, fire breaks, or other intrusive development/features. The appropriate buffer width will depend on adjacent land uses and resource values that need to be maintained in the preserve, in consideration of the topographic and hydrologic conditions.

- Project-specific vernal pool restoration, enhancement, and preservation plans will be provided by Covered Activity project applicants to the City for review and revision as part of City project approval process, consistent with the measures as required as part of compensatory mitigation under the Subarea Plan. The restoration/enhancement/ preservation plans and perpetual management and monitoring plans shall then be provided to the Wildlife Agencies for technical review and approval. Upon receipt of the plans, the Wildlife Agencies shall have 30 working days in which to review and provide written comments to the City. Subsequent reviews and comments by the Wildlife Agencies shall be completed within 15 working days following revisions and re-submittal by the applicant based on previous review and comments. Wildlife Agency failure to respond within the specified timelines shall result in Wildlife Agency approval of the draft plans unless an extension is agreed to by all parties.

1.5 Vernal Pool Restoration/Enhancement/Preservation Plan

The City will ensure that the following conditions specific to vernal pool restoration/enhancement/preservation and perpetual management and monitoring plans are met by the Covered Activity applicants as part of the project review and approval process:

1. The project proponent shall submit a vernal pool restoration/enhancement/preservation plan to the City for approval as part of the development review process and the draft plan shall be included as an attachment to the project's CEQA document provided to the City. The restoration/enhancement/preservation plan must be approved by the City prior to the City's issuance of a grading permit for the project, and will be implemented concurrent with project impacts. The restoration/enhancement/preservation plan shall include the following information and conditions:

    a. The vernal pool restoration/enhancement/preservation plans will utilize an ecosystem approach to avoidance, minimization, and mitigation measures (Leidy and White 1996; USFWS 1998). It will use a methodology for assessing the functions of the vernal pool ecosystems involved, and incorporate contemporary ecological principles into the development of avoidance and mitigation strategies and measures to be implemented.

    b. Implementation of the specified enhancement/restoration on the restoration/ enhancement/preservation site shall be conducted under the direction of a qualified biologist (vernal pool restoration specialist) with at least 3 years of vernal pool restoration experience, to be approved by the City.

    c. If the restoration/enhancement/preservation plan measures are to be implemented within or nearby to a Covered Activity construction site, impacts to any extant vernal pools in the area will be avoided or minimized by: all conservation measures required at the project construction site to avoid and/or minimize impacts to adjacent vernal pools and their watersheds shall also be implemented at the restoration site and thus specified in the restoration/enhancement/preservation plan.

    d. Vernal pools to be preserved and enhanced, as required by the by the City, will be required by the applicant to achieve the same success criteria or better as the restored pools and surrounding uplands. Evaluation of implementation of the restoration/enhancement/preservation plan in meeting these success criteria will be monitored by the applicant, with regular reporting to the City. Enhancement activities will include establishment/restoration of appropriate native vernal pool plant species within pools being enhanced, and restoration of appropriate upland natural communities (e.g., coastal sage scrub, native grassland, and/or chaparral) within the watershed of pools to enhanced. The measures to be implemented for the enhancement of these watershed areas will be informed by comparing the degraded watershed areas to similarly situated intact (un-degraded) areas of the same natural community . All plant material used for enhancement measures will be collected from local sources (i.e., close to the enhancement site) to the maximum extent practicable. Enhancement measures within vernal pools will include, to maximum extent feasible: redistribution of salvaged topsoil containing seeds, spores, bulbs, eggs, and other propagules from pools affected by Covered Activities ; salvage and redistribution of topsoil from Covered Activity affected site watersheds into vernal pool watersheds to be enhanced; translocation of propagules of individual native species from offsite vernal pools and watersheds; the use of commercially available native plant species; the use of

any vernal pool inoculum or plant material from an offsite source approved by the City, as long as collection/removal of such inoculum or plant material would not disturb intact vernal pools or associated watersheds. Topsoil and native plant materials from the intact natural communities to be affected on-site by Covered Activities will be salvaged and applied to/planted within the watersheds of the enhanced and restored pools to the maximum extent practicable. Exotic plant control shall be implemented within the vernal pool and watershed enhancement areas to protect and enhance the natural communities to remain on-site.

e. All restoration/enhancement/preservation activities shall commence the first summer-fall season prior to, or concurrently with, the initiation of Covered Activity project impacts that would affect vernal pools.

f. For each vernal pool required to be restored or enhanced, a record shall be kept of the exact restoration or enhancement-related activities and measures that occur at the site, which will include a discussion and a table outlining those activities and relevant details. The discussion and table shall also include the initial and planned conditions of the pools (e.g., basin size, average depth, ponding duration), existing native and nonnative cover from plants within the basins and watersheds, and presence/absence of listed species within the pools and/or watershed. This record will be provided to the City as part of regular monitoring reports from the applicant for measures implemented per the Standards.

g. All final specifications and topographic-based grading, planting, and watering plans provided to the City for review and approval per the Standards shall have 0.5-foot contours for the vernal pools, watersheds, and surrounding uplands (including adjacent mima mounds) at the restoration sites. The basis for this fine-scale resolution is the micro-depth (i.e., several inches) of the vernal pools that shall be restored. The grading plans shall also show the watersheds of extant vernal pools, and overflow water pathways that hydrologically connect the restored pools in a way that closely mimics natural vernal pool complex topography/hydrology.

h. A hydraulic analysis (i.e., surface and subsurface flow, where applicable) that evaluates and provides exhibits of each vernal pool proposed for restoration and its watershed, and hydrologic connections between the pools, is required. The activities associated with pools and their watersheds to be restored shall not cause impacts to the watersheds of any extant vernal pools, except where needed to establish hydrologic connections.

i. A geological analysis of the impervious soil layer or layers (e.g., hardpan) under pools to be enhanced or restored; each pool will be functionally evaluated for natural water holding edaphic conditions inherent to vernal pools, is required. The analysis will evaluate the related surface water storage in pool: the capacity of the pool basin to seasonally pond and retain surface water for natural duration periods. Such analysis will be provided to the City for review and approval. Vernal pools with functionally degraded soil impervious layer or layers will not be subject to restoration or enhancement without

previously demonstrated successful restoration of the impervious soil layer or layers to natural water holding conditions.

j. As a last resort (when sufficient inoculum from pools to be lost to Covered Activities is not available before initiation of project activities) and after approval by the City and Wildlife Agencies, additional inoculum from donor vernal pools (i.e., pools that are to remain intact and preserved) as close to the project site as possible may be used to supplement the inoculum collected at the project impact site. Donor pools shall be maintained intact, and potential impacts from salvage activities to these donor pools shall be minimized and offset through follow-up enhancement measures of affected donor pools. If inoculum is used for restoration and enhancement, the plan shall identify any proposed donor pools and include documentation that they are free of versatile fairy shrimp (*Branchinecta lindahli*). No more than 10 percent of the basin area of any donor pool shall be disturbed/used for collection of inoculum. Collection of inoculum from donor pools shall be coordinated with the Wildlife Agencies.

k. Inoculum and seeds/plants shall not be installed at pools to be restored/enhanced until the City has approved the vernal pool restoration site grading. All planting shall be installed in ways that mimic natural plant distribution (e.g., not in rows, appropriate density, diversity, and spacing with appropriate planting methods and establishment). Inoculum shall not be introduced into the restored or enhanced pools until after they have been demonstrated to retain water for the appropriate amount of time to support the targeted vernal pool species (i.e., at least 21 to 28 days for San Diego fairy shrimp or 30 to 60 days for Riverside fairy shrimp). If versatile fairy shrimp are detected in the restored or enhanced pools, inoculum shall not be introduced until appropriate measures to address versatile fairy shrimp are approved by the City. Inoculum shall be spread evenly over the surface of the pool, no more than 0.25 inch deep. If any ponding water is present at the time of soil inoculation, the soil shall only be placed on the wet soil adjacent to the currently ponded areas. Inoculum shall be placed into the bottoms of the restored/enhanced pools in a manner that preserves, to the maximum extent possible, the orientation of the fairy shrimp cysts and plant seeds within the surface layer of soil (e.g., collected inoculum shall be shallowly distributed within the pond so that cysts have the potential to be brought into solution upon inundation).

l. Plant palettes (species, size, and number/acre) and seed mix (species and pounds of pure-live seed/acre) for each area subject to restoration/enhancement, shall be included in the restoration/enhancement plan. The plant palette shall include native species specifically associated with the on-site natural community types to be restored/enhanced. Plant and seed utilized shall be from a local source to the maximum extent practicable. The source and proof of local origin of all plant material and seed shall be provided by the applicant to the City as part of compliance monitoring.

m. Native plants and animals shall be established within the restored/enhanced pools, their watersheds, and surrounding uplands. This can be accomplished by redistributing topsoil containing seeds, spores, bulbs, eggs, and other propagules from affected pools

and adjacent vernal pools and upland habitats (where allowed, per the above); by the translocation of propagules of individual species; and by the use of commercially available native plant species. Any vernal pool inoculum or plant material from an offsite source must be approved by the City. Topsoil and plant materials from the native habitats to be affected on-site shall be applied to the watersheds of the enhanced and restored pools to the maximum extent practicable. Exotic weed control shall be implemented within the restoration/enhancement areas to protect and enhance habitat remaining on-site.

n. In the event that natural rain is inadequate to support plant establishment, artificial watering of the restored/enhanced pools and their watersheds may be done upon approval by the City in order to establish plants but not hydrate shrimp. Any artificial watering shall be done in a manner that prevents ponding in the pools. Any water to be used shall be identified and documented to be free of contaminants that could harm the pools.

o. All weeding within and immediately adjacent to the enhanced/restored pools shall be performed by hand. All workers conducting weed removal activities shall be educated to distinguish between native and nonnative species so that local native plants are not inadvertently killed by weed removal activities.

p. All herbicide and pesticide use shall be under the direction of a licensed pest control advisor and shall be applied by a licensed applicator, under the supervision of a vernal pool restoration specialist. Glyphosate-based herbicides, such as RoundUp or Aquamaster, shall be applied on all areas that have been dethatched. Herbicide shall only be applied when wind speed is less than 5 miles per hour, and spray nozzles shall be of a design to maximize the size of droplets, to reduce the potential for drift of herbicide to non-target plants. A 10-foot buffer shall be maintained between concentrations of any sensitive plant species. Application of herbicide shall not occur if rain is projected within 24 hours of the scheduled application. When vernal pools are ponding or close to saturation, only hand herbicide application (i.e., saturated glove technique) shall be used in and around the edges of pools by specially trained herbicide applicators under the direct supervision of the vernal pool restoration specialist. When vernal pools are not ponding or close to saturation, herbicide may be sprayed but applicators must stay at least 3 feet from the edge of the pools.

q. A final implementation schedule shall be included that indicates when all vernal pool impacts, as well as vernal pool restoration/enhancement grading and planting, shall begin and end. A temporal loss of vernal pools shall be avoided by initiating the restoration work prior to or concurrent with impacts. This will minimize the length of time inoculum is kept in storage and ensure that there is appropriate habitat to translocate it to.

r. A minimum of 5 years of monitoring shall be conducted to ensure that success criteria are achieved. Success criteria for vernal pool and upland habitat restoration/enhancement areas shall include quantitative hydrological, vegetation

transects, fairy shrimp protocol surveys, or other measurements as approved by the City (e.g., viable cyst, hatched fairy shrimp, and gravid female measurements), floral and faunal inventories, and photographic documentation. To minimize impacts to the vernal pool's soil surface during restoration, enhancement, and monitoring, cobbles shall be oriented within the vernal pools to serve as stepping stones. Reference data shall be established from a vernal pool reference or control site located in the vicinity of the Santee. The vernal pool control sites shall be approved by the City.

s. Restoration success for fairy shrimp shall be determined by measuring the ponding of water, and density of viable cysts, hatched fairy shrimp, and gravid females, within the restored pools. Water measurements shall be taken in the restored pools to determine the depth, duration, and quality (e.g., pH, temperature, total dissolved solids, and salinity) of ponding. Dry samples shall be taken in the restored and reference pools to determine the density of viable cysts in the soils. Dry sampling shall occur in the first year of the restoration monitoring program to establish a baseline, and the last year to identify changes to viable cyst density. Wet samples shall also be taken in the restored and reference pools to determine the density of hatched fairy shrimp and gravid females. The pools shall pond during an average rainfall year at an appropriate depth and quality to support fairy shrimp. The hatched fairy shrimp and gravid female density of the restored pools shall not differ significantly ($p < 0.05$) from reference pools for, at least, three wet seasons before a determination of success can be made. The average viable cyst density of the restored pools shall not differ significantly ($p < 0.05$) from reference pools at the end of the monitoring period before a determination of success can be made. Vernal pools selected as reference or control pools for evaluating restoration success shall be identified and described in the restoration plan. Alternate methods of determining success may be used upon approval by the City.

t. To ensure that the construction and operation of the project do not adversely affect the vernal pools on-site, post-construction monitoring shall be conducted throughout the rainy season of an adequate rainfall year (i.e., at least 55 percent of average rainfall) to verify that avoidance measures were successful and determine whether the project is changing the hydrology of, or causing erosion and sediment delivery to, these vernal pools (based on pre-construction conditions). Monitoring shall occur for 3 years following project construction. In the event that sufficient rainfall to demonstrate adequate ponding does not occur during the 3 years following project construction, monitoring shall continue in 1-year increments, to a maximum of 5 years. A monitoring report shall be submitted to the City by September 1 following each monitoring season. The monitoring program shall be described in the final vernal pool restoration/ enhancement plan. If monitoring detects impacts to the adjacent vernal pools from construction and/or operation of the proposed project (e.g., from changes in hydrology) within the monitoring period, remediation shall be required.

u. Monitoring and success criteria for vernal pool and upland restoration/enhancement areas shall include native species richness and cover criteria for all 5 years of monitoring. Success criteria for weed cover shall be as follows: 0 percent cover for

perennial weed species categorized as High or Moderate in the Cal- IPC Invasive Plant Inventory, and cover of all other weed species is no more than 5 and 10 percent coverage in the pool basins and watersheds, respectively, for all 5 years of the monitoring period. Container plant survival success criteria shall be 80 percent of the initial plantings for the first 5 years. At the first and second anniversaries of plant installation, all dead plants shall be replaced unless their function has been replaced by natural recruitment. The method used for monitoring shall be described and a map of proposed sampling locations shall be included. Qualitative monitoring shall be conducted throughout each year, and shall include documentation at photo points. Quantitative botanical monitoring shall be conducted annually in April/May, and shall include transect and/or quadrat sampling.

v. Verification that restoration/enhancement of vernal pools is complete shall require written sign-off by the City. If a performance criterion is not met for any of the restored/enhanced vernal pools or upland habitat in any year, or if the final success criteria are not met, the project proponent shall prepare an analysis of the cause(s) of failure and, if deemed necessary by the City, propose remedial actions for approval. If any of the restored/enhanced vernal pools or upland habitat has not met a performance criterion during the initial 5-year period, the project proponent's maintenance and monitoring obligations shall continue until the City deem the restoration/enhancement successful. Contingency measures may be required by the City. Restoration/ enhancement shall not be deemed successful until success criteria are achieved. If contingency measures are required, restoration/enhancement shall not be deemed successful until at least 2 years after any required contingency measures are implemented, as determined by the City.

w. Annual reports shall be submitted to the City and Wildlife Agencies by October 1 of each year that assess both the attainment of yearly success criteria and progress toward the final success criteria. The reports shall also summarize the project's compliance with all applicable mitigation measures and permit conditions.

2. In the event that a new occurrence of a covered species is identified (i.e., previously undocumented) within an area to be impacted by a covered project or covered activity, mitigation shall be required in the form of salvage and restoration for the impact to the new occurrence. Mitigation shall occur consistent with Conditions 1 above.

1.6 Long-Term Management and Monitoring of Vernal Pool Habitats

The management and monitoring for vernal pools within protected open space will be completed by the applicant in a manner consistent with the methodologies established in the City of San Diego VPHCP (City of San Diego 2020). To assess the status and need for management actions, the City will ensure that the following standards will be implemented and monitored as part of Covered Activities:

- Annually identify threats (invasive species, trampling, OHV activity, etc.) to all pools monitored, as well as to overall watershed integrity. Implement actions as appropriate to prevent or reduce those threats, so as to effectively reduce the ecological risks and long-term impacts of artificial disturbances to vernal pools and the watersheds to be preserved.
- Prevent an average decline of at least one cover class of any covered plant species over 3 years for years having at least 55 percent average rainfall.
- Prevent a 20 percent decline in the density of the covered shrimp species over 3 years (average within complex).
- At complexes with 10 percent or greater average total nonnative species cover, prevent an increase in one cover class for nonnative cover over 3 consecutive years, regardless of rainfall.
- Maintain vernal pool watershed and hydrological network (i.e., inlet and outlet features) and water storage (maximum depth within +/-10 percent of baseline) functions.
- Reduce establishment, spread, and impact of biological stressors to vernal pools and their watersheds to be preserved.

The Subarea Plan and these Standard require the City to ensure the use a tiered three-level approach for adaptive monitoring and management of vernal pool complexes within conserved lands by Covered Activities with potential to affect vernal pools and/or their watersheds. The levels are linked to the standards listed above. Levels of monitoring and maintenance are assigned at the complex level based on evaluation of the existing habitat conditions and population status of the covered species within a complex. The objectives of complex-wide management and monitoring at each level are as follows:

- Level 1 – maintain existing natural community and habitat conditions for vernal pools species, and maintain vernal pool Covered Species subpopulations/occurrences within conserved vernal pool preserves. This level of management and monitoring considered basic stewardship.
- Level 2 – in addition to the above, stabilize vernal pool Covered Species subpopulation/occurrence status within vernal pool preserves by enhancing habitat and natural community conditions to a level that will likely support viable subpopulations/occurrences of Covered Species within conserved lands.
- Level 3 – restore natural community and habitat conditions to a level that will likely increase and, where appropriate, establish/re-establish vernal pool Covered Species so as to support viable subpopulations/occurrences within conserved vernal pool preserve lands.

The City will ensure as part of approvals of Covered Activities that the monitoring and management actions required at each level are determined by achievement of the Standards herein and Subarea Plan vernal pool requirements. The City will ensure that management levels will be implemented by Covered Activities across the affected vernal pool complexes, and applied to particular subpopulation/occurrence conditions within the complex. Covered Activity monitoring within a

vernal pool complex will occur so as to determine potential changes in the relevant ecological status of the vernal pool complex conditions. Specific triggers to be monitored linked to the vernal pool Standards herein are identified and described below. These triggers will determine an increase or decrease the management and monitoring level and thus the conservation measures and efforts required. The overall goal will be achieved if all relevant vernal pool natural community, habitat, and species-specific objectives of the Standards are accomplished and vernal pools and their watersheds are managed and monitored under the Subarea Plan and maintained at a Level 1 condition in perpetuity.

1.6.1 Monitoring Approach

The City will ensure that Covered Activities potentially affecting vernal pools and/or their watershed are effectively monitored. The tiered three-level monitoring approach required by the Standards will involve both qualitative and quantitative monitoring at vernal pool complexes that will be protected under the Subarea Plan. The City will ensure that monitoring will be the responsibility of the Preserve Manager identified by the Covered Activity applicant, and will be conducted by a qualified biologist that will follow the standard monitoring protocol provided by the City. Monitoring under the Plan for vernal pools will be coordinated by the City and Preserve Managers with regional efforts conducted by other entities (e.g., USFWS, San Diego Management and Monitoring Program).

Table G-2 provides an overview of the Subarea Plan vernal pool monitoring methods for Covered Activities, and the sample size for each level of monitoring (qualitative and quantitative). More detail is provided below on the required monitoring methods associated with each of the three monitoring levels. The decision to move to a different monitoring level is based on triggers directly tied to the standards.

Table G-2. Monitoring Methods, Frequency, and Sample Size

Survey Type	Frequency and Timing	Monitoring Method	Sample Size (based on Monitoring and Management Level)
Qualitative			
Threat assessment, pool inundation verification, and verification of fairy shrimp viability and reproduction	Three visits annually during wet season	Visual assessment.	All basins in complex (all Levels)
Quantitative			
Baseline hydrologic survey	One time (within 5 years of acquisition of conserved lands)	Measure maximum pool depth, pool inlet and outlet, and geomorphic setting of complex.	All basins in complex (all Levels)

Survey Type	Frequency and Timing	Monitoring Method	Sample Size (based on Monitoring and Management Level)
Covered plant surveys	Annually, spring	Collection of cover class data of each covered plant species and each nonnative plant species. Nonnative species shall be aggregated into one cover class estimate for comparison to the triggers. Individual nonnative species and problematic invasive exotics shall be listed on the monitoring form to direct management actions for nonnatives.	**Level 1:** 10% of occupied pools in each complex OR if complex has <10 pools for each covered species, survey at least one pool for each covered species known to occur **Level 2 and 3**: All pools in complex with covered plant species
Fairy shrimp density surveys	As-needed based on qualitative observations (see above)	Dry season sampling with genetic identification of cysts.	**Level 1:** Only conduct if a notable change to hydrology or other vernal pool functions is observed, that would trigger a Level 2 or 3 management response **Level 2:** Up to 10 pools or 10% of pools with covered shrimp species, whichever is greater **Level 3:** Up to 10 pools or 20% of pools with covered shrimp species, whichever is greater
Topographic disturbance assessment	As needed, if topographic and/or hydrologic disturbance is observed during qualitative monitoring	Maximum basin depth shall be measured, and inlet and outlet locations shall be recorded for comparison against baseline hydrologic data. If basin reconstruction is required to address topographic disturbance, then monitoring shall be performed to determine if restored hydrological function is achieved (measured by maximum pool depth and inlet/outlet location).	Topographically and/or hydrologically disturbed basins (all Levels)

Qualitative Monitoring

Qualitative monitoring corresponds to documenting observations during annual site visits, as well as incidental observations during management activities (e.g., weed control). Annual qualitative monitoring shall be conducted at vernal pools managed under the Subarea Plan, regardless of the designated monitoring level. General site assessment information shall be collected, including current or potential threats (such as invasive plants, dumping, OHV activity, and trampling), and

recommendations for management shall be generated. Each complex shall be assessed for the following conditions and threats:

- Fencing and Signage: The conditions of fencing or other site protection measures shall be checked to verify that the site is secured, and that appropriate signage is in place.
- Edge Effects: Each complex shall be inspected for edge effects from landscaping (irrigation runoff, invasive species, herbicide application, etc.), water drainage (water quality, increased ponding, etc.), dust production, dumping, and other issues within the complex or on adjacent properties.
- Fire and Fire Suppression: Evidence of fire or disturbance from fire suppression shall be evaluated for impacts to the site (loss of native habitat, weed invasion, erosion, etc.).
- Trespass: Each complex shall be inspected for signs of trespass or illegal OHV activity.
- Topographic Disturbance: Each complex shall be evaluated for topographic disturbance or altered hydrology from vehicle damage, illegal trespass, or other landscape-damaging impacts. The qualitative assessment of topographic disturbance shall evaluate the following:
    - Pool integrity and hydrologic function
    - Shape and size of the disturbance and the overall pool
    - Depth and duration of ponding
    - Need for hand work or mechanical equipment for repairs
    - Need for watershed analysis and/or microtopographic plans
- Invasive Species: A general assessment of nonnative plant and animal invasion shall be made during each qualitative survey for the vernal pool and upland areas. Observations of invasive plant species and invasive wildlife presence shall be noted.
- Inundation: A visual check for pool inundation shall be performed; inundation of at least 1.5 inches in depth shall be noted.
- Other: Any additional observed disturbances that could affect habitat quality shall be noted.

In addition, the overall disturbance category of the complex shall be identified, based on the disturbance categories defined in the HGM Manual (Bauder et al. 2009). The categories range from minimal/no disturbance to severe disturbance.

Qualitative surveys shall also evaluate the presence of fairy shrimp (visual survey) and verification of fairy shrimp viability and reproduction (i.e., observation of gravid females).

Visits should occur in the winter and spring seasons (generally February through May). Qualitative monitoring can be conducted in conjunction with the quantitative monitoring.

In addition to an annual threat assessment, each vernal pool complex shall be visited up to three times a year during the wet season to check for pool inundation. These visits shall be timed, when feasible, to occur following a large rain event when inundation of the pools is expected.

Quantitative Monitoring

Quantitative monitoring involves activities such as mapping and estimation of species cover, population size/density, and presence/absence at each complex. Quantitative monitoring requirements vary based on the three levels of monitoring, with higher levels collecting more data with greater precision to inform management actions. More data collection requires greater effort and cost. The sample size for covered plant and shrimp species monitoring will depend on the assigned monitoring level (see Table G-2).

Annual quantitative monitoring shall be conducted for vernal pools managed under the Subarea Plan. Surveys should be timed to coincide with the appropriate ecological conditions for the target species at a specific complex. For the covered plant species, timing should coincide with the optimal flowering time later in the season when detection and identification of both early and late vernal pool plant species are possible. For the covered shrimp species, cyst collection visits should occur during the dry season.

Monitoring for floral and faunal components shall be conducted from the pool margins so that trampling of vernal pool resources and the inadvertent transferring of vernal pool propagules (plant seeds and shrimp cyst) are minimized.

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Covered Shrimp Species Monitoring

Wet season sampling and/or dry season sampling of cysts with genetic identification to species shall be used to monitor the covered shrimp species.

An estimate of density for each covered shrimp species can be calculated as the number of cysts per volume of soil. The change in density can be tracked over time as an indicator of the population size of the pool. If the average cyst density is stable or increases across the occupied pools in a complex, it can be inferred that the population is stable or increasing at that complex. To verify that shrimp cysts are viable and that reproduction is occurring, a visual assessment during the wet season is required to observe hatched cysts and gravid females. These wet season verifications should be timed to occur in conjunction with inundation surveys performed as part of qualitative monitoring.

ed to observe hatched cysts and gravid females. These wet season verifications should be timed to occur in conjunction with inundation surveys performed as part of qualitative monitoring.

Sampling for shrimp cyst density and identification shall be done in accordance with the USFWS protocol, as modified by Andrew Bohonak, PhD, at San Diego State University (USFWS 1996; Bohonak and Simovich 2011), using the following guidelines:

- Samples shall be collected within 1.0 meter from each pool's lowest point where shrimp cyst densities are the highest.
- Set up two perpendicular transects so that they intersect in each pool's deepest spot, and one transect should pass over the pool's second deepest point.
- Five core samples (2 inches in diameter and 2 inches deep) shall be collected per pool as follows: one in the pool center, and one radiating out 1.0 meter in each of the four transect line directions, for a total of five samples per pool. The five samples shall be combined to determine the average density in the pool.
- The core samples shall be taken when each pool's sediments are completely dry at the surface and subsurface.
- Core samples should be processed in the laboratory using standard washing protocol and cysts shall be removed from the damp soil by trained personnel and inspected under a dissecting microscope.

If the average cyst density decreases across the occupied pools in a complex, it can be inferred that the covered shrimp population is decreasing at that complex. A reduction in shrimp population is likely the result of an indirect impact, such as change in pool inundation resulting from an impact to watershed hydrology or nonnative plant invasion. Thus, a decrease in a shrimp population would trigger additional monitoring, for instance to detect topographical or hydrological disturbance (Table G-3).

If topographic or hydrologic disturbance is observed in a vernal pool, then maximum basin depth shall be measured, and inlet and outlet locations shall be recorded for comparison against baseline hydrologic data. If topographic reconstruction is required, then monitoring shall be performed (Level 2 or 3) to determine if restored hydrological function achieves Subarea Plan vernal pool standard "E".

Covered Plant Species Monitoring

Monitoring shall include cover estimates within the pool basins containing covered plant species, using a modification of cover classes taken from the California Native Plant Society's (CNPS) plant cover methodology, following the McEachern et al. (2006) MSCP rare plant monitoring protocol. With the modified CNPS methodology that will be used under the VPHCP, some cover classes have been combined (the cover classes <1, 1–5 and 5–10 percent are combined into one cover class <10 percent, and cover classes of 50–75 percent and 75+ percent are combined to one cover class of 50+ percent) because the resolution of the cover classes below 10 and above 50 percent are not necessary to inform management decisions (e.g., need for weed control or remedial seeding). Therefore, estimated absolute percent cover of each covered plant species in a pool is grouped in the following classes to track changes in cover over time to inform management decisions: <10, 10–

25, 25–50, 50+ percent. Use of this modified class system allows for valuable data collection without the time required for other types of vegetation assessments (transects, plot-frames, etc.). In addition to the covered plant species, other native and nonnative vegetative cover can be estimated with this modified CNPS class system.

vered plant species, other native and nonnative vegetative cover can be estimated with this modified CNPS class system.

At Monitoring Level 1, quantitative monitoring shall be performed on all vernal pool up to 10 pools and a subset of the vernal pools beyond 10 pools containing covered plant species at each applicable complex. Using the CNPS cover class system described above, 10 percent of the vernal pools with covered plant species shall be assessed quantitatively. If a complex has less than 10 pools for a particular covered species, survey shall take place for at least one pool where that covered species is known to occur. Only the covered species shall be assessed in each pool. Pools in a given complex with more than one covered species shall be preferentially chosen to reduce the total number of pools required for sampling. These intentionally chosen pools are considered sentinel pools. If all covered plant species in a complex do not co-occur in the same pools, the remaining needed pools shall be chosen randomly in each complex to meet the 10 percent criterion. The sentinel pools and the randomly chosen pools shall then be sampled every year to provide greater precision in changes observed in cover class estimates. While not random, the use of sentinel pools with multiple covered plant species, as well as the use of permanent sampling, shall increase the efficiency and precision of monitoring at Level 1.

itoring at Level 1.

At Levels 2 and 3, monitoring shall be conducted in all vernal pools occupied by covered plant species. At Levels 2 and 3, the covered plant species are declining (Level 2) or extirpated (Level 3) from a complex. Therefore, more intensive monitoring of occupied, or previously occupied, pools is necessary to determine the cause of the population decline and to determine where management actions should be focused.

1.6.2 Management Approach

The tiered monitoring program described above will be used to evaluate site conditions for each complex managed under the Subarea Plan to determine the appropriate management level.

Rainfall amounts will determine whether the vernal pool flora and fauna are adequately expressed to determine covered species population status. The benchmark for annual survey assessments comparable to the Subarea Plan standards shall be 55 percent of the average rainfall for the City of San Diego, as recorded at Gillespie Field weather station. According to the HGM approach, approximately 55 percent of normal rainfall should be considered the minimum to express the full ecological parameters required for vernal pools in southern California (Bauder et al. 2009). For the Subarea Plan, the minimum rainfall required for adequate assessments is 55 percent of average rainfall for the appropriate region for the period of July through June. The 55 percent of average rainfall years do not need to be sequential. Quantitative monitoring shall be conducted annually,

regardless of rainfall; however, only those years with 55 percent average rainfall will be compared to the Subarea Plan vernal pool standards.

Management Action Triggers

The required management level (Level 1, 2, or 3) for each complex managed under the Subarea Plan is determined by evaluating monitoring results against the Subarea Plan vernal pool standards. The triggers to move between management levels are outlined in Table G-3.

Table G-3. Quantitative Management Triggers

Management Trigger	Monitored Vernal Pool Resource	Monitoring Observation Compared to VPMMP Standards
A- (Level 1 to Level 2)	Covered Plant Species	An average decline of one cover class for any covered plant species present in the pools assessed over 3 years with adequate rainfall, **OR** An average increase of one cover class in combined nonnative cover in the vernal pools over 3 years, regardless of rainfall. This trigger only applies to complexes with at least 10% total nonnative cover.
	Covered Shrimp Species	A 20% decline in species density in the covered shrimp species present in the pools assessed over 3 years.
	Hydrologic Function	A change in the vernal pool hydrological network (i.e., inlet and outlet features) and water storage function such that the maximum depth of ponding is changed (increased or decreased) by more than +/-10% but less than +/-20% from the baseline recorded for the basin.
A+ (Level 2 to Level 1)	Covered Plant Species	An average increase of one cover class for ALL target covered plant species present in the pools assessed over 3 years with adequate rainfall, **OR** An average decrease of one cover class in combined nonnative cover in the vernal pools over 3 years, regardless of rainfall.
	Covered Shrimp Species	A 20% increase in species density in the covered shrimp species present in the pools assessed over 3 years.
	Hydrologic Function	Through active restoration and enhancement (i.e., topographic recontouring), a reestablishment of the baseline vernal pool hydrological network and water storage function to within +/-10% of the baseline recorded for the basin.
B+ (Level 2 to Level 3)	Covered Plant Species	An average decline of two cover classes for any covered plant species present in the pools assessed over 3 years with adequate rainfall, **OR** An average increase of two cover classes in combined nonnative cover in the vernal pools over 3 years, regardless of rainfall. This trigger only applies to complexes with at least 10% total nonnative cover.
	Covered Shrimp Species	A 40% decline in species density in the covered shrimp species present in the pools assessed over 3 years. Additionally, if a complex has remained at Level 2 for 3 years with at least 55% of average rainfall, the complex would be elevated to Level 3 monitoring and management.

Management Trigger	Monitored Vernal Pool Resource	Monitoring Observation Compared to VPMMP Standards
	Hydrologic Function	A change in the vernal pool hydrological network (i.e., inlet and outlet features) and water storage function such that the maximum depth of ponding is changed (increased or decreased) by +/-20% or more from the baseline recorded for the basin.
C- (Level 1 to Level 3)	Covered Plant Species	An average decline of two cover classes for any covered plant species present in the pools assessed over 3 years with adequate rainfall, **OR** An average increase of two cover classes in combined nonnative cover in the vernal pools over 3 years, regardless of rainfall. This trigger only applies to complexes with at least 10% total nonnative cover.
	Covered Shrimp Species	A 40% decline in species density in the covered shrimp species present in the pools assessed over 3 years. Additionally, if a complex has remained at Level 2 for 3 years with at least 55% of average rainfall, the complex would be elevated to Level 3 monitoring and management.
	Hydrologic Function	A change in the vernal pool hydrological network (i.e., inlet and outlet features) and water storage function such that the maximum depth of ponding is changed (increased or decreased) by +/-20% or more from the baseline recorded for the basin.
C+ (Level 3 to Level 1)	Covered Plant Species	An average increase of two cover classes for ALL target covered plant species present in the pools assessed over 3 years with adequate rainfall, **OR** An average decrease of one cover class in combined nonnative cover in the vernal pools over 3 years, regardless of rainfall.
	Covered Shrimp Species	A 40% increase in species density in the covered shrimp species present in the pools assessed over 3 years with at least 55% of average rainfall.
	Hydrologic Function	Through active restoration and enhancement (i.e., topographic recontouring), a reestablishment of the baseline vernal pool hydrological network and water storage function to within +/-10% of the baseline recorded for the basin.

Management Actions

Management levels will be assigned to each complex under the Subarea Plan based on a review by the Preserve Manager of available quantitative and qualitative data to site-specific management needs, and will be reviewed and approved by the City of Santee.

Level 1 is considered the stewardship-level requirement for monitoring and management. A complex will remain at Level 1 in perpetuity unless the Management Triggers to move to Level 2 or Level 3 are met. Because of seasonal climate variability and resulting effects on the expression of both invasive species (weed germination, flowering, and seed-set; dispersal of invasive animals; etc.) and covered species (plant germination, flowering, and seed- set; shrimp hatching, development,

and reproduction; etc.), management activities shall be applied for a minimum of 3 years for Level 2 and 5 years for Level 3. If, after 3 or 5 years of implementation of Management Level 2 or Level 3, respectively, the complex is not achieving the Subarea Plan vernal pool standards to elevate to the next management level, then the respective management level will continue to be implemented until the standards are achieved.

The following describes the overall desired activity for each management level. General management activities that will be required at each Management Level are described in Table G-4.

Management Level 1

The objective of Level 1 is to maintain existing habitat conditions and existing covered species population status. Level 1 complexes are deemed functioning at an acceptable to optimal condition. The required management actions are expected to result in maintenance of those conditions. In general, the management can be characterized as stewardship where little maintenance is needed to achieve the habitat and species-level objectives. It is assumed that routine access patrol and enforcement will occur at all Level 1 sites. Access patrol visits shall occur annually, at a minimum, at each site, or more frequently (e.g., monthly, weekly) as deemed appropriate by the City.

Level 1 sites. Access patrol visits shall occur annually, at a minimum, at each site, or more frequently (e.g., monthly, weekly) as deemed appropriate by the City.

Management Level 2

The objective of Level 2 is to stabilize habitat conditions and covered species populations. Level 2 complexes are deemed functioning at an unacceptable condition and are perceived as declining in habitat quality and/or covered species persistence. In general, the management can be characterized as enhancement where maintenance is needed to achieve the habitat and species-level objectives. Management Level 2 includes all activities listed for Management Level 1, plus the additional activities listed in Table G-4. The required management actions are expected to result in an improvement in those conditions to Level 1.

Management Level 3

The objective of Level 3 is to restore habitat conditions and covered species populations. Level 3 complexes are deemed highly degraded and need restoration to meet the habitat and species objectives of the Subarea Plan. Management Level 3 includes all activities listed for Management Level 1, plus the additional activities discussed in Table G-4. The required management actions are expected to result in an improvement in those conditions to Level 1.

Where required, project-specific vernal pool restoration plans for Level 2 or 3 sites will be consistent with the general requirements outlined in the Subarea Plan vernal pool policy, as applicable. A vernal pool restoration/enhancement plan will be prepared for approval by the City and Wildlife Agencies.

Table G-4. Management Actions by Level

Level	Management Action	Management Requirement

Level	Management Action	Management Requirement
Level 1	Trash and Debris Removal	All complexes will be kept free of trash and debris through annual or as-needed removal.
	Fencing and Signage Maintenance	Every complex will be protected with site-appropriate fencing, vehicle barriers, and/or other access controls. Any complex without adequate protection will be fenced or protected by other types of access barriers. Status of access restrictions will be documented as part of the qualitative monitoring. If problems are identified, recommendations for repair or replacement will be made and implemented (e.g., replacement of locks, gates, signs, or fence repairs).
	Edge Effects Maintenance	Recommendations for addressing edge effects that are noted during qualitative monitoring will be implemented. This may include changes in irrigation designs or schedules, modification of landscape species, erosion-control measures, dust-suppression measures, and other adaptive efforts. If problems are being caused by adjacent land use and management, the City or other land manager will contact adjacent property owners/managers to address the issues.
	Fire and Fire Suppression Damage Repair	If a complex is affected by fire, there are general expectations for recovery and invasion by weeds. Following a fire, quantitative data should be carefully evaluated to identify short- and long-term impacts. Any damage resulting from fire suppression (fencing damage, vehicle damage, contamination from fire suppressant chemicals, etc.) will be addressed immediately.
	Trespass Damage Repair	During qualitative assessment, any signs of trespass will be assessed for damage. Unauthorized trails will be closed and signage installed, where appropriate. Damage that alters hydrology will be assessed and measures will be implemented to resolve the problem.
	Topographic Disturbance Repair	Qualitative assessment of topographic and/or hydrologic disturbance will include recommendations for repair measures, as appropriate. If damage occurs during the wet season, it may be necessary to postpone repair measures until the site is dry. Minor topographic damage (e.g., footprints, small tire ruts) will be repaired with hand tools.
	Covered Vernal Pool Weed Control	Covered Vernal Pool Weed Control Level 1 (two visits per spring) will be performed in vernal pools occupied by covered species to maintain acceptable nonnative cover levels.
	General Weed Control	The purpose of General Weed Control Level 1 (two visits per spring) is to target invasive nonnative species identified during qualitative monitoring in non-covered species vernal pools and/or associated upland watersheds. The primary goals are to prevent spread of invasive nonnative species into covered species pools and eradicate problematic invasive species upon detection.
Level 2	Trash and Debris Removal	Same as Level 1.

Level	Management Action	Management Requirement
	Fencing and Signage Maintenance	Same as Level 1.
	Edge Effects Maintenance	Same as Level 1.
	Fire and Fire Suppression Damage Repair	Same as Level 1.
	Trespass Damage Repair	Same as Level 1.
	Topographic Reconstruction	Moderate topographic disturbance that affects pool integrity, ponding potential (depth and duration), or overall size will require microtopographic repair involving mechanized equipment and hand work. Where necessary, ponding characteristics, flow patterns, and other hydrological functions will be reestablished to within ±10% of the baseline conditions (as determined during the baseline hydrogeological surveys). These involve measuring maximum basin depth and inlet and outlet locations using a laser transit. Baseline hydrologic data will be used to guide management decisions to repair observed topographic and/or hydrologic disturbance and restore hydrologic function. A more detailed plan may be necessary for grading if equipment is used. tions using a laser transit. Baseline hydrologic data will be used to guide management decisions to repair observed topographic and/or
	Dethatching	Dethatching is recommended prior to other types of weed control. Although some complexes may require weed control without dethatching, this will be evaluated on a complex-by-complex basis. For example, dethatching is not needed to treat invasive forbs at a complex with limited thatch. For most complexes, dethatching will be applied to the basins and in a 20-foot (on average) watershed buffer around each basin. The actual buffer for each vernal pool will be determined on a site-specific basis, based on weed conditions. Thatch and nonnative seed control is important for both the pool and the upland watershed, as the watershed can be a major source of weed seed and nonnative thatch input. conditions. Thatch and nonnative seed control is important for both the pool and the upland watershed, as the watershed can be a major
	Covered Vernal Pool Weed Control	Covered Vernal Pool Weed Control Level 2 (two visits per spring) will be conducted in vernal pools with covered species plus an average 20-foot watershed buffer. An average 20-foot buffer around a pool is approximately equivalent to a 5:1 watershed-to-vernal pool area ratio (based on the average size of vernal pools managed under the Subarea Plan that have Covered Species). Management of the upland watershed habitat at this ratio is considered appropriate when the site needs stabilization of habitat and covered species populations. The actual buffer for each vernal pool will be determined on a site-specific basis, based on weed conditions. Weed control includes all aspects of invasive plant control such as hand weeding, mechanical weeding, and herbicide use.
	General Weed Control	Same as Level 1 except three visits per spring.
	Seed Collection, Bulking, and Redistribution	At Management Level 2, the seed bank is assumed intact but may be declining for certain covered species. Seed collection, bulking, and redistribution may be implemented for declining covered plant species to enhance existing covered species seed banks.

Level	Management Action	Management Requirement
	Shrimp Cyst Collection and Reinoculation	If quantitative monitoring indicates a decline in density of one or both covered fairy shrimp species, additional monitoring will be necessary to determine the cause of population decline (e.g., hydrological disturbance resulting from edge effects). Once the cause is addressed, shrimp cyst soil may be collected from other occupied pools in the same complex for reinoculation into impacted pools. Shrimp cyst soil will only be collected from pools that do not contain versatile fairy shrimp. Cyst collection from offsite sources may be considered if the potential cyst bank on-site is gone or too limited for collection.
Level 3	Trash and Debris Removal	Same as Level 1.
	Fencing and Signage Maintenance	Same as Level 1.
	Edge Effects Maintenance	Same as Level 1.
	Fire and Fire Suppression Damage Repair	Same as Level 1.
	Trespass Damage Repair	Same as Level 1.
	Pool Restoration	Existing pools will be restored where needed to increase the population of covered species in a complex. Restored pools will not impact the watersheds of extant pools except as appropriate to establish hydrological connections between restored and extant pools (see topographic reconstruction below).
	Topographic Reconstruction	Extensive topographic disturbance that affects pool integrity, ponding potential (depth and duration), or overall size will require microtopographic repair involving mechanized equipment and hand work. Where necessary, ponding characteristics, flow patterns, and other hydrological functions will be reestablished using hand tools and/or equipment, as appropriate. Hydrological function must be reestablished to within +/-20% of the baseline conditions to elevate from Management Level 3 to Management Level 2, and within +/-10% of the baseline conditions to elevate to Management Level 1. A more detailed plan may be necessary for grading if equipment is used. 3 to Management Level 2, and within +/-10% of the baseline conditions to elevate to Management Level 1. A more detailed plan
	Dethatching	Same as Level 2, except assume an average 35-foot watershed buffer around each pool.

Level	Management Action	Management Requirement
	Covered Vernal Pool Weed Control	Covered Vernal Pool Weed Control Level 3 (four visits per spring) will be conducted on the vernal pools with covered species plus a 35-foot watershed buffer. An average 35-foot buffer around a pool is approximately equivalent to a 10:1 watershed-to-vernal pool area ratio (based on the average size of vernal pools managed under the Subarea Plan that have covered species). Management of the upland watershed habitat at this ratio is considered appropriate when the site needs stabilization of habitat and covered species populations. The actual buffer for each vernal pool will be determined on a site-specific basis, based on weed conditions. Weed control includes all aspects of invasive plant control such as hand weeding, mechanical weeding, and herbicide use.
	General Weed Control	The purpose of General Weed Control Level 3 (four visits per spring) is to target invasive nonnative species identified during qualitative monitoring in non-covered species vernal pools and/or associated upland watersheds. The primary goals are to prevent spread of invasive nonnative species into covered species pools and eradicate problematic invasive species upon detection.
	Seed Reintroduction	At Management Level 3, certain covered species may be absent from the seed bank. Seed will be collected from offsite genetically appropriate populations, bulked in a greenhouse, and redistributed to restore covered species seed banks.
	Shrimp Cyst Collection and Reinoculation	Same as Level 2.
	Container Plant Production/Installation	Under Management Level 3, container plant production will be conducted for the annual covered plant if timing is appropriate.

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Exhibit A – List of Indicator Species for Vernal Pools

Based on:

U. S. Army Corps of Engineers (USACE). 1997. Indicator Species for Vernal Pools. U.S. Army Corps of Engineers, Los Angeles District. Regulatory Branch. November.

FLORAL LIST

Apiaceae

- *Eryngium aristulatum* var*. parishii Eryngium armatum*
- *Eryngium vaseyi*
- *Eryngium pendletonensis* sp*. nova (Pendleton)*
- *Eryngium* sp*. nova (San Quintin)*

Asteraceae

- *Belnnospermum nanum*
- *Hemizonia perennis*
- *Lasthenia glabrata* ssp*. coulteri*
- *Psilocarphus brevissiums*
- *Psilocarphus oregonus*
- *Psilocarphus tenellus*

Boraginaceae

- *Plagiobothrys acanthocarpus*
- *Plagiobothrys bracteatus*
- *Plagiobothrys stipitatus*
- *Plagiobothrys undulatus*
- *Plagiobothrys leptocladus*

Brassicaceae

- *Sibara virginica*
- *Lepidium latipes*

Callitrichaceae

- *Callitriche heterophylla*
- *Callitriche marginata*
- *Callitriche verna*
- *Campanulaceae*
- *Downingia bella*
- *Downingia cuspidata*
- *Downingia concolor* var*. brevior*

Crassulaceae

- *Crassula aquatica*

Elatinaceae

- *Bergia texana*
- *Elatine californica*
- *Elatine chilensis*

Hydrophyllaceae

- *Nama stenocarpum*

Isoetaceae

- *Isoetes howellii*
- *Isoetes orcuttii*

Juncaginaceae

- *Lilaea scilloides*

Lamiaceae

- *Pogogyne abramsii*
- *Pogogyne nudiuscula*
- *Pogogyne douglasii*
- *Pogogyne serpylloides*

Limnanthaceae

- *Limnanthes gracilis* ssp*. Parishii*

Malvaceae

- *Malvella leprosa*

- *Marsileaceae*
- *Marsilea vestita*
- *Pilularia americana*

Onagraceae

- *Epilobium pygmaeum*

Plantaginaceae

- *Plantago bigelovii*

Poaceae

- *Alopecurus saccatus*
- *Deschampsia danthonioides*
- *Orcuttia californica*
- *Phalaris caroliniana*
- *Phalaris lemmonii*
- *Phalaris paradoxa*
- *Hordeum intercedens*

Polemoniaceae

- *Navarretia fossalis*
- *Navarretia prostrata*

Primulaceae

- *Centunculus minimus*

Ranunculaceae

- *Myosurus minimus*
- *Myosurus minimus* var. *apus*
- *Myosurus minimus* var. *filiformis*

Scrophulariaceae

- *Mimulus latidens*

Solanaceae

- *Petunia parviflora*

Verbenaceae

- *Verbena bracteata*

FAUNAL LIST

Anostraca

- *Branchinecta sandiegonensis*
- *Branchinecta lindahli*
- *Branchinecta lynchii*
- *Linderiella* sp.
- *Streptocephalus woottoni*

Cladocera

- *Alona cf. diaphana*
- *Ceriodaphnia dubia*
- *Daphnia magna*
- *Daphnia rosea*
- *Macrothrix hirsuticornis*
- *Moina micrura*
- *Scapholebris cf.rammneri*
- *Simocephalus* sp.

Chenopodiaceae

- *Atriplex coronata* var. *notatior*

Copepoda

- *Acanthocyclops robustus*
- *Acanthocyclops vernalis*

Cyperaceae

- *Eleocharis acicularis*
- *Eleocharis macrostachya*

Juncaceae

- *Juncus bufornius*

Lythraceae

- *Rotala ramosior*

Ostracoda

- *Bradleycypris* sp.
- *Cypria pustulosa*
- *Cypriconcha* sp.
- *Cypridopsis vidua*
- *Cypris pubera*
- *Cypris virens*
- *Eucypris* sp.
- *Herpetocypris* sp.
- *Heterocypris* sp.
- *Lymnocythere* sp.
- *Potamocypris* sp.
- *Prionocypris* sp.
- *Pseudoilcypris* sp.

Themidaceae

- *Brodiaea orcuttii*
- *Brodiaea terrestris* var. *kernensis*

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Appendix H
Preserve Resource Management Plan (RMP) Outline

The City and/or the Preserve Managers will prepare a Resource Management Plan (RMP) for each Preserve or Preserve complex consistent with the requirements of the Subarea Plan. The RMPs will be prepared utilizing the general format presented below as guidance:

RESOURCE MANAGEMENT PLAN – SAMPLE TABLE OF CONTENTS

1. Preserve Complex Description and History (provide a summary of resources on site, maps and a brief description of history of land; ownership; past management; surrounding environment)

1.1. Geographic and functional setting and regional ecological significance

- Name of preserve or preserve complex
- Location within Santee Subarea Plan Area and SDMMP Management Unit (MU)
- Relationship to core areas and linkages of Subarea Plan and SDMMP Management Strategic Plan (MSP)
- Relationship to Subarea Plan Managed Preserve and existing protected open space.
- Preserve or preserve complex location within watershed and hydrologic processes
- Level of fragmentation within region of Subarea Plan Area and MU
- Jurisdiction, land owners, and management agencies for preserve or preserve complex
- Role of MU and contributions of preserve or preserve complex to this MU (vegetation community, species, connectivity)—relationship to Subarea Plan and regional goals and objectives

1.2. Biological Resources

- Summary of baseline surveys and/or Rapid Ecological Assessment
- Table of (potential) Subarea Plan covered species in preserve or preserve complex by MSP management category and priority; context with regional populations; map of species locations where available
- Table of acreages by natural community in preserve or preserve complex and natural community map, depending on which map best suits a given preserve or preserve complex (preserve-specific mapping, Subarea Plan vegetation database, SANDAG (1995) or SANDAG (2012)).
- Connectivity with other preserves and protected open space
- Primary threats and stressors for preserve or preserve complex

1.3. Management and Monitoring Strategy

- Summary and vision statement
- Biological priorities and priority management actions
- Authorized land uses and potential conflicts
- Preserve-level and regional-level monitoring strategy

2. Area-specific Management Directives and Timeline for the Preserve Complex (Goals, Objectives, and Implementation Action/Tasks[1])

Goals are broad, concise, visionary statements that set overall direction for monitoring and management. They state the desired future conditions of the preserve, but do not define measurable units. Objectives are concise statements of what we want to achieve, how much we want to achieve, when and where we want to achieve it, and who is responsible for the work. They should be "Specific, Measurable, Achievable, Results-oriented, and Time-fixed". Implementation Strategies are specific actions, tools and techniques, including monitoring, used to meet the objectives.

Example:

Vegetation Goal: Maintain the grassland onsite as open grassland to maximize its use as foraging and nesting habitat for grassland dependent species, including the burrowing owl.

Objective: The land manager will manage 195 acres of grassland vegetation such that the height is on average no greater than 6 inches across the Property.

Implementation Action/Task: Maintain vegetation height at approximately 6 inches and reduce overall density by instituting a cattle grazing program.

You may have more than one goal, objective, or task for each category – outline below can be expanded or contracted as necessary. The following is a list of suggested goals, however it is not meant to be limiting, in addition, some goals (e.g. Cultural) may not be relevant to some sites.

Objectives to consider, including but are not limited to, vegetation mapping, invasive species mapping, weed control, and restoration. An example of the first objective: Every five years, update vegetation map of the preserve complex and assess the identified changes in terms of Goal 1 targets to guide management decisions.

2.1. Vegetation Communities Goal(s)

- Vegetation Objectives
- Vegetation Implementation Tasks

To achieve this objective the first Implementation Task might be: Complete a refined vegetation map for the property utilizing the Vegetation Classification Manual for Western San Diego County. Vegetation mapping should be a minimum mapping appropriate to the level of management required and scale of the preserve complex.

If enhancement or restoration is identified as an implementation task, be sure to include recommended techniques (e.g., burn, graze, herbicide, mechanical, planting, seeding); success criteria; monitoring methods; and contingency measures.

2.2. Specific Animal Species Goal(s)

- Animal Objectives
- Animal Implementation Tasks

[1] The USFWS's Handbook uses the term "strategies," but the terminology of actions or tasks is acceptable

In this section, include all the species specific management and monitoring tasks that are needed to meet the species goals. Objectives to consider include, but are not limited to: baseline surveys/inventories; mapping and maintenance of suitable habitat; and species specific management and monitoring

2.3. Specific Plant Species Goal(s)

- Plant Objectives
- Plant Implementation Tasks

In this section include all the species specific management and monitoring tasks that are needed to meet the species goals. Objectives to consider including, but are not limited to: baseline surveys/inventories; mapping and maintenance of suitable habitat; and species specific management and monitoring.

2.4. Coordination Goal(s) (adjacent land mangers)

- Coordination Objectives
- Coordination Implementation Tasks

An example of a coordination objective: Land manager will coordinate grazing actions, fire management and public access controls with the adjacent landowners. To achieve this objective the first Implementation Task might be: Land manager will meet at least annually with adjacent property owners to coordinate grazing actions, fire management and public access control

2.5. Property Stewardship Goal(s) (patrol, fencing, access control, trash)

- Stewardship Objectives
- Stewardship Implementation Tasks

This section should address:

Existing fencing/gates and fencing/gate needs Existing signage and signage needs
Trail maintenance needs Facility maintenance
Measures to reduce impacts of fragmentation and edge effects Preserve Enforcement

2.6. Fire Management Goal(s)

- Fire Objectives
- Fire Implementation Tasks

This section should identify:

Primary response Fire agency Meeting Schedule
Phone numbers
Sensitive areas/Species to avoid
Location of Species that might benefit from fire Staging areas
Fuel management needs Road conditions/needs
Pre, during and after fire actions and associated contacts at each agency

2.7. Cultural Resources Goal(s)

- Cultural Objectives
- Cultural Implementation Task

2.8. Public Outreach, Education, Research Goal(s)

- Outreach Objectives
- Outreach Implementation Tasks

2.9. Program Administration and Reporting Goal(s)

- Administration Objectives
- Administration Implementation Tasks

This section should address data entry, storage, review, and reporting (e.g annual reports; work plans); review and updates to the management plan; contingency measures; etc.

3. Adaptive Management

4. Staffing, Management Costs and Funding

This section should include an estimate of annual costs (e.g. results of Property Record Analysis or similar documented estimation), staffing needs, potential sources of funding as known

APPENDICES

A. Rapid Assessment Results with respect to Natural Communities and Species Goals and Objectives
   - Biological Inventory (if available)
   - Management priorities for vegetation communities relative to Subarea Plan Area, MU and regional goals
   - Management priorities for species, within the context of the Subarea Plan Area, MU and region
   - Connectivity priorities
   - Hydrologic processes
   - Primary threats and stressors

B. Land Use History and Physical Characteristics
   - Onsite land uses (previous and ongoing)
   - Management history
   - Existing facilities and fencing
   - Adjacent land uses and parcelization
   - Fire history
   - Cultural features
   - Geology and soils
   - Hydrology

C. Technical resource documents and data sources

Appendix I
Invasive Nonnative Plant Species List

Table I-1. Zero Tolerant Invasive Nonnative Species

Scientific Name	Common Name
Aegilops triuncialis	Barbed goat grass
Acacia spp.	Acacia
Agrostis avenacea	Pacific bent grass
Ailanthus altissima	Tree of heaven
Alternanthera philoxeroides	Alligator weed
Arundo donax	Giant reed
Asphodelus fistulosus	Onion weed
Atriplex semibeccata	Austrian saltbush
Brachypodium distachyon	Purple falsebrome
Brassica tournefortii	Sahara mustard
Carduus pycnocephalus	Italian thistle
Carpobrotus spp.	Iceplant
Carrichtera annua	Ward's weed
Centaurea calcitrapa	Purple star thistle
Centaurea solstitialis	Yellow star thistle
Chasmanthe floribunda	African corn flag
Cirsium vulgare	Bull thistle
Conium maculatum	Poison hemlock
Cortaderia spp.	Pampas grass
Cynara cardunculus	Artichoke thistle
Cytisus scoparius; C. striatus	Scotch and Portuguese brooms
Delairea odorata	Cape ivy
Dipsacus sativas	Fuller's teasel
Dittrichia graveolens	Stinkwort
Echium candicans	Pride-of-Madeira
Ehrharta calycina; E. erecta; E. longiflora	Veldt grasses
Elymus caput-medusae	Medusahead
Eucalyptus spp.	Eucalyptus
Euphorbia virgata	Leafy spurge
Ficus carica	Edible fig
Foeniculum vulgare	Fennel
Fraxinus uhdei	Shamal ash
Genista monspessulana	French broom
Glebionis coronaria	Crown marigold

Scientific Name	Common Name
Hedera helix	English ivy
Hydrilla verticillata	Hydrilla
Hypericum canariense	Canary Island St. John's wort
Iris pseudacorus	Yellow flat iris
Lepidium latifolium; L. draba	Pepperweed
Limonium ramosissimum	Algerian sea lavender
Lythrum salicaria	Purple loosestrife
Melenis repens	Natal grass
Myoporum laetum	Myoporum
Oncoshiphon pilulifer	Stinknet
Onopordum acanthium	Scotch thistle
Osteospermum spp.	African daisy
Oxalis pes-caprae	Bermuda buttercup
Pennisetum setaceum	Fountain grass
Phalaris aquatica	Harding grass
Phalaris paradoxa	Paradox canary grass
Phoenix canariensis	Canary Island date palm
Retama monosperma	Bridal broom
Ricinis communis	Castor bean
Rubus armeniacus	Himalaya blackberry
Schinus molle; S. terrebinthifolius	California and Brazilian pepper trees
Senecio linearifolius var. linearifolius	Fireweed
Sesbania punicea	Scarlet wisteria
Silybum marianum	Blessed milk thistle
Sorghum halepense	Johnson grass
Spartium junceum	Spanish broom
Tamarix spp.	Tamarisk/salt cedar
Vinca major	Periwinkle
Washingtonia robusta	Mexican fan palm
Yucca gloriosa	Spanish dagger
Zantedeschia sp.	Cala lily

Sources:

California Invasive Pest Council (www.cal-ipc.org)

San Diego Department of Weights and Measures (Weed Management Area: Invasive Weed Watch) https://www.sandiegocounty.gov/content/sdc/awm/ipm_sdwma.html

Dendra Inc., California Invasive Pest Council and Conservation Biological Institute. 2012 *Management Priorities for Invasive Non-native Plants A Strategy for Regional Implementation San Diego County, California.*